Technical Aids

Vertical NEMA Frame Sizes

GALLONS	56	56H	143T	145T	182T	184T	213T	215T	254T
30	X	X	X	X					
60				X	X	X	X		
80				X	X	X	X		
120						X	X	X	X

Horizontal NEMA Frame Sizes

GALLONS	56	56H	143T	145T	182T	184T	213T	215T	254T
30	X	X	X	X					
60				X	X	X	X		
80						X	X	X	X
120						X	X	X	X

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

CAPACITY		PRESSURE (in pounds)					
GALLONS	CU. FT.	75	100	125	150	200	250
30	4.0	4.0	27.3	34.2	41.0	54.7	68.3
60	8.0	8.0	54.7	68.2	82.0	109.4	136.7
80	10.7	10.7	73.0	10.7	109.4	146.0	182.4
120	16.1	16.1	109.3	92.2	164.0	218.7	273.3
200	26.8	26.8	182.2	136.2	273.4	364.5	455.6
240	32.2	32.2	218.7	227.8	328.0	437.4	546.7
400	53.6	53.6	364.5	455.6	546.7	729.0	911.2
660	88.4	88.4	601.4	751.7	902.1	1202.8	1503.4
1060	142.0	142.0	965.9	1207.3	1448.8	1931.7	2414.5
1600	214.4	214.4	1457.9	1822.4	2186.9	2915.8	3644.8
2560	343.0	343.0	2333.0	2916.0	3499.0	4655.0	5832.0

Capacites 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.

$$\text{Gallons} = \frac{\text{Cu. Ft.}}{0.134} \quad \cdots \quad \text{Cu. Ft.} = \text{Gallons} \times 0.134$$

Useful Formulas - Sizing a Tank

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

B Typical Sizing Formula: $VR = \frac{14.7\ t\ (Qr-Qc)}{Pmax - Pmin}$ 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 = 1 ft3 Volume

D 14.5 psi = Bar

E $35\ \text{CFM} = \frac{1\ \text{Meter3}}{\text{Min}}$

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

$$\frac{\text{80 Gallon Tank}}{\text{7.5 gl./ft3}} \times (\text{100 psig - 0 psig}) = \frac{1066.67}{\text{14.7 (the ATM Pressure)} \times \text{18 (the CFM of Unit)}} = 4\ \text{min}$$