

Table 4.10 Data for Selection of Receiver

Diameter, in.	Length, ft	Actual Compressor Capacity*	Volume, ft ³
14	4	40	4 1/2
18	6	110	11
24	6	190	19
30	7	340	34
36	8	570	57
42	10	960	96
48	12	2115	151
54	14	3120	223
60	16	4400	314
66	18	6000	428

*Cubic feet of free air per minute at 40 to 125 psig for constant-speed regulation. For automatic start-and-stop service, the receivers are suitable only for capacities one-half of the actual compressor capacities listed here-to avoid starting too frequently.

Energy management systems, with adequate and strategically placed air receivers, intermediate controls and pressure regulation, have been developed to suit specific plant systems, maintaining a very narrow band of system pressures, minimizing run time of compressors and improving quality of work performed by pneumatic tools and equipment.

Machines can be equipped to detect an idle threshold and stop air flow to an idle machine. A simple solenoid valve, arranged to close when the machine is idle, can reduce air consumption significantly.

When an air distribution system is operated at a higher than required pressure, this requires approximately one percent additional power for each 2 psi of operating pressure. In addition, leakage increases as pressure increases. This can be seen from Table 4.11 which shows that a 1/4 inch diameter orifice with 100 psig on one side and atmospheric pressure on the other will have a flow rate of 104 acfm of free air. At 110 psig the flow rate increases to 113 acfm. The combined effect of an increase of 5% in power for the 10 psi pressure increase, combined with the 8.6% increase in leakage flow rate, results in an overall power increase of approximately 14%.