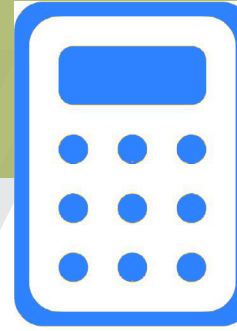


# TECHNICAL INFORMATION

## Gas/Liquid Separators



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### Temperature Correction Factor

Temp °F	Factor
-20	0.904
-10	0.917
0	0.929
10	0.941
20	0.953
30	0.965
40	0.977
50	0.989
60	1.000
70	1.012
80	1.023
90	1.034
95	1.040
100	1.046
105	1.051
110	1.057
120	1.068
130	1.079
140	1.090
150	1.101
160	1.112
170	1.121
180	1.133
190	1.143
200	1.154
250	1.206
300	1.256
400	1.353
500	1.445
550	1.490
600	1.533
700	1.618
800	1.701
900	1.780
1000	1.858

### Specific Gravity Correction Factors

GAS	Symbol	M.W.	G	F <sub>g</sub>
Hydrogen	H <sub>2</sub>	2.0	0.069	0.344
Helium	He	4.0	0.138	0.452
Synthesis	75% H <sub>2</sub> , 25% N <sub>2</sub>	8.5	0.295	0.611
Coke Oven	-	11.0	0.379	0.679
*Methane	CH <sub>4</sub>	16.0	0.551	0.788
Ammonia	NH <sub>3</sub>	17.0	0.586	0.808
Steam (Water Vapor)	H <sub>2</sub> O	18.0	0.621	0.826
*Natural Gas	75% CH <sub>4</sub> , 25% N <sub>2</sub>	-	-	-
Acetylene	C <sub>2</sub> H <sub>2</sub>	26.0	0.897	0.957
Nitrogen	N <sub>2</sub>	28.0	0.950	0.986
Carbon Monoxide	CO	28.0	0.950	0.986
Air	-	29.0	1.00	1.00
Flue Gas	81%N <sub>2</sub> , 19%CO <sub>2</sub>	31.0	1.08	1.027
Oxygen	O <sub>2</sub>	32.0	1.10	1.039
Argon	A	39.9	1.38	1.136
Propane	C <sub>3</sub> H <sub>8</sub>	44.1	1.52	1.182
*Carbon Dioxide	CO <sub>2</sub>	44.0	1.52	1.181
Nitrous Oxide	N <sub>2</sub> O	44.0	1.52	1.181
Butadiene	C <sub>4</sub> H <sub>6</sub>	54.1	1.86	1.284
Sulfur Dioxide	SO <sub>2</sub>	64.1	2.21	1.374
Chlorine	Cl <sub>2</sub>	70.9	2.45	1.431
Freon 12	CCl <sub>2</sub> F <sub>2</sub>	120.9	4.17	1.770

\* For applications involving gases (above 500 psi at 200 °F) so marked, contact Eaton to determine whether there is an additional correction factor for compressibility

$$1 \text{ psi} = 2.036'' \text{ Hg}$$

$$1'' \text{ Hg} = .4912 \text{ psi}$$

$$1 \text{ psi} = 27.71'' \text{ H}_2\text{O}$$

$$1'' \text{ H}_2\text{O} = .03613 \text{ psi}$$

### Symbol Key

- F<sub>g</sub> = Correction factor for specific gravity
- F<sub>t</sub> = Correction factor for temperature (See table on the inside page)
- G = Specific gravity
- MMSCFD = Million standard cubic feet per day
- MW = Molecular weight
- P<sub>a</sub> = Pressure (psia) at which volume is measured
- Q<sub>a</sub> = Rate of flow-standard cubic feet per minute (ACFM)
- Q<sub>c</sub> = Rate of flow-standard cubic feet per minute of equivalent air
- Q<sub>sg</sub> = Rate of flow-standard cubic feet per minute
- T = Operating temp. (°F)
- T<sub>a</sub> = Temperature (°F) at which volume is measured
- W = Rate of flow-pounds per hour

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The Eaton Air Flow Chart on the next page is based on SCFM (cubic feet per minute of air measured at standard conditions of 14.7 psia and 60 °F). If any of the operating conditions are varied from the above, then correction factors must be applied.

To use the Air Flow Chart for applications involving other gases or

other than standard conditions, the following equation must be solved for Q<sub>c</sub>:

$$Q_c = Q_{sg} \times F_g \times F_t$$

In the event that Q<sub>sg</sub> is not provided in the proper form, any of the following equations may be used to arrive at the correct flow rate to insert in the above equation:

$$Q_{sg} = \frac{6.3 \times W}{MW}$$

$$Q_{sg} = \frac{35.7 \times Q_a \times P_a}{460 + T_a}$$

$$Q_{sg} \text{ (air only)} = .218 \times W$$

$$Q_{sg} = \frac{MMSCFD}{1440}$$

$$W = (\text{pounds mols/hour}) \times MW$$