

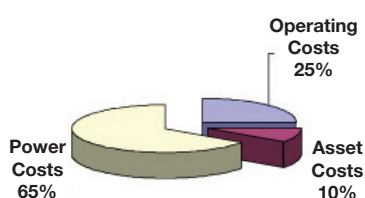


Technical Topic

Air Compressors — Care & Maintenance Tips

It takes more than an air compressor to provide the kind of air you want and need in your plant. In a time when operating costs have sky-rocketed, it pays to be able to identify those areas where overall cost can be reduced.

Did you know there are three basic factors involved in the total cost of producing compressed air in plant systems?



1. **Power** — The power to drive the prime mover represents 65% of the expense.
2. **Operations** — Attendant labor, lubrication and cooling water expenses represent 25% of the cost.
3. **Assets** — Compressor purchase, installation, depreciation, insurance, taxes, replacement parts and maintenance labor represents the final 10%.

Critical Elements that Contribute to Effective Cost Reduction

Clean, Cool Inlet Air: Cooler air means less work is required to produce line pressure. Ideally, the air intake should be located in a clean, dry, shaded area outside the building, at least six feet from the ground. Intake ducts should deliver minimum pressure drop at full capacity.

Correct Air Filter Capacity and Condition: Take readings from the instrumentation installed in the suction line between the filter and compressor at each shift to check for leakage (insufficient vacuum) or excessive restriction (too much vacuum). Using the correct filter can produce a dollar benefit through longer filter change intervals and/or reduced load time.



Optimum Compressor Operating Temperature:

Abnormally high operating temperatures can result in a fire or explosion, so take steps to maintain proper temperatures as recommended by the compressor manufacturer.

As a rule of thumb for reciprocating compressors, maintain the water temperature at 10°F above the inlet air temperature to prevent moisture from condensing in the cylinders of water-cooled compressors. Cooling water outlet temperatures should not exceed 120°F. To ensure proper operating temperatures, never start a compressor with water flow and cease flow when the compressor is shut down.

Control proper temperature by periodically inspecting and cleaning water jackets. Measuring temperature difference between inlet and outlet water pipes helps determine when the water jacket requires cleaning. If air cooled, routinely check that the fins are not clogged with dirt.

Proper Lubricant and Feed Rate: To allow compressors to perform correctly, select lubricants with characteristics suited to your service conditions. Best practice considerations include ensuring cleanliness in storing and dispensing these lubes and the application of correct quantities.

- **Reciprocating** — Cylinder oil lubrication is an important factor. Maintaining the correct feed rate protects metal surfaces and helps prevent sludge and deposit build-up. If over- or under-fed, you can run the risk of high wear rates on cylinders and rings, as well as over-heating and high oil consumption.
- **Centrifugal** — Centrifugal lubrication helps protect the bearings (and step-up gears in some models). Therefore, using the correct oil helps minimize wear, resist oxidation and perform in the presence of water.
- **Rotary Screw** — Some are flooded by lubricant, others operate with dry screws. When wet, properly cooled oil is required to help absorb the heat of compression and also lubricate the rotors and provide sealing. Oil-to-air or water-to-air heat exchangers help ensure a cool oil supply and minimize carbon deposits on compressor components. Dry-screw compressors simply require proper lubrication of the bearings.

Efficient Air Cooling Systems: Between stages of air-cooled compressors, air is directed by a fan. Clogged dirt restricts proper cooling. Adequate means for separating, trapping and draining water condensed from the air are essential. Check to ensure that proper water draining is taking place.

Safe Storage of Reserve Air Capacity: An air receiver is an essential part of most plant air systems. Arrange receivers to completely drain entrained oil or water condensed from air or carried over from after-coolers. Also, a spring-loaded safety valve, installed at the receiver and tested regularly, helps ensure safe operations.

Delivery of Dry Air To Point of Use at Required Pressure: Up to five percent of plant maintenance costs can be spent combating the damaging effects of unwanted moisture in compressed air systems. Frequently, air discharged from compressors is cooled in after-coolers in order to remove water and thus prevent or minimize the condensation of moisture in the air distribution system. Dryers may also be required. Routine inspection and maintenance helps ensure dry air and delivery at the intended pressure. Loss of pressure between the compressor and the point of use is unrecoverable and, therefore, money out of your pocket. A good rule of thumb to remember is that air pressure below 90 psi is too low for air devices to operate at 100 percent efficiency.

Air Line Lubricators: Air line lubricators provide lubrication to devices run by compressed air. Typically, a lightweight oil, easily carried by the air, helps operational efficiency. Keep the oilers full and replace oil that appears to be milky or dirty.

Minimized Air Leaks: Air leaks anywhere in the air system cause the compressor to compress more air than it needs to thus increasing your operating costs. Air leaks can be easily located with ultrasonic leak detectors.