

## Compressed Air Challenge: Turning Down Pressure To Cut Operating Costs

Written by Ron Marshall, for the Compressed Air Challenge®  
Tuesday, 11 October 2011 14:47

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The following is a question received by the Compressed Air Challenge (CAC) from a concerned electrical- controls programmer. Queries such as these are commonly a result of someone participating in a CAC training event and learning about efficiency measures.

### Question:

“We have a new maintenance supervisor that has turned down our shop air pressure to 86 psi, supposedly saving operating cost. My opinion is it should be set between 90 and 100 psi to accommodate surges. Is there really a significant savings by turning the supply down to 86 psi?”

### The CAC Answer:

Yes indeed, lowering discharge pressure reduces the compressor motor power by about 1% for every two psi of lower pressure. Also, the lower pressure makes any unregulated uses in the “shop” reduce consumption (cfm) by almost 1% for every one psi of pressure reduction. You will achieve extra savings if your compressor-control systems can turn down compressor power in response to reduced flow or unload and possibly shut off unnecessary compressors.

The best pressure at which to set your system is the level where your production can operate efficiently and effectively without waste: There is no right pressure—*it depends on your machines*. That being said, often you may have 90 to 100 psig at the compressor, but at the production machine, where the actual work is being done, you could have only 65 to 70 psig. In some cases, it may be even lower due to pressure drops in undersized piping, filters, regulators, lubricators and tubing and connectors. The goal is to lower compressor discharge pressure without affecting the end-users. The method is to address these pressure differentials and get the pressure to the machines with minimal loss; then the compressor discharge pressure may be reduced even more. This is typically a job for a controls programmer.

Having artificially high plant-pressure can help you deal with surges in compressed air demand that might occasionally cause low-pressure and affect production. The higher pressure acts to store reserve air in the various volumes made up of receivers, pipes and such in your system. However, the higher pressure costs more to produce and makes unregulated end uses consume more air, which is an expensive trade-off. Another strategy might be to use a pressure/flow controller and large storage receiver capacity in the compressor room. This will supply stored air for surges, but maintain lower plant pressures to reduce artificial demand caused by elevated pressures. Your compressed air service provider can assist with implementing this.

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To learn more about optimizing your system, download the free resource Improving Compressed Air Performance: A Sourcebook for Industry, written by the Compressed Air Challenge and the Department of Energy. Also check out the CAC's Compressed Air Best Practices Manual. You also may be interested in learning about our upcoming November 7 Web-based "Compressed Air Fundamentals" seminar and/or the many in-person seminars that the CAC presents across the country. For additional information on all these items, go to [www.compressedairchallenge.org](http://www.compressedairchallenge.org)

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