<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>MODEL DESCRIPTION</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERIES 8800</td>
<td>MODEL 8800A, 8801B, 8802B, 8803A</td>
<td>3-8</td>
</tr>
<tr>
<td>SERIES 8800</td>
<td>Specifications &amp; How To Order</td>
<td>4</td>
</tr>
<tr>
<td>MODEL 8800A</td>
<td>Pressure Relief Capacity</td>
<td>5-6</td>
</tr>
<tr>
<td>MODEL 8800A</td>
<td>Vacuum Relief Capacity</td>
<td>7-8</td>
</tr>
<tr>
<td>SERIES 8820</td>
<td>MODEL 8820A, 8821B, 8822B, 8823A</td>
<td>9-15</td>
</tr>
<tr>
<td>SERIES 8820</td>
<td>Features</td>
<td>9</td>
</tr>
<tr>
<td>SERIES 8820</td>
<td>Specifications</td>
<td>10</td>
</tr>
<tr>
<td>SERIES 8820</td>
<td>How To Order</td>
<td>11</td>
</tr>
<tr>
<td>MODEL 8820A</td>
<td>Pressure Relief Capacity</td>
<td>12-13</td>
</tr>
<tr>
<td>MODEL 8820A</td>
<td>Vacuum Relief Capacity</td>
<td>14-15</td>
</tr>
</tbody>
</table>

**ADDITIONAL GROTH PRODUCTS**

Please see our other Groth Datasheets for additional product lines:
• Sizes 2” through 12”
• Pressure settings 0.5 oz/in² to 15 psig
• Vacuum settings 0.5 oz/in² to 12 psig
• Available in carbon steel (WCB/CS), stainless steel (CF8M/316), aluminum (356/6061) and other materials
• Proven spiral-wound, crimped-ribbon flame element
• Modular construction
• ATEX Certificate available

PRESSURE / VACUUM RELIEF VALVE WITH FLAME ARRESTER
The Model 8800A Pressure/Vacuum Valve & Flame Arrester combination units are designed to protect your tank from damage created by over-pressure or excessive vacuum, at the same time that they provide protection from externally caused sources of heat and ignition. The result is increased fire protection and safety.

SPECIAL FEATURES
The Model 8800A Pressure/Vacuum Relief Valve offers Groth’s special “cushioned air” seating. Superior performing fluoropolymer seating diaphragms are standard to minimize sticking caused by resinous vapors and atmospheric moisture. Self draining housings and drip rings protect seating surfaces from condensate and freezing.

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

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

<table>
<thead>
<tr>
<th>Inlet Flg (Metric)</th>
<th>Max. Set Pressure Weight Loaded</th>
<th>Max. Set Vacuum Weight Loaded</th>
<th>Min. Setting Spring Loaded</th>
<th>Min. Setting Weight Loaded</th>
<th>Max. W.P.† for Min. Vacuum Setting</th>
<th>Min. Vac. Setting for Max. W.P.†</th>
<th>A Length (Metric)</th>
<th>B Height (Metric)</th>
<th>BB Height (Metric)</th>
<th>C Width (Metric)</th>
<th>Approx. Ship Wt. Lbs. (Aluminum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; (50 mm)</td>
<td>12 oz/in² (52.7 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>13.63&quot; (346 mm)</td>
<td>28.5&quot; (724 mm)</td>
<td>33.87&quot; (860 mm)</td>
<td>9.50&quot; (241 mm)</td>
<td>35 (16 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&quot; (80 mm)</td>
<td>11 oz/in² (48.3 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>18&quot; (457 mm)</td>
<td>29.63&quot; (752 mm)</td>
<td>38.75&quot; (894 mm)</td>
<td>11.50&quot; (292 mm)</td>
<td>45 (20 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; (100 mm)</td>
<td>11 oz/in² (48.3 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>19.75&quot; (502 mm)</td>
<td>34.63&quot; (819 mm)</td>
<td>46.25&quot; (984 mm)</td>
<td>13&quot; (241 mm)</td>
<td>70 (32 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; (150 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td></td>
<td></td>
<td>See TPD2 for Vacuum Settings and MAWP</td>
<td>28.75&quot; (730 mm)</td>
<td>43.25&quot; (1175 mm)</td>
<td>58.75&quot; (1765 mm)</td>
<td>19&quot; (453 mm)</td>
<td>125 (67 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8&quot; (200 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>36&quot; (914 mm)</td>
<td>51.38&quot; (1305 mm)</td>
<td>69.50&quot; (1695 mm)</td>
<td>23.63&quot; (453 mm)</td>
<td>210 (95 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; (250 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>42&quot; (1067 mm)</td>
<td>58.88&quot; (1495 mm)</td>
<td>83&quot; (2108 mm)</td>
<td>30.75&quot; (781 mm)</td>
<td>350 (160 kg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; (300 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td></td>
<td></td>
<td></td>
<td>48.50&quot; (1232 mm)</td>
<td>65.38&quot; (1601 mm)</td>
<td>88.12&quot; (2238 mm)</td>
<td>35.75&quot; (908 mm)</td>
<td>500 (227 kg)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


