GROTH CORPORATION®
a Continental Disc company

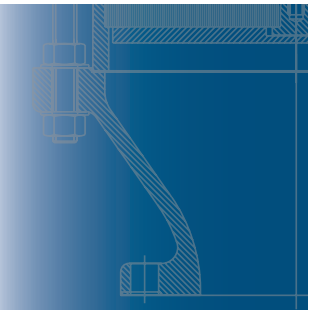
WASTEWATER BIOGAS CATALOG

SMART RELIEF...SAFE SOLUTIONS℠

SAFETY DEVICES THAT PROTECT EQUIPMENT, LIVES & THE ENVIRONMENT

COMPANY OVERVIEW

GROTH CORPORATION

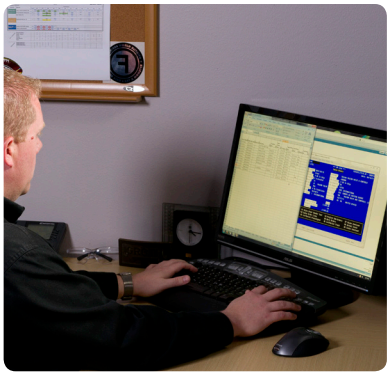


Groth Corporation

Groth Corporation, formerly Groth Equipment Corporation, was founded by Edward Groth on August 1, 1960 and incorporated on September 7th that same year. Groth began as a manufacturers' representative, distributor, and re-manufacturer of pressure relief valves sold to the refining and petrochemical industries. In 1999, Groth Corporation joined Continental Disc Corporation and moved to its current Stafford, Texas manufacturing site in 2002. These two events strengthened Groth's position as a global leader in low pressure safety solutions.

Today, Groth is a global leader in low pressure safety equipment with representatives around the world, providing engineered solutions with uncompromising commitment to customer satisfaction.

Groth industrial products are comprised of independent product lines, classified as: Pressure/Vacuum Relief Valves, Blanket Gas Regulators and Flame Arresters.



OUR EXPERTISE & DEVOTION

When ordering from Groth Corporation, you can be assured that our expertise and devotion to quality will translate into efficiency and safety, and that our every effort will demonstrate our commitment to provide innovative solutions, quality products, and comprehensive service.

We pride ourselves in providing this expertise to the following industries:

- Biogas Processing
- Chemical
- Equipment
- Food & Beverage
- OEM
- Oil & Gas
- Pharmaceutical
- Transportation
- Utilities
- Wastewater

as well as many others.

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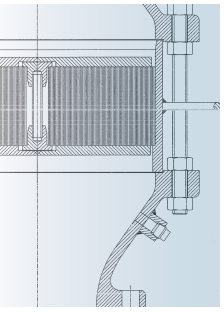
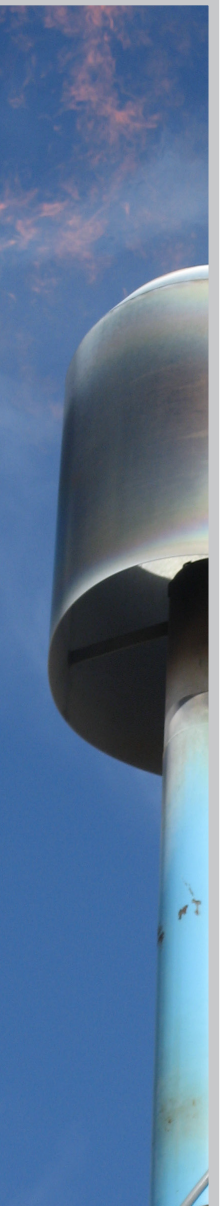
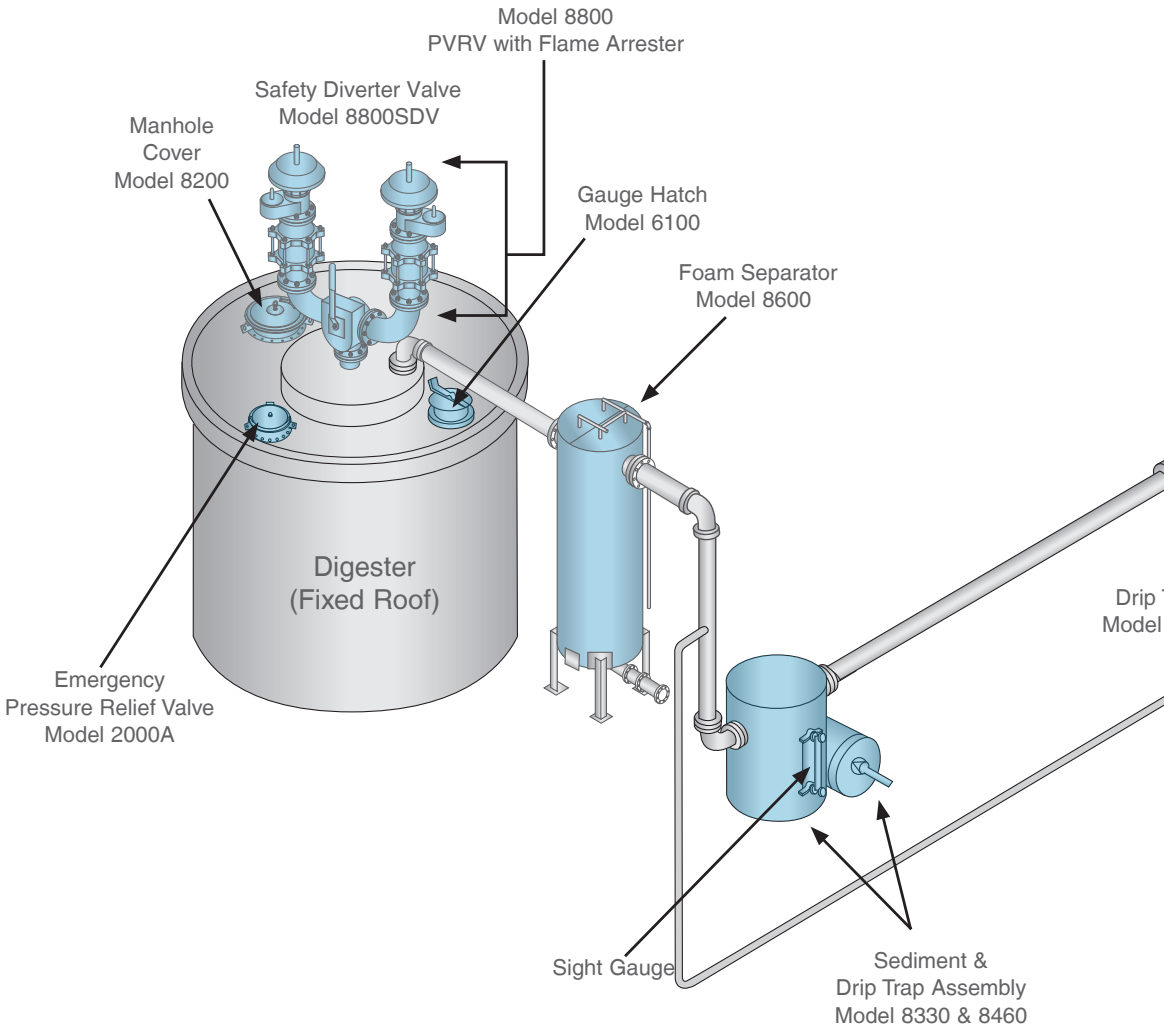
TYPICAL FLOW AND INSTALLATION DIAGRAM S

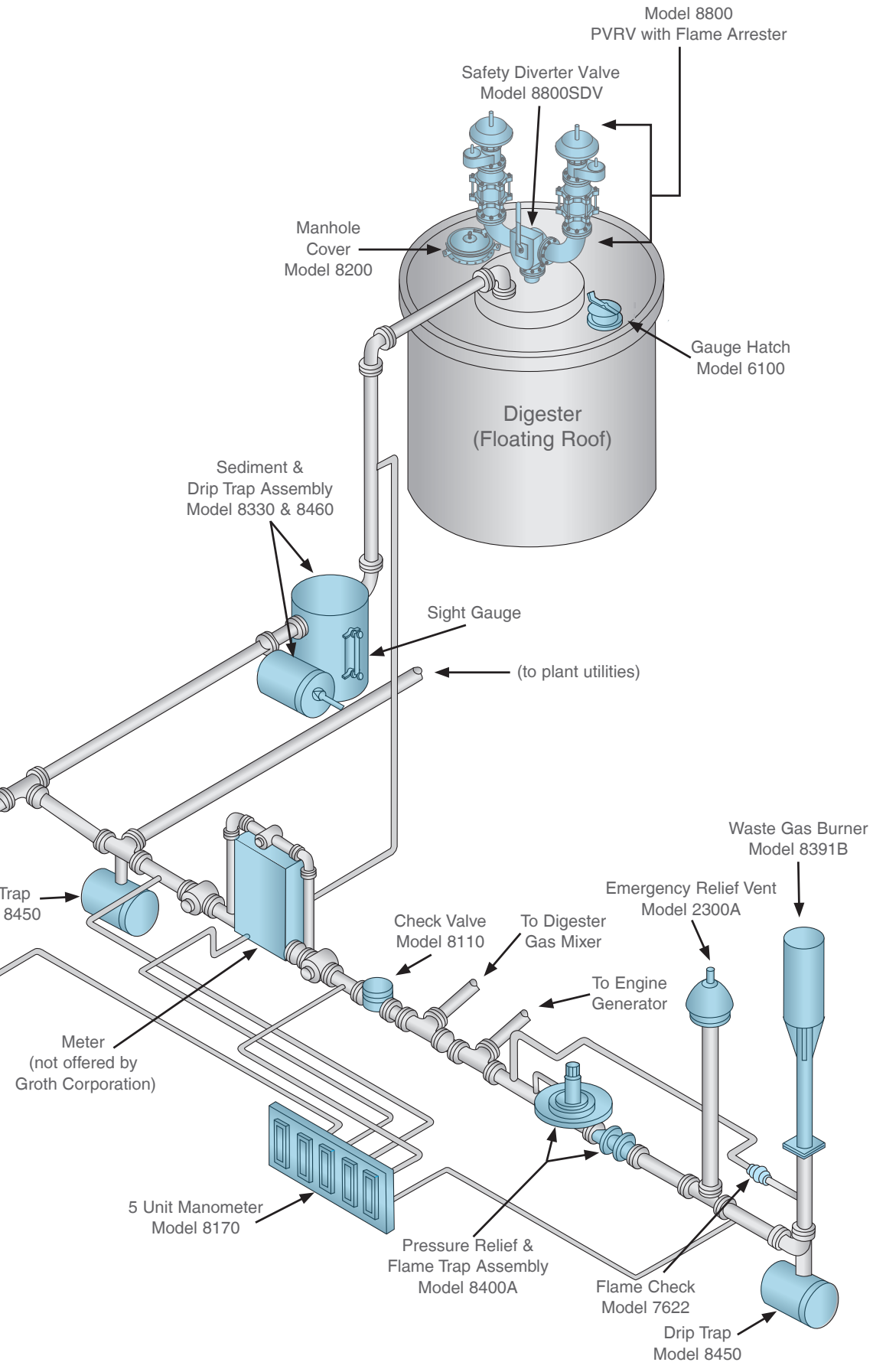
This schematic is for general presentation purposes only and is not intended to represent a specific design. Please consult the Groth Corporation Biogas catalog or visit www.grothcorp.com for complete product information.

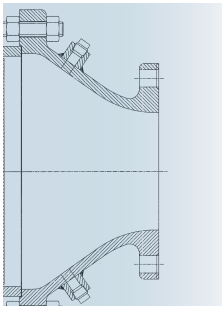


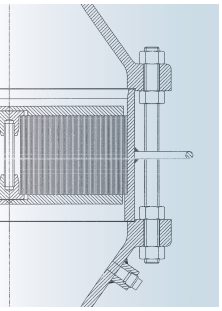




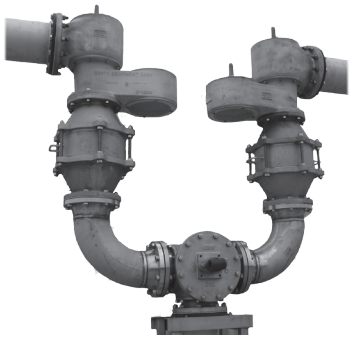
SHOWING A MULTIPLE DIGESTER GAS SYSTEM







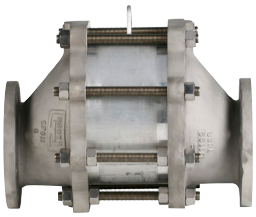
DIGESTER COVER EQUIPMENT



Model 8800SDV
Safety Diverter Valve
- Provides a quick and easy way for valve changeover
- Allows a no-interruption process
- Easy and safe maintenance with no down time

Models 8800A & 8820A
Pressure Relief & Vacuum Breaker Valve with Flame Arrester
- Protects tank from damage created by overpressure or excessive vacuum
- Provides protection from externally caused sources of heat & ignition
- Proven spiral wound, crimped ribbon flame element

Model 7618 // Vertical
Model 7628 // Horizontal
Flame Arresters
- Units designed for quick and easy cleaning and maintenance
- Protects the system from externally caused sources of heat and ignition for increased fire protection and safety



Model 8200
Roof Manhole Cover
- Non-sparking and gas-tight
- Provides quick and easy access
- Uniform surface seating
- Limited maintenance required

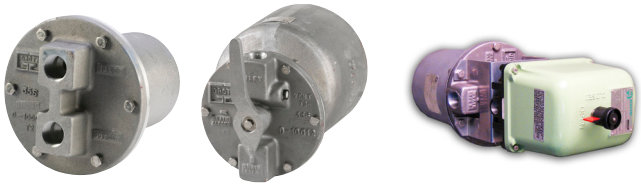
Model 6100
Sample and Gauge Hatch
- Assures uniform seating
- Incorporates a positive cover lockdown to assure a tight seal

GAS SAFETY AND CONTROL EQUIPMENT

Model 8330 // Sediment Trap
Model 8331 // Condensate Accumulator
- Removes excess water and sediment
- Quick and easy cleaning is facilitated by removing top cover
- Available with flanged connections as standard
- Drip trap and sight glass attach quickly
- Optional high and low level alarm switches

Model 8600
Foam Separator
- Eliminates foam
- Removes particles
- Continuous water spray systems
- High and low level alarms

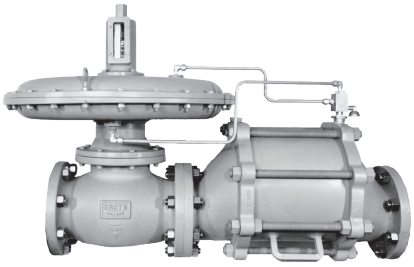
GAS SAFETY AND CONTROL EQUIPMENT



Model 8450 // Automatic
Model 8460 // Manual
Model 8490 // Electrically Actuated

Drip Traps

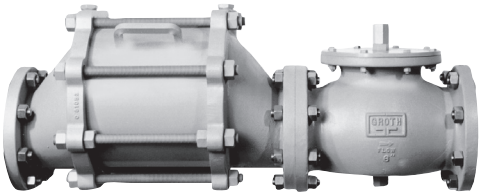
- Provides safe removal of liquids from the low point in gas control line
- Designed for quick opening and maintenance
- Easily attaches to Groth Corporation sediment trap for extra efficiency



Model 8400A

Pressure Relief & Flame Trap Assembly

- Maintains upstream pressure, allowing only surplus gas to flow downstream
- Field adjustable set pressure
- Integral thermal valve stops gas flow when flashback is sensed at the flame arrester
- Easy to maintain



Model 8500A

Flame Trap Assembly

- Unit protects against flame propagation into upstream piping
- Unit composed of horizontal flame arrester and thermal operated shut-off valve
- Valve has low temperature fusible type element to shut off flow in event of a flashback
- Element may be replaced without disassembly of valve

Model 2300A

Pressure Relief Vent

- Corrosion-resistant construction
- Self-closing air cushion pallet with center stabilizing stem and peripheral guidance provides uniform seating and alignment

Model 8391B // Waste Gas Burner
Model 8392B // Flame Front Generated Ignition
Model 8393B // Fully Enclosed

- Includes an automatic ignition system
- Reliable downdraft prevention for wind protection
- Provides proper air/fuel mixture to ensure efficient burn
- Wind shield controls outside winds up to 150 mph and operates efficiently in heavy rain
- Flame retention vortex vanes vastly improve burning efficiency
- Quick, easy maintenance

Model 7622

Flame Check

- Easy disassembly to replace or clean screens
- High flow capacity
- Element of perforated plates provide minimum pressure drop and still prevent flashbacks in pilot lines

Model 8170

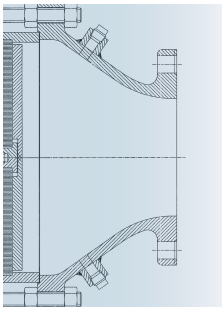
Manometer

- Solid acrylic assembly with shatter-proof tube and scale protect against dust, dirt and rain
- Any number of tubes may be mounted side-by-side
- Long-lasting and designed for easy cleaning and maintenance

Model 8110

Back Pressure Check Valve

- Allows full flow with low working pressure
- Easy maintenance by quickly removing cover and replacing pallet
- Variety of materials available
- Flanged connection standard



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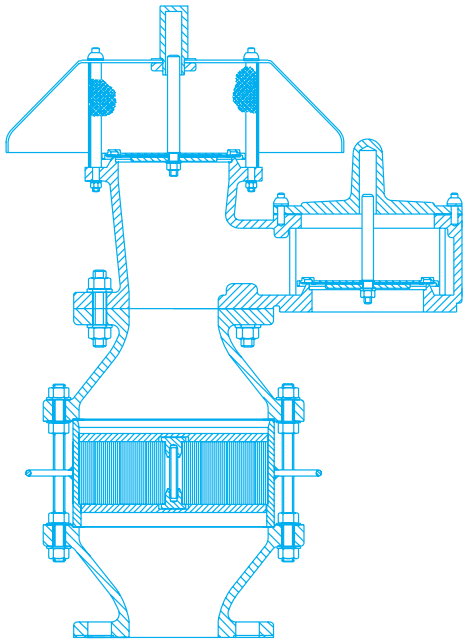
Pressure Relief and Vacuum Breaker Valve with Flame Arrester
Model 8800A

MODEL 8800A USED ON DIGESTERS AND GAS HOLDERS

A combination of the Groth Model 1200A pressure relief and vacuum breaker vent and Groth Model 7618 flame arrester make up the Model 8800A unit. The superior Buna-N seating diaphragms are standard on the valve to insure extra tight sealing to prevent sludge vapors from escaping. Self draining housing body and drip rings protect seating surface from condensate freezing. Groth flame bank utilizes the spiral wound, crimped ribbon constructed flame element. These elements provide the best flame quenching performance for the least pressure drop. All Groth flame arresters are factory leak tested at 15 psig.



FEATURES

- Sizes 2” (50 mm) through 12” (300 mm)
- Pressure settings 1 InWC to 30 InWC
- Vacuum settings 1 InWC to 30 InWC
- Available in aluminum (type 356-T6), 316 stainless steel and other materials
- Factory Mutual approved flame arrester
- Proven spiral wound, crimped ribbon flame element

BENEFITS

Protects against over pressure, over vacuum, and deflagrations preventing damage to tanks, pipeline, and other process equipment

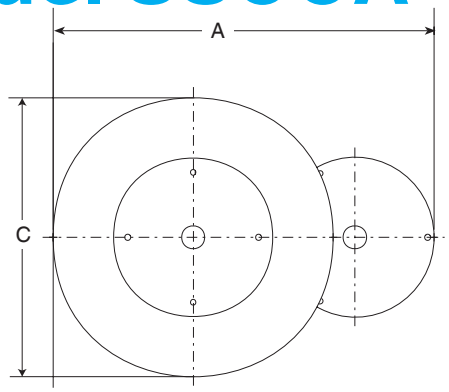
OPTIONS

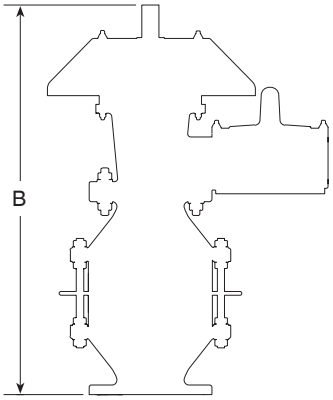
- All weather coating
- Insulation jackets
- Bug screens
- Stem/pallet proximity switches
- Incremental weights for setting adjustment

END-OF-LINE

- Gas Group: NEC D, IEC IIA
- Operating Temperature <= 140°F (60°C)
- Pre-Ignition Pressure = Atmosphere

Pressure Relief Capacity
Model 8800A





SPECIFICATION TABLE • MODEL 8800A

Specifications subject to change without notice.
Certified dimensions available upon request.

Inlet Flg◊	Max. Setting Weight Loaded	Min. Setting Weight Loaded	A Length (Metric)	B Height (Metric)	C Width (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
2” (50 mm)	30 InWC	0.87 InWC	13.63” (346 mm)	27” (685 mm)	9.50” (241 mm)	35 (16 kg)
3” (80 mm)			18” (457 mm)	29.63” (752 mm)	11.50” (292 mm)	45 (20 kg)
4” (100 mm)			19.75” (500 mm)	34.63” (879 mm)	13” (330 mm)	70 (32 kg)
6” (150 mm)			28.75” (730 mm)	43.25” (1099 mm)	19” (480 mm)	125 (57 kg)
8” (200 mm)			36” (914 mm)	51.38” (1305 mm)	23.63” (600 mm)	210 (95 kg)
10” (250 mm)			42” (1067 mm)	58.88” (1495 mm)	30.75” (781 mm)	350 (160 kg)
12” (300 mm)			48.50” (1232 mm)	65.38” (1661 mm)	35.75” (908 mm)	500 (227 kg)

◊150# ASME drilling compatibility, F.F. on aluminum and R.F. on stainless steel alloys.
Consult factory for other settings. Above 27.68 InWC set requires a spacer.
SS set weights-Consult factory.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # ☐☐☐☐☐ --- SIZE ☐☐ --- MATERIAL ☐☐☐☐ --- OPTIONS ☐☐☐

- MODEL #: 8800A Weight Loaded
- SIZE: 02” Thru 12”
- MATERIAL:
  - Flame Element Material
  - Pallet Material
  - Seat Material
  - * Body Material
  - 1 = Aluminum
  - 5 = 316 SS
  - Z = Special
- OPTIONS:
  - O = No Options
  - Z = Special Options
  - O = No Options
  - Diaphragm Material (Seat):
    - B = Buna-N
    - T = TEFLON®
    - Z = Special

NOTES
- Include model number and setting when ordering.
- * Stainless steel guides, stems are standard with aluminum bodies.

EXAMPLE

8 8 0 0 A — 0 2 — 1 1 5 1 — B 0 0

Indicates a 2” Model 8800A with Aluminum Body and Seat, 316 SS Pallet, Buna-N Seat Diaphragm, Aluminum Flame Element and no other options.

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Pressure Relief Capacity
Model 8800A

Set Pressure (Ps)		Air Flow Capacity at 100% Over-pressure (Double Set Pressure) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4"(100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.87	0.50	3.01	5.98	10.7	21.5	34.8	55.2	62.3
1.00	0.58	3.29	6.68	12.0	24.2	39.2	62.1	72.0
1.73	1.00	4.56	9.70	17.6	36.3	58.4	92.0	112
2.00	1.16	4.96	10.7	19.3	39.9	64.2	101	125
2.60	1.50	5.76	12.6	22.7	47.2	75.9	120	148
3.00	1.73	6.26	13.7	24.8	51.7	82.9	131	163
3.46	2.00	6.79	15.0	27.1	56.4	90.5	143	178
4.00	2.31	7.36	16.3	29.5	61.5	99.0	155	195
6.00	3.47	9.20	20.6	37.3	78.1	125	197	249
8.00	4.62	10.9	24.3	44.0	92.2	148	233	295
10.0	5.78	12.3	27.6	50.0	105	168	264	335
12.0	6.93	13.6	30.6	55.4	116	186	293	372
15.0	8.66	15.4	34.6	62.8	132	211	332	422
20.0	11.60	18.0	40.7	73.7	155	248	390	497
25.0	14.40	20.4	46.0	83.5	175	281	442	563
30.0	17.30	22.6	50.9	92.4	194	311	489	623

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-pressure.

Read the flow capacity at 100% over-pressure directly from the table above. Use linear interpolation if the set pressure is not listed.

If the allowable over-pressure is less than 100%, modify the flow capacity using the appropriate "C" factor from the table.

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

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

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

Example—To find "C" factor from table:
Read "C" factor for 75% Over-pressure at intersection of row **70** and column **5**
"C" factor at 75% OP = **0.87**

"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	0.91	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

For over-pressure less than 50%, consult factory.

Example—Flow Capacity Calculation

6" Model 8800A
4 InWC set pressure [P_s]
7 InWC flowing pressure [P_f]

1. Read flow capacity at set pressure from table
2. Calculate over-pressure
3. Read "C" factor from table
4. Calculate flow capacity

Flow = 61,500 SCFH
% OP = [(7 - 4)/4] x 100 = 75%
"C" = 0.87
Flow = 0.87 x 61,500 = 53,505 SCFH

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.

