

Air Pressure Amplifiers Can Cut Electric Power Consumption



Complete Pneumatic System
Designed to Provide Amplified
Pressure and Momentary High Flow

Challenge

Almost every industrial plant has a problem department where its central air system cannot deliver sufficient pressure to properly operate air tools or machinery. The reason usually is a poorly designed, overloaded, leaky, or clogged air distribution system. To get back into production, one frequent solution is to increase the system pressure to accommodate the problem location. This solves one production problem, but unnecessarily increases electric power use at the central compressor—often dramatically, due to increased load, leakage, heat, and pressure drop.

Engineers usually apply an electrical cost factor of about 1/2% per psig for compressor operation over the typical plant system range of 70 to 110 psig. In other words, if a system operates at 90 psig instead of 70 psig, the 20-psig difference could add as much as 10% to electric power cost.

Solution

A better solution might be to install an air-pressure amplifier or booster in the problem department. A simple booster can routinely double the pressure at its inlet, and this output (then can be regulated to suit tool or machine requirements). The unit automatically cycles whenever air on its downstream side is used and automatically varies its speed to suit the flow required. The rest of the central air system remains at a lower, more-efficient pressure. Air-pressure amplifiers are compact and completely self-contained, require no electrical connections or unloading devices, and can be wall-, bench-, or floor-mounted in any position. Models are available with optional receivers to store high-pressure air for applications requiring momentary high flow rates.

Results

Based on our example, a savings of \$6,240 can be realized in a typical 6000-hour year. Assuming a 100-hp installation, an energy cost of \$.12 kWh, and 86% compressor efficiency. Using the factor of 0.7457 kW/hp: $(100) (0.7457) / 0.86 = 86.7$ kW/hour $(86.7) (\$.12) = \10.40 /hour. The 10% additional cost of operating at the higher pressure would be \$1.04 per hour.

Installing an economical air amplifier will pay for itself within one year.