Air Compressors

We can supply air compressors for all types of environmental applications. From 3/4 HP oil-less designs for ground water sampling up to 15 HP models for remediation projects. Selecting the optimum air compressor system will ensure efficient operation and reduce the need for maintenance and repairs. A correctly sized, good quality air compressor will provide years of trouble free operation.

Two factors need to be considered when selecting the optimum size and type of compressor, air volume and pressure. The air volume required, usually expressed as CFM (cubic feet per minute). This is the actual volume of air delivered by the compressor as measured when discharged to the atmosphere at a set pressure. Once the CFM requirements have been determined, the compressor can be selected. It is important to allow for a 50% duty cycle for the compressor to prevent the system from cycling continuously. (See Tech Tip Below)

A compressor will turn approximately 7 cubic feet of ambient air into 1 cubic foot of compressed air. The net result is seven times as much moisture and contamination inside the compressor receiver and air lines. The compression process will also increase the ambient temperature of the air inside the receiver. Air compressors can generate over 20 gallons of water in an 8-hour operating period. If not removed, the moisture and contaminants can cause premature failure of the air lines and pumping equipment. Compressors should therefore include the following accessories: an aftercooler, a receiver autodrain and, depending on the climatic conditions where the compressor will be used, an air dryer.

An after cooler will reduce the temperature of the compressed air. This will result in the water vapor condensing into droplets which will collect in the bottom of the receiver. An auto drain fitted to the receiver will open automatically, allowing the water to drain.

Tech Tip:
Formula for determining total air flow (cfm) requirements:

Total cfm required x 1.5 = Total cfm

Example: If you are using two MVP IV Pumps each producing 3 gpm (1 cfm required per gallon pumped), your actual air requirements will be 6 cfm. Multiply this number by 1.5 (50% duty cycle) and your total cfm requirement will be 9 cfm.

Air Flow & Pressure Loss

Flow (cfm)	Flow Rate (lb/hr)	Tube Size							
		1/4" Tubing (.250" ID)		1/2" Tubing (.500" ID)		3/4" Tubing (.750" ID)		1" Tubing (1.00" ID)	
		Velocity (ft/sec)	Pressure Drop (psi/100 ft)	Velocity (ft/sec)	Pressure Drop (psi/100 ft)	Velocity (ft/sec)	Pressure Drop (psi/100 ft)	Velocity (ft/sec)	Pressure Drop (psi/100 ft)
0.5	15.01	24.45	0.60	6.11	0.019	2.72	0.012	1.53	0.01
1	30.02	48.91	2.39	12.23	0.075	5.43	0.050	3.06	0.04
2	60.04	97.81	9.57	24.45	0.299	10.87	0.199	6.11	0.15
4	120.07	195.63	38.27	48.91	1.196	21.74	0.797	12.23	0.60
8	240.15	391.25	153.08	97.81	4.784	43.47	3.189	24.45	2.39
16	480.30	782.51	612.32	195.63	19.135	86.95	12.757	48.91	9.57
32	960.59	1565.01	2449.27	391.25	76.540	173.89	51.026	97.81	38.27
64	1921.19	3130.03	9797.07	782.51	306.158	347.78	204.106	195.63	153.08

Dry Air @ 80ºF and 100psi
Density = PV/RT
P = Pressure, psi
V = Volume, ft^3
R = Gas Constant (for Air) = 53.33
T = Temperature, degR

Wh = Flow Rate, lb/hr = (60) x (Density, lb/ft^3) x (Flow Rate, cfm)
Velocity, ft/sec =((183.4) x (Wh, lb/hr)) / ((3600) x (d, in)^2 x (Density, lb.ft^3))
Pressure Drop, lb/in^2 = [((L, ft) x (Velocity, ft/sec)^2) / ((25000) x (d, in))] / (16 oz/lb) = psi
Density, lb/ft^3 = 0.50

Cells highlighted in dark blue are for non-recommended flows.

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