S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Pressure Relief Capacity
Model 8800A

Set Pressure (Ps)		Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.09	0.18	0.32	0.64	1.04	1.65	1.91
50	4.90	0.14	0.30	0.55	1.13	1.82	2.87	3.53
75	7.35	0.18	0.39	0.70	1.46	2.35	3.70	4.62
100	9.80	0.21	0.46	0.83	1.74	2.80	4.40	5.53
150	12.3	0.26	0.58	1.06	2.21	3.55	5.59	7.05
200	19.6	0.31	0.69	1.25	2.61	4.19	6.59	8.35
250	24.5	0.35	0.78	1.42	2.97	4.76	7.48	9.50
300	29.4	0.39	0.87	1.57	3.29	5.27	8.30	10.5
375	36.8	0.44	0.98	1.78	3.73	5.98	9.41	12.0
500	49.0	0.51	1.15	2.09	4.39	7.02	11.0	14.1
625	61.3	0.58	1.30	2.36	4.97	7.96	12.5	15.9
750	73.5	0.64	1.44	2.62	5.50	8.80	13.8	17.6

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% overpressure.

Consult Factory for flow capacity with fiberglass valve.

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.

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

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

Example—To find "C" factor from table:
Read "C" factor for 67% overpressure at intersection of row **60** and column **7**
"C" factor at 67% OP = **0.82**

"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—Flow Capacity Calculation

6" Model 8800A
150 mmWC Set Pressure [P_s]
250 mmWC Flowing Pressure [P_f]

1. Read flow capacity at set pressure from table
2. Calculate overpressure
3. Read "C" factor from table
4. Calculate flow capacity

Flow = 2,210 NCMH
% OP = [(250 - 150)/150] x 100 = 67%
"C" = 0.82
Flow = 0.82 x 2,210 = 1,812 NCMH

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Vacuum Relief Capacity
Model 8800A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4"(100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.87	0.50	2.55	5.19	8.80	17.9	28.6	44.3	53.6
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	89.8
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	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	11.60	14.7	33.1	55.1	116	184	282	381
25.0	14.40	16.6	37.5	62.3	131	209	319	432
30.0	17.30	18.3	41.5	68.9	145	231	353	478

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

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.

Calculate the percentage over-vacuum by the following formula. Note that all pressures are gage 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.

Example—To find "C" factor from table:
Read "C" factor for 75% Over-pressure at intersection of row **70** and column **5**
"C" factor at 75% OP = **0.87**

"C" Factor Table										
%OV	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

For over-vacuum less than 50%, consult factory.

Example—Flow Capacity Calculation

6" Model 8800A
4 InWC set vacuum [P_s]
7 InWC flowing vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 46,700 SCFH
2. Calculate over-vacuum — % OV = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 46,700 = 40,629 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.

S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Vacuum Relief Capacity
Model 8800A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Normal Cubic Meters per Hour at 0° C						
mm WC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.07	0.15	0.26	0.52	0.84	1.29	1.60
50	4.90	0.12	0.25	0.42	0.87	1.39	2.13	2.78
75	7.35	0.14	0.32	0.53	1.11	1.77	2.72	3.59
100	9.80	0.17	0.38	0.63	1.32	2.09	3.21	4.27
150	14.7	0.21	0.48	0.79	1.66	2.64	4.05	5.42
200	19.6	0.25	0.56	0.93	1.95	3.11	4.76	6.40
250	24.5	0.28	0.63	1.05	2.21	3.53	5.40	7.27
300	29.4	0.31	0.70	1.17	2.45	3.90	5.97	8.06
375	36.8	0.35	0.80	1.32	2.78	4.42	6.77	9.10
500	49.0	0.41	0.93	1.55	3.26	5.19	7.94	10.7
625	61.3	0.47	1.06	1.76	3.69	5.87	8.98	12.2
750	73.5	0.52	1.17	1.94	4.08	6.50	9.90	13.5

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-vacuum.

Consult Factory for flow capacity with fiberglass valve.

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.

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**

"C" Factor Table										
%OV	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—Flow Capacity Calculation

6" Model 8800A
150 mm WC Set Vacuum [P_s]
250 mm WC Flowing Vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 1,660 NCMH
2. Calculate over-vacuum — % OV = [(250 - 150)/150] x 100 = 67%
3. Read "C" factor from table — "C" = 0.82
4. Calculate flow capacity — **Flow = 0.82 x 1,660 = 1,361 NCMH**

GROTH CORPORATION
a Continental Disc company

Pressure Relief & Vacuum Breaker Valve With Flame Arrester
Model 8820A

PRESSURE / VACUUM RELIEF VALVE WITH FLAME ARRESTER (PIPE-AWAY)

The Model 8820A combination units are used for pressure and vacuum relief where vapors must be piped away. They are designed to protect your tank from damage created by overpressure or excessive vacuum, at the same time that they provide protection from externally caused sources of heat and ignition. The result is reduced emissions level and increased fire protection and safety.

FEATURES

- Sizes 2" (50 mm) through 12" (300 mm)
- Pressure settings 1 InWC to 30 InWC
- Vacuum settings 1 InWC to 30 InWC
- Available in aluminum (type 356-T6), 316 stainless steel and other materials
- Factory Mutual approved flame arrester
- Proven spiral wound, crimped ribbon flame element

SPECIAL FEATURES

The Model 8820A Pressure/Vacuum Relief Valve with flanged pipe-away outlet offers Groth's special "cushioned air" seating. Superior performing Buna-N seating diaphragms are standard to minimize sticking caused by condensate from vapors and atmospheric moisture. Self draining housings and drip rings protect seating surfaces from condensate freezing. TEFLON®, Viton® and other seating diaphragms can be provided when required.

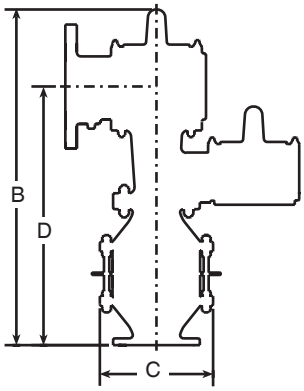
All Groth flame arresters utilize spiral wound, crimped ribbon constructed flame elements. These proven, Factory Mutual approved elements, provide the best flame quenching performance for the least pressure drop. Factory Mutual regulates that flame arresters be installed less than 10 diameters from the source of ignition. Groth flame arresters are pneumatic tested to 15 psig as standard.

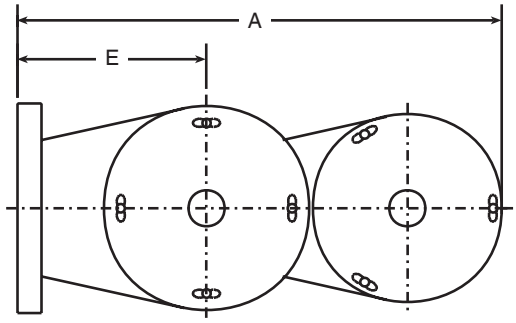
BENEFITS

Protects against over pressure, over vacuum, and deflagrations preventing damage to tanks, pipeline, and other process equipment.

END-OF-LINE	IN-LINE
(Flanged Outlet with or without Discharge Piping) • Gas Group: NEC D, IEC IIA • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure = Atmosphere • Discharge Piping Length <= 10 pipe diameters	• Gas Group: IEC IIA1, Methane (includes most Biogas applications) • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure <= 1 psig • Run-up Length <= 50 pipe diameters (2") • Run-up Length <= 20 pipe diameters (3") • Run-up Length <= 10 pipe diameters (4" – 12")

Pressure Relief Capacity
Model 8820A





Specifications subject to change without notice. Certified dimensions available upon request.

Inlet Flg.◊ (Metric)	Max. Set Outlet Flg.◊ (Metric)	Max. Set Pressure Weight Loaded	Min. Vacuum Weight Loaded	Setting Weight Loaded	A Length (Metric)	B Height (Metric)	C Width (Metric)	D (Metric)	E (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
2″ (50 mm)	3” (80 mm)	11 oz/in² (48.2 gm/cm²)	12 oz/in² (52.7 gm/cm²)	*0.5 oz/in² WEIGHT LOADED (2.20 gm/cm²)	14-1/4” (361 mm)	26-5/8” (676 mm)	8-3/4” (221 mm)	20-1/4” (514 mm)	5-1/2” (140 mm)	45 (20 kg)
3” (80 mm)	4” (100 mm)	13 oz/in² (57.0 gm/cm²)	11 oz/in² (48.3 gm/cm²)		18” (457 mm)	31-1/8” (790 mm)	9-1/2” (241 mm)	23-1/8” (588 mm)	6” (152 mm)	60 (27 kg)
4” (100 mm)	6” (150 mm)	16 oz/in² (70.3 gm/cm²)	11 oz/in² (48.3 gm/cm²)		19-1/4” (489 mm)	37” (940 mm)	11-1/2” (292 mm)	26-3/4” (679 mm)	6-1/2” (165 mm)	90 (41 kg)
6” (150 mm)	8” (200 mm)	16 oz/in² (70.3 gm/cm²)	16 oz/in² (70.3 gm/cm²)		26-1/2” (673 mm)	44-3/4” (1136 mm)	16-1/2” (419 mm)	31-1/2” (800 mm)	8-1/2” (216 mm)	160 (73 kg)
8” (200 mm)	10” (250 mm)	16 oz/in² (70.3 gm/cm²)	16 oz/in² (70.3 gm/cm²)		32-1/2” (826 mm)	53-1/2” (1358 mm)	21” (533 mm)	37-3/8” (949 mm)	10-3/4” (273 mm)	270 (123 kg)
10” (250 mm)	12” (300 mm)	16 oz/in² (70.3 gm/cm²)	16 oz/in² (70.3 gm/cm²)		37-1/4” (959 mm)	64-1/2” (1638 mm)	24-3/4” (629 mm)	45-1/4” (1149 mm)	12-1/2” (318 mm)	420 (190 kg)
12” (300 mm)	14” (350 mm)	16 oz/in² (70.3 gm/cm²)	16 oz/in² (70.3 gm/cm²)		42-3/4” (1086 mm)	71-5/8” (1819 mm)	28-5/8” (727 mm)	50-1/8” (1273 mm)	15” (381 mm)	600 (273 kg)

† 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.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # □□□□□ — SIZE □□ — MATERIAL □□□□ — OPTIONS □□□

MODEL #: 8820A Weight Loaded

SIZE: 02″ Thru 12″

MATERIAL:
- * Body Material
- Seat Material
- Pallet Material
- Flame Element Material

1 = Aluminum
5 = 316 SS
Z = Special

OPTIONS:
- O = No Options
- Z = Special Options

- O = No Options
- 2 = Special Options

Diaphragm Material (Seat):
B = Buna-N
T = TEFLON®
Z = Special

NOTES
- Include model number and setting when ordering.
- For special options, consult factory.
- * 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 — B 0 0

Indicates a 2” Model 8820A with Aluminum Body and Seat, 316 SS Pallet, Aluminum Flame Element, Buna-N Diaphragm, and no other options.

GROTH CORPORATION
a Continental Disc company

Pressure Relief Capacity
Model 8820A

Set Pressure (Ps)		Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
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 is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% overpressure.

Consult Factory for flow capacity with fiberglass valve.

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.

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

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

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**

"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	0.91	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—Flow Capacity Calculation

6" Model 8820A
4 InWC set pressure [P_s]
7 InWC flowing pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 58,000 SCFH
2. Calculate overpressure — % OP = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 58,000 = 50,460 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.

S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Pressure Relief Capacity
Model 8820A

Set Pressure (Ps)		Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.08	0.17	0.31	0.62	0.96	1.53	1.80
50	4.90	0.14	0.29	0.52	1.07	1.65	2.62	3.28
75	7.35	0.17	0.37	0.67	1.38	2.12	3.37	4.27
100	9.80	0.20	0.44	0.80	1.64	2.52	4.01	5.11
150	14.7	0.26	0.55	1.01	2.08	3.19	5.07	6.51
200	19.6	0.30	0.65	1.19	2.46	3.76	5.98	7.70
250	24.5	0.34	0.74	1.35	2.79	4.27	6.79	8.75
300	29.4	0.38	0.82	1.50	3.10	4.73	7.52	9.70
375	36.8	0.43	0.93	1.70	3.51	5.36	8.53	11.0
500	49.0	0.50	1.09	2.00	4.12	6.29	10.0	13.0
625	61.3	0.57	1.23	2.26	4.67	7.13	11.3	14.7
750	73.5	0.63	1.36	2.50	5.17	7.89	12.5	16.3

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% overpressure.

Consult Factory for flow capacity with fiberglass valve.

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.

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

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

Example—To find "C" factor from table:
Read "C" factor for 67% overpressure at intersection of row **60** and column **7**
"C" factor at 67% OP = **0.82**

"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	0.91	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—Flow Capacity Calculation

6" Model 8820A
150 mmWC Set Pressure [P_s]
250 mmWC Flowing Pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 2,080 NCMH
2. Calculate overpressure — % OP = [(250 - 150)/150] x 100 = 67%
3. Read "C" factor from table — "C" = 0.82
4. Calculate flow capacity — **Flow = 0.82 x 2,080 = 1,706 NCMH**

GROTH CORPORATION
a Continental Disc company

Vacuum Relief Capacity
Model 8820A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.87	0.50	2.55	5.19	8.80	17.9	28.6	44.3	53.6
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	89.8
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 is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-vacuum.

Consult Factory for flow capacity with fiberglass valve.

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.

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**

"C" Factor Table										
%OV	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	0.91	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—Flow Capacity Calculation

6" Model 8820A
4 InWC set vacuum [P_s]
7 InWC flowing vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 46,700 SCFH
2. Calculate over-vacuum — % OV = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 46,700 = 40,629 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.

S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Vacuum Relief Capacity
Model 8820A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.07	0.15	0.26	0.52	0.84	1.29	1.60
50	4.90	0.12	0.25	0.42	0.87	1.39	2.13	2.78
75	7.35	0.14	0.32	0.53	1.11	1.77	2.72	3.59
100	9.80	0.17	0.38	0.63	1.32	2.09	3.21	4.27
150	14.7	0.21	0.48	0.79	1.66	2.64	4.05	5.42
200	19.6	0.25	0.56	0.93	1.95	3.11	4.76	6.40
250	24.5	0.28	0.63	1.05	2.21	3.53	5.40	7.27
300	29.4	0.31	0.70	1.17	2.45	3.90	5.97	8.06
375	36.8	0.35	0.80	1.32	2.78	4.42	6.77	9.10
500	49.0	0.41	0.93	1.55	3.26	5.19	7.94	10.7
625	61.3	0.47	1.06	1.76	3.69	5.87	8.98	12.2
750	73.5	0.52	1.17	1.94	4.08	6.50	9.90	13.5

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-vacuum.

Consult Factory for flow capacity with fiberglass valve.

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.

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**

"C" Factor Table										
%OV	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	0.91	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—Flow Capacity Calculation

6" Model 8820A
150 mmWC Set Vacuum [P_s]
250 mmWC Flowing Vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 1,660 NCMH
2. Calculate over-vacuum — % OV = [(250 - 150)/150] x 100 = 67%
3. Read "C" factor from table — "C" = 0.82
4. Calculate flow capacity — **Flow = 0.82 x 1,660 = 1,361 NCMH**

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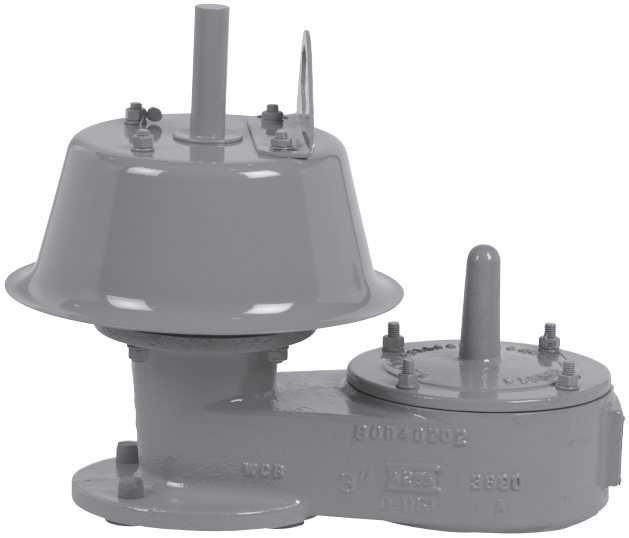
Pressure Relief and Vacuum Breaker
Model 1200A

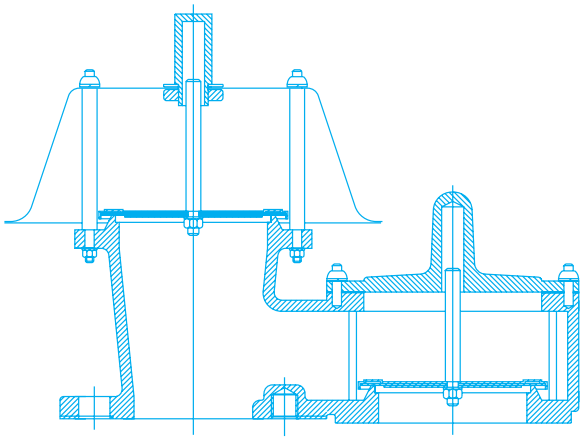


PRESSURE RELIEF & VACUUM BREAKER

Model 1200A is designed to protect your sludge digester and gas holder from excessive pressure or vacuum. Either of these two situations in a system can unbalance the total gas system as well as damage the digester cover or gas holder roof. The Model 1200A should be installed on the digester cover or gas holder roof. Because the Model 1200A retains sludge vapors, atmospheric contamination is prevented. This also helps to provide increased fire protection and safety.

FEATURES

- Sizes 2" (50 mm) through 12" (300 mm)
- Pressure settings 1 InWC to 30 InWC
- Vacuum settings 1 InWC to 30 InWC
- Available in aluminum (type 356-T6), 316 stainless steel, and other materials



SPECIAL FEATURES

Model 1200A offers Groth's special "cushioned air" seating. Superior performing Buna-N seating diaphragms are standard to insure extra tight seal to prevent sludge vapors escaping to the atmosphere. The Model 1200A has a self draining housing body and drip rings to protect seating surfaces from condensate and freezing. This design also avoids dangerous pressure or vacuum buildup due to binding or clogging of the vent. Special seating diaphragms can be provided when required. To insure the proper alignment of seating surfaces, there is peripheral guiding and a center stabilizing system.

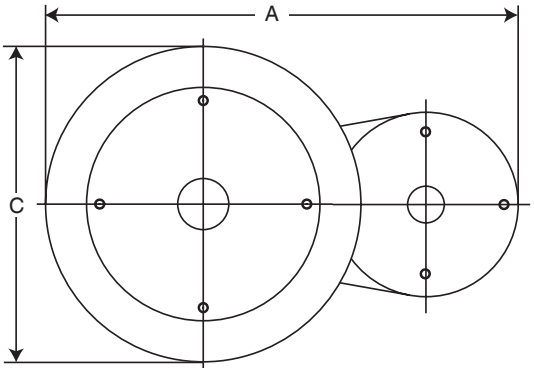
BENEFITS

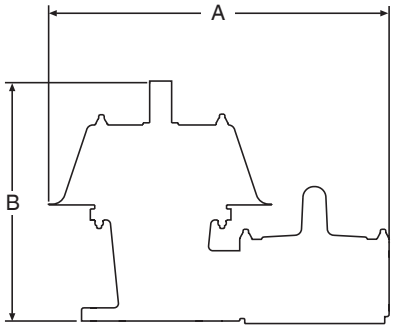
Protects against over pressure and under pressure preventing damage to tanks, pipeline, and other process equipment.

OPTIONS

- All weather coating
- Insulation jackets
- Bug screens
- Stem/pallet proximity switches
- Incremental weights for setting adjustment

Pressure Relief Capacity
Model 1200A





Specification Table • Model 1200A

Specifications subject to change without notice.
Certified dimensions available upon request.

Inlet Flg◊	Max. Setting Weight Loaded	Min. Setting Weight Loaded	A Length (Metric)	B Height (Metric)	C Width (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
2” (50 mm)	30 InWC	0.87 InWC	13.63” (346 mm)	13” (330 mm)	9..50” (241 mm)	16 (7 kg)
3” (80 mm)			18” (457 mm)	13.63” (346 mm)	11..50” (292 mm)	21 (9 kg)
4” (100 mm)			19.75” (500 mm)	15..88” (403 mm)	13” (330 mm)	31 (14 kg)
6” (150 mm)			27.75” (704 mm)	22.25” (565 mm)	19” (480 mm)	57 (26 kg)
8” (200 mm)			33..88” (860 mm)	26..38” (669 mm)	23..63” (600 mm)	75 (34 kg)
10” (250 mm)			40.88” (1038 mm)	28..88” (733 mm)	30.75” (781 mm)	116 (53 kg)
12” (300 mm)			46” (1168 mm)	32..88” (835 mm)	36” (914 mm)	157 (71 kg)

◊150# ASME drilling compatibility, F.F. on aluminum and R.F. on carbon steel and stainless steel alloys.
Consult factory for new model number.
Fiberglass dimensions on request. 30 InWC set with spacer. SS set weights: consult factory.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # □□□□□ --- SIZE □□ --- MATERIAL □□□ --- OPTIONS □□□

- MODEL #: 1200A Weight Loaded
- SIZE: 02” Thru 12”
- MATERIAL: Pallet Material / Seat Material / * Body Material
  - 1 = Aluminum
  - 5 = 316 SS
  - Z = Special
- OPTIONS:
  - O = No Options
  - Z = Special Options
  - O = No Options
  - Diaphragm Material (Seat):
    - B = Buna-N
    - T = TEFLON®
    - Z = Special

NOTES
- Include model number and setting when ordering.
- For special options, consult factory.
- * Stainless steel guides, stems are standard with aluminum bodies.

EXAMPLE

1 2 0 0 A — 0 2 — 1 1 5 — B 0 0

Indicates a 2” Model 1200A with Aluminum Body and Seat, 316 SS Pallet, Buna-N Seat Diaphragm and no other options.

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Pressure Relief Capacity
Model 1200A

Set Pressure (Ps)		Air Flow Capacity at 100% Over-pressure (Double Set Pressure) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.87	0.50	7.65	16.2	28.9	61.9	108	174	217
1.00	0.58	8.22	17.4	31.1	66.5	116	187	233
1.73	1.00	10.8	22.8	40.8	87.2	152	246	305
2.00	1.16	11.6	24.5	43.8	93.7	164	264	328
2.60	1.50	13.2	27.8	49.8	106	186	300	373
3.00	1.73	14.1	29.9	53.4	114	200	322	400
3.46	2.00	15.2	32.0	57.3	123	214	345	429
4.00	2.31	16.3	34.4	61.5	131	230	371	460
6.00	3.47	19.8	41.8	74.7	160	279	450	560
8.00	4.62	22.7	47.9	85.7	183	320	516	641
10.0	5.78	25.1	53.1	95.1	203	355	573	712
12.0	6.93	27.3	57.8	103	221	386	623	774
15.0	8.66	30.2	63.9	114	244	427	689	856
20.0	11.6	34.3	72.5	130	277	485	781	971
25.0	14.4	37.7	79.6	142	305	532	859	1067
30.0	17.3	40.6	85.7	153	328	573	925	1149

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-pressure.

Read the flow capacity at 100% over-pressure directly from the table above. Use linear interpolation if the set pressure is not listed.

If the allowable over-pressure is less than 100%, modify the flow capacity using the appropriate "C" factor from the table.

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

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

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

Example—To find "C" factor from table:
Read "C" factor for 75% Over-pressure at intersection of row **70** and column **5**
"C" factor at 75% OP = **0.87**

"C" Factor Table										
%OP	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—Flow Capacity Calculation

6" Model 1200A
4 InWC set pressure [P_s]
7 InWC flowing pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 131,000 SCFH
2. Calculate over-pressure — % OP = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 131,000 = 113,970 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.

S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Pressure Relief Capacity
Model 1200A

Set Pressure (Ps)		Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Normal Cubic Meters per Hour at 0° C						
mm WC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.22	0.46	0.82	1.74	3.05	4.91	6.11
50	4.90	0.32	0.68	1.22	2.62	4.58	7.38	9.17
75	7.35	0.40	0.83	1.49	3.19	5.58	9.00	11.2
100	9.80	0.45	0.96	1.72	3.67	6.42	10.4	12.9
125	12.3	0.51	1.07	1.91	4.09	7.15	11.5	14.3
150	14.7	0.55	1.17	2.09	4.47	7.81	12.6	15.6
175	17.2	0.59	1.26	2.25	4.81	8.40	13.5	16.8
200	19.6	0.63	1.34	2.39	5.12	8.95	14.4	17.9
225	22.1	0.67	1.41	2.53	5.41	9.46	15.3	18.9
250	24.5	0.70	1.49	2.66	5.68	9.93	16.0	19.9
275	27.0	0.73	1.55	2.78	5.94	10.4	16.7	20.8
300	29.4	0.76	1.62	2.89	6.18	10.8	17.4	21.6
375	36.8	0.85	1.79	3.20	6.84	12.0	19.3	23.9
500	49.0	0.96	2.03	3.63	7.76	13.6	21.9	27.2
625	61.3	1.05	2.23	3.99	8.52	14.9	24.0	29.9
750	73.5	1.14	2.40	4.29	9.18	16.1	25.9	32.2

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% overpressure.

For an equivalent size fiberglass valve, reduce tabulated capacities by 32%.

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.

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

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

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**

"C" Factor Table										
%OP	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—Flow Capacity Calculation

6" Model 1200A
100 mm WC Set Pressure [P_s]
175 mm WC Flowing Pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 3,670 NCMH
2. Calculate overpressure — % OP = [(175 - 100)/100] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 3,670 = 3,193 NCMH**

GROTH CORPORATION
a Continental Disc company

Vacuum Relief Capacity
Model 1200A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
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 is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

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.

Calculate the percentage over-vacuum by the following formula. Note that all pressures are gage 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.

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**

"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—Flow Capacity Calculation

6" Model 1200A
4 InWC set vacuum [P_s]
7 InWC flowing vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 74,000 SCFH
2. Calculate over-vacuum — % OV = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 74,000 = 64,380 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.	
S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Vacuum Relief Capacity
Model 1200A

Set Vacuum (Ps)		Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
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 is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-vacuum.