#### HOW TO ORDER

For easy ordering, select proper model numbers

**MODEL #**

- **O** = No Options
- **Z** = Special Options

**SIZE**

- **O2** = 2"
- **Thru** = Thru
- **12** = 12"

**MATERIAL**

- **1** = Aluminum
- **3** = Carbon Steel
- **5** = 316 SS
- **Z** = Special

**OPTIONS**

- **O** = No Options
- **Z** = Special Options

**Diaphragm Material (Seat):**

- **B** = Buna-N
- **T** = Fluoropolymer
- **V** = FKM
- **Z** = Special

**EXAMPLE**

```
8800A 02 15 31 51 TO
```

Indicates a 2" Model 8800A with Aluminum Body and Seat, 316 SS Pallet, Fluoropolymer Seat Diaphragm, and no other options.
Flow capacity values listed above are based on full open valves at 100% overpressure.

Read the flow capacity at 100% overpressure directly from the table above. Use linear sted.

If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable overpressure is more than 100%, consult your Groth Representative.

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

\[ \% \text{ OP} = \frac{(P_f - P_s)}{P_s} \times 100 \]

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

**Example—Flow Capacity Calculation**

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

**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

**% OP**

<table>
<thead>
<tr>
<th>%OP</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.72</td>
<td>0.73</td>
<td>0.73</td>
<td>0.74</td>
<td>0.75</td>
<td>0.75</td>
<td>0.76</td>
<td>0.77</td>
<td>0.77</td>
<td>0.78</td>
</tr>
<tr>
<td>20</td>
<td>0.78</td>
<td>0.79</td>
<td>0.80</td>
<td>0.80</td>
<td>0.81</td>
<td>0.81</td>
<td>0.82</td>
<td>0.82</td>
<td>0.83</td>
<td>0.84</td>
</tr>
<tr>
<td>30</td>
<td>0.84</td>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
<td>0.86</td>
<td>0.87</td>
<td>0.88</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>40</td>
<td>0.90</td>
<td>0.91</td>
<td>0.91</td>
<td>0.92</td>
<td>0.92</td>
<td>0.93</td>
<td>0.93</td>
<td>0.94</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>50</td>
<td>0.95</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>60</td>
<td>0.95</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.99</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**“C” Factor Table**

<table>
<thead>
<tr>
<th>[\frac{P_f}{P_s}]</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.87</td>
<td>0.87</td>
<td>0.87</td>
<td>0.87</td>
<td>0.87</td>
<td>0.87</td>
</tr>
</tbody>
</table>

**Model 8800a // Pressure Relief Capacity**

Air Flow Capacity at 100% Overpressure (Double Set Pressure)
1000 Standard Cubic Feet per Hour at 60° F

