## Air Receiver Capacity in Cubic Feet of Free Air at Various Pressures

| Capacity | | Pressures (in pounds) | | | | | |
|---|---|---|---|---|---|---|---|
| Gals. | Cu.Ft. | 75 | 100 | 125 | 150 | 200 | 250 |
| 30 | 4.0 | 20.5 | 27.3 | 34.2 | 41.0 | 54.7 | 68.3 |
| 60 | 8.0 | 41.0 | 54.7 | 68.2 | 82.0 | 109.4 | 136.7 |
| 80 | 10.7 | 54.7 | 73.0 | 91.2 | 109.4 | 146.0 | 182.4 |
| 120 | 16.1 | 82.0 | 109.3 | 136.2 | 164.0 | 218.7 | 273.3 |
| 200 | 26.8 | 136.7 | 182.2 | 227.8 | 273.4 | 364.5 | 455.6 |
| 240 | 32.2 | 164.0 | 218.7 | 273.4 | 328.0 | 437.4 | 546.7 |
| 400 | 53.6 | 273.4 | 364.5 | 455.6 | 546.7 | 729.0 | 911.2 |
| 660 | 88.4 | 451.0 | 601.4 | 751.7 | 902.1 | 1202.8 | 1503.4 |
| 1060 | 142.0 | 724.4 | 965.9 | 1207.3 | 1448.8 | 1931.7 | 2414.5 |
| 1600 | 214.4 | 1093.4 | 1457.9 | 1822.4 | 2186.9 | 2915.8 | 3644.8 |
| 2560 | 343.0 | 1749.0 | 2333.0 | 2916.0 | 3499.0 | 4665.0 | 5832.0 |

Capacities at other pressures are exactly in proportion. Example: at 200 lbs. pressure the capacity of a given size tank is exactly double the capacity at 100 lbs. pressure.
Gallons = $\frac{\text{cu.ft.}}{.134}$ ••• cu.ft. = Gallons x .134.

## USEFUL FORMULAS - Sizing a Tank



**A)** ***Constant Speed Operation:*** Tank Size (ft³) = $\frac{\text{Compressor Flow (CFM)}}{7}$

**B)** ***Typical Sizing Formula:*** $V_r = \frac{14.7t(Qr-Qc)}{Pmax - Pmin}$ **where**

- $t$ = time (min) that receiver can supply required amount of air,
- $Qr$ = consumption rate of pneumatic system (cfm),
- $Qc$ = output flow rate of compressor (cfm),
- $Pmax$ = maximum pressure level in receiver (psi),
- $Pmin$ = minimum pressure level in receiver (psi),
- $Vr$ = receiver size (ft³)

**C)** 7.48 Gallons = 1ft³ Volume

**D)** 14.5 psi = 1 BAR

**E)** 35 CFM = $\frac{\text{1 Meter}^3}{\text{Min.}}$

**F)** ***Pump Up Time:*** Example – 5 hp compressor on an 80 gallon tank, pumping from 0-100psig.

$$\frac{\text{80 Gallon Tank}}{\text{7.5 gal./ft}^3} \times (100 \text{ psig} - 0 \text{ psig}) = \frac{1066.67}{14.7 \text{ (the ATM Pressure)} \times 18 \text{ (the CFM of Unit)}} = 4 \text{ min}$$

| NOM. CAP. | | Horz. | No | NEMA Frame Sizes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GAL. | CU.FT. | Vert. | Slots | 56 | 56H | 143T | 145T | 182T | 184T | 213T | 215T | 254T |
| 10 | 1.34 | H | X | | | | | | | | | |
| 15 | 2.01 | H | X | | | | | | | | | |
| 20 | 2.67 | H | X | | | | | | | | | |
| 30 | 4.01 | H&V | | X | X | X | X | | | | | |
| 60 | 8.02 | H&V | | | | | X | X | X | X | | |
| 80 | 10.70 | V | | | | | X | X | X | X | | |
| 80 | 10.70 | H | | | | | | | X | X | X | X |
| 120 | 16.04 | H&V | | | | | | | X | X | X | X |
| 200 | 26.74 | H | X | | | | | | | | | |
| 240 | 32.09 | H | X | | | | | | | | | |