For an equivalent size fiberglass valve, reduce tabulated capacities by 32%.

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.

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**

"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—Flow Capacity Calculation

6" Model 1200A
100 mmWC Set Vacuum [P_s]
175 mmWC Flowing Vacuum [P_f]

1. Read flow capacity at set vacuum from table — Flow = 2,080 NCMH
2. Calculate over-vacuum — % OV = [(175 - 100)/100] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 2,080 = 1,810 NCMH**

GROTH CORPORATION
a Continental Disc company

Flame Arresters
Models 7618 & 7628

FLAME ARRESTER

Both models are designed to inhibit flame propagation in gas piping systems and to protect digesters containing flammable gases. Groth flame arresters protect from externally caused sources of heat and ignition. This provides increased fire protection and safety.

MODEL 7618

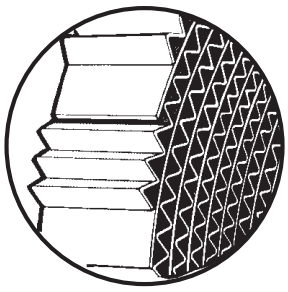
FEATURES

- Sizes 2" (50 mm) through 12" (300 mm), horizontal or vertical
- Available in aluminum (type 356-T6), 316 stainless steel, and other materials
- Unique recessed seating for positive seal
- Factory Mutual approved for standard sizes and materials including non-asbestos gaskets
- Proven spiral wound, crimped ribbon flame element

MODEL 7628

SPECIAL FEATURES

Both models are built of corrosion resistant materials throughout. All Groth flame arrester flame banks utilize spiral wound, crimped ribbon constructed flame elements. These proven, Factory Mutual approved elements provide the best flame quenching performance for the least pressure drop. Groth's special recessed flame bank seating construction uniquely provides an extra measure of protection against leakage and possible flame propagation. Model 7628 (horizontal) is specifically designed to prevent liquid accumulation in the flame bank assembly. All Groth flame arresters are standard tested at 15 psig. Consult factory for higher working pressure requirements.

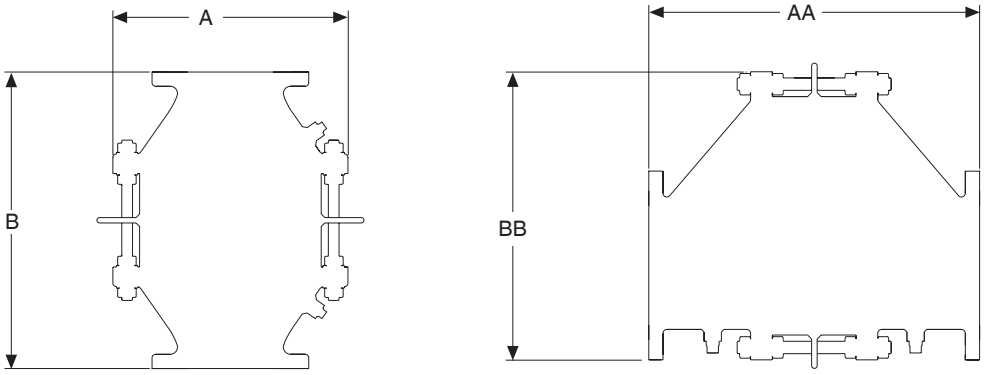


OPTIONS

- Insulation jacket
- Thermocouple/thermowell connection
- Drip trap/drain connections
- Instrument ports

END-OF-LINE (7618 ONLY) *(Weather Hood Outlet)* • Gas Group: NEC D, IEC IIA • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure = Atmosphere	END-OF-LINE (7618 & 7628) *(Flanged Outlet with or without Discharge Piping)* • Gas Group: NEC D, IEC IIA • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure = Atmosphere • Discharge Piping Length <= 10 pipe diameters	IN-LINE (7618 & 7628) • Gas Group: IEC IIA1, Methane (includes most Biogas applications) • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure <= 1 psig • Run-up Length <= 50 pipe diameters (2") • Run-up Length <= 20 pipe diameters (3") • Run-up Length <= 10 pipe diameters (4" – 12")

Pressure Relief Capacity of Groth Flame Arrester
Models 7618/7628



Specification Table • Models 7618 / 7628

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*†	A Width (Metric)	B Height (Metric)	AA Length (Metric)	BB Height (Metric)	Approx. Ship. Wt. Lbs. (Aluminum)
2” (50 mm)	8.75” (221 mm)	14” (356 mm)	13.75” (349 mm)	9.50” (241 mm)	18 (8kg)
3” (80 mm)	9.50” (241 m)	16” (406 mm)	15.75” (400 mm)	11” (279 mm)	25 (11kg)
4” (100 mm)	11.50” (292 mm)	18.25” (464 mm)	18” (457 mm)	12.50” (318 mm)	40 (18kg)
6” (150 mm)	16.50” (419 mm)	21” (533 mm)	21” (533 mm)	16.50” (419 mm)	70 (32kg)
8” (200 mm)	21” (533 mm)	25” (635 mm)	25” (635 mm)	20.50” (521 mm)	135 (61kg)
10” (250 mm)	24.75” (629 mm)	30” (762 mm)	30” (762 mm)	24.50” (622 mm)	235 (107kg)
12” (300 mm)	28.63” (727 mm)	32.50” (826 mm)	32.50” (826 mm)	28.50” (724 mm)	345 (156kg)

* Larger sizes available on special application. †150# ASME drilling compatibility, F.F. on aluminum and R.F. on carbon steel and stainless steel alloys. Pneumatic tested to 15 PSI as standard.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

- MODEL #: 7618 Vertical; 7628 Horizontal
- SIZE: 02” Thru 30”
- MATERIAL:
  - Flame element winding
  - Body Material: 1 = Aluminum; 5 = 316 SS; Z = Special
- OPTIONS:
  - O = No Options; Z = Special Options
  - O = No Options
  - F = Flanged outlet (in-line design)

NOTES
- Include model number when ordering.
- For special options, consult factory.

EXAMPLE

7 6 2 8 — 0 2 — 1 5 — F 0 0

Indicates a 2” Model 7628 with Aluminum Body, 316 SS Flame Element Winding, Flanged Outlet and no other options.

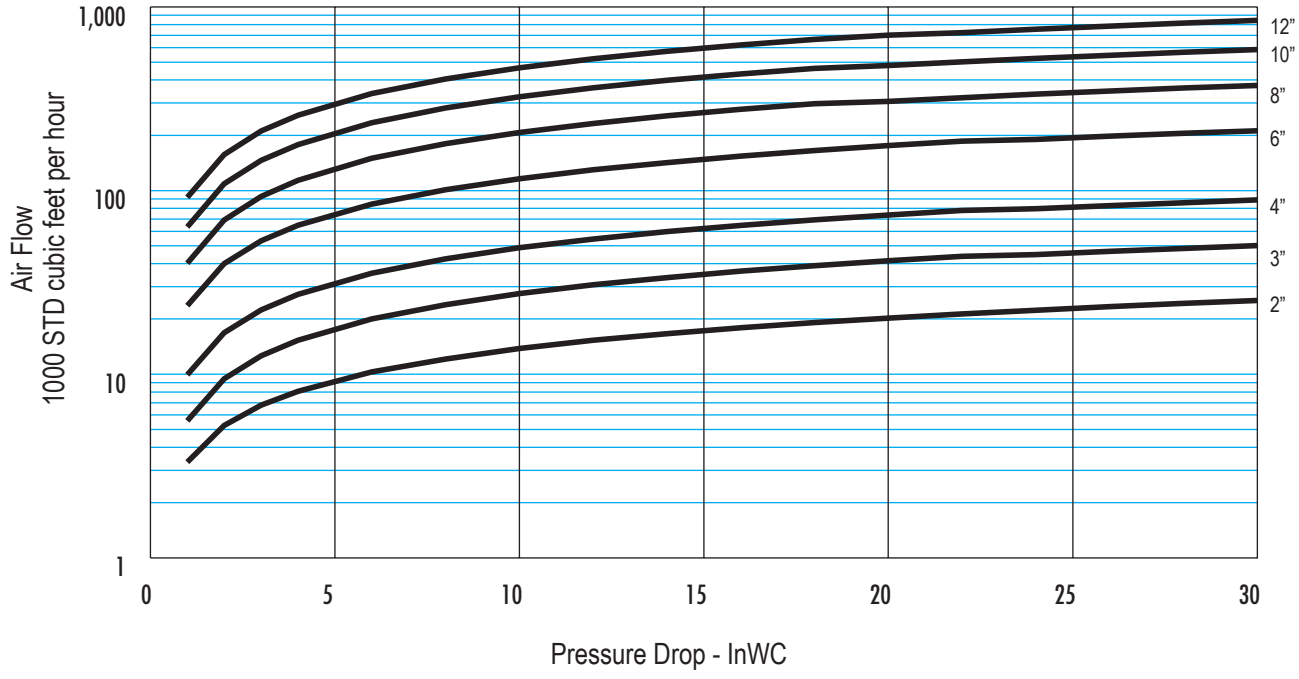
GROTH CORPORATION
a Continental Disc company

Pressure Relief Capacity of Groth Flame Arrester
Models 7618/7628

Pressure Drop		Air Flow - 1000 Standard Cubic feet per Hour						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
1	0.58	3.32	5.58	9.92	23.6	40.2	63.4	91.8
2	1.16	5.27	9.44	16.8	40.0	69.1	109	157
3	1.73	6.79	12.6	22.4	53.3	93.0	146	211
4	2.31	8.08	15.3	27.2	64.8	113.8	178	257
6	3.47	10.3	20.0	35.5	84.5	150	234	337
8	4.62	12.1	23.9	42.5	101	180	282	405
10	5.78	13.8	27.5	48.8	116	207	324	466
12	6.93	15.3	30.7	54.5	130	232	363	522
14	8.00	16.6	33.6	59.8	142	255	398	573
16	9.00	17.9	36.4	64.7	154	277	431	620
18	10.00	19.1	39.0	69.3	165	297	463	665
20	11.60	20.2	41.5	73.7	176	306	480	701
22	13.00	21.3	43.8	77.9	186	320	502	723
24	14.00	22.3	44.8	79.7	190	335	524	756
26	15.00	23.3	46.6	82.9	198	348	545	786
28	16.00	24.3	48.4	86.0	205	362	566	816
30	17.30	25.2	50.1	89.1	212	374	586	845

1.Flow facility and equipment comply with the API Std. 2000.
2.Flow measurement accuracy verified by an independent research organization.
3.Flow capacity is based on actual tests and certified by Groth Corporation.
4. Flow data are for in-line mounting and does not include entrance losses or exit losses.

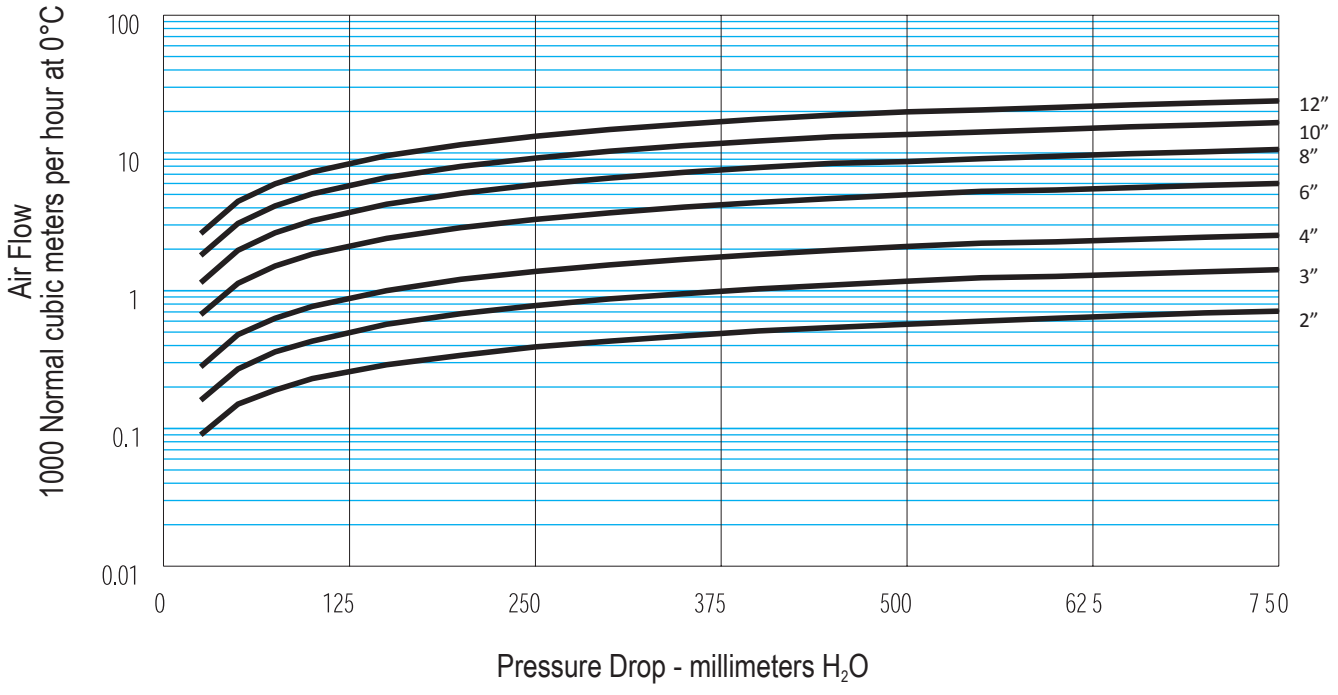
Note: Flow stated in cubic feet of air can be corrected for gas at 0.7 specific gravity by multiplying all flows by 1.19 factor.



Flow Capacity of Groth Flame Arrester
Models 7628 In-Line

Pressure Drop		Air Flow - 1000 Normal Cubic Meters per Hour at 0°C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
25	2.45	0.09	0.16	0.28	0.67	1.14	1.80	2.60
50	4.90	0.15	0.27	0.48	1.13	1.96	3.08	4.45
75	7.35	0.19	0.36	0.63	1.51	2.63	4.13	5.97
100	9.80	0.23	0.43	0.77	1.84	3.22	5.05	7.29
150	14.7	0.29	0.57	1.00	2.39	4.24	6.63	9.55
200	19.6	0.34	0.68	1.21	2.87	5.10	7.98	11.5
250	24.5	0.39	0.78	1.38	3.29	5.88	9.18	13.2
300	29.4	0.43	0.87	1.54	3.68	6.58	10.3	14.8
350	34.3	0.47	0.95	1.69	4.04	7.23	11.3	16.2
400	39.2	0.51	1.03	1.83	4.37	7.84	12.2	17.6
450	44.1	0.54	1.10	1.96	4.68	8.41	13.1	18.8
500	49.0	0.57	1.17	2.09	4.97	8.66	13.6	19.9
550	53.9	0.60	1.24	2.21	5.26	9.08	14.2	20.5
600	59	0.63	1.27	2.26	5.38	9.48	14.8	21.4
650	64	0.66	1.32	2.35	5.60	9.87	15.5	22.3
700	69	0.69	1.37	2.44	5.81	10.2	16.0	23.1
750	74	0.71	1.42	2.52	6.01	10.6	16.6	23.9

1. Flow facility and equipment comply with API 2000.
2. Flow measurement accuracy verified by an independent research organization.
3. Flow capacity is based on actual tests and certified by Groth Corporation.
4. Flow data are for in-line mounting and does not include entrance losses or exit losses.

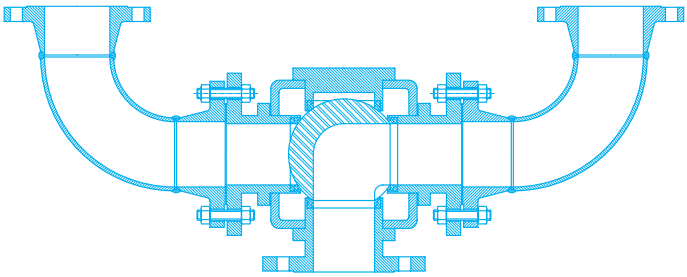


GROTH CORPORATION
a Continental Disc company

Safety Diverter Valve
Model 8800SDV

SAFETY DIVERTER VALVE

The Safety Diverter Valve (SDV) is a 3-way, multi-port ball valve, offering a safe, quick and easy way for valve "changeover" used quite commonly on bio-digesters for ease of inspection, maintenance and cleaning. This allows for redundant pressure vacuum relief valve (PVRV) and flame arrester (FA) assemblies allowing no process interruption, while providing continuous system overpressure or vacuum protection due to pumping-in (influent) and pumping-out (effluent). The design makes it impossible to shut-off both valve outlets at the same time which guarantees continuous operation.



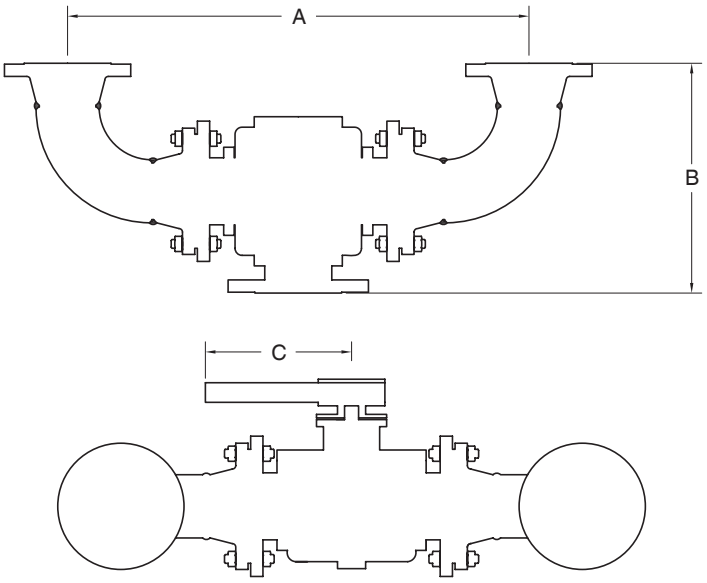
FEATURES

- 3-way, multi-port, full bore design
- L Port (90 degrees) or T Port (180 degrees)
- Low pressure drop offering unrestricted flow compared to plug-type valves
- Blow-out proof stem for maximum safety
- Live-loaded stem packing for positive sealing
- High spherocity and mirror surface finish of ball ensures positive shut-off and low operating torque.
- Handlever (standard), gear-operator (optional)
- Visual indicator (standard) provides positive induction of active valve
- Lock-out mechanism (standard) prevents unwanted access
- Includes pipe-elbows and flanges suitable for mounting [2] Groth pressure vacuum relief valves
- Threaded ports with manual valves (optional) allows pressure testing and field calibration

BENEFITS

- Ability to perform maintenance without interrupting service or vessel protection
- Flow area is never restricted
- Balanced internal forces
- Smoother valve shifting
- Able to apply pressure to any port

Safety Diverter Valve
Model 8800SDV



SPECIFICATION TABLE • MODEL 8800SDV

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A		B		C	
	IN	MM	IN	MM	IN	MM
2”	21.34	542	10.61	269	12.80	325
3”	26.89	683	13.38	340	19.69	500
4”	32.89	835	16.38	416	25.59	650
6”	42.19	1071	21.03	534	47.24	1200
8”	53.32	1354	26.60	676	59.06	1500

* ASME 150# class flange connection.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # | SIZE | MATERIAL | OPTIONS

□□□□ ---------- □□ ---------- □□ ---------- □□□

- MODEL #: 8800SDV
- SIZE: 02” Thru 08”
- MATERIAL:
  - Valve Trim: 5 = 316 SS
  - Body Material: 5 = 316 SS
- OPTIONS:
  - Special: O = No Options; Z = Special Options
  - Port Type: L = L-Port; T = T-Port
  - Seat Material: T = TEFLON® PTFE

NOTES

- Include model number when ordering.
- For special options, consult factory.

EXAMPLE 8800—02—55—TTO

Indicates 2” Model 8800SDV with 316 SS Valve Trim, 316 SS Body Material, TEFLON® PTFE, T-Port, and no other options.

GROTH CORPORATION
a Continental Disc company

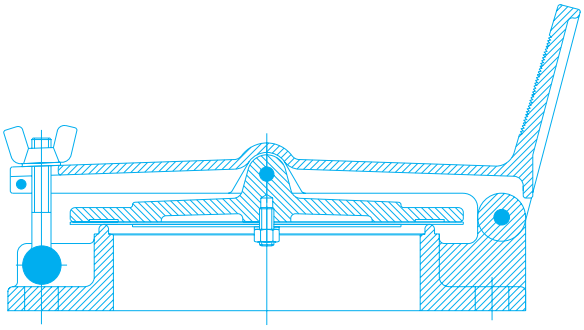
Sample and Gauge Hatches
Model 6100

SAMPLE & GAUGE HATCHES

Model 6100 Series provide access for gauging or obtaining product samples from digester tanks. The Model 6100 incorporates a positive cover lockdown which assures a premium tight seal on digester tanks with internal pressures up to 3 psig.

FEATURES

- Sizes 4" (100 mm) through 10" (250 mm)
- Constructed in all aluminum (type 356-T6), stainless steel, and additional materials
- Designed to assure uniform seating



SPECIAL FEATURES

Model 6100 Series is designed with a serrated foot treadle surface to avoid foot slippage when opening. This model permits the use of both hands during gauging or sampling. Gravity will close the cover upon removal of pressure on the foot treadle. Groth's special "cushioned-air" gasketed seating is provided.

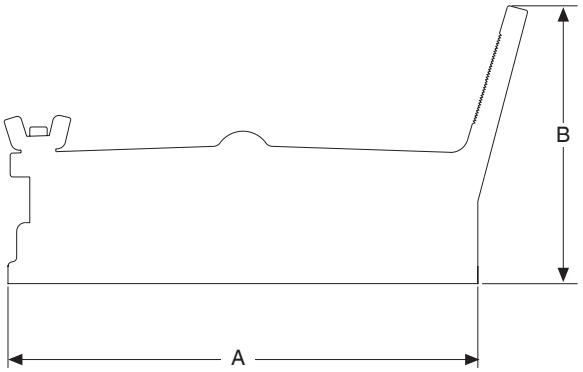
BENEFITS

Non-sparking design provides deflagration prevention

OPTIONS

- Pad lock feature
- Locking Pin

Sample and Gauge Hatches
Model 6100



Specification Table • Model 6100

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A Width (Metric)	B Height (Metric)	Approx. Ship. Wt. Lbs. (Aluminum)
4” (100 mm)	10” (254 mm)	6” (152 mm)	7 (3 kg)
6” (150 mm)	12.50” (318 mm)	8” (203 mm)	10 (5 kg)
8” (200 mm)	15” (381 mm)	8” (203 mm)	13 (6 kg)
10” (250 mm)	17.75” (451 mm)	9” (229 mm)	17 (8 kg)

* 150 # ASME drilling compatibility, F.F. on aluminum and stainless steel alloys.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

- MODEL #: 6100
- SIZE: 04” Thru 10”
- MATERIAL:
  - 1 = Aluminum
  - 5 = 316 SS
  - Z = Special
- OPTIONS:
  - O = No Options
  - Z = Special Options
  - D = Drilled 150 # ASME
  - Diaphragm Material (Seat):
    - B = Buna-N
    - T = TEFLON®
    - Z = Special

NOTES
- Include model number when ordering.
- For special options, consult factory.

EXAMPLE

6 1 0 0 — 0 4 — 1 — T D 0

Indicates a 4” Model 6100 with Aluminum material, TEFLON® Diaphragm, Drilled Flange and no other options.

GROTH CORPORATION
a Continental Disc company

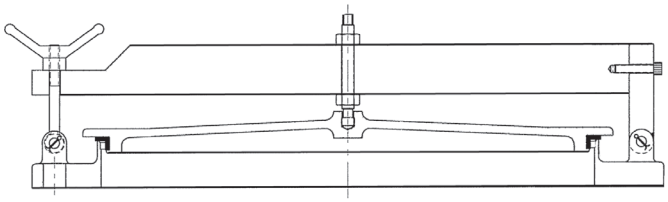
Roof Manhole Cover
Model 8200

MODEL 8200 MANHOLE OR ENTRANCE HATCH

This product is used when quick and easy access is desired. It is generally placed on digester covers or roofs.

Required in most cases by insurance underwriters, to be non-sparking and gas-tight, the Groth Model 8200 meets the specifications. The seal is provided by a Buna-N diaphragm and the surface bearing is distributed evenly all around by the design.

The model 8200 incorporates a positive cover lockdown which assures a premium type seal on digester tanks with internal pressures up to 1 psig.



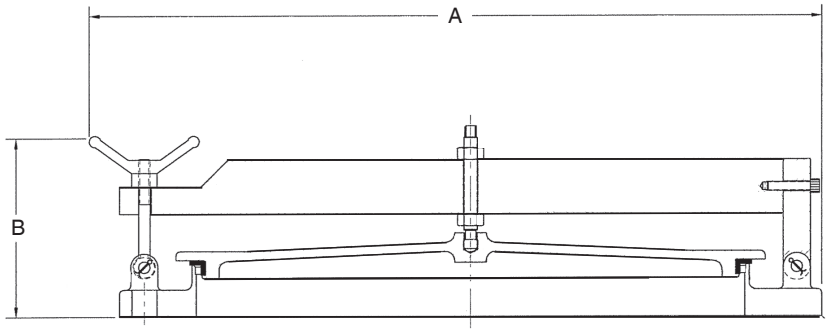
FEATURES

- Sizes 20" (500 mm), 24" (600 mm), 30" (750 mm), and 36" (900 mm). Larger sizes available
- Available in aluminum (type 356-T6), 316 stainless steel and other materials
- Easy to open and seal
- Non-sparking and gas-tight

BENEFITS

Non-sparking design provides deflagration prevention

Roof Manhole Cover
Model 8200



Specification Table • Model 8200

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A Width (Metric)	B Height (Metric)	Approx. Ship Wt. Lbs. (Steel)
20” (500 mm)	29.50” (749 mm)	9.38” (238 mm)	125 (57 kg)
24” (600 mm)	32.75” (832 mm)	9.38” (238 mm)	200 (91 kg)
30” (750 mm)	40.38” (1026 mm)	9.38” (238 mm)	250 (114 kg)
36” (900 mm)	47.75” (1213 mm)	9.38” (238 mm)	400 (182 kg)

* 150# ASME compatibility. F.F. on aluminum and R.F. on carbon steel and stainless steel alloys.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

□□□□ ---------- □□ ---------- □ ---------- □□

8200

20” (500 mm)
24” (600 mm)
30” (750 mm)
36” (900 mm)
42” (1000 mm)
48” (1200 mm)

Body Material

1 = Aluminum (Standard)
5 = 316 SS
Z = Special

Z = Special Options
O = No Special Options

Diaphragm Material
B = Buna-N
Z = Special

NOTES

- For special options, consult factory.