<table>
<thead>
<tr>
<th>Set Pressure ((P_s))</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>InWC</td>
<td>2&quot; (50 mm)</td>
</tr>
<tr>
<td>0.87</td>
<td>0.50</td>
</tr>
<tr>
<td>1.00</td>
<td>0.58</td>
</tr>
<tr>
<td>1.73</td>
<td>1.00</td>
</tr>
<tr>
<td>2.00</td>
<td>1.16</td>
</tr>
<tr>
<td>2.60</td>
<td>1.50</td>
</tr>
<tr>
<td>3.00</td>
<td>1.73</td>
</tr>
<tr>
<td>3.46</td>
<td>2.00</td>
</tr>
<tr>
<td>4.00</td>
<td>2.31</td>
</tr>
<tr>
<td>6.00</td>
<td>3.47</td>
</tr>
<tr>
<td>8.00</td>
<td>4.62</td>
</tr>
<tr>
<td>10.0</td>
<td>5.78</td>
</tr>
<tr>
<td>12.0</td>
<td>6.93</td>
</tr>
<tr>
<td>15.0</td>
<td>8.66</td>
</tr>
<tr>
<td>20.0</td>
<td>11.6</td>
</tr>
<tr>
<td>25.0</td>
<td>14.4</td>
</tr>
<tr>
<td>30.0</td>
<td>17.3</td>
</tr>
</tbody>
</table>
### Air Flow Capacity at 100% Overpressure (Double Set Pressure)

1000 Normal Cubic Meters per Hour at 0°C

<table>
<thead>
<tr>
<th>Set Pressure (Pₙ) mmWC</th>
<th>2&quot; (50 mm)</th>
<th>3&quot; (80 mm)</th>
<th>4&quot; (100 mm)</th>
<th>5&quot; (150 mm)</th>
<th>6&quot; (200 mm)</th>
<th>8&quot; (250 mm)</th>
<th>10&quot; (300 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.0</td>
<td>0.09</td>
<td>0.18</td>
<td>0.32</td>
<td>0.64</td>
<td>1.04</td>
<td>1.65</td>
<td>1.91</td>
</tr>
<tr>
<td>50.0</td>
<td>0.14</td>
<td>0.30</td>
<td>0.55</td>
<td>1.13</td>
<td>1.82</td>
<td>2.87</td>
<td>3.53</td>
</tr>
<tr>
<td>75.0</td>
<td>0.18</td>
<td>0.39</td>
<td>0.70</td>
<td>1.46</td>
<td>2.35</td>
<td>3.70</td>
<td>4.62</td>
</tr>
<tr>
<td>100</td>
<td>0.21</td>
<td>0.46</td>
<td>0.83</td>
<td>1.74</td>
<td>2.80</td>
<td>4.40</td>
<td>5.53</td>
</tr>
<tr>
<td>150</td>
<td>0.26</td>
<td>0.58</td>
<td>1.06</td>
<td>2.21</td>
<td>3.55</td>
<td>5.59</td>
<td>7.05</td>
</tr>
<tr>
<td>200</td>
<td>0.31</td>
<td>0.69</td>
<td>1.25</td>
<td>2.61</td>
<td>4.19</td>
<td>6.59</td>
<td>8.35</td>
</tr>
<tr>
<td>250</td>
<td>0.35</td>
<td>0.78</td>
<td>1.42</td>
<td>2.97</td>
<td>4.76</td>
<td>7.48</td>
<td>9.50</td>
</tr>
<tr>
<td>300</td>
<td>0.39</td>
<td>0.87</td>
<td>1.57</td>
<td>3.29</td>
<td>5.27</td>
<td>8.30</td>
<td>10.5</td>
</tr>
<tr>
<td>375</td>
<td>0.44</td>
<td>0.98</td>
<td>1.78</td>
<td>3.73</td>
<td>5.98</td>
<td>9.41</td>
<td>12.0</td>
</tr>
<tr>
<td>500</td>
<td>0.51</td>
<td>1.15</td>
<td>2.09</td>
<td>4.39</td>
<td>7.02</td>
<td>11.0</td>
<td>14.1</td>
</tr>
<tr>
<td>625</td>
<td>0.58</td>
<td>1.30</td>
<td>2.36</td>
<td>4.97</td>
<td>7.96</td>
<td>12.5</td>
<td>15.9</td>
</tr>
<tr>
<td>750</td>
<td>0.64</td>
<td>1.44</td>
<td>2.62</td>
<td>5.50</td>
<td>8.80</td>
<td>13.8</td>
<td>17.6</td>
</tr>
</tbody>
</table>

### Flow Capacity Calculation

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

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

If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable overpressure is more than 100%, consult your Groth Representative.

