

Michaels Engineering Energy Brief

COMPRESSED AIR STORAGE

SUGGESTIONS...

Do you have certain Energy Efficiency topics you'd like to know more about? Send an email with your suggestion to the author listed below and your topic might become a future Energy Brief!

DID YOU KNOW...

...Air compressors are not very efficient...only about 10-15%!

...Adding storage improves pressure AND compressor control.

MEET THE AUTHOR



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→ COMPRESSED AIR STORAGE CAN SAVE YOU ENERGY

Compressed air is expensive! Did you know the cost of electricity to operate a compressor around the clock for one year could be greater than the cost of the compressor itself! In addition, an air compressor is only about 10 to 15% efficient.

In many cases there is a relatively cheap and effective way to increase the efficiency of your compressed air system, while making it easier to control. Compressed air storage is the solution.

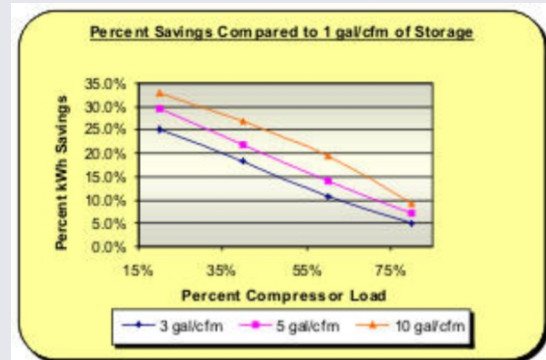
→ AVOIDING COMPRESSED AIR PROBLEMS

Some of the problems associated with compressed air systems operation include system pressure fluctuations and inadequate airflow due to peak demand or regular but intermittent events. Many times, these problems are "solved" by adding or running another compressor or increasing the system pressure. This is a huge energy waster.

Rather than using another compressor or increasing your system pressure to meet peak demands, consider the use of compressed air storage. Storage can reduce the amount of pressure drop and the rate of decay of your compressed air pressure.

Storage will also allow you to sequence multiple compressors so that all but one are operating fully loaded (most efficiently) and the other is modulating to provide "trimming".

The graph to the right shows the percent power savings versus the percent compressor capacity at different storage volumes for a lubricant injected, rotary screw compressor with load/unload capacity control. A rule of thumb for sizing compressed air storage for today's compressed air systems is from 3 to 5 gallons per cfm of compressor capacity.



Secondary storage is another option that can be helpful if you have an intermittent demand of a relatively high volume for one application. Storage that serves only this application can protect the rest of the system from pressure fluctuations. Installing a metering valve can allow the compressors to slowly re-fill this storage if the time between uses allows it.

→ BENEFITS

Other benefits of compressed air storage include:

- Reducing short cycling of load/unload compressors. Storage allows the compressor to fully unload before it has to start again.
- Simplifying the control strategy by allowing multiple compressors to be properly sequenced.

Properly sized air storage tanks can be an inexpensive alternative to operating another compressor.