EXAMPLE

8 2 0 0 — 2 4 — 1 — B O

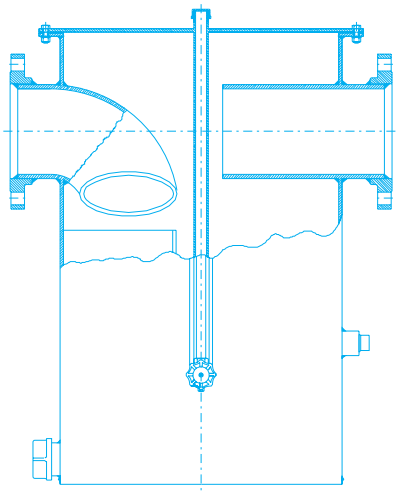
Indicates a 24” Model 8200 with an aluminum body, Buna-N diaphragm and no special option.

GROTH CORPORATION
a Continental Disc company

Sediment Traps
Model 8330
Condensate Accumulator Model 8331

SEDIMENT TRAPS

Groth traps are for use in low pressure gas lines to remove sediment and/or condensate from a "wet" gas. These traps are normally installed to provide additional safety by removing almost all of the solids and liquid from the gas stream. Groth's design creates a combination of internal centrifugal force and a drop in the velocity of the gas which contributes to the successful removal of solids and liquids.



Note: Sight glass, Model 8460 shown are optional.

FEATURES

- Sizes 2" (50 mm) to 12" (300 mm), larger sizes available
- Available in carbon steel, stainless steel, and other materials
- 2" (50 mm) through 6" (150 mm) sizes have a 12 gallon capacity minimum
- 8" (200 mm) through 12" (300 mm) sizes have a 28 gallon capacity minimum
- Standard pressure rated to 5 psig, up to 25 psig available
- Sight glass and drip trap available as option

SPECIAL FEATURES

Model 8330 may be furnished with threaded or flanged connectors. A Groth drip trap and a sight glass (both shown) may be easily attached. Removal of top cover is quickly accomplished for cleaning. Carbon steel sediment traps are epoxy coated, inside and outside, as standard.

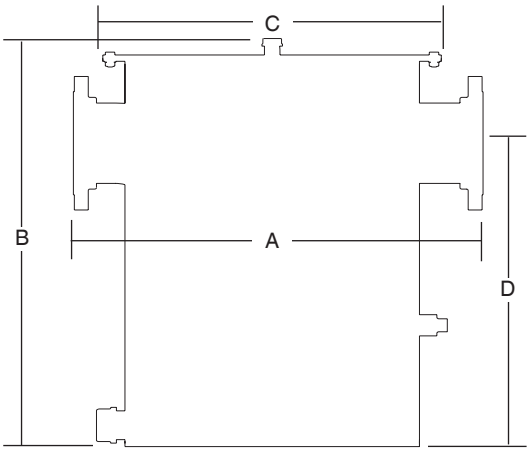
BENEFITS

- Removes particulates and condensation from pipeline preventing damage to downstream equipment
- Sight glass allows for exterior monitoring of liquid level in vessel for easy indication of condensate draining requirements

OPTIONS

- Hot-dip galvanization
- 25 psig rated
- Insulation jacket
- Stainless steel hand valves
- Wire mesh strainer
- Inspection port
- Glass sight glass

Sediment Traps
Model 8330



Specification Table • Model 8330

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A Length (Metric)	B Height (Metric)	C Width (Metric)	D Connection Height (Metric)	Approx. Ship Wt. Lbs. (Steel)
2” (50 mm)	27” (685 mm)	33.75” (857 mm)	23” (584 mm)	25” (635 mm)	200 (91 kg)
3” (80 mm)	27” (685 mm)	33.75” (857 mm)	23” (584 mm)	25” (635 mm)	210 (95 kg)
4” (100 mm)	27” (685 mm)	33.75” (857 mm)	23” (584 mm)	25” (635 mm)	220 (100 kg)
6” (150 mm)	27” (685 mm)	33.75” (857 mm)	23” (584 mm)	25” (635 mm)	275 (125 kg)
8” (200 mm)	38” (965 mm)	35.75” (908 mm)	33” (838 mm)	25” (635 mm)	375 (170 kg)
10” (250 mm)	38” (965 mm)	35.75” (908 mm)	33” (838 mm)	25” (635 mm)	395 (180 kg)
12” (300 mm)	38” (965 mm)	35.75” (908 mm)	33” (838 mm)	25” (635 mm)	425 (193 kg)

* 150# ASME compatibility. R.F. on carbon steel and stainless steel alloys.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

□□□□ ---------- □□ ---------- □ ---------- □□□□

- MODEL #: 8330
- SIZE: 02” Thru 12”
- MATERIAL: Body Material
  - 3 = Carbon Steel
  - 5 = 316 SS
  - Z = Special
- OPTIONS
  - Z = Special Options; O = No Special Options
  - 1 = Sight Gauge; O = No Sight Gauge
  - 1 = Drip Trap; O = No Drip Trap
  - N = NPT Threaded; F = 150# ASME Flanged

NOTES

- For special options, consult factory.
- Carbon steel units are epoxy paint coated inside and outside as standard.
- 2” – 6” sizes have 12 gallon capacity minimum.
- 8” – 12” sizes have 28 gallon capacity minimum.

EXAMPLE

8 3 3 0 — 0 2 — 3 — F 1 1 O

Indicates a 2” Model 8330 with carbon steel body, 150# ASME flange, drip trap, sight glass and no special options.

GROTH CORPORATION
a Continental Disc company

Sediment Traps
Model 8330

Pressure		Air Flow Capacity 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	1.38	3.10	5.50	12.4	22.0	34.4	49.5
0.50	0.30	1.95	4.38	7.80	17.5	31.1	48.6	70.0
0.75	0.40	2.38	5.40	9.50	21.4	38.1	60.0	86.0
1.00	0.58	2.75	6.20	11.0	24.8	44.0	69.0	99.0
1.50	0.90	3.37	7.60	13.5	30.3	54.0	84.0	121
2.00	1.16	3.89	8.80	15.6	35.0	62.0	97.0	140
3.00	1.73	4.77	10.7	19.1	42.9	76.0	119	172
4.00	2.31	5.50	12.4	22.0	49.5	88.0	138	198
5.00	3.00	6.20	13.8	24.6	55.0	98.0	154	222
6.00	3.47	6.70	15.2	27.0	61.0	108	169	243
8.0	4.62	7.80	17.5	31.1	70.0	125	195	280
10.0	5.78	8.70	19.6	34.8	78.0	139	218	313
12.0	6.93	9.50	21.4	38.1	86.0	153	238	343
14.0	8.00	10.3	23.2	41.2	93.0	165	257	371
16.0	9.00	11.0	24.8	44.0	99.0	176	275	396
18.0	10.00	11.7	26.3	46.7	105	187	292	420
20.0	11.60	12.3	27.7	49.2	111	197	308	443
25.0	14.40	13.8	31.0	55.0	124	220	344	495
30.0	17.30	15.1	33.9	60.0	136	241	377	543

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	1.64	3.70	6.60	14.8	26.3	41.1	59.0
0.50	0.30	2.33	5.23	9.30	20.9	37.2	58.0	84.0
0.75	0.40	2.85	6.40	11.4	25.6	45.6	71.0	103
1.00	0.58	3.29	7.40	13.2	29.6	52.6	82.0	118
1.50	0.90	4.03	9.10	16.1	36.3	64.0	101	145
2.00	1.16	4.65	10.5	18.6	41.9	74.0	116	167
3.00	1.73	5.70	12.8	22.8	51.3	91.0	142	205
4.00	2.31	6.60	14.8	26.3	59.0	105	164	237
5.00	3.00	7.40	16.5	29.4	66.0	118	184	265
6.00	3.47	8.10	18.1	32.2	73.0	129	201	290
8.0	4.62	9.30	20.9	37.2	84.0	149	233	335
10.0	5.78	10.4	23.4	41.6	94.0	166	260	374
12.0	6.93	11.4	25.6	45.6	103	182	285	410
14.0	8.00	12.3	27.7	49.2	111	197	308	443
16.0	9.00	13.2	29.6	52.6	118	210	329	474
18.0	10.00	14.0	31.4	56.0	126	223	349	502
20.0	11.60	14.7	33.1	59.0	132	235	368	530
25.0	14.40	16.4	37.0	66.0	148	263	411	592
30.0	17.30	18.0	40.5	72.0	162	288	450	649

Model 8330

Pressure		Air Flow Capacity 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.04	0.08	0.15	0.33	0.59	0.92	1.33
12.7	1.00	0.05	0.12	0.21	0.47	0.83	1.30	1.88
19.1	2.00	0.06	0.14	0.25	0.57	1.02	1.61	2.30
25.4	3.00	0.07	0.17	0.29	0.66	1.18	1.85	2.65
38.1	4.00	0.09	0.20	0.36	0.81	1.45	2.25	3.24
50.8	5.00	0.10	0.24	0.42	0.94	1.66	2.60	3.75
76.2	7.50	0.13	0.29	0.51	1.15	2.04	3.19	4.61
102	10.00	0.15	0.33	0.59	1.33	2.36	3.70	5.30
127	12.50	0.17	0.37	0.66	1.47	2.63	4.13	5.95
152	15.00	0.18	0.41	0.72	1.63	2.89	4.53	6.51
203	20.00	0.21	0.47	0.83	1.88	3.35	5.22	7.50
254	25.00	0.23	0.53	0.93	2.09	3.72	5.84	8.39
305	30.00	0.25	0.57	1.02	2.30	4.10	6.38	9.19
356	35.00	0.28	0.62	1.10	2.49	4.42	6.89	9.94
406	40.00	0.29	0.66	1.18	2.65	4.72	7.37	10.61
457	45.00	0.31	0.70	1.25	2.81	5.01	7.82	11.25
508	50.00	0.33	0.74	1.32	2.97	5.28	8.25	11.87
635	62.00	0.37	0.83	1.47	3.32	5.89	9.22	13.26
762	75.00	0.40	0.91	1.61	3.64	6.46	10.10	14.55

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.04	0.10	0.18	0.40	0.70	1.10	1.58
12.7	1.00	0.06	0.14	0.25	0.56	1.00	1.55	2.25
19.1	2.00	0.08	0.17	0.31	0.69	1.22	1.90	2.76
25.4	3.00	0.09	0.20	0.35	0.79	1.41	2.20	3.16
38.1	4.00	0.11	0.24	0.43	0.97	1.71	2.71	3.88
50.8	5.00	0.12	0.28	0.50	1.12	1.98	3.11	4.47
76.2	7.50	0.15	0.34	0.61	1.37	2.44	3.80	5.49
102	10.00	0.18	0.40	0.70	1.58	2.81	4.39	6.35
127	12.50	0.20	0.44	0.79	1.77	3.16	4.93	7.10
152	15.00	0.22	0.48	0.86	1.96	3.46	5.38	7.77
203	20.00	0.25	0.56	1.00	2.25	3.99	6.24	8.97
254	25.00	0.28	0.63	1.11	2.52	4.45	6.97	10.02
305	30.00	0.31	0.69	1.22	2.76	4.88	7.64	10.98
356	35.00	0.33	0.74	1.32	2.97	5.28	8.25	11.87
406	40.00	0.35	0.79	1.41	3.16	5.63	8.81	12.70
457	45.00	0.38	0.84	1.50	3.38	5.97	9.35	13.45
508	50.00	0.39	0.89	1.58	3.54	6.30	9.86	14.20
635	62.00	0.44	0.99	1.77	3.96	7.05	11.01	15.86
762	75.00	0.48	1.08	1.93	4.34	7.72	12.06	17.39

GROTH CORPORATION
a Continental Disc company

Drip Traps
Model 8450, 8460 & 8470

TYPES OF DRIP TRAPS
Groth offers automatic or manual design of drip traps. Each type may be easily attached to a Groth sediment trap for extra efficiency or installed for collection and safe removal of liquids from low points in gas control lines.

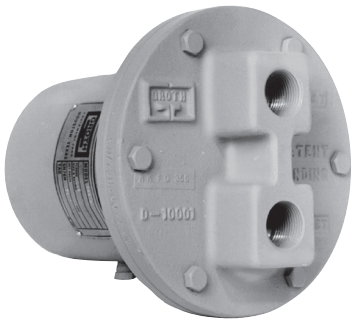
FEATURES
- Automatic, manual, and high pressure designs available
- Standard with 1" NPT connection
- Aluminum (type 356-T6) body with SS internal working parts
- Quick, easy access
- No gas escapes when draining

FEATURES
Model 8450, automatic design contains a unique float operated valve with self-aligning spherical seat. Extra large discharge port reduces clogging. Easy maintenance is provided by removable bowl design. Powerful, reliable shut-off action is provided by a longer moment arm coupled with a non-sticking teflon bearing. Cast aluminum body is rated for maximum working pressure of 5 psig.

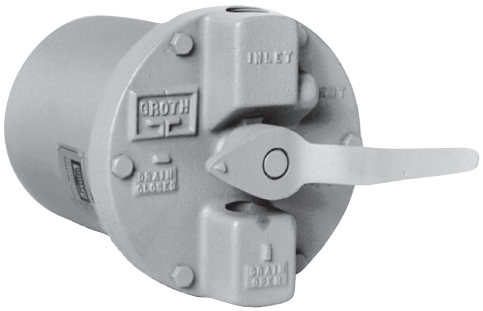
Model 8460, manually operated design is standard in aluminum with ports and shaft positively sealed by synthetic O-Ring to prevent gas escaping, no matter what position the disc is in. Model 8460 is rated for a maximum working pressure of 5 psig and Model 8470 is available up to 60 psig on special order. Capacity of 3 quarts or 6 quarts standard.

BENEFITS
For easy removal of pipeline condensation, preventing pipeline blockage

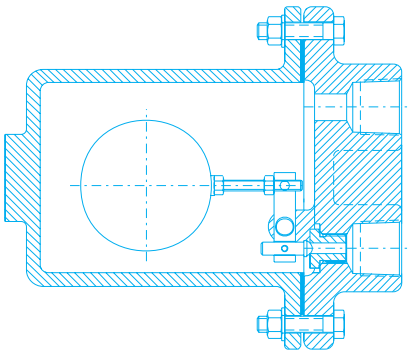
OPTIONS
Insulation jacket

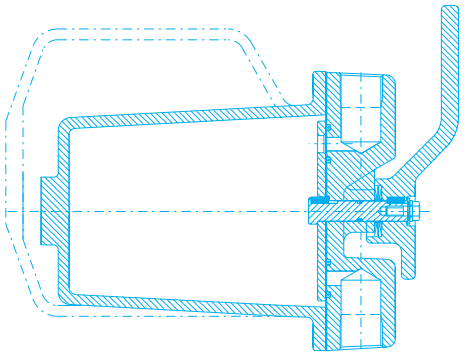


MODEL 8450 AUTOMATIC

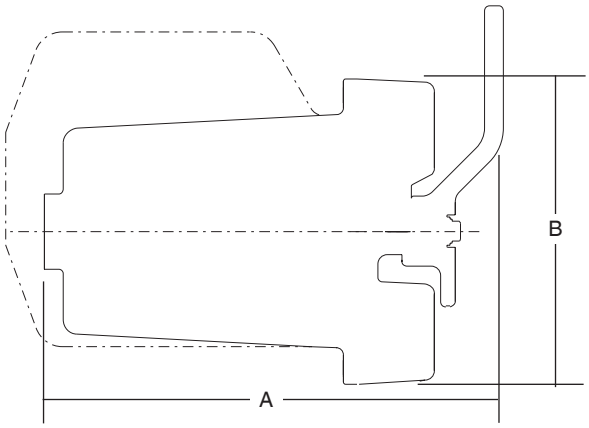


MODEL 8460 MANUAL

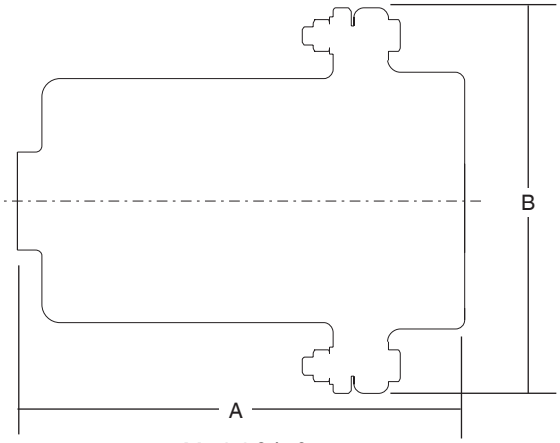




Drip Traps
Model 8450, 8460 & 8470



Model 8460



Model 8450

Specification Table • Model 8450, 8460, 8470

Specifications subject to change without notice.
Certified dimensions available upon request.

Model No.	Size (Liters)	A Length (Metric)	B Width (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
8450	1.2 qt. (1.1)	9.50" (241 mm)	7.88" (200 mm)	20 (9 kg)
8460*	3 qt. (2.8)	13" (330 mm)	8.50" (206 mm)	25 (11 kg)
8460*	6 qt. (5.7)	14" (356 mm)	8.50" (206 mm)	30 (14 kg)

* If pressures up to 60 psig required, request special order and denote Model 8470.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

□□□□ ---------- □ ---------- □ ---------- □ □

MODEL #: 8450, 8460, 8470, 8480

SIZE:
- 1 = 1.2 Quarts
- 2 = 3 Quarts
- 3 = 6 Quarts

MATERIAL (Body Material):
- 1 = Aluminum
- Z = Special

OPTIONS:
- Z = Special Options
- O = No Special Options
- N = NPT Threaded

NOTES
- For special options, consult factory.

EXAMPLE

8460 — 2 — 1 — N O

Indicates a 3 Quart Model 8460 with an aluminum body, NPT threaded and no specials.

GROTH CORPORATION
a Continental Disc company

Drip Traps
Model 8490/8491

DRIP TRAP

The Model 8490 electrically operated drip trap combines the reliability of a rotating disc manual drip trap with the convenience of an automatic drip trap.

It can be controlled by an integral cycle timer, a Groth remote sequence controller, or the owner's master control system.

The drip trap is a Groth Model 8460 or 8470, equipped with an electric valve actuator in a NEMA 7 housing, so it can operate automatically with the optimum fill/drain cycle to suit your condensate removal requirements. It is available with either 3 or 6 quart bowl capacity and rated for up to 60 psig condensate line pressure. The drip trap utilizes O-rings in contact with a polished stainless steel disc, so gas cannot escape in any position.

An integral cycle timer can be provided in the actuator housing. Both fill and drain times can be independently adjusted from 30 seconds to 12 hours.

A separate local or remote control panel can be provided for cycle timing single or multiple drip traps. Time intervals can be independently adjusted from 30 seconds to 30 hours. The panels have manual or automatic control with dry contacts for both local and remote position status and fault indication, in a NEMA 7 enclosure.

Consult factory for additional materials of construction, soft goods, controls systems, NEMA classifications or other requirements.

FEATURES

- Reliable, low maintenance rotating disc drip trap
- Heavy duty electric actuator
- NEMA 7 Explosion-proof actuator housing
- 3 or 6 quart bowl
- 5 or 60 PSI pressure rating

ADDITIONAL FEATURES

- Visual position indicator
- Electronic contacts for remote position indication
- Override for manual operation
- Low copper aluminum construction

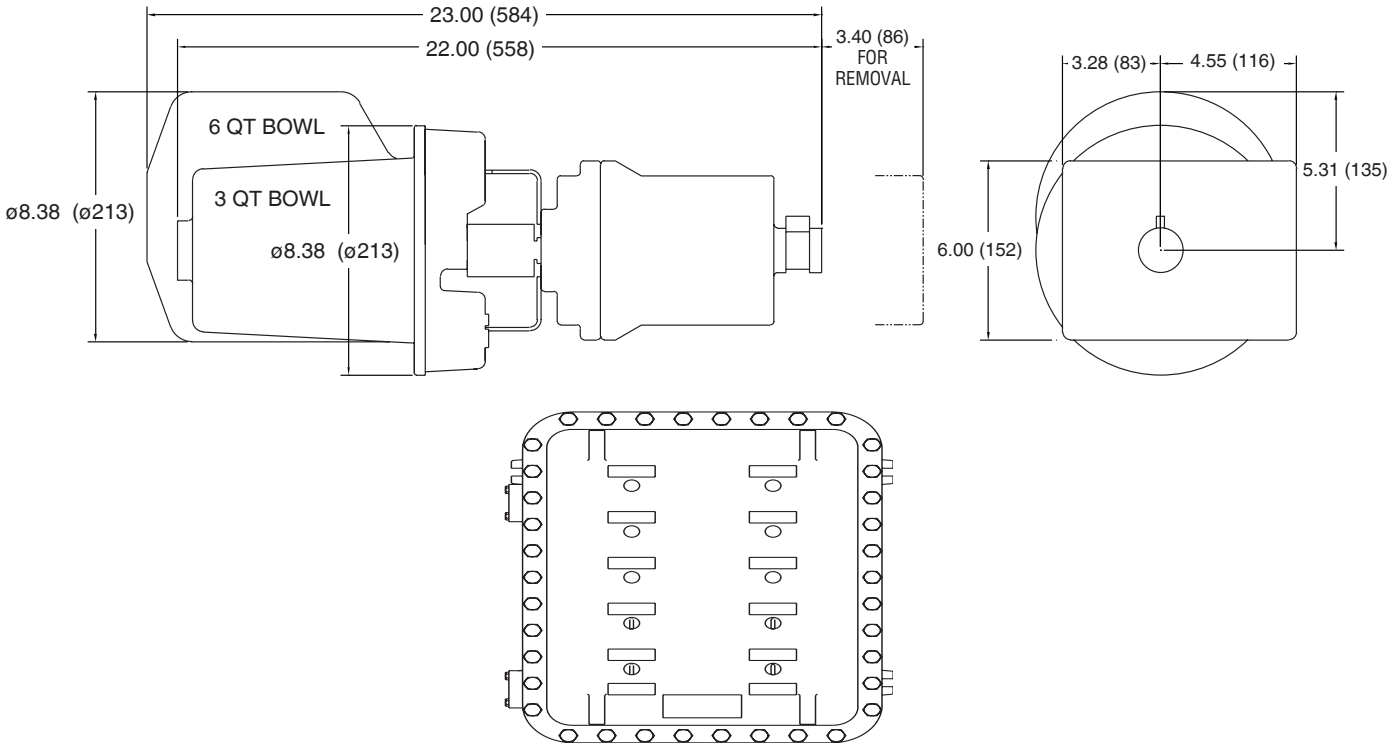
BENEFITS

For easy removal of pipeline condensation, preventing pipeline blockage

OPTIONS

- Integral cycle timer
- Remote control panel
- Insulating jacket
- Actuator heater

Drip Traps Model 8490/8491



Drip trap:

Drip trap housing & bowl	Low copper aluminum
Drip trap seal disc	316SS
Drip trap shaft	304SS
Drip trap o-rings	Buna-N

Actuator:

Open/Close speed	10 Sec.
Enclosure class	NEMA 7
Status limit switches	Two SPDT
Visual indicator	Mechanical
Manual over ride	With standard wrench
Temp rating	-40 to 150°F
Voltage	115 VAC
Motor	High torque, reversible, overload protected
Gearing & shaft	Hardened alloy steel
Lubrication	Permanent
Bracket	Heavy gage aluminum
Coupling	304 SS
Cycle timer [integral]	30 seconds to 12 hours ON/OFF independent

Remote control panel:

Manual/Automatic selector switch
Open/Closed selector switch in manual mode
Cycle timer for automatic mode
30 seconds to 30 hours ON/OFF independent
Indicating lights to show Fill/Drain status
Dry contacts for remote Fill/Drain status
Fault alarm for failure to Open/Close
Dry contacts for remote fault status
NEMA 7 enclosure
Panel controls multiple drip traps

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # ☐☐☐☐ ---- CAPACITY ☐ ---- BODY MATERIAL ☐ ---- SEAL MAT'L ☐ ---- DRIP TRAP OPTION ☐ ---- TIMER OR PANEL ☐☐ ---- OPTIONS ☐☐☐

- MODEL #: 8490 (5 PSI), 8491 (60 PSI)
- CAPACITY: 2 = 3 Quart; 3 = 6 Quart
- BODY MATERIAL: 1=Aluminum
- SEAL MAT'L: B=Buna-N
- DRIP TRAP OPTION: O=None; H=Actuator Heater; J=Insulating Jacket
- TIMER OR PANEL: CT = Integral Timer (no panel); P1 = Panel w/ 1 DT; P2 = Panel w/ 2 DT; P3 = Panel w/ 3 DT; P4 = Panel w/ 4 DT; P5 = Panel w/ 5 DT; P6 = Panel w/ 6 DT; P7 = Panel w/ 7 DT; P8 = Panel w/ 8 DT
- OPTIONS: CERT: 0 = None, A = ATEX; PANEL ALARM: 2 = Included, 0 = None; PANEL HEATER: 8 = Included, 0 = None

NOTES
Include model number when ordering.
For special options, consult factory.