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

\[
P_f = \text{Flowing pressure} \\
P_s = \text{Set pressure} \\
\%\ OP = \left(\frac{(P_f - P_s)}{P_s}\right) \times 100
\]

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

**Example—Flow Capacity Calculation**

6" Model 8800A 150 mmWC Set Pressure [Pₙ] 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
\[
\%\ OP = \left(\frac{(250 - 150)}{150}\right) \times 100 = 67%
\]

“C” factor at 67% OP = 0.82

Flow = 0.82 x 2,210 = 1,812 NCMH

---

### “C” Factor Table

<table>
<thead>
<tr>
<th>%OP</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.72</td>
<td>0.73</td>
<td>0.73</td>
<td>0.74</td>
<td>0.75</td>
<td>0.75</td>
<td>0.76</td>
<td>0.77</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.78</td>
<td>0.79</td>
<td>0.80</td>
<td>0.80</td>
<td>0.81</td>
<td>0.81</td>
<td>0.82</td>
<td>0.82</td>
<td>0.83</td>
<td>0.84</td>
</tr>
<tr>
<td>30</td>
<td>0.84</td>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
<td>0.86</td>
<td>0.87</td>
<td>0.88</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>40</td>
<td>0.90</td>
<td>0.90</td>
<td>0.91</td>
<td>0.91</td>
<td>0.92</td>
<td>0.92</td>
<td>0.93</td>
<td>0.93</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>50</td>
<td>0.95</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.99</td>
<td>1.00</td>
</tr>
</tbody>
</table>

---

**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

---

**Example—Flow Capacity Calculation**

6" Model 8800A 150 mmWC Set Pressure [Pₙ] 250 mmWC Flowing Pressure [P_f]
### Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum)

1000 Standard Cubic Feet per Hour at 60° F

<table>
<thead>
<tr>
<th>Set Vacuum (P&lt;sub&gt;s&lt;/sub&gt;)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2” (50 mm)</td>
</tr>
<tr>
<td>InWC</td>
<td>oz/in&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.87</td>
<td>0.50</td>
</tr>
<tr>
<td>1.00</td>
<td>0.58</td>
</tr>
<tr>
<td>1.73</td>
<td>1.00</td>
</tr>
<tr>
<td>2.00</td>
<td>1.16</td>
</tr>
<tr>
<td>2.60</td>
<td>1.50</td>
</tr>
<tr>
<td>3.00</td>
<td>1.73</td>
</tr>
<tr>
<td>3.46</td>
<td>2.00</td>
</tr>
<tr>
<td>4.00</td>
<td>2.31</td>
</tr>
<tr>
<td>6.00</td>
<td>3.47</td>
</tr>
<tr>
<td>8.00</td>
<td>4.62</td>
</tr>
<tr>
<td>10.0</td>
<td>5.78</td>
</tr>
<tr>
<td>12.0</td>
<td>6.93</td>
</tr>
<tr>
<td>15.0</td>
<td>8.66</td>
</tr>
<tr>
<td>20.0</td>
<td>11.6</td>
</tr>
<tr>
<td>25.0</td>
<td>14.4</td>
</tr>
<tr>
<td>30.0</td>
<td>17.3</td>
</tr>
</tbody>
</table>

### FLOW CAPACITY CALCULATION

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

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

If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

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

\[
P_f = \text{Flowing pressure} \\
P_s = \text{Set pressure} \\
\% \text{OV} = \left(\frac{P_f - P_s}{P_s}\right) \times 100
\]

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

**Example—Flow Capacity Calculation**

1. Read flow capacity at set vacuum from table: Flow = 46,700 SCFH
2. Calculate over-vacuum: % OV = \(\left(\frac{P_f - 7}{4}\right) \times 100 = 75\%\)
3. Read “C” factor from table: “C” = 0.87
4. Calculate flow capacity: Flow = 0.87 x 46,700 = 40,629 SCFH

