

**Review Piping Infrastructure. Many systems aren't optimized.**

Your piping system design should optimize transfer of compressed air at the desired flow and pressure to the point of use. Increasing the size of your pipe from 2" to 3" can reduce pressure drop up to 50%. Shortening the distance air has to travel can further reduce pressure drops by about 20-40%. The more flow you try to put through a pipe the greater the pressure drop will be. Pressure drop in a pipe increases with the square of the increase in flow. For example, if you triple the flow, the pressure drop will increase nine times what it was! Air distribution piping should be large enough in diameter to minimize pressure drop.

**Change Filters Systematically. Not every once in a while.**

Just as you change oil in your car at scheduled intervals to ensure optimum performance, change filters in your air compressor and air system regularly to ensure air quality and to prevent pressure drops. Inspect and replace filters systematically to ensure the quality of your air. Go beyond the air compressor and compressor room. There are several air line and point of use filters within your facility. Those are just as important to maintain as the air compressor and air compressor room filters.

**A dirty air filter reduces air flow 5% to 10%**  
**A dirty oil separator increases power usage up to 6%**

**Recover Heat. Compressing air generates heat – reuse it!**

It's simple physics that compressing air gives off heat, and you can recover as much as 90% of the heat for use in your operation. For example, you can produce hot water for washrooms or direct warm air into a workspace, warehouse, loading dock, or entryway. The savings can really add up!

**Emphasize Proper Maintenance. Ignoring maintenance costs more.**

As with most industrial machinery, a compressor runs more efficiently when properly maintained. Proper compressor maintenance cuts energy costs around 1% and helps prevent breakdowns that result in downtime and lost production. It's way less expensive to perform preventive maintenance than it is to perform breakdown maintenance. Protect your reputation and profits with proper maintenance.

**Stop inappropriate use of compressed air. Cut these to save even more.**

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, often high pressure air is used for cooling or applications where much lower air pressure is effective.

**When Saving Energy is a Priority**

**POWER COST & SAVING EXAMPLES**

25hp Air Compressor			50hp Air Compressor			75hp Air Compressor		
Cap. Used	*Annual Power Cost	20% Annual Savings	Cap. Used	*Annual Power Cost	20% Annual Savings	Cap. Used	*Annual Power Cost	20% Annual Savings
50%	\$9,188	\$1,838	50%	\$18,375	\$3,675	50%	\$27,563	\$5,513
70%	\$11,393	\$2,279	70%	\$22,785	\$4,557	70%	\$34,178	\$6,836
100%	\$14,700	\$2,940	100%	\$29,400	\$5,880	100%	\$44,100	\$8,820

100hp Air Compressor			150hp Air Compressor			200hp Air Compressor		
Cap. Used	*Annual Power Cost	20% Annual Savings	Cap. Used	*Annual Power Cost	20% Annual Savings	Cap. Used	*Annual Power Cost	20% Annual Savings
50%	\$36,750	\$7,350	50%	\$55,125	\$11,025	50%	\$73,501	\$14,700
70%	\$45,570	\$9,114	70%	\$68,356	\$13,671	70%	\$91,141	\$18,226
100%	\$58,801	\$11,760	100%	\$88,201	\$17,640	100%	\$117,601	\$23,520

\*Above figures are calculated using load/no load machines running 24 hours per day, 50 weeks per year at 8c/kWh

**AIR LOSS COST**

Leakage Loss Orifice dia.	Air Loss CFM	Air Loss CFM/day	Loss/day \$	Loss/month \$	Loss/year \$
1/16	6.5	9345	\$2.34	\$71	\$854
1/8	26	37152	\$9.29	\$283	\$3,391
1/4	104	149760	\$37.44	\$1,139	\$13,666
3/8	234	336960	\$84.24	\$2,562	\$30,748
1/2	415	597600	\$149.40	\$4,544	\$54,531

Based on values from the Compressed Air & Gas Handbook. Calculations assume a conservative cost of \$0.25/1000 cu. ft. of compressed air, 100% coefficient of flow, and working 8,760 hours/year, at 100 psig.

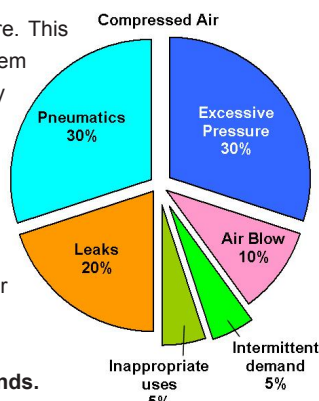
# We can help to significantly lower your compressed air cost and improve productivity!

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. Maximizing energy efficiency saves you money.



## Where to Start? Measure.

You can't build a cost saving strategy around unknowns, so begin by measuring your compressed air system's energy consumption, flow rates and operating air pressure. This will provide baseline values, help to identify problem areas and compute actual cost savings from any improvements you make. A great way to analyze a compressed air system is to draw a pressure profile that shows the pressure drops through a system. These pressure measurements give feedback for control adjustments, determine pressure drops across components and help to determine system operating pressures. Ask your Air Technologies representative to show you how.



## Turn It Off. Set your machines to switch off nights and weekends.



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

## Fix Existing Leaks. Start with the oldest and biggest pipes.

A quarter-inch air leak at 100 psi costs more than \$2,500 a year! Pipe systems older than five years can have leaks of up to 25%. You must spend money to compress air, so air that leaks out is money wasted. Fix leaks, save money. A word of caution here is that around 80% of air leaks are not audible and so to really minimize these problems, third party help in detecting these is a necessity.

**Prevent New Leaks. Dry and clean your compressed air.** Prevention beats cure, so be proactive and look inside your piping system. A clean, dry pipe means you have good quality air and should have no corrosion issues. Dust in the pipe is caused by particles in your air. If you don't filter it, or if your filter is clogged, you'll have pressure drops and increase the risk of contaminating your end product. Sludge in the pipe



is bad news and must be fixed immediately. In addition to the problems that occur with dust in the pipe, your pipes will corrode very quickly (if you see sludge it's likely started already) and leaks will greatly increase. Dried and filtered compressed air keeps piping clean.



**Reduce Pressure. Run at required pressures, not beyond.** Each 2 psig reduction cuts energy consumption 1%. Check the pressure your system is running and don't keep turning up the pressure to compensate for leaks or drops in pressure due to piping problems or clogged filters. Fix these issues and the chances are you can drop the pressure. For multiple compressors a central supply side controller can greatly reduce the operational pressure band and orchestrate air production much more efficiently and effectively.

## Check Drains. Are you blowing air down the drain?

If you have timer drains that are set to relieve condensate at a preset time (every 10 minutes or so) you are throwing money down the drain. These type drains need to be adjusted periodically to ensure they open as intended and aren't stuck open. By replacing these timer drains with no-loss drains your payback can be quick and you can start saving that money.

## Compressor controls. Possibly the number one energy saving investment.

The traditional way of controlling compressed air systems is with cascade controls: As system pressure drops, more compressors turn on. As it rises, they drop off. Each compressor uses its own controls and runs in its own pressure band. The problem with staggering pressure switches is you need to have your final compressor 20 to 25 psi higher than the needed pressure. Good PC based controllers use a single pressure band to control multiple compressors. For example, if the needed pressure is 100 psi, set the pressure at 105 psi. When the pressure drops the controller turns on the next compressor. It only allows one compressor to trim. These type controllers will choose the right combination of installed compressors for a given demand situation and to minimize total power requirements. Controllers save you energy dollars by lowering your pressure band which lowers your leaks and by sequencing your compressors. Estimate energy savings between 20 - 30% versus no controls.