EXAMPLE

8 4 9 0 — 2 — 1 — B — 0 — C T — 0 0 0

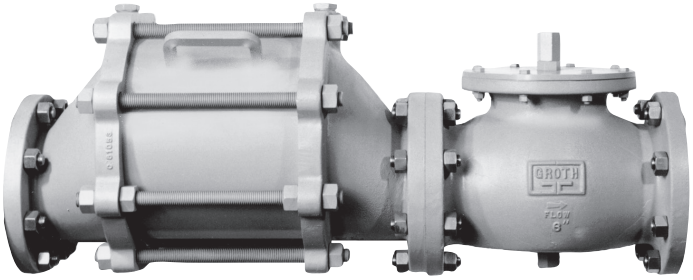
Indicates a 3 quart Electrically Actuated Drip Trap with Aluminum body, Buna-N seal and Integral Cycle Timer.

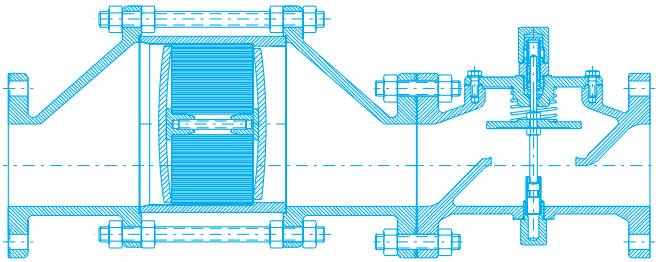
GROTH CORPORATION
a Continental Disc company

Flame Trap Assembly
Model 8500A

FLAME TRAP ASSEMBLY

This unit includes a Groth Model 7628 horizontal flame arrester and a Groth Model 8530 thermal operated shut-off valve. This unit is generally installed in gas lines leading from each digester and gas holder. They are also installed in a line to gas utilization equipment, as close as possible to the source of combustion.





FEATURES

- Sizes 2" (50 mm) through 12" (300 mm)
- Aluminum (type 356-T6) and other materials
- Designed for quick and easy maintenance
- Factory Mutual approved flame arrester

SPECIAL FEATURES

The unit may be installed in horizontal or vertical lines. The valve includes a fusible element which melts at 260°F and provides shut-down within 15 seconds. A pyrex sight glass is used to provide a view of the indicator rod showing valve position. Easy maintenance features are provided which enable the quick removal and cleaning of the Groth flame bank assembly. Additionally, the fusible element is replaceable without disassembly of valve.

BENEFITS

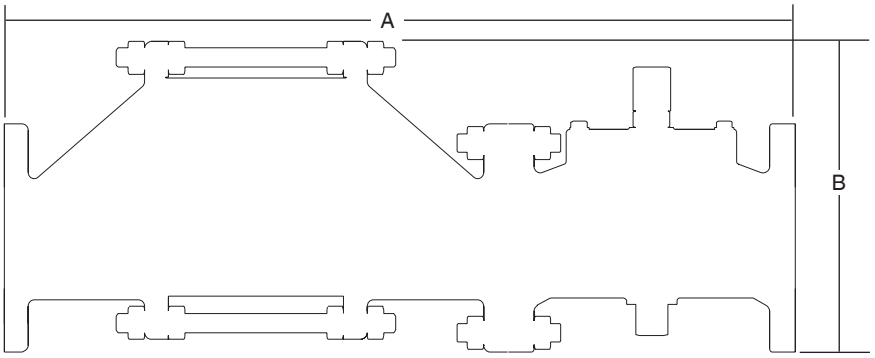
- Simple replaceable fusible element for ease of maintenance
- Blocks gas flow in the presence of a flame at the flame arrester, preventing damage to upstream equipment

OPTIONS

- Thermocouple/thermowell connection
- Insulation jacket
- Flame arrester drain connection
- Instrument ports

END-OF-LINE	IN-LINE
(Flanged Outlet with or without Discharge Piping) • Gas Group: NEC D, IEC IIA • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure = Atmosphere • Discharge Piping Length <= 10 pipe diameters	• Gas Group: IEC IIA1, Methane (includes most Biogas applications) • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure <= 1 psig • Run-up Length <= 50 pipe diameters (2") • Run-up Length <= 20 pipe diameters (3") • Run-up Length <= 10 pipe diameters (4" – 12")

Flame Trap Assembly
Model 8500A



Specification Table • Model 8500A

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A Length (Metric)	B Height (Metric)	MAX W.P.[1]	Approx. Ship Wt. Lbs. (Aluminum)
2” (50 mm)	22.81” (579 mm)	9.50” (241 mm)	10 PSIG 0.689 barg	50 (23 kg)
3” (80 mm)	26.06” (662 mm)	11” (279 mm)		75 (34 kg)
4” (100 mm)	29.69” (754 mm)	12.50” (318 mm)		100 (45 kg)
6” (150 mm)	36.06” (916 mm)	16.50” (419 mm)		150 (68 kg)
8” (200 mm)	47.94” (1218 mm)	20.50” (521 mm)		200 (91 kg)
10” (250 mm)	55.75” (1416 mm)	24.50” (622 mm)		565 (257 kg)
12” (300 mm)	67.38” (1711 mm)	28.50” (724 mm)		715 (325 kg)

* 150# ASME compatibility. F.F. on aluminum and R.F. on carbon steel and stainless steel alloys.
1. W.P. = Working Pressure

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # ---------- SIZE ---------- MATERIAL ---------- OPTIONS

- MODEL #: 8500A
- SIZE: 02” Thru 12”
- MATERIAL: Flame Element, Flame Arrester, Body Material
  - 1 = Aluminum
  - Z = Special
- OPTIONS
  - Z = Special Options
  - O = No Specials

NOTES
- For special options, consult factory.

EXAMPLE 8 5 0 0 A — 0 2 — 1 1 1 — O

Indicates a 2” Model 8500A with aluminum body, pallet and flame element and no special options.

GROTH CORPORATION
a Continental Disc company

Flame Trap Assembly
Model 8500A

Pressure		Air Flow Capacity 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	0.62	1.40	2.48	5.58	9.92	15.5	22.3
0.50	0.30	0.99	2.24	3.97	8.94	15.9	24.8	35.8
0.75	0.40	1.29	2.90	5.15	11.6	20.6	32.2	46.4
1.00	0.58	1.54	3.46	6.15	13.8	24.6	38.5	55.4
1.50	0.90	1.96	4.42	7.85	17.7	31.4	49.1	70.7
2.00	1.16	2.32	5.23	9.29	20.9	37.2	58.1	83.6
3.00	1.73	2.93	6.59	11.7	26.4	46.9	73.2	105
4.00	2.31	3.44	7.75	13.8	31.0	55.1	86.1	124
5.00	3.00	3.90	8.76	15.6	35.1	62.3	97.4	140
6.00	3.47	4.30	9.69	17.2	38.7	68.9	108	155
8.0	4.62	5.03	11.3	20.1	45.3	80.5	126	181
10.0	5.78	5.67	12.8	22.7	51.1	90.8	142	204
12.0	6.93	6.26	14.1	25.0	56.3	100	156	225
14.0	8.00	6.79	15.3	27.2	61.1	109	170	244
16.0	9.00	7.29	16.4	29.1	65.6	117	182	262
18.0	10.00	7.75	17.4	31.0	69.8	124	194	279
20.0	11.60	8.20	18.4	32.8	73.8	131	205	295
25.0	14.40	9.21	20.7	36.9	82.9	147	230	332
30.0	17.30	10.1	22.8	40.5	91.2	162	253	365

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	0.74	1.67	2.97	6.67	11.9	18.5	26.7
0.50	0.30	1.19	2.67	4.75	10.7	19.0	29.7	42.7
0.75	0.40	1.54	3.46	6.16	13.9	24.6	38.5	55.4
1.00	0.58	1.84	4.14	7.36	16.6	29.4	46.0	66.2
1.50	0.90	2.35	5.28	9.39	21.1	37.5	58.7	84.5
2.00	1.16	2.78	6.25	11.1	25.0	44.4	69.4	100
3.00	1.73	3.50	7.88	14.0	31.5	56.0	87.5	126
4.00	2.31	4.11	9.26	16.5	37.0	65.8	103	148
5.00	3.00	4.66	10.5	18.6	41.9	74.5	116	168
6.00	3.47	5.15	11.6	20.6	46.3	82.3	129	185
8.0	4.62	6.02	13.5	24.1	54.1	96.2	150	217
10.0	5.78	6.78	15.3	27.1	61.0	109	170	244
12.0	6.93	7.48	16.8	29.9	67.3	120	187	269
14.0	8.00	8.12	18.3	32.5	73.0	130	203	292
16.0	9.00	8.71	19.6	34.8	78.4	139	218	314
18.0	10.00	9.27	20.9	37.1	83.4	148	232	334
20.0	11.60	9.80	22.0	39.2	88.2	157	245	353
25.0	14.40	11.0	24.8	44.0	99.1	176	275	396
30.0	17.30	12.1	27.2	48.4	109	194	303	436

Flame Trap Assembly
Model 8500A

Pressure		Air Flow Capacity 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.02	0.04	0.07	0.15	0.27	0.42	0.60
12.7	1.00	0.03	0.06	0.11	0.24	0.43	0.66	0.96
19.1	2.00	0.03	0.08	0.14	0.31	0.55	0.86	1.24
25.4	3.00	0.04	0.09	0.16	0.37	0.66	1.03	1.48
38.1	4.00	0.05	0.12	0.21	0.47	0.84	1.32	1.89
50.8	5.00	0.06	0.14	0.25	0.56	1.00	1.56	2.24
76.2	7.50	0.08	0.18	0.31	0.71	1.26	1.96	2.81
102	10.00	0.09	0.21	0.37	0.83	1.48	2.31	3.32
127	12.50	0.10	0.23	0.42	0.94	1.67	2.61	3.75
152	15.00	0.12	0.26	0.46	1.04	1.85	2.89	4.15
203	20.00	0.13	0.30	0.54	1.21	2.16	3.38	4.85
254	25.00	0.15	0.34	0.61	1.37	2.43	3.80	5.47
305	30.00	0.17	0.38	0.67	1.51	2.68	4.18	6.03
356	35.00	0.18	0.41	0.73	1.64	2.92	4.55	6.54
406	40.00	0.20	0.44	0.78	1.76	3.13	4.88	7.02
457	45.00	0.21	0.47	0.83	1.87	3.32	5.20	7.47
508	50.00	0.22	0.49	0.88	1.98	3.51	5.49	7.90
635	62.00	0.25	0.55	0.99	2.22	3.94	6.16	8.89
762	75.00	0.27	0.61	1.08	2.44	4.34	6.78	9.78

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.02	0.04	0.08	0.18	0.32	0.50	0.72
12.7	1.00	0.03	0.07	0.13	0.29	0.51	0.80	1.14
19.1	2.00	0.04	0.09	0.17	0.37	0.66	1.03	1.48
25.4	3.00	0.05	0.11	0.20	0.44	0.79	1.23	1.77
38.1	4.00	0.06	0.14	0.25	0.57	1.00	1.57	2.26
50.8	5.00	0.07	0.17	0.30	0.67	1.19	1.86	2.68
76.2	7.50	0.09	0.21	0.38	0.84	1.50	2.34	3.38
102	10.00	0.11	0.25	0.44	0.99	1.76	2.76	3.96
127	12.50	0.12	0.28	0.50	1.12	2.00	3.11	4.50
152	15.00	0.14	0.31	0.55	1.24	2.20	3.46	4.96
203	20.00	0.16	0.36	0.65	1.45	2.58	4.02	5.81
254	25.00	0.18	0.41	0.73	1.63	2.92	4.55	6.54
305	30.00	0.20	0.45	0.80	1.80	3.21	5.01	7.21
356	35.00	0.22	0.49	0.87	1.96	3.48	5.44	7.82
406	40.00	0.23	0.53	0.93	2.10	3.72	5.84	8.41
457	45.00	0.25	0.56	0.99	2.23	3.96	6.22	8.95
508	50.00	0.26	0.59	1.05	2.36	4.21	6.56	9.46
635	62.00	0.29	0.66	1.18	2.65	4.72	7.37	10.61
762	75.00	0.32	0.73	1.30	2.92	5.20	8.12	11.68

GROTH CORPORATION
a Continental Disc company

Well Type Manometer
Model 8170

MODEL 8170 MANOMETER

Groth's well-type Manometer is a direct reading, single column type pressure gauge providing accurate pressure readings, positive, negative or differential. It is used to indicate gas pressure in lines from the digester and those leading to utilities and waste gas burners.

MANOMETER PANEL

Groth manometer panels are constructed of 14 gauge carbon steel with a corrosion resistant epoxy finish. Multiple manometers are factory installed and inter-connected to simplify installation. Each pressure port is connected to a vented stainless steel valve for isolation and zero calibration. All manometers are connected to a common panel vent port, and a flame check is provided for the vent line. Wall mounting is easy and connections are made at the bottom of the panel.

FEATURES

- Scale sizes available:
  12" (300 mm)
  20" (500 mm)
  24" (600 mm)
  30" (750 mm)
  36" (900 mm)
- Indoor or outdoor service
- Standard, over-pressure safety traps provide absolute protection against loss of fluid
- Heavy, heat treated aluminum construction

SPECIAL FEATURES

The Groth unit may be used indoors or outdoors and is designed to be mounted almost anywhere for convenience. The Groth Model 8170 may be wall mounted or panel mounted. Any number of tubes may be mounted side by side on a common panel. A solid acrylic assembly protects the shatter-proof tube and the scale against dust, dirt and rain. Groth manometers have no hidden wells or packing glands, they are leak proof. The tube can be filled with a red or green oil type liquid. The large type inch scale is easy to read. Heavy aluminum construction and durable coating provides a long lasting product which is designed for easy cleaning and maintenance.

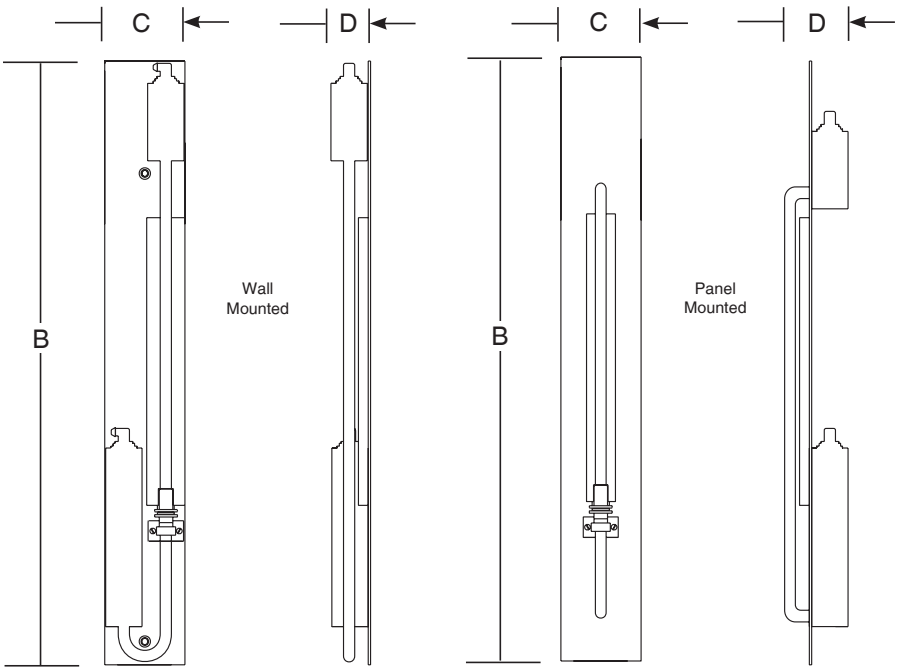
BENEFITS

Allow for easy monitoring of pressure drops within pipeline to prevent overpressure within process

OPTIONS

- Flame check
- Moisture filter with bowl

Well Type Manometer
Model 8170



Specifications subject to change without notice.
Certified dimensions available upon request.

Specification Table • Model 8170

Size*	B Height (Metric)	C Width (Metric)	D Depth** (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
12” (300 mm)	20.88” (530 mm)	2.75” (70 mm)	2.50” (64 mm)	4 (1.8 kg)
20” (500 mm)	29.31” (742 mm)	2.75” (70 mm)	2.50” (64 mm)	5 (2.2 kg)
24” (600 mm)	33.56” (852 mm)	2.75” (70 mm)	2.50” (64 mm)	6 (2.7 kg)

* Scale size in inches of water column. Above dimensions apply to liquid of 1.0 specific gravity.
** Panel mounted. Wall mounted is 1.50” (38 mm).

Note: Dimensions for panel mount available. Consult factory.

MANOMETER – HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # | SIZE | MOUNTING | INDICATOR | OPTIONS

□□□□ ------- □□ ---------- □□ --------- □ ---------- □

8170 (Well-Type)

12”
20”
24”

WM = Wall Mounted
P1 = (1) Panel Mounted
P2 = (2) Panel Mounted
P3 = (3) Panel Mounted
P4 = (4) Panel Mounted
P5 = (5) Panel Mounted
P6 = (6) Panel Mounted

1 = Green Indicator S.G. = 1.0 (standard)
2 = Red Oil *S.G. = 0.826

Z = Special Options
O = No Specials

NOTES
- When panel mounted any number of tubes may be mounted on a single panel with reading columns on 1.50” centers.
* Requires manometer scale for 0.826 S.G.

EXAMPLE

8 1 7 0 — 2 0 P 1 — 1 — O

Indicates a 20” scale manometer, Model 8170 wall mounted with green indicator fluid and no special options.

GROTH CORPORATION
a Continental Disc company

Foam Separator
Model 8600

FOAM SEPARATOR

The Groth Model 8600 Foam Separator is designed to eliminate foam and remove particles from the digester gas discharge. Clogging of down-stream equipment can be prevented by utilizing a Groth Foam Separator.

OPERATION

Foam and solids removal is accomplished by first directing the flow into a baffle that is located in an oversized chamber. Secondly, the gas is subjected to an extended exposure (dwell time) of a continuous water spray. As a result, the foam is knocked down and removed through the drain.

Level switches are supplied to provide alarms in case the water should rise above the drain level. At this point, a signal is sent to the spray water solenoid valve for automatic shut-down. The system will automatically reset when a safe water level is re-established.

By using a Groth Foam Separator, gas line equipment such as recirculation compressors can be protected. Contact your local Groth Representative for information.

FEATURES

- Sizes 2" (50 mm) through 12" (300 mm) Larger sizes available
- All stainless steel construction
- Eliminates foam
- Removes particles
- Continuous water spray systems
- High and low level alarms
- Automatic water supply shut down
- Visual drain flow indicator
- Visual water supply indicator
- Custom designs available
- NEMA 7 Control panel available

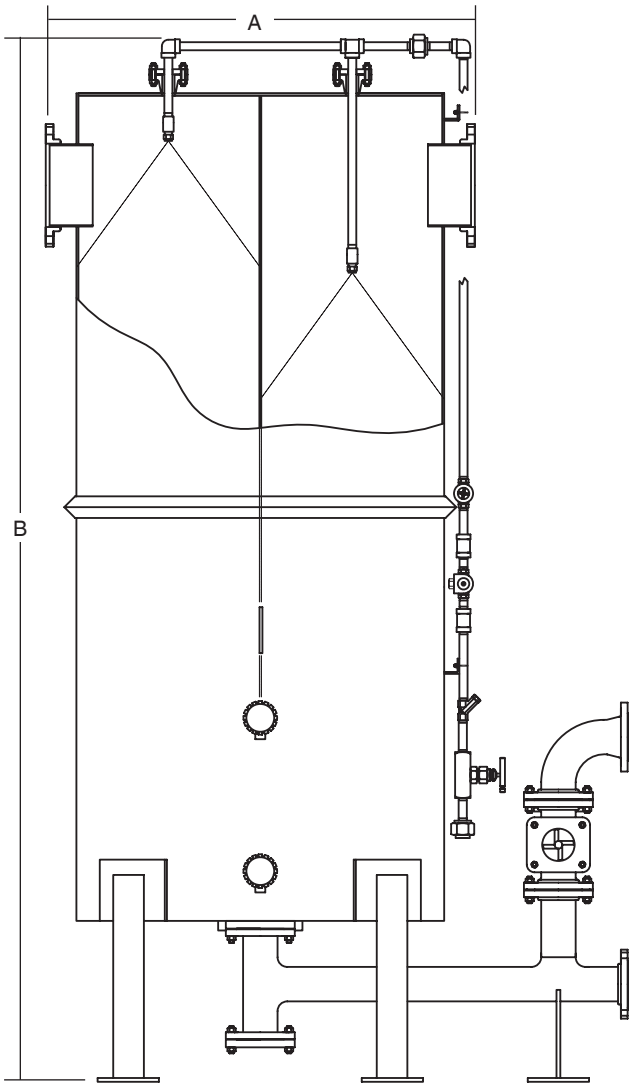
SPECIAL FEATURES

The Groth Model 8600 Foam Separator is supplied in all stainless steel construction to prevent corrosion and maintenance problems. The large reservoir and baffled design will provide an extended "dwell" period to insure the elimination of foam and will provide additional flow capacity with a low pressure drop. Flow indicators are available to provide visual assurance of the drain and supply water flow. Maximum working pressure is 1 psig (27.68 InWC).

BENEFITS

Separation of foam and removal of particulated helps protect down stream equipment damage.

Foam Separator
Model 8600



Specification Table • Model 8600

Size*	A Length (Metric)	B Height (Metric)	Approx. Ship. Wt. Lbs.
2” (50 mm)	24” (610 mm)	125” (3175 mm)	310 (141 kg)
3” (80 mm)	24” (610 mm)	125” (3175 mm)	310 (141 kg)
4” (100 mm)	24” (610 mm)	125” (3175 mm)	310 (141 kg)
6” (150 mm)	36” (914 mm)	136” (3454 mm)	560 (254 kg)
8” (200 mm)	36” (914 mm)	136” (3454 mm)	560 (254 kg)
10” (250 mm)	60” (1524 mm)	152” (3861 mm)	1000 (454 kg)
12” (300 mm)	60” (1524 mm)	152” (3861 mm)	1000 (454 kg)

* 150# ASME R.F.

Specifications subject to change without notice.
Certified dimensions available upon request.
Dimensions may vary depending on system specifications.
Consult factory.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

- MODEL #: 8600
- SIZE: 02” Thru 12”
- MATERIAL:
  - 4 = 304 SS
  - 5 = 316 SS
  - Z = Special
- OPTIONS:
  - Z = Special Options / O = No Specials
  - 1 = Water Supply Indicators / O = No Water Supply Indicators
  - 1 = Flow Indicators / O = No Flow Indicators
  - 1 = Alarms/Solenoid / O = No Alarms/Solenoid

NOTES
- For special options, consult factory.

EXAMPLE

8600 — 04 — 5 — 1110

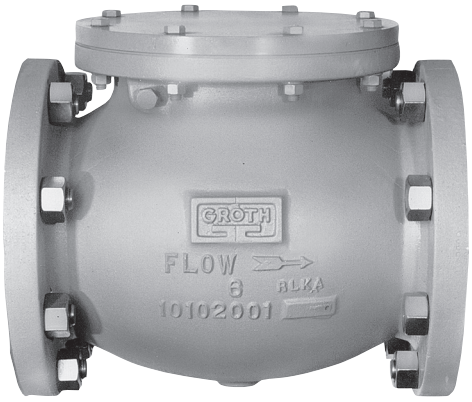
Indicates a 4” Model 8600, 316 SS construction with alarms/Solenoid, drain and water supply indicators and no specials.

GROTH CORPORATION
a Continental Disc company

Back Pressure Check Valve
Model 8110

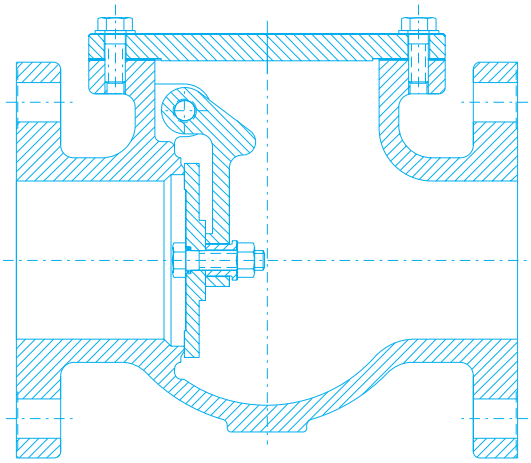
BACK PRESSURE CHECK VALVE

Model 8110 is used specifically in low pressure gas control lines where minimum pressure drops and maximum flow capacity are required. A choice of a standard 125# ASME FF flanged connector or a threaded connection for 2" and 3" sizes only.



FEATURES

- Sizes 2" (50 mm) through 12" (300 mm)
- Full flow with low pressure drop
- Standard aluminum (type 356-T6)



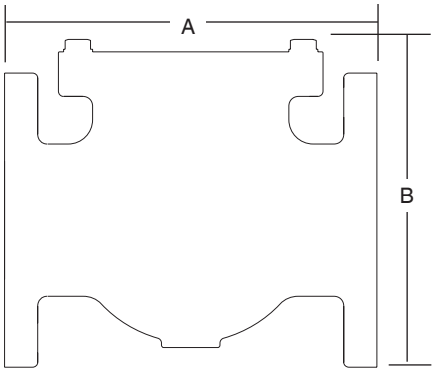
SPECIAL FEATURES

Model 8110 valves are built of corrosion resistant material throughout. Furnished standard in aluminum with free swinging aluminum pendulum type pallet. By removing the cover, easy access is provided for quick inspection and maintenance. Model 8110 check valves should be installed in your low pressure line downstream of meters, regulators and other gas control devices that may be otherwise damaged by an accidental reversal of the pressure in the system due to pressure waves from an explosion or such mishap.