**“C” Factor Table**

<table>
<thead>
<tr>
<th>%OP</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.72</td>
<td>0.73</td>
<td>0.73</td>
<td>0.74</td>
<td>0.75</td>
<td>0.75</td>
<td>0.76</td>
<td>0.77</td>
<td>0.77</td>
<td>0.78</td>
</tr>
<tr>
<td>20</td>
<td>0.78</td>
<td>0.79</td>
<td>0.80</td>
<td>0.80</td>
<td>0.81</td>
<td>0.81</td>
<td>0.82</td>
<td>0.82</td>
<td>0.83</td>
<td>0.84</td>
</tr>
<tr>
<td>30</td>
<td>0.84</td>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
<td>0.86</td>
<td>0.87</td>
<td>0.88</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>40</td>
<td>0.90</td>
<td>0.91</td>
<td>0.91</td>
<td>0.91</td>
<td>0.92</td>
<td>0.92</td>
<td>0.93</td>
<td>0.93</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>50</td>
<td>0.95</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>60</td>
<td>0.99</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

***Consult Factory***
Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum)
1000 Normal Cubic Meters per Hour at 0° C

| Set Vacuum (P_s) | Size
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mmWC</td>
<td>2&quot; (50 mm)</td>
<td>3&quot; (80 mm)</td>
<td>4&quot; (100 mm)</td>
<td>6&quot; (150 mm)</td>
<td>8&quot; (200 mm)</td>
<td>10&quot; (250 mm)</td>
<td>12&quot; (300 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.0</td>
<td>0.07</td>
<td>0.15</td>
<td>0.26</td>
<td>0.52</td>
<td>0.84</td>
<td>1.29</td>
<td>1.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.0</td>
<td>0.12</td>
<td>0.25</td>
<td>0.42</td>
<td>0.87</td>
<td>1.39</td>
<td>2.13</td>
<td>2.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75.0</td>
<td>0.14</td>
<td>0.32</td>
<td>0.53</td>
<td>1.11</td>
<td>1.77</td>
<td>2.72</td>
<td>3.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>0.17</td>
<td>0.38</td>
<td>0.63</td>
<td>1.32</td>
<td>2.09</td>
<td>3.21</td>
<td>4.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>0.21</td>
<td>0.48</td>
<td>0.79</td>
<td>1.66</td>
<td>2.64</td>
<td>4.05</td>
<td>5.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>0.25</td>
<td>0.56</td>
<td>0.93</td>
<td>1.95</td>
<td>3.11</td>
<td>4.76</td>
<td>6.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.28</td>
<td>0.63</td>
<td>1.05</td>
<td>2.21</td>
<td>3.53</td>
<td>5.40</td>
<td>7.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>0.31</td>
<td>0.70</td>
<td>1.17</td>
<td>2.45</td>
<td>3.90</td>
<td>5.97</td>
<td>8.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>375</td>
<td>0.35</td>
<td>0.80</td>
<td>1.32</td>
<td>2.78</td>
<td>4.42</td>
<td>6.77</td>
<td>9.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>0.41</td>
<td>0.93</td>
<td>1.55</td>
<td>3.26</td>
<td>5.19</td>
<td>7.94</td>
<td>10.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>0.47</td>
<td>1.06</td>
<td>1.76</td>
<td>3.69</td>
<td>5.87</td>
<td>8.98</td>
<td>12.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>0.52</td>
<td>1.17</td>
<td>1.94</td>
<td>4.08</td>
<td>6.50</td>
<td>9.90</td>
<td>13.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Flow Capacity Calculation**

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

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

If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

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

\[
P_f = \text{Flowing pressure}
\]
\[
P_s = \text{Set pressure}
\]
\[
% \text{OV} = \left\{\frac{(P_f - P_s)}{P_s}\right\} \times 100
\]

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

**Example—Flow Capacity Calculation**

1. Read flow capacity at set vacuum from table
2. Calculate over-vacuum
3. Read “C” factor from table
4. Calculate flow capacity

6” Model 8800A
150 mmWC Set Vacuum \[P_s\]
250 mmWC Flowing Vacuum \[P_f\]

Flow = 1,660 NCMH
% \text{OV} = \left\{\frac{(250 - 150)}{150}\right\} \times 100 = 67% 
“C” = 0.82
Flow = 0.82 \times 1,660 = 1,361 NCMH
SERIES 8820

- Sizes 2” through 12”
- Pressure settings
  0.5 oz/in² to 15 psig
- Vacuum settings
  0.5 oz/in² to 12 psig
- Available in carbon steel (WCB/CS), stainless steel (CF8M/316), aluminum (356/6061) and other materials
- Proven spiral-wound, crimped-ribbon flame element
- Modular construction
- ATEX Certificate available

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.

