



Air Compressor Considerations for Breweries

With nearly 7,000 existing craft breweries in the United States and another 3,000+ in planning (according to the Brewers Association), the craft beer industry is a fast growing market. As with other food and beverage industries, compressed air is often vital to production. From smaller craft breweries to large international companies with multiple facilities, each system needs compressed air. The questions are how much and how do their needs differ?

Home brewers typically have minimal, if any, compressed air needs, and for small commercial breweries and brew-pubs a small light-duty piston compressor will often suffice. These range widely in quality and price from those found at a local big box store to those sold by industrial distributors and catalogs. The relatively low and intermittent air demand makes the piston a cost-effective choice for these shops. Those investing in keg washers can add dryers and filters to increase reliability and reduce maintenance.

At some point, however, it makes sense to take the next step up to the rotary screw compressor. The additional air requirements of canning or bottling equipment, palletizers and de-palletizers, multiple keg-washers, etc. will at some point exceed the effective air delivery of piston units, which have limited duty cycles. This is when the rotary screw compressor becomes a better long term fit. Rotaries present several advantages, including better energy efficiency. Since compressed air is one of the biggest energy users in the facility, investing in energy efficient compressors reduces power bills noticeably, especially in areas with higher electricity costs.

Higher duty cycles and lower operating temperatures of rotary screw compressors offer more reliable operation and better quality air, which is vital to reducing maintenance and increasing up time on the pneumatic equipment. Additionally, much lower noise and vibration make for a better working environment and a more patron friendly taproom. The time and costs in building a compressor room to hide noise usually exceeds the cost of the rotary screw compressor.

Location, Location, Location

The type of compressor used affects where it's installed. Compressors are often installed where their noise, vibration and heat will be least bothersome to staff and customers rather than where they'll best perform and be easily serviced.

Here are some guidelines for where to install a compressor:

- Avoid extreme hot or cold temperatures.
- Ensure an adequate airflow for cooling as well as ventilation for heat exhaust generated from the equipment
- Avoid dirty/dusty areas.
- Allow enough space around the compressor for maintenance access.

Energy Savings Aren't Just for Big Manufacturing Plants

For many businesses, power is costly and compressors are usually the biggest electricity consumers in the brewery. Many brewery owners do not know it but are probably spending thousands in electricity.

An average brewery running a 15 hp compressor 6 hours per day, 5 days per week could expect to pay approximately \$1,600 in power at the national average of \$.10 per kWh each year. Increase the horsepower, the hours of operation, or the cost per kilowatt hour and it goes up. In the Northeast or Southern California it would be closer to \$2,700 per year.

With that in mind, below are some additional tips for improving energy efficiency:

1. Operate at the lowest possible pressure
2. Find and fix leaks
3. Eliminate inappropriate uses of compressed air
4. Size pipes and tank properly
5. Use zero-loss automatic drains
6. Change filters on schedule to reduce pressure drop
7. Use CAGI datasheets to compare compressor efficiencies before buying
8. Turn off compressors when not needed

Compressor reliability, maintenance requirements and long-term compressor performance are essential considerations.

Piston compressors and rotary compressors have different maintenance and service requirements. Piston compressors have proven to be reliable and require relatively little preventive maintenance other than sustaining a minimal oil level, changing the oil periodically, replacing the air inlet filter and maintaining proper belt tension. Rotary screw compressors require these, as well as oil filter and air/oil separator changes.

The pistons, cylinders, rings and valves in reciprocating units will wear over time, causing the compressor to deliver less air and send more lubricating oil past the rings into the compressed air system. Without proper filtration and added filter maintenance, this could cause your batch to be compromised. Preventive maintenance will slow this process. Rotary screw compressors are designed so they won't wear because the rotors don't touch each other or the rotor housing.

Beyond the compressor, having the right combination of dryer, filters and drains to remove moisture, particulate and hydrocarbons is critical to both production equipment and product quality. Contaminants may cause downtime through equipment malfunction and excessive maintenance. If untreated compressed air comes in direct or indirect contact with ingredients, product quality and safety may be compromised. Equipment life, maintenance hours, downtime, and scrapped ingredients are all affected by compressed air system design.

It's a given that no one wants to spend more money on compressed air equipment. After all, you may argue, you've been using the same system for years and it's just like everyone else's. But have you ever calculated the cost of one compromised batch of beer? The labor, material and workflow-interruption costs far exceed the price of investing some thought and money in your current compressed air system.

Regardless of how big the operation is, everyone wants reliable equipment to provide air where and when needed. But which size and type of compressor, and how much air treatment you need depends on a number of considerations. For starters, how critical is air to your operation, how much air do you need, and how often do you need it? How much are your power costs, and how much does air quality impact the operation of your tools and equipment? Answer these and other questions before buying.

A thorough analysis goes a long way in building a reliable, cost effective system. Carefully consider each system component and its impact on the application. And remember: Value is more than initial price. Purchasing quality equipment now will save time and money for years to come. ■