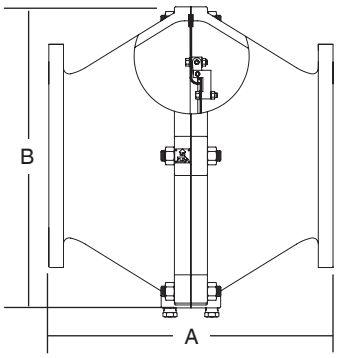
BENEFITS

- Prevents damage to equipment from any backpressure in pipeline
- Low maintenance reduces the cost to operate the product

Back Pressure Check Valve
Model 8110



2” - 8”



10” - 12”

Specification Table • Model 8110

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	Length Flange A (Metric)	Height Flange B (max) (Metric)	MAX W.P.[1]	Approx. Ship. Wt. Lbs
2” (50 mm)	8” (203 mm)	8.12” (206 mm)	10 PSIG 0.689 barg	9 (4 kg)
3” (80 mm)	9.50” (241 mm)	10.50” (267 mm)		15 (7 kg)
4” (100 mm)	11.50” (292 mm)	11.50” (292 mm)		28 (13 kg)
6” (150 mm)	14” (356 mm)	13.50” (343 mm)		50 (23 kg)
8” (200 mm)	19.50” (495 mm)	16.50” (419 mm)		90 (41 kg)
10” (250 mm)	25.69” (653 mm)	19.00” (480 mm)		111 (50 kg)
12” (300 mm)	34.82” (884 mm)	22.50” (572 mm)		150 (68 kg)

* 150# ASME compatibility. F.F. on aluminum. NPT connection available on 2” and 3” size only.
1. W.P. = Working Pressure

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # — SIZE — MATERIAL — OPTIONS

□□□□ — □□ — □ — □□

- MODEL #: 8110
- SIZE: 02” Thru 12”
- MATERIAL: Body Material
  - 1 = Aluminum
  - Z = Special
- OPTIONS
  - Z = Special Options
  - O = No Specials
  - N = NPT Threaded
  - F = Flanged

NOTES

- For special options, consult factory.

EXAMPLE

8 1 1 0 — 0 4 — 1 — F O

Indicates a 4” Model 8110 with an aluminum body, flanged and no specials.

GROTH CORPORATION
a Continental Disc company

Back Pressure Check Valve
Model 8110

Pressure		Air Flow Capacity 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	1.11	2.50	4.44	10.0	17.8	27.8	40.0
0.50	0.30	2.22	5.00	8.89	20.0	35.6	55.6	80.0
0.75	0.40	3.33	7.50	13.3	30.0	53.3	83.3	120
1.00	0.58	4.44	10.0	17.8	40.0	71.1	111	160
1.50	0.90	6.67	15.0	26.7	60.0	107	167	240
2.00	1.16	7.70	17.3	30.8	69.3	123	192	277
3.00	1.73	9.43	21.2	37.7	84.9	151	236	339
4.00	2.31	10.9	24.5	43.5	98.0	174	272	392
5.00	3.00	12.2	27.4	48.7	110	195	304	438
6.00	3.47	13.3	30.0	53.3	120	213	333	480
8.0	4.62	15.4	34.6	61.6	139	246	385	554
10.0	5.78	17.2	38.7	68.9	155	275	430	620
12.0	6.93	18.9	42.4	75.4	170	302	471	679
14.0	8.00	20.4	45.8	81.5	183	326	509	733
16.0	9.00	21.8	49.0	87.1	196	348	544	784
18.0	10.00	23.1	52.0	92.4	208	370	577	831
20.0	11.60	24.3	54.8	97.4	219	389	609	876
25.0	14.40	27.2	61.2	109	245	435	680	980
30.0	17.30	29.8	67.1	119	268	477	745	1073

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	1.33	2.99	5.31	12.0	21.2	33.2	47.8
0.50	0.30	2.66	5.98	10.6	23.9	42.5	66.4	95.6
0.75	0.40	3.98	8.96	15.9	35.9	63.7	100	143
1.00	0.58	5.31	12.0	21.2	47.8	85.0	133	191
1.50	0.90	7.97	17.9	31.9	71.7	127	199	287
2.00	1.16	9.20	20.7	36.8	82.8	147	230	331
3.00	1.73	11.3	25.4	45.1	101	180	282	406
4.00	2.31	13.0	29.3	52.0	117	208	325	468
5.00	3.00	14.5	32.7	58.2	131	233	364	524
6.00	3.47	15.9	35.9	63.7	143	255	398	574
8.0	4.62	18.4	41.4	73.6	166	294	460	662
10.0	5.78	20.6	46.3	82.3	185	329	514	741
12.0	6.93	22.5	50.7	90.1	203	361	563	811
14.0	8.00	24.3	54.8	97.4	219	389	609	876
16.0	9.00	26.0	58.6	104	234	416	651	937
18.0	10.00	27.6	62.1	110	248	442	690	994
20.0	11.60	29.1	65.5	116	262	466	727	1047
25.0	14.40	32.5	73.2	130	293	520	813	1171
30.0	17.30	35.6	80.2	143	321	570	891	1283

Back Pressure Check Valve
Model 8110

Pressure		Air Flow Capacity 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.03	0.07	0.12	0.27	0.48	0.74	1.07
12.7	1.00	0.06	0.13	0.24	0.54	0.95	1.49	2.14
19.1	2.00	0.09	0.20	0.36	0.80	1.43	2.23	3.21
25.4	3.00	0.12	0.27	0.48	1.07	1.90	2.97	4.29
38.1	4.00	0.18	0.40	0.72	1.61	2.87	4.47	6.43
50.8	5.00	0.21	0.46	0.83	1.86	3.30	5.14	7.42
76.2	7.50	0.25	0.57	1.01	2.27	4.05	6.32	9.08
102	10.00	0.29	0.66	1.17	2.63	4.66	7.29	10.50
127	12.50	0.33	0.73	1.30	2.95	5.22	8.14	11.73
152	15.00	0.36	0.80	1.43	3.21	5.71	8.92	12.86
203	20.00	0.41	0.93	1.65	3.72	6.59	10.31	14.84
254	25.00	0.46	1.04	1.85	4.15	7.37	11.52	16.61
305	30.00	0.51	1.14	2.02	4.55	8.09	12.62	18.19
356	35.00	0.55	1.23	2.18	4.90	8.73	13.64	19.64
406	40.00	0.58	1.31	2.33	5.25	9.32	14.57	21.00
457	45.00	0.62	1.39	2.48	5.57	9.91	15.46	22.26
508	45.00	0.65	1.47	2.61	5.87	10.42	16.32	23.47
635	62.00	0.73	1.64	2.92	6.56	11.65	18.22	26.25
762	75.00	0.80	1.80	3.19	7.18	12.78	19.96	28.75

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.04	0.08	0.14	0.32	0.57	0.89	1.28
12.7	1.00	0.07	0.16	0.28	0.64	1.14	1.78	2.56
19.1	2.00	0.11	0.24	0.43	0.96	1.71	2.68	3.83
25.4	3.00	0.14	0.32	0.57	1.28	2.28	3.56	5.12
38.1	4.00	0.21	0.48	0.85	1.92	3.40	5.33	7.69
50.8	5.00	0.25	0.55	0.99	2.22	3.94	6.16	8.87
76.2	7.50	0.30	0.68	1.21	2.71	4.82	7.55	10.88
102	10.00	0.35	0.78	1.39	3.13	5.57	8.71	12.54
127	12.50	0.39	0.88	1.56	3.51	6.24	9.75	14.04
152	15.00	0.43	0.96	1.71	3.83	6.83	10.66	15.38
203	20.00	0.49	1.11	1.97	4.45	7.88	12.32	17.73
254	25.00	0.55	1.24	2.20	4.96	8.81	13.77	19.85
305	30.00	0.60	1.36	2.41	5.44	9.67	15.08	21.73
356	35.00	0.65	1.47	2.61	5.87	10.42	16.32	23.47
406	40.00	0.70	1.57	2.79	6.27	11.14	17.44	25.10
457	45.00	0.74	1.66	2.95	6.64	11.84	18.49	26.63
508	50.00	0.78	1.75	3.11	7.02	12.48	19.48	28.05
635	62.00	0.87	1.96	3.48	7.85	13.93	21.78	31.37
762	75.00	0.95	2.15	3.83	8.60	15.27	23.87	34.37

GROTH CORPORATION
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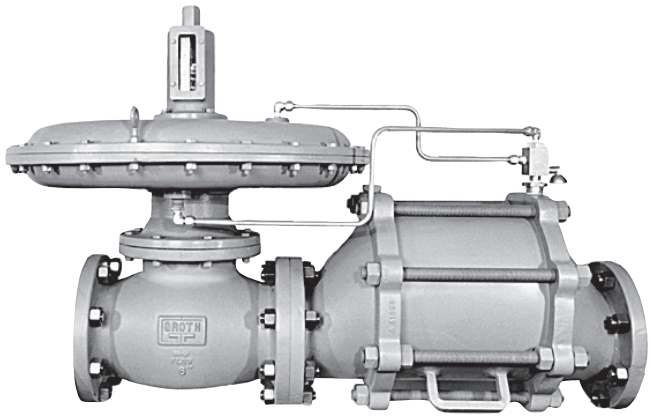
Pressure Relief and Flame Trap Assembly
Model 8400A



GROTH REGULATOR
The regulator part of the assembly is a back pressure regulator to maintain upstream pressure over a range of 2 InWC to 24 InWC. This assembly is usually placed just upstream from the waste gas burner.

GROTH FLAME ARRESTER
Model 7628 flame arrester is attached to Model 8860 Back Pressure Regulator with the Model 8410 thermal switch valve. See Model 7628 information in this catalog.

FEATURES
- Sizes 2" (50 mm) through 12" (300 mm)
- Unit designed for quick and easy maintenance
- Single port regulator for tight shut-off
- Aluminum (type 356-T6), and other materials
- Factory Mutual approved flame arrester
- Custom spring ranges available

SPECIAL FEATURES
This unit accomplishes two purposes. It will maintain a predetermined back pressure in order that only surplus gas is flared and inhibits a possible flame flashback of the flare into the gas control system. A fusible element that is rated at 260°F precludes valve shut-off unless contacted by flame. The visual indicator provides operator with easy adjustments. The proven spiral wound, crimped ribbon flame element provides the best flame quenching performance for the least pressure drop.

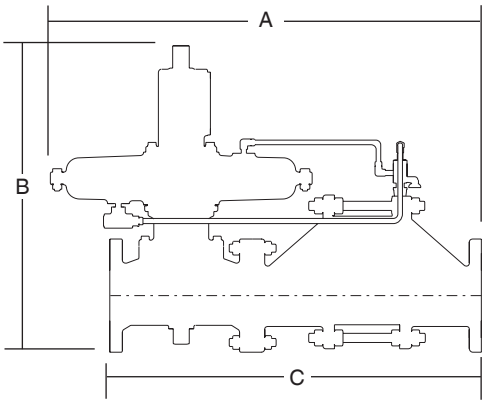
The unit is corrosion resistant throughout and quick and easy to open and maintain. Standard operating range is 2 to 12 InWC or a special range of 8" to 24" is available when higher pressures are required. Consult factory for 10 to 12 InWC for optional settings. When not specified, factory sets standard at 6 InWC.

BENEFITS
- Simple upstream pressure regulation allows for accurate pressure relief
- Adjustable set pressure for easy process pressure relief adjustment
- Prevents pipeline deflagration from damaging tanks, pipelines, and other process equipment

OPTIONS
- Drain connection
- Drip trap connection
- Insulation jacket
- Thermocouple/thermowell connection
- Flame check (vent line)
- Electronic shut-off
- Various spring ranges

END-OF-LINE	IN-LINE
(Flanged Outlet with or without Discharge Piping) • Gas Group: NEC D, IEC IIA • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure = Atmosphere • Discharge Piping Length <= 10 pipe diameters	• Gas Group: IEC IIA1, Methane (includes most Biogas applications) • Operating Temperature <= 140°F (60°C) • Pre-Ignition Pressure <= 1 psig • Run-up Length <= 50 pipe diameters (2") • Run-up Length <= 20 pipe diameters (3") • Run-up Length <= 10 pipe diameters (4" – 12")

Pressure Relief and Flame Trap Assembly
Model 8400A



Specification Table • Model 8400A

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*	A Length (Metric)	B Height (Metric)	C Face to Face (Metric)	MAX Working Pressure	Approx. Ship. Wt. Lbs. (Aluminum)
2” (50 mm)	28.69” (729 mm)	25” (635 mm)	22.81” (579 mm)	10 PSIG 0.689 barg	80 (36 kg)
3” (80 mm)	31.31” (795 mm)	26” (660 mm)	26.06” (662 mm)		100 (45 kg)
4” (100 mm)	34.25” (870 mm)	27” (686 mm)	29.69” (754 mm)		150 (68 kg)
6” (150 mm)	41.81” (1062 mm)	32.25” (819 mm)	36.06” (916 mm)		200 (91 kg)
8” (200 mm)	50.06” (1272 mm)	33.50” (851 mm)	47.94” (1218 mm)		300 (136 kg)
10” (250 mm)	55.75” (1416 mm)	47.75” (1213 mm)	55.75” (1416 mm)		645 (293 kg)
12” (300 mm)	67.38” (1711 mm)	50.75” (1289 mm)	67.38” (1711 mm)		795 (362 kg)

* 150# ASME compatibility. NPT connection available on 2” and 3” size only.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # ☐☐☐☐☐ ---------- SIZE ☐☐ ---------- MATERIAL ☐☐☐☐ ---------- OPTIONS ☐☐

- MODEL #: 8400A
- SIZE: 02” Thru 12”
- MATERIAL:
  - Flame Element*
  - Flame Arrester Body*
  - Pallet Material
  - Body Material
    - 1 = Aluminum
    - Z = Special
    - 5 = 316 SS
- OPTIONS:
  - Z = Special Options
  - O = No Specials
  - Diaphragm Material
    - B = Buna-N
    - Z = Special

NOTES
- For special options, consult factory.
- * Not required for Model 8860

EXAMPLE ☐8☐4☐0☐0☐A — ☐0☐4 — ☐1☐5☐5☐5 — ☐B☐O

Indicates a 4” Model 8400A with aluminum body, 316SS pallet and flame element, Buna-N diaphragm.

GROTH CORPORATION
a Continental Disc company

Pressure Relief and Flame Trap Assembly
Model 8400A

Pressure		Air Flow Capacity 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	0.62	1.40	2.48	5.58	9.92	15.5	22.3
0.50	0.30	0.99	2.24	3.97	8.94	15.9	24.8	35.8
0.75	0.40	1.29	2.90	5.15	11.6	20.6	32.2	46.4
1.00	0.58	1.54	3.46	6.15	13.8	24.6	38.5	55.4
1.50	0.90	1.96	4.42	7.85	17.7	31.4	49.1	70.7
2.00	1.16	2.32	5.23	9.29	20.9	37.2	58.1	83.6
3.00	1.73	2.93	6.59	11.7	26.4	46.9	73.2	105
4.00	2.31	3.44	7.75	13.8	31.0	55.1	86.1	124
5.00	3.00	3.90	8.76	15.6	35.1	62.3	97.4	140
6.00	3.47	4.30	9.69	17.2	38.7	68.9	108	155
8.0	4.62	5.03	11.3	20.1	45.3	80.5	126	181
10.0	5.78	5.67	12.8	22.7	51.1	90.8	142	204
12.0	6.93	6.26	14.1	25.0	56.3	100	156	225
14.0	8.00	6.79	15.3	27.2	61.1	109	170	244
16.0	9.00	7.29	16.4	29.1	65.6	117	182	262
18.0	10.00	7.75	17.4	31.0	69.8	124	194	279
20.0	11.60	8.20	18.4	32.8	73.8	131	205	295
25.0	14.40	9.21	20.7	36.9	82.9	147	230	332
30.0	17.30	10.1	22.8	40.5	91.2	162	253	365

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.25	0.10	0.74	1.67	2.97	6.67	11.9	18.5	26.7
0.50	0.30	1.19	2.67	4.75	10.7	19.0	29.7	42.7
0.75	0.40	1.54	3.46	6.16	13.9	24.6	38.5	55.4
1.00	0.58	1.84	4.14	7.36	16.6	29.4	46.0	66.2
1.50	0.90	2.35	5.28	9.39	21.1	37.5	58.7	84.5
2.00	1.16	2.78	6.25	11.1	25.0	44.4	69.4	100
3.00	1.73	3.50	7.88	14.0	31.5	56.0	87.5	126
4.00	2.31	4.11	9.26	16.5	37.0	65.8	103	148
5.00	3.00	4.66	10.5	18.6	41.9	74.5	116	168
6.00	3.47	5.15	11.6	20.6	46.3	82.3	129	185
8.0	4.62	6.02	13.5	24.1	54.1	96.2	150	217
10.0	5.78	6.78	15.3	27.1	61.0	109	170	244
12.0	6.93	7.48	16.8	29.9	67.3	120	187	269
14.0	8.00	8.12	18.3	32.5	73.0	130	203	292
16.0	9.00	8.71	19.6	34.8	78.4	139	218	314
18.0	10.00	9.27	20.9	37.1	83.4	148	232	334
20.0	11.60	9.80	22.0	39.2	88.2	157	245	353
25.0	14.40	11.0	24.8	44.0	99.1	176	275	396
30.0	17.30	12.1	27.2	48.4	109	194	303	436

Pressure Relief and Flame Trap Assembly

Model 8400A

Pressure		Air Flow Capacity 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.02	0.04	0.07	0.15	0.27	0.42	0.60
12.7	1.00	0.03	0.06	0.11	0.24	0.43	0.66	0.96
19.1	2.00	0.03	0.08	0.14	0.31	0.55	0.86	1.24
25.4	3.00	0.04	0.09	0.16	0.37	0.66	1.03	1.48
38.1	4.00	0.05	0.12	0.21	0.47	0.84	1.32	1.89
50.8	5.00	0.06	0.14	0.25	0.56	1.00	1.56	2.24
76.2	7.50	0.08	0.18	0.31	0.71	1.26	1.96	2.81
102	10.00	0.09	0.21	0.37	0.83	1.48	2.31	3.32
127	12.50	0.10	0.23	0.42	0.94	1.67	2.61	3.75
152	15.00	0.12	0.26	0.46	1.04	1.85	2.89	4.15
203	20.00	0.13	0.30	0.54	1.21	2.16	3.38	4.85
254	25.00	0.15	0.34	0.61	1.37	2.43	3.80	5.47
305	30.00	0.17	0.38	0.67	1.51	2.68	4.18	6.03
356	35.00	0.18	0.41	0.73	1.64	2.92	4.55	6.54
406	40.00	0.20	0.44	0.78	1.76	3.13	4.88	7.02
457	45.00	0.21	0.47	0.83	1.87	3.32	5.20	7.47
508	50.00	0.22	0.49	0.88	1.98	3.51	5.49	7.90
635	62.00	0.25	0.55	0.99	2.22	3.94	6.16	8.89
762	75.00	0.27	0.61	1.08	2.44	4.34	6.78	9.78

Pressure		Flow Capacity of 0.7 SG Digester Gas 1000 Normal Cubic Meters per Hour at 0° C						
mmWC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
6.35	0.60	0.02	0.04	0.08	0.18	0.32	0.50	0.72
12.7	1.00	0.03	0.07	0.13	0.29	0.51	0.80	1.14
19.1	2.00	0.04	0.09	0.17	0.37	0.66	1.03	1.48
25.4	3.00	0.05	0.11	0.20	0.44	0.79	1.23	1.77
38.1	4.00	0.06	0.14	0.25	0.57	1.00	1.57	2.26
50.8	5.00	0.07	0.17	0.30	0.67	1.19	1.86	2.68
76.2	7.50	0.09	0.21	0.38	0.84	1.50	2.34	3.38
102	10.00	0.11	0.25	0.44	0.99	1.76	2.76	3.96
127	12.50	0.12	0.28	0.50	1.12	2.00	3.11	4.50
152	15.00	0.14	0.31	0.55	1.24	2.20	3.46	4.96
203	20.00	0.16	0.36	0.65	1.45	2.58	4.02	5.81
254	25.00	0.18	0.41	0.73	1.63	2.92	4.55	6.54
305	30.00	0.20	0.45	0.80	1.80	3.21	5.01	7.21
356	35.00	0.22	0.49	0.87	1.96	3.48	5.44	7.82
406	40.00	0.23	0.53	0.93	2.10	3.72	5.84	8.41
457	45.00	0.25	0.56	0.99	2.23	3.96	6.22	8.95
508	50.00	0.26	0.59	1.05	2.36	4.21	6.56	9.46
635	62.00	0.29	0.66	1.18	2.65	4.72	7.37	10.61
762	75.00	0.32	0.73	1.30	2.92	5.20	8.12	11.68

GROTH CORPORATION
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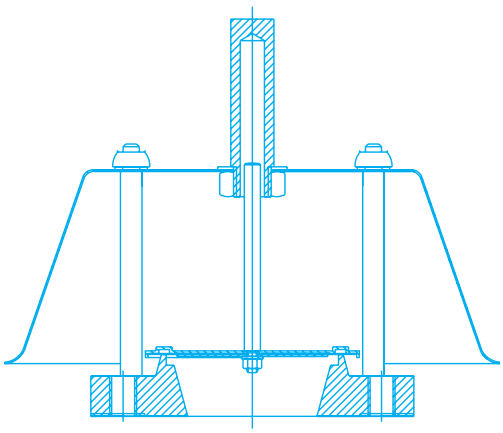
Pressure Relief Vent
Model 2300A

EMERGENCY RELIEF VENT

Model 2300A is designed for emergency relief on gas line leading to waste gas burner and other low pressure equipment. Pressures are relieved thereby protecting major equipment.



FEATURES

- Sizes 2" (50 mm) through 12" (300 mm)
- Pressure settings 1 InWC to 30 InWC
- Available in aluminum (type 356-T6) and other materials

SPECIAL FEATURES

Model 2300A is built of corrosion resistant material throughout. Groth's self-closing special "cushioned air" pallet with center stabilizing stem and peripheral guiding provides uniform seating and alignment. Superior performing Buna-N seating diaphragms are standard to insure extra tight seal to prevent sludge vapors escaping to the atmosphere. The guides support a weatherhood which covers and protects the valve structure. As added protection against the entry of foreign matter, a mesh screen encircles the valve under the weatherhood.

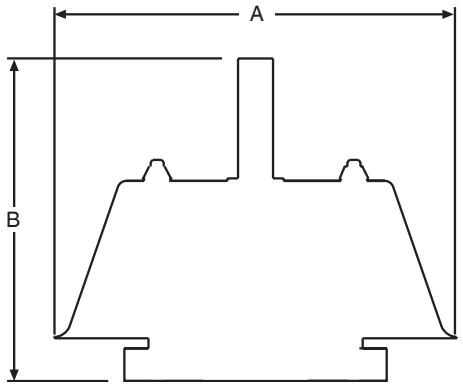
BENEFITS

Prevents high pressure from damaging upstream equipment by venting pressure quickly.

OPTIONS

- All weather coating
- Proximity switch
- Incremental weights for setting adjustment

Pressure Relief Vent
Model 2300A



Specification Table • Model 2300A†

Specifications subject to change without notice.
Certified dimensions available upon request.

Size*† Flange	Maximum Set Pressure	Minimum Set Pressure	A Diameter (Metric)	B Height (Metric)	Approx. Ship Wt. Lbs. (Aluminum)
2” (50 mm)	30 InWC WEIGHT LOADED	0.87 InWC WEIGHT LOADED	9.50” (241 mm)	6.63” (168 mm)	12 (5 kg)
3” (80 mm)			11.50” (292 mm)	8.63” (219 mm)	15 (7 kg)
4” (100 mm)			13” (330 mm)	10.56” (268 mm)	20 (9 kg)
6” (150 mm)			19” (480 mm)	15” (381 mm)	30 (14 kg)
8” (200 mm)			23.63” (600 mm)	16.63” (422 mm)	45 (20 kg)
10” (250 mm)			30.75” (781 mm)	17” (431 mm)	65 (30 kg)
12” (300 mm)			36” (914 mm)	18” (457 mm)	100 (45 kg)

† Larger sizes available - consult factory. *150# ASME drilling compatibility, F.F. on aluminum and R.F. on stainless steel alloys.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # | SIZE | MATERIAL | OPTIONS

- MODEL #: 2300A Weight Loaded
- SIZE: 02” Thru 12”
- MATERIAL: Pallet Material, Seat Material, * Body Material
  - 1 = Aluminum
  - Z = Special
  - 5 = 316 SS
- OPTIONS
  - O = No Options
  - Z = Special Options
  - O = No Options
  - Diaphragm Material (Seat):
    - B = Buna-N
    - T = TEFLON®

NOTES
- Include model number and setting when ordering.
- For special options, consult factory.
- * Stainless steel guides and stems are standard with aluminum bodies.

EXAMPLE

2 3 0 0 A — 0 2 — 1 1 5 — B 0 0

Indicates a 2” Model 2300A with Aluminum Body and Seat, 316 SS Pallet, Buna-N Seat Diaphragm and no other options.