SPECIAL FEATURES

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

END-OF-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

IN-LINE
- 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”)

### Specifications

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; (50 mm)</td>
<td>3&quot; (76 mm)</td>
<td>11 oz/in² (48.2 gm/cm²)</td>
<td>12 oz/in² (52.7 gm/cm²)</td>
<td>14.25&quot; (361 mm)</td>
<td>26.62&quot; (676 mm)</td>
<td>33.62&quot; (854 mm)</td>
<td>8.75&quot; (221 mm)</td>
<td>20.25&quot; (514 mm)</td>
<td>5.50&quot; (140 mm) (20 kg)</td>
</tr>
<tr>
<td>3&quot; (80 mm)</td>
<td>4&quot; (102 mm)</td>
<td>13 oz/in² (57.5 gm/cm²)</td>
<td>11 oz/in² (48.3 gm/cm²)</td>
<td>18&quot; (457 mm)</td>
<td>31.12&quot; (790 mm)</td>
<td>39.37&quot; (900 mm)</td>
<td>9.50&quot; (241 mm)</td>
<td>23.12&quot; (588 mm)</td>
<td>6&quot; (152 mm) (27 kg)</td>
</tr>
<tr>
<td>4&quot; (100 mm)</td>
<td>6&quot; (152 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>11 oz/in² (48.3 gm/cm²)</td>
<td>19.25&quot; (489 mm)</td>
<td>37&quot; (940 mm)</td>
<td>47.37&quot; (1203 mm)</td>
<td>11.50&quot; (292 mm)</td>
<td>26.75&quot; (679 mm)</td>
<td>6.50&quot; (165 mm) (41 kg)</td>
</tr>
<tr>
<td>6&quot; (150 mm)</td>
<td>8&quot; (203 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>26.50&quot; (673 mm)</td>
<td>44.75&quot; (1138 mm)</td>
<td>59.75&quot; (1518 mm)</td>
<td>16.50&quot; (419 mm)</td>
<td>31.50&quot; (500 mm)</td>
<td>8.50&quot; (216 mm) (73 kg)</td>
</tr>
<tr>
<td>8&quot; (200 mm)</td>
<td>10&quot; (254 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>32.50&quot; (826 mm)</td>
<td>53.50&quot; (1358 mm)</td>
<td>70.25&quot; (1174 mm)</td>
<td>21&quot; (533 mm)</td>
<td>37.37&quot; (949 mm)</td>
<td>10.75&quot; (273 mm) (123 kg)</td>
</tr>
<tr>
<td>10&quot; (250 mm)</td>
<td>12&quot; (305 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>37.25&quot; (959 mm)</td>
<td>64.50&quot; (1638 mm)</td>
<td>84.12&quot; (2137 mm)</td>
<td>24.75&quot; (529 mm)</td>
<td>45.25&quot; (1149 mm)</td>
<td>12.50&quot; (318 mm) (190 kg)</td>
</tr>
<tr>
<td>12&quot; (300 mm)</td>
<td>14&quot; (356 mm)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>16 oz/in² (70.3 gm/cm²)</td>
<td>42.75&quot; (1086 mm)</td>
<td>71.62&quot; (1819 mm)</td>
<td>91.37&quot; (2321 mm)</td>
<td>28.62&quot; (727 mm)</td>
<td>50.12&quot; (1273 mm)</td>
<td>15&quot; (381 mm) (273 kg)</td>
</tr>
</tbody>
</table>

† 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.
For easy ordering, select proper model numbers

<table>
<thead>
<tr>
<th>MODEL #</th>
<th>SIZE</th>
<th>MATERIAL</th>
<th>OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8820A</td>
<td>02&quot;</td>
<td></td>
<td>O = No Options</td>
</tr>
<tr>
<td>8821B</td>
<td>Thru</td>
<td></td>
<td>Z = Special Options</td>
</tr>
<tr>
<td>8822B</td>
<td>12&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8823A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Weight Loaded
- Pressure Spring
- Vacuum Spring
- Pressure & Vacuum Springs

- Diaphragm Material (Seat):
  - B = Buna-N
  - T = Fluoropolymer
  - V = FKM
  - Z = Special

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

- Body Material
  - 1 = Aluminum
  - 3 = Carbon Steel
  - 5 = 316 SS
  - Z = Special

- Includes model number and setting when ordering.
- For special options, consult factory.
- When ordering steam jacket, include steam pressure/temperature.
- Stainless steel guides, stems are standard with aluminum and carbon steel bodies. Stainless steel seats standard with carbon steel bodies.

