

## Compressed Air Systems – 10 steps to save energy

The most expensive component in the total cost of compressed air is energy. In fact, over the lifespan of a typical compressor, energy typically costs several times more than the purchase price of the compressor. The bottom line, maximizing energy efficiency saves money. Therefore, the first step to reducing compressed air energy costs is to measure and monitor the energy consumption, flow rates and operating air pressure. In this context, small adjustments can reduce operating pressure and energy costs while improving flow rates and output. This article highlights several steps one can take to optimize compressed air system and save energy.

### Turn it off

There are 168 hours in a week, but most compressed air systems only run at or near full capacity between 60 to 100 hours. Therefore, depending on the shift pattern, turning off compressors during the evenings and weekends could reduce the energy bills up to 20%.



### Fix existing leaks

A quarter-inch air leak at 100 psi will cost more than PKR 262,037 per year. The pipe systems older than five years can have leaks of up to 25%.

Approximately 80 percent of air leaks are not audible, so to minimize these problems, third-party help in detecting these leaks may be a necessary measure for long-term profitability.



### Prevent new leaks

A clean, dry pipe indicates good quality air with no corrosion issues. Dust in the pipe is caused by particles in the

compressed air. If compressed air is not filtered, or if the filter is clogged, pressure drops will occur and the risk of end product contamination will subsequently increase further. Sludge in the pipe is bad news and must be fixed immediately. Dust and sludge in a compressed air piping system will cause corrosion and will greatly increase the number of leaks. Dried and filtered compressed air keeps piping clean.

### Reduce pressure

The compressor should be run at the required pressures, not beyond. Each two psig reduction, cuts energy consumption by 1%. Check the system pressure and resist the urge to turn up the pressure to compensate for leaks or drops in pressure due to piping problems or clogged filters. A central supply side controller can greatly reduce the operational pressure band and orchestrate air production more efficiently and effectively.

### Check drains

Condensate drains on timers should be adjusted periodically to ensure they open as intended or are not stuck as open. Better yet, replace timer drains with zero-loss drains to stop wasting compressed air.



### Review piping infrastructure

A piping system design should optimize the transfer of compressed air at the desired flow and pressure. Increasing the size of a pipe from two to three inches can reduce pressure drop up to 50%. Shortening the distance air has to travel can further reduce pressure drops by about 20-40 percent. The air distribution piping should be large enough in diameter to minimize pressure drop. One should also avoid using galvanized



iron pipes used for water plumbing applications.

### Change filters systematically

Inspect and replace filters systematically to ensure the quality of air and to prevent pressure drops. Go beyond the air compressor and compressor room. There are several air-line and point-of-use filters within the facility. Those are just as important to maintain as the air compressor and air compressor room filters.

### Recover Heat

It is simple physics that compressing air gives off heat, and as much as 90% of that heat can be recovered for use in other operations. For example, you can produce hot water for washrooms or direct warm air into a workspace, warehouse, loading dock, or entryway. These savings can really add up.

### Emphasize proper maintenance

Proper compressor maintenance cuts energy costs by one percent and helps prevent breakdowns that result in downtime and lost production. The operators are advised to check for leaks on machines, which use compressed air and replace worn out parts or valves, etc.

### Identify and eliminate inappropriate uses of compressed air

Inappropriate uses of compressed air include any application that can be done more effectively or more efficiently by a method other than compressed air. For example, high pressure air often is used for cooling or applications where much lower air pressure is needed. ♦