GROTH CORPORATION
a Continental Disc company

Pressure Relief Vent
Model 2300A

Set Pressure (Ps)		Air Flow Capacity at 100% Over-pressure (Double Set Pressure) 1000 Standard Cubic Feet per Hour at 60° F						
InWC	oz/in²	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
0.87	0.50	6.98	15.4	26.1	58.5	88.4	143	211
1.00	0.58	7.50	16.5	28.0	62.8	95.0	154	227
1.73	1.00	9.85	21.7	36.8	82.5	125	203	298
2.00	1.16	10.6	23.3	39.6	88.6	134	218	320
2.60	1.50	12.1	26.6	45.1	101	153	248	365
3.00	1.73	12.9	28.6	48.4	108	164	266	392
3.46	2.00	13.9	30.7	52.0	116	176	285	420
4.00	2.31	14.9	33.0	55.8	125	189	307	451
6.00	3.47	18.2	40.4	68.2	152	230	374	550
8.00	4.62	21.0	46.6	78.5	175	265	430	633
10.0	5.78	23.4	52.1	87.6	194	295	479	705
12.0	6.93	25.6	57.1	95.7	212	322	523	769
15.0	8.66	28.5	63.8	107	235	358	581	855
20.0	11.60	32.7	73.6	122	268	409	665	979
25.0	14.40	36.3	82.2	136	296	454	736	1084
30.0	17.30	39.5	89.9	148	321	492	799	1177

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% over-pressure.

Read the flow capacity at 100% over-pressure directly from the table above. Use linear interpolation if the set pressure is not listed.

If the allowable over-pressure is less than 100%, modify the flow capacity using the
appropriate "C" factor from the table.

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

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

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

Example—To find "C" factor from table:
Read "C" factor for 75% Over-pressure at intersection of row **70** and column **5**
"C" factor at 75% OP = **0.87**

"C" Factor Table										
%OP	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—Flow Capacity Calculation

6" Model 2300A
4 InWC set pressure [P_s]
7 InWC flowing pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 125,000 SCFH
2. Calculate over-pressure — % OP = [(7 - 4)/4] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x 125,000 = 108,750 SCFH**

To determine flow capacity of vapors other than air, multiply the capacities above by the following factors.	
S.G. of Vapor	Factor
0.70	1.19
0.75	1.15
0.80	1.12
0.85	1.08

Pressure Relief Capacity
Model 2300A

Set Pressure (Ps)		Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Normal Cubic Meters per Hour at 0° C						
mm WC	mbar	2" (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
22	2.16	0.20	0.43	0.73	1.65	2.49	4.04	5.95
50	4.90	0.30	0.65	1.11	2.48	3.75	6.08	8.95
75	7.35	0.36	0.80	1.35	3.03	4.58	7.43	10.9
100	9.80	0.42	0.92	1.56	3.49	5.28	8.57	12.6
125	12.3	0.47	1.03	1.74	3.89	5.89	9.56	14.1
150	14.7	0.51	1.13	1.91	4.25	6.44	10.5	15.4
175	17.2	0.55	1.22	2.06	4.58	6.94	11.3	16.6
200	19.6	0.59	1.30	2.19	4.88	7.40	12.0	17.7
225	22.1	0.62	1.38	2.32	5.16	7.84	12..7	18.7
250	24.5	0.65	1.46	2.45	5.43	8.25	13.4	19.7
275	27.0	0.69	1.53	2.56	5.68	8.63	14.0	20.6
300	29.4	0.72	1.59	2.67	5.92	9.00	14.6	21.5
375	36.8	0.80	1.78	2.98	6.57	10.0	16.2	23.9
500	49.0	0.91	2.06	3.42	7.49	11.4	18.6	27.4
625	61.3	1.02	2.30	3.80	8.28	12.7	20.6	30.3
750	73.5	1.11	2.51	4.13	8.97	13.8	22.4	32.9

Flow capacity is certified by Groth Corporation, based on actual tests conducted in compliance with API Std. 2000.
Flow measurement accuracy has been verified by an independent testing laboratory.

Flow capacity values listed above are based on full open valves at 100% overpressure.

For an equivalent size fiberglass valve, reduce tabulated capacities by 32%.

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.

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

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

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**

"C" Factor Table										
%OP	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—Flow Capacity Calculation

6" Model 2300A
100 mm WC Set Pressure [P_s]
175 mm WC Flowing Pressure [P_f]

1. Read flow capacity at set pressure from table — Flow = 3,490 NCMH
2. Calculate overpressure — % OP = [(175 - 100)/100] x 100 = 75%
3. Read "C" factor from table — "C" = 0.87
4. Calculate flow capacity — **Flow = 0.87 x ,490 = 3,036 NCMH**

GROTH CORPORATION
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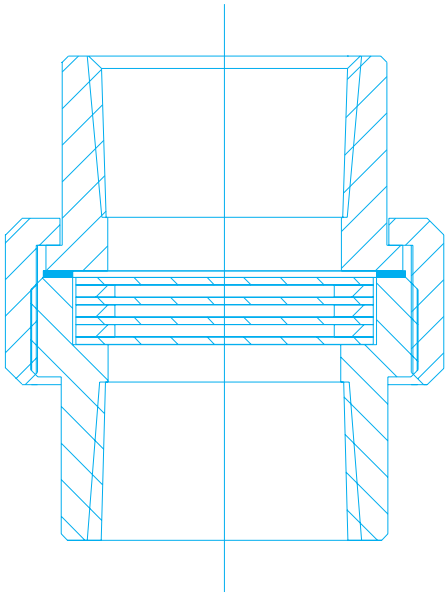
Flame Checks
Model 7622

FLAME CHECKS

Model 7622 is designed to prevent flashback in small lines carrying flammable gases. They are often used in small pilot lines and are intended for use where the gas flow can be shut off. Flame Checks are union type fittings with FNPT connections.

FEATURES

- Sizes 1/2” through 2”
- Available in housing of 316 SS with element (perforated plates) of 304 SS or 316 SS
- Designed for easy maintenance



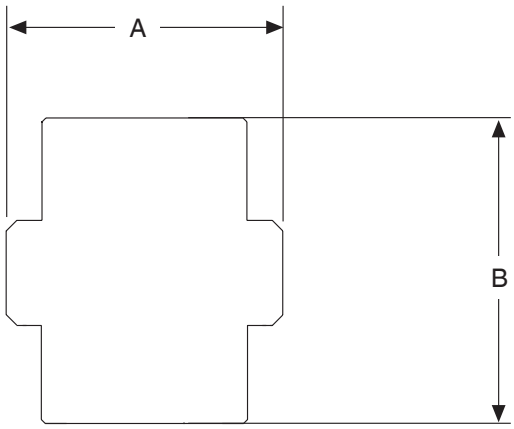
SPECIAL FEATURES

The Model 7622 flame element consists of perforated plates with sufficient openings to provide a minimum pressure drop and still prevent flash-back in the line. The construction permits easy access for inspection and maintenance. Flame elements consist of 316 SS perforated plates with exact passage way sized holes.

BENEFITS

- Quenches flashbacks in pilot gas pipelines, preventing damage to upstream equipment
- Easy maintenance

Flame Checks
Model 7622



Specification Table • Model 7622

Specifications subject to change without notice.
Certified dimensions available upon request.

Size (FNPT)	A Width (Metric)	B Height (Metric)	Approx. Ship. Wt. Lbs. (Aluminum)
.50"*	1.87"	2.77"	1
(13 mm)	(48 mm)	(70 mm)	(.5 kg)
.75"	1.87"	1.84"	1
(19mm)	(48 mm)	(47 mm)	(.5 kg)
1"	2.12"	2.34"	3
(25 mm)	(54 mm)	(59 mm)	(1.4 kg)
1.50"	2.50"	2.59"	4
(38 mm)	(64 mm)	(66 mm)	(1.8 kg)
2"	4.12"	3.50"	6
(50 mm)	(105 mm)	(89 mm)	(2.7 kg)

* .50" size utilizes a .75" flame check with .75" x .50" reducers. Note: Maximum working pressure 25 psig.

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # □□□□ ---------- SIZE □□ ---------- MATERIAL □□ ---------- OPTIONS □□

- MODEL #: 7622
- SIZE: .50" Thru 2"
- MATERIAL:
  - * Flame Element
  - Body Material
  - 4 = 304 SS (Flame element only)
  - 5 = 316 SS
  - Z = Special
- OPTIONS:
  - O = No Specials
  - Z = Special Options
  - N = FNPT threaded connections
  - F = Flange Connections

NOTES
- Include model number when ordering.
- For special options, consult factory.
- * Standard material 304 SS for flame element.

EXAMPLE 7622 — 01 — 54 — NO

Indicates a 1" Model 7622 with 316 SS, 304 SS flame element, FNPT connections and no options.

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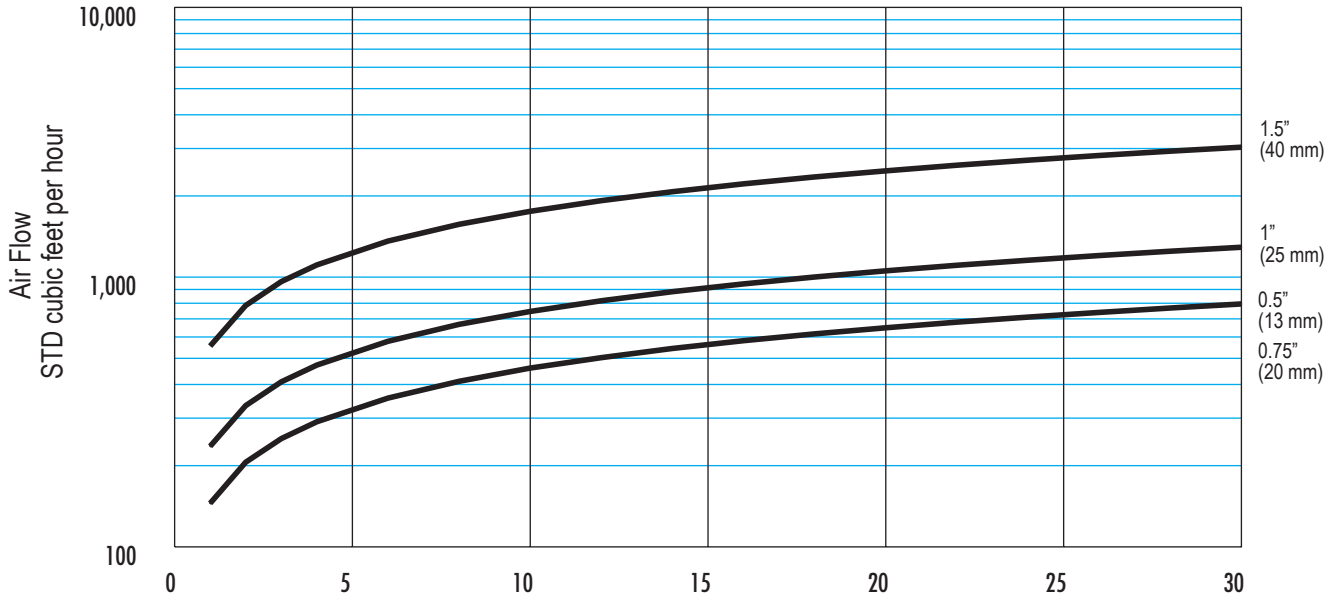
Pressure Relief Capacity of Groth Flame Check
Model 7622

Pressure Drop		Air Flow – 1000 Standard Cubic feet per Hour at 60° F			
InWC	oz/in²	0.5" (13 mm) & 0.75" (20 mm)	1" (25 mm)	1.5" (40 mm)	2" (50 mm)
1	0.58	145	236	555	
2	1.16	206	334	785	
3	1.73	252	409	962	
4	2.31	291	472	1110	
6	3.47	356	578	1360	
8	4.62	411	668	1570	
10	5.78	460	746	1755	
12	6.93	503	817	1922	
14	8.00	544	883	2075	
16	9.00	581	944	2218	
18	10.00	616	1001	2353	
20	11.60	649	1055	2479	
22	13.00	681	1106	2600	
24	14.00	711	1155	2715	
26	15.00	740	1202	2825	
28	16.00	768	1247	2932	
30	17.30	795	1290	3034	

CONSULT FACTORY

1. Flow facility and equipment comply with API Std. 2000.
2. Flow measurement accuracy verified by an independent research organization.
3. Flow capacity is based on actual tests and certified by Groth Corporation.



Pressure Relief Capacity of Groth Flame Check

Model 7622

Pressure Drop		Air Flow – 1000 Normal Cubic Meters per Hour at 0° C			
mmWC	mbar	0.5" (13 mm) & 0.75" (20 mm)	1" (25 mm)	1.5" (40 mm)	2" (50 mm)
25.4	3.00	3.9	6.3	14.9	
50.8	5.00	5.5	8.9	21.0	
76.2	7.50	6.8	11.0	25.8	
102	10.00	7.8	12.6	29.7	
152	15.00	9.5	15.5	36.4	
203	20.00	11.0	17.9	42.1	
254	25.00	12.3	20.0	47.0	
305	30.00	13.5	21.9	51.5	
356	35.00	14.6	23.7	55.6	
406	40.00	15.6	25.3	59.4	
457	45.00	16.5	26.8	63.0	
508	50.00	17.4	28.3	66.4	
559	55.00	18.2	29.6	69.7	
610	60.00	19.0	30.9	72.7	
660	65.00	19.8	32.2	75.7	
711	70.00	20.6	33.4	78.5	
762	75.00	21.3	34.6	81.3	

CONSULT FACTORY

1. Flow facility and equipment comply with API Std. 2000.
2. Flow measurement accuracy verified by an independent research organization.
3. Flow capacity is based on actual tests and certified by Groth Corporation.

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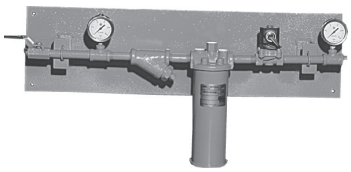
Waste Gas Burners
Model 8391B
8392B & 8393B

WASTE GAS IGNITION & BURNER SYSTEM

The Model 8391B includes an ignition system with all of the best features available in a waste gas burner. The burner wind shield contains the unique “downdraft prevention” with a bevel design which virtually eliminates the possibility of the flame being blown out. The design also provides the proper air/fuel mixture to ensure an efficient burn. The wind shield will control outside winds, up to 150 MPH, and operates efficiently in heavy rains. This will prevent smoke and odors from permeating the neighborhood.

CONTROL PANEL



Pilot Gas Manifold

FEATURES

- Sizes 2” through 12”
- All stainless steel construction in flame area
- Automatic ignition and re-ignition
- Stoichiometric pilot on all burners
- Efficient combustion with biogas BTU value as low as 300/cu. ft.
- Reliable “downdraft prevention” for wind protection
- Flame retention vortex vanes vastly improve burning efficiency
- Pilot system operates as low as 4 InWC
- Quick, easy maintenance
- Flame front generator (FFG) pilot ignition system available (consult factory)
- Fully enclosed flare (FEF) configuration available for high destruction rate efficiency (consult factory)

The automatic ignition option provides extra high reliability coupled with “state-of-the-art” positive pilot ignition. When gas is to flow, a signal to the control panel causes the solenoid to open providing gas to the pilot. The ignitor then sparks until the pilot is lit. The system does not require compressed air, adjustments for various gases, or separate ignition line. You may choose to locate the control panel close to the burner or at some remote distance.

The unique burning system of the Groth gas flares contain flame retention vortex vanes in the tip of the burners and when coupled with the “downdraft prevention” in the shield, the result is an updraft and an air mixing action that will provide excellent high efficiency, smokeless and odorless burning. With the prevention of “flame licking”, the requirement for a remote ignition source (flame front) and associated piping and other problems are eliminated.

Waste Gas Burners Model 8391B, 8392B & 8393B

Trouble-free start-up is assured. All adjustments and maintenance can be performed safely at ground level. An additional benefit to the "downdraft prevention" in the main burner is the fact that winds up to 150 MPH or heavy rain will not take out the flame.

The control system provides contacts for remote indication of "Pilot flame failure" and "Pilot flame on", as well as panel lights for "Pilot flame on", "Pilot flame failure", "Thermocouple OK" and "Pilot gas on". All Groth pilot systems are provided with an inspirating venturi to insure a stoichiometric mixture of the pilot gas. A solenoid valve is included with each automatic pilot system. Fuel consumption of the pilot is only 22-150 SCFH. Normal operating pressure range of the pilot is 4 InWC to 10 psig. The reduced fuel consumption at a manageable waste gas pressure means that it might be possible to utilize biogas for the operation of the pilot system. However, natural gas with a supply pressure of 5 to 10 psig (specify exact pressure when ordering) is recommended for optimum pilot operation.

The Groth Model 8391B offers several options to meet your specific requirements. For example, the burner can be provided with

(1) Manual Electric Ignitor which will provide manual start-up ignition from a remote location. A switch in a remote weatherproof enclosure will be provided to operate a sparking electrode at the pilot tip. (Flame sensing is not included in this system).

(2) Automatic Electric Pilot Ignition System which provides a fully automatic start-up, flame monitoring, re-ignition and alarming system. This automatically operated system will provide auto-ignition from a contact closure (usually a pressure switch), sense pilot flame status, provide automatic re-ignition sequencing and flame failure alarm, and provide status lights on the control panel and contacts for remote monitoring. A manual mode override will be provided on the control panel. Additionally, the pilot solenoid valve is included in the fully automatic system manifold.

(3) Dual Flame Sensing which provides pilot shut down while main burner flame is burning and re-ignition if main burner flame fails, conserving pilot fuel.

OPERATION

When gas is to flow to the burner, a signal to the control panel (normally, a contact closure) causes the solenoid to open, providing a stoichiometric air/fuel mixture to the pilot. The ignitor begins sparking and continues until the pilot is lit. The flame sensor will signal "flame on" and the sparking will cease.

When the biogas arrives at the burner tip, ignition immediately takes place and the burn is continuous until the gas supply is removed. The pilot will continue to be ignited until the signal is received (contact is opened). The pilot start signal may be provided by a Groth supplied pressure switch. When flaring of the gas is required again, the above sequence will be repeated.

MAINTENANCE

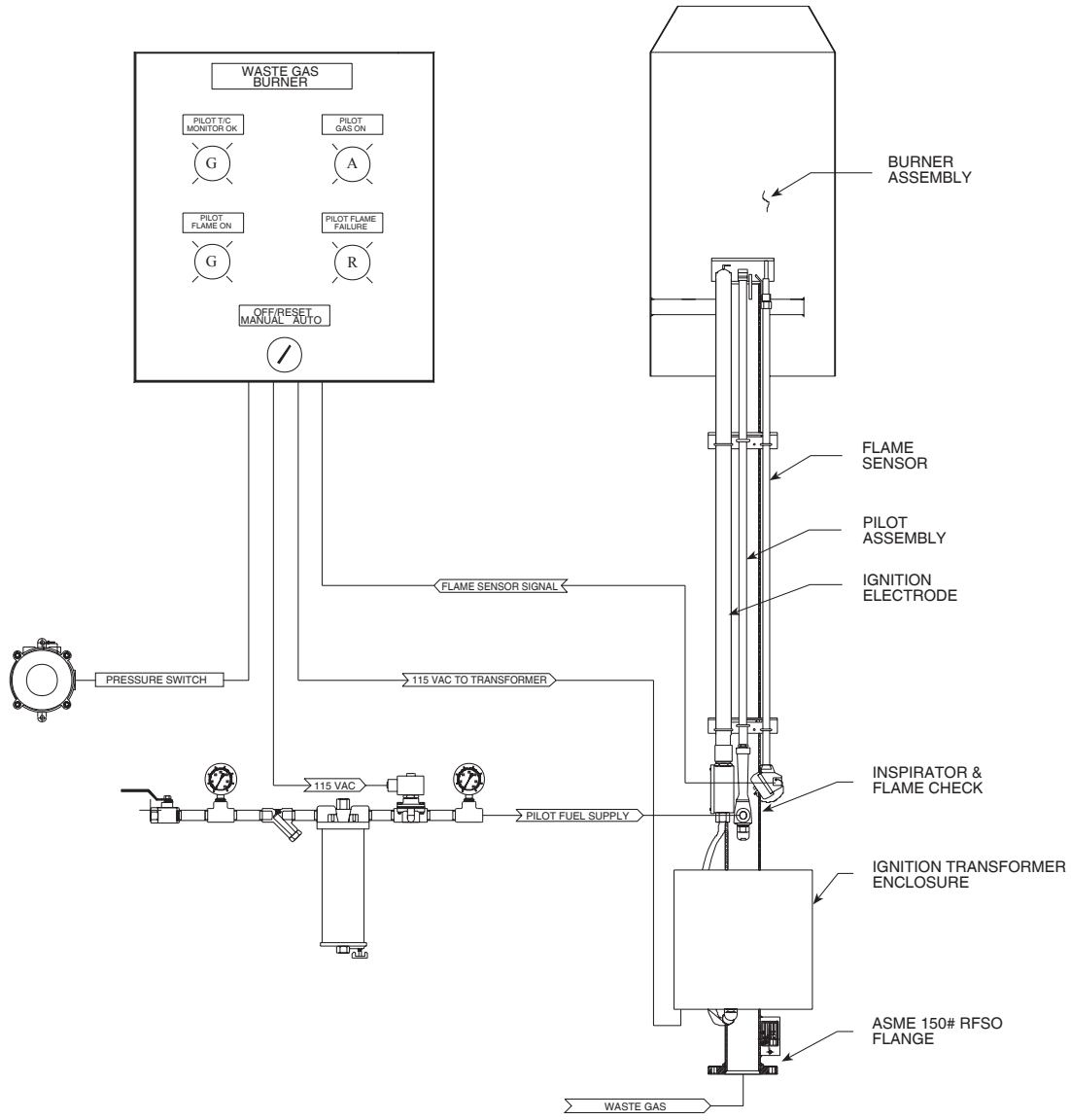
All components and controls for the pilot system are easily accessible at ground level. No components that would require adjustment or periodic maintenance are located in the flame area. Most maintenance checks can be made safely while the burner is in operation.

SPECIFICATION TABLE • MODEL 8391B

Specifications subject to change without notice.
Certified dimensions available upon request.

Nominal Diameter of Burner D_T (Metric)	Flow Rate SCFH S_G = 0.8 ΔP = .50" WC Temp = 60°F (NM3/H)	Minimum Recommended Overall Height Above Grade H_S (Metric)	Minimum Recommended Safe Distance To Control Panel D_S (Metric)	Diameter of Shield D (Metric)	Burner Weight Lbs (kg)
2" (50 mm)	4,040 (114)	10' (3.0 mm)	8' (2.4 mm)	18" (457 mm)	176 (80 kg)
3" (80 mm)	9,090 (257)	12' (3.7 mm)	10' (3.0 mm)	18" (457 mm)	212 (97 kg)
4" (100 mm)	16,200 (459)	12' (3.7 mm)	15' (4.6 mm)	24" (610 mm)	272 (124 kg)
6" (150 mm)	36,400 (1031)	12' (3.7 mm)	22' (6.7 mm)	24" (610 mm)	363 (165 kg)
8" (200 mm)	64,600 (1829)	16' (4.9 mm)	28' (8.5 mm)	30" (762 mm)	512 (233 kg)
10" (250 mm)	100,930 (2858)	20' (6.1 mm)	36' (11.0 mm)	36" (914 mm)	572 (260 kg)
12" (300 mm)	144,600 (4095)	25' (7.6 mm)	42' (12.8 mm)	36" (914 mm)	619 (282 kg)

Waste Gas Burners Model 8391B, 8392B & 8393B



BURNER CONSTRUCTION

Carbon Steel lower burner pipe with 150# flange mounting. Stainless steel upper burner pipe and windshield. Alloy pilot nozzle and cast iron venturi. Self supporting on 150# flange with 150 mph winds and zone 4 seismic coefficient. Other mounting plates optional. Control panel may be remotely installed from burner.

SPECIFICATIONS

Electrical

115V, 1PH, 60 Hz, 10 AMP, grounded neutral
Contacts for remote monitoring
(1) NO, 3 AMP, "Flame On"
(1) NO, 3 AMP, "Flame Failure"

Enclosures

Standard: Nema 4, Weatherproof
Optional: Nema 4X, Nema 7, etc.

Pressure Switch

Explosion Proof: 4 - 20 InWC
Range: 0.4 - 0.6 InWC Deadband

Pilot Fuel for stoichiometric pilot

- Natural Gas — 4 InWC to 10 psig Supply Pressure
- LPG — 1 psig to 10 psig Supply Pressure
- Digester Gas 4 InWC to 10 psig Supply Pressure
- Pilot Consumption: 22-150 SCFH

BENEFITS

- Safely incinerates waste gases preventing fugitive VOC emissions
- Reliable pilot gas ignition system ensures that the waste gas is properly incinerated

Check with your local regulatory body and NFPA 820 for regulations.

Waste Gas Burners Model 8391B, 8392B & 8393B

HOW TO ORDER

FOR EASY ORDERING, SELECT PROPER MODEL NUMBER

MODEL # | SIZE | MATERIAL | OPTIONS

MODEL #

8391B
8392B
(Flame Front Generator)
8393B
(Fully Enclosed)

SIZE

2"
Thru
12"

MATERIAL

Materials

1 = Standard Materials: 304 SS windshield, upper burner pipe, pilot, ignitor & flame sensor. Carbon steel lower pedestal, flange & enclosures. High temp. cast iron inspirating venturi.

2 = Standard Materials: Except 304 SS lower pedestal, flange & burner mounted enclosures.