Example: 8820A 02 Z 1 1 5 1 T O

Indicates a 2" Model 8820A with Aluminum Body and Seat, 316 SS Pallet, Aluminum Flame Element, Fluoropolymer Seat Diaphragm, and no other options.
Air Flow Capacity at 100% Overpressure (Double Set Pressure)
1000 Standard Cubic Feet per Hour at 60° F

<table>
<thead>
<tr>
<th>Set Pressure (P_s)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>InWC oz/in²</td>
</tr>
<tr>
<td>0.87</td>
<td>0.50</td>
</tr>
<tr>
<td>1.00</td>
<td>0.58</td>
</tr>
<tr>
<td>1.73</td>
<td>1.00</td>
</tr>
<tr>
<td>2.00</td>
<td>1.16</td>
</tr>
<tr>
<td>2.60</td>
<td>1.50</td>
</tr>
<tr>
<td>3.00</td>
<td>1.73</td>
</tr>
<tr>
<td>3.46</td>
<td>2.00</td>
</tr>
<tr>
<td>4.00</td>
<td>2.31</td>
</tr>
<tr>
<td>6.00</td>
<td>3.47</td>
</tr>
<tr>
<td>8.00</td>
<td>4.62</td>
</tr>
<tr>
<td>10.0</td>
<td>5.78</td>
</tr>
<tr>
<td>12.0</td>
<td>6.93</td>
</tr>
<tr>
<td>15.0</td>
<td>8.66</td>
</tr>
<tr>
<td>20.0</td>
<td>11.6</td>
</tr>
<tr>
<td>25.0</td>
<td>14.4</td>
</tr>
<tr>
<td>30.0</td>
<td>17.3</td>
</tr>
</tbody>
</table>

FLOW CAPACITY CALCULATION

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

Read the flow capacity at 100% overpressure directly from the table above. Use linear sted.

If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable overpressure is more than 100%, consult your Groth Representative.

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

\[
P_f = \text{Flowing pressure} \quad P_s = \text{Set pressure} \quad \% \text{ OP} = \frac{[P_f - P_s]}{P_s} \times 100
\]

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

**Example—Flow Capacity Calculation**

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

Flow = 58,000 SCFH
\[
\% \text{ OP} = \frac{[7 - 4]}{4} \times 100 = 75\%
\]

“C” factor at 75% OP = 0.87

Flow = 0.87 x 58,000 = 50,460 SCFH
Flow capacity values listed above are based on full open valves at 100% overpressure.

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

If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable overpressure is more than 100%, consult your Groth representative.

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

\[
P_{\text{f}} = \text{Flowing pressure} \\
P_{\text{s}} = \text{Set pressure} \\
\%\text{OP} = \left(\frac{P_{\text{f}} - P_{\text{s}}}{P_{\text{s}}}\right) \times 100
\]

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

**Example—Flow Capacity Calculation**

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

**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.
### Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum)

1000 Standard Cubic Feet per Hour at 60° F

<table>
<thead>
<tr>
<th>Set Vacuum (P&lt;sub&gt;s&lt;/sub&gt;)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>InWC</td>
<td>oz/in²</td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>0.87</td>
<td>0.50</td>
</tr>
<tr>
<td>1.00</td>
<td>0.58</td>
</tr>
<tr>
<td>1.73</td>
<td>1.00</td>
</tr>
<tr>
<td>2.00</td>
<td>1.16</td>
</tr>
<tr>
<td>2.60</td>
<td>1.50</td>
</tr>
<tr>
<td>3.00</td>
<td>1.73</td>
</tr>
<tr>
<td>3.46</td>
<td>2.00</td>
</tr>
<tr>
<td>4.00</td>
<td>2.31</td>
</tr>
<tr>
<td>6.00</td>
<td>3.47</td>
</tr>
<tr>
<td>8.00</td>
<td>4.62</td>
</tr>
<tr>
<td>10.0</td>
<td>5.78</td>
</tr>
<tr>
<td>12.0</td>
<td>6.93</td>
</tr>
<tr>
<td>15.0</td>
<td>8.66</td>
</tr>
<tr>
<td>20.0</td>
<td>11.6</td>
</tr>
<tr>
<td>25.0</td>
<td>14.4</td>
</tr>
<tr>
<td>30.0</td>
<td>17.3</td>
</tr>
</tbody>
</table>