Z = Special

OPTIONS

Special Options

0 = None
*2 = Audible Alarm
*3 = Pilot Supply Booster
4 = Pilot Gas Regulator
*6 = Back-up Power Supply
8 = Heater & Thermostat in Control Panel
Z = Special

Electronic Enclosure (with Ignition System)

0 = None
4 = NEMA 4 (standard)
7 = NEMA 7
9 = NEMA 4X (304 SS)
Z = Special

Flame Sensor Options

0 = No sensor (if O or M is chosen)
2 = Thermocouple (if S or D is chosen)
Z = Special (if S or D is chosen)

Ignitor

0 = None
M = Manual
S = Automatic Ignition System
D = Dual Flame Sensing
Z = Special

Connection (Pedestal)

F = 150# ASME
A = Anchor Plate
Z = Special

NOTES

- Automatic Ignition System (S) includes a pressure switch, flame check, solenoid valve, pressure gages (2), and filter as standard.
- Contact factory for Models 8392B & 8393B.
- * Not available with manual ignition control.

EXAMPLE

8 3 9 1 B — 1 0 — 2 — F S 2 4 0

Indicates a 10" Model 8391B constructed with standard materials except stainless steel lower pedestal. Options include 150# ASME connection, automatic ignition system using a thermocouple sensor in a standard NEMA 4 electronic enclosure.

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Sample Specifications

PRESSURE RELIEF AND VACUUM BREAKER VALVE WITH FLAME ARRESTER UNIT shall have an _____ inch size, ASME Class 150 flat face flanged mounting connection, a pressure relief capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation and a vacuum relief capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation. Vent valve and flame arrester shall be two independent items of equipment; however, the valve shall be mounted on the flame arrester by means of a bolted and gasketed flange connection.

The valve portion shall be light weight aluminum construction throughout consisting of cast aluminum body, seat rings, pallets and hood over pressure pallet. On weatherhooded units, protective wire mesh screens shall be provided at the exhaust ports and shall be located external of the pallets. Pallets shall be center and side guided and shall incorporate replaceable synthetic rubber seat inserts. Pressure pallet shall include removable lead weights for adjusting setting from 1" to 15 InWC in 1 InWC increments. Vacuum pallet shall be weighted for 2 InWC setting. Valve shall be GROTH Model 1200A or GROTH Model 1220A for pipe-away application.

Flame arrester shall have housing constructed of cast aluminum. The bank assembly shall be all aluminum and shall be wafer design for easy removal from the housing to facilitate inspection and cleaning. Net free area through the bank assembly shall be not less than 3 times that of the corresponding size standard pipe. The element shall be the proven spiral wound, crimped ribbon design. It shall be approved by Associated Factory Mutual's Laboratories. Flame arrester shall be GROTH Model 7618. Assembly shall be GROTH Model 8800A or Groth Model 8820A for pipe-away application.

PRESSURE RELIEF AND VACUUM BREAKER VALVE shall have an _____ inch size, ASME Class 150 flat face drilling flanged mounting connection, a pressure relief capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation and a vacuum relief capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation.

The valve shall be light weight aluminum construction throughout consisting of cast aluminum body, seat rings, pallets and hood over pressure pallet. On weatherhooded units, protective wire mesh screens shall be provided at the exhaust ports and shall be located external of the pallets. Pallets shall be center and side guided and shall incorporate replaceable synthetic rubber seat inserts. Pressure pallet shall include removable lead weights for adjusting setting from 1" to 15 InWC in 1 InWC increments. Vacuum pallet shall be weighted for 2 InWC setting. Valve shall be GROTH Model 1200A or Groth Model 1220A for pipe-away application.

FLAME ARRESTER shall have an _____ inch size ASME Class 150 flat face flat face flange drilling and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop. Housing construction shall be cast aluminum. The bank assembly shall be all aluminum and shall be wafer design for easy removal from the housing to facilitate inspection and cleaning. Net free area through the bank assembly shall be not less than 3 times that of the corresponding size standard pipe. The element shall be the proven spiral wound, crimped ribbon design. It shall be approved by Factory Mutual's Laboratories. Flame arrester for installing in a vertical pipe line shall be GROTH Model 7618 and for installing in horizontal pipe line shall be GROTH Model 7628.

SAMPLING HATCH shall have an _____ inch size ASME Class 150 flat face flange drilling connection and shall include an inclined foot pedal to facilitate opening and handwheel type lockdown device. Construction shall be aluminum except carbon steel lockdown and stainless steel hinge pin. Cover shall incorporate a replaceable synthetic rubber seat insert. Sampling hatch shall be GROTH Model 6100.

MANHOLE COVER shall be the _____ inch inside diameter size and shall include a 125 lbs. ASME Class flanged drilling base for mounting. Cover shall be held closed by a quick opening handle nut and shall include synthetic rubber diaphragm seal. Construction shall be aluminum with stainless steel hinge pin. Manhole cover shall be GROTH Model 8200.

SEDIMENT TRAP shall have an _____ inch size in-line ASME Class 150 flanged connections and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop. Storage capacity shall not be less than 6 gallons sediment and 6 gallons condensate.

Sample Specifications continued...

The operating principle for removing sediments from gas shall be centrifugal force developed by a circular motion of gas entering at a high velocity, then gravity as the gas undergoes a large reduction in velocity. A 2" FNPT blowout connection, a 1" FNPT drip trap connection and two 1/2" FNPT connections for a sight glass shall be provided. A removable top cover for interior access and an inspection pipe for content level measurement shall be provided. Construction shall be fabricated carbon steel GROTH Model 8330.

SEDIMENT AND DRIP TRAP ASSEMBLY shall have an _____ inch size "in-line" pipe connections on the sediment trap and 1" NPT connections on the drip trap. Flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop. Storage capacity shall not be less than 6 gallons sediment and 6 gallons condensate. Capacity of the drip trap shall not be less than 3 quarts. A sight glass shall be provided for observing content level. Assembly shall consist of GROTH Model 8330 sediment trap with Model 8460 drip trap and Model 8180 sight glass.

The operating principle for removing sediments from gas shall be centrifugal force developed by a circular motion of gas entering at a high velocity, then gravity as the gas undergoes a large reduction in velocity. A removable top cover for interior access and an inspection pipe for content level measurement shall be provided.

Drip trap portion shall be manually operated rotating disc type. An air inlet port shall be provided to permit free flow of condensate from bowl when draining. All ports shall be "O-Ring" sealed. The escape of gas shall not be possible while draining or when revolving operating handle from "fill" to "drain" positions. Construction shall be aluminum throughout except for stainless steel shaft and spring.

Sight glass shall be 1/2" Pyrex glass tube size. It shall include two valves for isolating the tube from the sediment trap to facilitate cleaning. Guard rods for protecting the glass tube and drain cock on the lower valve for draining the tube shall be provided.

MANUALLY OPERATED DRIP TRAP shall have
1" size NPT inlet and outlet connections and a minimum of 3 quarts storage capacity. It shall be the rotating disc type. The handle rotation from drain closed to drain open shall not be more than 90 degrees. The handle position shall be horizontal when drain is closed and vertical when drain is open.

An air inlet port shall be provided to permit free flow of condensate from bowl when draining. All ports shall be "O-Ring" sealed. The escape of gas shall not be possible while draining or when revolving operating handle from "fill" to "drain" positions. Construction shall be aluminum throughout except for stainless steel shaft and spring. Drip trap shall be GROTH Model 8460.

AUTOMATIC DRIP TRAP shall have _____ 1" size NPT inlet and outlet connections and shall be ball float operated with a self aligning ball-tip valve.

A plug shall be provided to permit manual draining of the bowl. Construction shall be aluminum cover, bowl and operating lever and stainless steel float, valve, and seat. Drip trap shall be GROTH Model 8450.

THERMAL VALVE AND FLAME TRAP ASSEMBLY shall have an _____ inch size ASME Class 150 flat face flat face drilled flange connections and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop. It shall be suitable for installing in horizontal or vertical pipe lines.

The thermal valve portion shall be a fusible element released and spring operated plug type shut-off valve. Fusible element shall release at 260°F gas temperature and shall be replaceable without disassembling the valve. A sight glass shall be included to permit visual observation of plug position indicator. Construction shall be aluminum throughout except for stainless steel internal parts.

Flame trap portion shall have housing constructed of cast aluminum.The bank assembly shall be all aluminum and shall be wafer design for easy removal from the housing to facilitate inspection and cleaning. Net free area through the bank assembly shall be not less than 3 times that of the corresponding size standard pipe. The element shall be the proven spiral wound, crimped ribbon design. It shall be approved by Factory Mutual's Laboratories. Flame arrester shall be GROTH Model 7628.

Assembly shall be GROTH Model 8500A.

MANOMETER shall be the _____ single tube well type with a direct reading scale suitable for maximum pressure reading of _____ InWC. Scale shall be graduated in increments of inch and tenths water column. Assembly shall be solid acrylic to protect the shatter-proof plastic tube.

GROTH CORPORATION a Continental Disc company

Sample Specifications continued...

Scale shall be adjustable from exterior of housing. Housing shall be suitable for indoors and outdoors service and shall be fitted for wall mounting. Gas connection shall be 1/4" FNPT. Labels shall be provided indicating DIGESTER, WASTE, etc_____ Manometer shall be GROTH Model 8170.

MANOMETER PANEL shall be _____ fabricated of lightweight steel and should allow installation of_____ manometers side by side. The manometers shall be the single tube well type with a direct reading scale suitable for maximum pressure reading of_____ InWC The indicating fluid shall be _____ with a specific gravity of _____ The manometers shall be connected to a vented petcock (SS) for zero calibration, and to a common panel vent port equipped with a flame check. Laminated plastic nameplates shall identify each manometer's function. Manometer panel shall be GROTH Model 8130.

BACK PRESSURE CHECK VALVE shall have an _____inch size ASME Class 150 flat face flange drilling connection and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation. Pallet shall be the free swing pendulum type and shall hang in true vertical position under static gas condition. Construction shall be aluminum body, seat, and pallet with stainless steel hinge pin. Check valves shall be GROTH Model 8110.

PRESSURE RELIEF AND FLAME TRAP ASSEMBLY shall have an _____ inch size ASME Class 150 flat face drilling flange connections and a pressure relief capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop.

The pressure relief portion shall be back pressure (upstream control) regulator valve actuated by a spring loaded diaphragm. The spring barrel shall include a glass enclosed pointer and scale to indicate setting and it shall be arranged to permit setting adjustments without disassembling the diaphragm housing. Setting range shall be from 2 to 12 InWC pressure.

Construction shall be aluminum throughout except for stainless steel shaft and bearings, molded synthetic rubber fabric reinforced diaphragm. Flame trap portion shall have housing constructed of cast aluminum. The bank assembly shall be all aluminum and shall be wafer design for easy removal from the housing to facilitate inspection and cleaning. Net free area through the bank assembly shall be not less than 3 times that of the corresponding size standard pipe. The element shall be the proven spiral wound, crimped ribbon design. It shall be approved by Factory Mutual's Laboratories. Flame arrester shall be GROTH Model 7628.

The pressure relief regulator and the flame trap assembly shall be functionally interconnected by a thermal shut-off valve assembly which will automatically close the regulator by applying full upstream gas pressure on the top side of the diaphragm housing in the event a fusible element is released due to gas temperature reaching 260°F at the flame trap outlet. Fusible element shall be replaceable without disassembling the valve. Assembly shall be GROTH Model 8400A.

REGULATOR (single port) shall have an _____ inch size ASME Class 150 flat face drilling flanged connections and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation. Pallet shall be controlled by a spring loaded diaphragm. The spring barrel shall include a glass enclosed pointer and scale to indicate setting and it shall be arranged to permit setting adjustments without disassembling the diaphragm housing. Setting range shall be from 2 to 12 InWC pressure.

Construction shall be aluminum throughout except for stainless steel shaft and bearings, molded synthetic rubber fabric reinforced diaphragm. Regulator shall be back pressure regulating (control-upstream), GROTH Model 8860.

PRESSURE RELIEF VALVE shall have an _____ inch size ASME Class 150 flat face flange drilling connection and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC accumulation.Construction shall be aluminum throughout except for type 316 SS guide rods and stems. Pallet shall incorporate a replaceable synthetic rubber diaphragm. Pallet shall include removable lead weights for adjusting settings from 1 to 30 InWC in 1 InWC increments. Valve shall be GROTH Model 2300A.

FLAME CHECK shall have _____inch size FNPT connections and a flow capacity of not less than _____ SCFH gas of _____ specific gravity at _____ InWC pressure drop. Housing shall be of "pipe union" design to permit easy removal of the element for inspection and cleaning, and shall be constructed of stainless steel.

Sample Specifications continued...

Element shall be stainless steel perforated sheets. Flame check shall be GROTH Model 7622.

WASTE GAS BURNER shall have an _____inch size ASME Class 150 flanged connection and a burning capacity of not less than _____ SCFH gas of _____ specific gravity at 0.5 InWC pressure drop. Burner construction shall consist of all stainless steel components in the flame area, carbon steel burner pipe and flange, cast iron inspirating venturi. Windshield shall include a bevel designed outlet to prevent downdraft and flame licking. Burner nozzle to include vortex vanes to insure biogas/air mixture. Burner to be self-supporting on #150 ASME flange for winds to 150 MPH and a seismic coefficient of 0.4.

The automatic pilot ignition control panel shall be housed in a NEMA 4 enclosure and shall provide automatic pilot ignition upon receiving signal (closed contact) from the pressure switch. Pilot controls to provide sparking for a pre-determined time or until the pilot is lit and will provide an alarm contact for "Pilot flame failure" if ignition is not realized within the adjustable time limit. "Pilot flame failure" alarm to operate anytime a flame is not sensed while the system is in the operate mode. A reset switch shall be provided to reset the control system. A switch shall be provided on the control panel for manual mode and will override the automatic mode. A status contact for "Pilot on" shall also be provided at the control panel. Status lights shall be provided for "T/C Monitor OK", "Pilot gas on", "Pilot flame on" and "Pilot flame failure".

Control panel shall include necessary pilot controls to provide automatic "start-up", flame sensing, reignition sequence for Pilot flame failure and automatic "shut-down" on "contact-open" signal. A solenoid valve shall be provided to operate the pilot fuel on/off function.

Pilot system to provide a stoichiometric air/fuel mixture by utilizing an inspirating venturi and shall sense the pilot flame by use of a thermocouple. Electrical input of the control panel to be 115 V, 1 phase, 60 Hz, 10 Amps, Grounded Neutral. Contacts for remote monitoring to be (1) Flame On - N.O. 5 A @ 115 VAC and (1) Flame Failure - N.C., 5A @ 115 VAC.

Minimum pilot fuel input to be 4 InWC - 10 psig supply pressure.

Pressure switch to be explosion-proof and have an operating range of 4 to 20 InWC with a 0.4 to 0.6 InWC deadband.

Waste gas burner to be GROTH Model 8391B.

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Conversion Tables

Conversion Tables

Pressure Conversion Table

ounces/in²	in WC	or in Hg	in Hg	to ounces/in²	or in WC	in WC	to in Hg	or ounces/in²
.05	.086	.0064	.05	.393	.68	.05	.0037	.0289
.10	.173	.0127	.10	.786	1.36	.10	.0074	.0578
.15	.260	.0192	.15	1.18	2.04	.15	.0110	.0867
.20	.346	.0255	.20	1.57	2.72	.20	.0147	.116
.25	.433	.0318	.25	1.96	3.40	.25	.0184	.144
.30	.519	.0382	.30	2.36	4.08	.30	.0221	.173
.35	.606	.0445	.35	2.75	4.76	.35	.0257	.202
.40	.692	.0509	.40	3.14	5.44	.40	.0294	.231
.45	.779	.0573	.45	3.54	6.12	.45	.0331	.260
.50	.865	.0636	.50	3.93	6.80	.50	.0368	.289
.55	.952	.0700	.55	4.32	7.48	.55	.0405	.318
.60	1.04	.0764	.60	4.71	8.16	.60	.0441	.347
.65	1.13	.0827	.65	5.11	8.84	.65	.0478	.376
.70	1.21	.0891	.70	5.50	9.52	.70	.0515	.404
.75	1.30	.0955	.75	5.89	10.20	.75	.0552	.433
.80	1.38	.102	.80	6.29	10.88	.80	.0588	.462
.85	1.47	.108	.85	6.68	11.56	.85	.0625	.491
.90	1.56	.115	.90	7.07	12.24	.90	.0662	.520
.95	1.64	.121	.95	7.46	12.92	.95	.0699	.549
1.00	1.73	.127	1.00	7.86	13.60	1.00	.0736	.578
2.00	3.46	.255	2.00	15.72	27.19	2.00	.147	1.16
3.00	5.19	.382	3.00	1.47#	40.79	3.00	.221	1.73
4.00	6.92	.509	4.00	1.96#	54.38	4.00	.294	2.31
5.00	8.65	.636	5.00	2.46#	67.98	5.00	.368	2.89
6.00	10.38	.764	6.00	2.95#	81.58	6.00	.441	3.47
7.00	12.12	.891	7.00	3.44#	95.17	7.00	.515	4.04
8.00	13.85	1.02	8.00	3.93#	108.77	8.00	.588	4.62
1.00#	27.69	2.04	9.00	4.42#	122.36	9.00	.662	5.20
2.00#	55.39	4.07	10.00	4.91#	135.96	10.00	.736	5.78

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Conversion Tables

ASME / ANSI B 16.5 Steel Flange Dimensions

Nominal Pipe Size Inches		Dia. of Flange	Flange Thick-ness*	Dia. Raised Face	Dia. Bolt Circle	No. Bolts	Dia. Bolts
150 lbs	300 lbs						
¾		3⅞	½	1 11/16	2¾	4	½
	¾	4⅝	⅝	1 11/16	3¼	4	⅝
1		4¼	7/16	2	3⅛	4	½
	1	4⅞	11/16	2	3½	4	⅝
1 1/4		4⅝	½	2½	3½	4	½
	1 1/4	5¼	¾	2½	3⅞	4	⅝
1½		5	9/16	2⅞	3⅞	4	½
	1½	6⅛	13/16	2⅞	4½	4	¾
2		6	⅝	3⅝	4¾	4	⅝
	2	6½	⅞	3⅝	5	8	⅝
2½		7	11/16	4⅛	5½	4	⅝
	2½	7½	1	4⅛	5⅞	8	¾
3		7½	¾	5	6	4	⅝
	3	8¼	1⅛	5	6⅝	8	¾
3½		8½	13/16	5½	7	8	⅝
	3½	9	1 3/16	5½	7¼	8	¾
4		9	15/16	6 3/16	7½	8	⅝
	4	10	1¼	6 3/16	7⅞	8	¾
5		10	15/16	7 5/16	8½	8	¾
	5	11	1⅜	7 5/16	9¼	8	¾
6		11	1	8½	9½	8	¾
	6	12½	1 7/16	8½	10⅝	12	¾
8		13½	1⅛	10⅝	11¾	8	¾
	8	15	1⅝	10⅝	13	12	⅞
10		16	1 3/16	12¾	14¼	12	⅞
	10	17½	1⅞	12¾	15¼	16	1
12		19	1¼	15	17	12	⅞
	12	20½	2	15	17¾	16	1⅛
14		21	1⅜	16¼	18¾	12	1
	14	23	2⅛	16¼	20¼	20	1⅛
16		23½	1 7/16	18½	21¼	16	1
	16	25½	2¼	18½	22½	20	1¼
18		25	1 9/16	21	22¾	16	1⅛
	18	28	2⅜	21	24¾	24	1¼
20		27½	1 11/16	23	25	20	1⅛
	20	30½	2½	23	27	24	1¼
24		32	1⅞	27¼	29½	20	1¼
	24	36	2¾	27¼	32	24	1½

*Includes 1/16" raised face.

Nominal Pipe Size Inches		Dia. of Flange	Min. Flange Thick-ness*	Dia. Raised Face	Dia. Bolt Circle	No. Bolts	Dia. Bolts
400 lbs	600 lbs						
¾		4⅝	⅝	1 11/16	3¼	4	⅝
	¾	4⅝	⅝	1 11/16	3¼	4	⅝
1		4⅞	11/16	2	3½	4	⅝
	1	4⅞	11/16	2	3½	4	⅝
1 1/4		5¼	13/16	2½	3⅞	4	⅝
	1 1/4	5¼	13/16	2½	3⅞	4	⅝
1½		6⅛	⅞	2⅞	4½	4	¾
	1½	6⅛	⅞	2⅞	4½	4	¾
2		6½	1	3⅝	5	8	⅝
	2	6½	1	3⅝	5	8	⅝
2½		7½	1⅛	4⅛	5⅞	8	¾
	2½	7½	1⅛	4⅛	5⅞	8	¾
3		8¼	1¼	5	6⅝	8	¾
	3	8¼	1¼	5	6⅝	8	¾
3½		9	1⅜	5½	7¼	8	⅞
	3½	9	1⅜	5½	7¼	8	⅞
4		10	1⅜	6 3/16	7⅞	8	⅞
	4	10¾	1½	6 3/16	8½	8	⅞
5		11	1½	7 5/16	9¼	8	⅞
	5	13	1¾	7 5/16	10½	8	1
6		12½	1⅝	8½	10⅝	12	⅞
	6	14	1⅞	8½	11½	12	1
8		15	1⅞	10⅝	13	12	1
	8	16½	2 3/16	10⅝	13¾	12	1⅛

Nominal Pipe Size Inches	Dia. of Flange	Min. Flange Thick-ness*	Dia. Raised Face	Dia. Bolt Circle	No. Bolts	Dia. Bolts
900 lbs						
¾	5⅛	1	1 11/16	3½	4	¾
1	5⅞	1⅛	2	4	4	⅞
1 1/4	6¼	1⅛	2½	4⅜	4	⅞
1½	7	1¼	2⅞	4⅞	4	1
2	8½	1½	3⅝	6½	8	⅞
2½	9⅝	1⅝	4⅛	7½	8	1
3	9½	1½	5	7½	8	⅞
4	11½	1¾	6 3/16	9¼	8	1⅛

*A 1/4" raised face is standard on the 400 lb., 600 lb. and 900 lb. flanges and is added to the minimum flange thickness.

Conversion Tables

ASME / ANSI B 16.5 Iron Flange Dimensions

Nominal Pipe Size Inches		Dia. of Flange	Flange Thick-ness*	Dia. Raised Face	Dia. Bolt Circle	No. Bolts	Dia. Bolts
125 lbs	250 lbs						
1		4¼	7/16		3⅛	4	½
	1	4⅞	11/16	2 11/16	3½	4	⅝
1 1/4		4⅝	½		3½	4	½
	1 1/4	5¼	¾	3 1/16	3⅞	4	⅝
1½		5	9/16		3⅞	4	½
	1½	6⅛	13/16	3 9/16	4½	4	¾
2		6	⅝		4¾	4	⅝
	2	6½	⅞	4 3/16	5	8	⅝
2½		7	1 1/16		5½	4	⅝
	2½	7½	1	4 15/16	5⅞	8	¾
3		7½	¾		6	4	⅝
	3	8¼	1⅛	5 11/16	6⅝	8	¾
3½		8½	13/16		7	8	⅝
	3½	9	1 3/16	6 5/16	7¼	8	¾
4		9	15/16		7½	8	⅝
	4	10	1¼	6 15/16	7⅞	8	¾
5		10	15/16		8½	8	¾
	5	11	1⅜	8 5/16	9¼	8	¾
6		11	1		9½	8	¾
	6	12½	1 1/16	9 1/16	10⅝	12	¾
8		13½	1⅛		11¾	8	¾
	8	15	1⅝	11 15/16	13	12	⅞
10		16	1 3/16		14¼	12	⅞
	10	17½	1⅞	14 1/16	15¼	16	1
12		19	1¼		17	12	⅞
	12	20½	2	16 7/16	17¾	16	1⅛

*Includes 1/16" raised face on 250 lb. flange only.

ASME / ANSI Brass Flange Dimensions

Nominal Pipe Size Inches		Dia. of Flange	Flange Thick-ness	Dia. Bolt Circle	No. Bolts	Dia. Bolts
150 lbs*	300 lbs*					
¾		3⅞	1 1/32	2¾	4	½
	¾	4⅝	17/32	3¼	4	⅝
1		4¼	⅜	3⅛	4	½
	1	4⅞	19/32	3½	4	⅝
1 1/4		4⅝	13/32	3½	4	½
	1 1/4	5¼	⅝	3⅞	4	⅝
1½		5	7/16	3⅞	4	½
	1½	6⅛	11/16	4½	4	¾
2		6	½	4¾	4	⅝
	2	6½	¾	5	8	⅝
2½		7	9/16	5½	4	⅝
	2½	7½	13/16	5⅞	8	¾
3		7½	⅝	6	4	⅝
	3	8¼	29/32	6⅝	8	¾
3½		8½	1 1/16	7	8	⅝
	3½	9	31/32	7¼	8	¾
4		9	1 1/16	7½	8	⅝
	4	10	1 1/16	7⅞	8	¾
5		10	¾	8½	8	¾
	5	11	1⅛	9¼	8	¾
6		11	13/16	9½	8	¾
	6	12½	1 3/16	10⅝	12	¾
8		13½	15/16	11¾	8	¾
	8	15	1⅜	13	12	⅞

*Two V-shaped concentric grooves between the port and the bolt holes.

Additional Markets & Applications Served by Groth Corporation

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Extreme Thermal Effect Protection
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EDC Storage
Solvent Tanks
Polymers Tanks
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Vapor Recovery System
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Storage Tank Terminals - BGR/ POV
Heater Fans
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NICHE MARKETS

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Coal Dust
Check Valve in piping system
Paint Mixing Tanks
Low Pressure Air Duct Protection
Hydraulic Fluid Storage
Crystallizer Vapor Columns
Semiconductor Facilities Industry
Feed Storage Tanks
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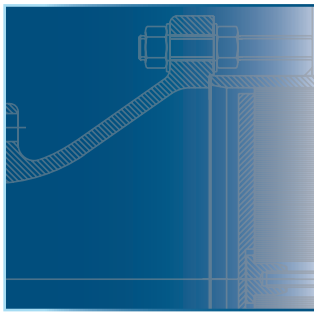

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