### FLOW CAPACITY CALCULATION

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

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

If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

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

\[
P_f = \text{Flowing pressure} \\
P_s = \text{Set pressure} \\
\%\ OV = \left(\frac{P_f - P_s}{P_s}\right) \times 100
\]

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

Example—Flow Capacity Calculation

1. Read flow capacity at set vacuum from table
   - 6" Model 8820A
   - 4 InWC Set Vacuum [P<sub>s</sub>]
   - 7 InWC Flowing Vacuum [P<sub>f</sub>]
2. Calculate over-vacuum
   - % OV = \left(\frac{7 - 4}{4}\right) \times 100 = 75%
   - “C” factor = 0.87
3. Read “C” factor from table
4. Calculate flow capacity
   - Flow = 0.87 \times 46,700 = 40,629 SCFH
### Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum)
1000 Normal Cubic Meters per Hour at 0° C

<table>
<thead>
<tr>
<th>Set Vacuum (P_s)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2”</td>
</tr>
<tr>
<td>mmWC</td>
<td>(50 mm)</td>
</tr>
<tr>
<td>22.0</td>
<td>0.07</td>
</tr>
<tr>
<td>28.0</td>
<td>0.08</td>
</tr>
<tr>
<td>50.0</td>
<td>0.12</td>
</tr>
<tr>
<td>75.0</td>
<td>0.14</td>
</tr>
<tr>
<td>100</td>
<td>0.17</td>
</tr>
<tr>
<td>150</td>
<td>0.21</td>
</tr>
<tr>
<td>200</td>
<td>0.25</td>
</tr>
<tr>
<td>250</td>
<td>0.28</td>
</tr>
<tr>
<td>300</td>
<td>0.31</td>
</tr>
<tr>
<td>375</td>
<td>0.35</td>
</tr>
<tr>
<td>500</td>
<td>0.41</td>
</tr>
<tr>
<td>625</td>
<td>0.47</td>
</tr>
<tr>
<td>750</td>
<td>0.52</td>
</tr>
</tbody>
</table>

### Flow Capacity Calculation

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

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

If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate “C” factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

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

\[
P_r = \text{Flowing pressure}
\]
\[
P_s = \text{Set pressure}
\]
\[
\% \text{OV} = \left( \frac{P_r - P_s}{P_s} \right) \times 100
\]

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

**Example—Flow Capacity Calculation**

1. Read flow capacity at set vacuum from table
2. Calculate over-vacuum
3. Read “C” factor from table
4. Calculate flow capacity

**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**

<table>
<thead>
<tr>
<th>%OV</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.72</td>
<td>0.73</td>
<td>0.73</td>
<td>0.74</td>
<td>0.75</td>
<td>0.76</td>
<td>0.77</td>
<td>0.77</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.78</td>
<td>0.79</td>
<td>0.80</td>
<td>0.81</td>
<td>0.81</td>
<td>0.82</td>
<td>0.82</td>
<td>0.83</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>0.84</td>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
<td>0.87</td>
<td>0.88</td>
<td>0.88</td>
<td>0.89</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0.90</td>
<td>0.90</td>
<td>0.91</td>
<td>0.91</td>
<td>0.92</td>
<td>0.92</td>
<td>0.93</td>
<td>0.93</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>0.95</td>
<td>0.95</td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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

**Flow Calculation Example**

6” Model 8820A 150 mmWC Set Vacuum \[P_s\] 250 mmWC Flowing Vacuum \[P_r\]

1. Read flow capacity at set vacuum from table
2. Calculate over-vacuum
3. Read “C” factor from table
4. Calculate flow capacity