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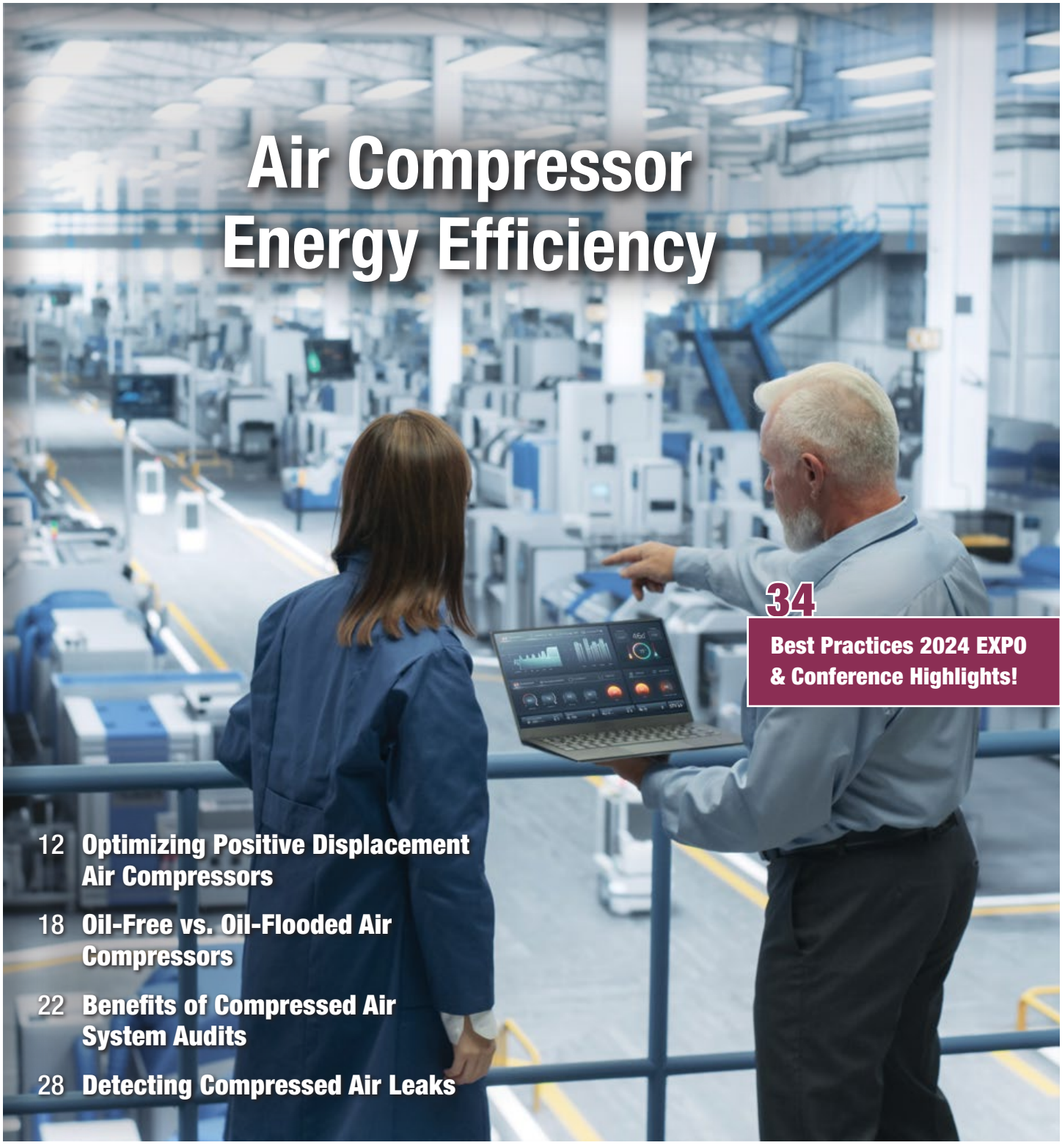

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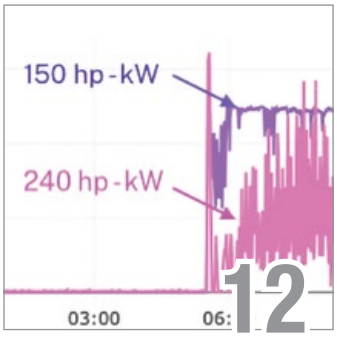

SAFETY & RELIABILITY

EVERY ISSUE

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FROM THE EDITOR

Compressed Air Fundamentals

Most Thursdays, *Compressed Air Best Practices* hosts a webinar where industry experts teach various topics. If you've never attended, they're free and an excellent use of an hour. When webinars are over, we sift through the data to see what questions attendees had and what other topics they want us to cover. What often strikes me is people want to go over the fundamentals. In our most recent webinars, for example, attendees requested future sessions on selecting air compressors, ways to save energy and choosing between reciprocating and rotary screw air compressors for small jobs. To view our webinar archive visit https://www.airbestpractices.com/webinars.

For newcomers, nailing the fundamentals is crucial, but I suspect even people with experience in the compressed air world enjoy a refresher from time to time. It's why this magazine covers essential topics regularly.

This issue has excellent features on compressed air fundamentals. Our lead story, by Andrew Smith-Carrier of SMARTCAir, explains how to improve the energy efficiency of positive displacement air compressors by understanding the forces involved, such as volumetric flow and isentropic efficiency. Readers with a weak grasp of physics will appreciate how he makes the topic accessible to everyone.

My feature on Quincy Compressor looks at how one major aeronautics manufacturer chose between oil-free and oil-flooded air compressors for its new facility. Menno Verbeek of VPInstruments discusses the best tools for uncovering compressed air leaks and improving the efficiency of your system. John Molnar of Rogers Machinery explains the benefits of compressed air system audits. These are foundational ideas to know and build on.

Be sure to read our show report from the Best Practices 2024 EXPO & Conference in Atlanta, GA, which took place in late October. It was a thrill meeting so many of you in person. I was glad to see all the parts of our industry represented. If you couldn't attend, I hope you enjoy the report – and plan on attending our October 21-23, 2025 conference in Kansas City! Visit https://cabpexpo.com for more information.

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Subscribers From Around the World

We salute all Best Practices Magazine Subscribers from around the world who own, operate, maintain, engineer and provide expertise for the on-site utilities (compressed air, nitrogen generation, vacuum, blowers, chillers, cooling towers and pumps) powering modern plant automation. This subscriber-driven monthly column hopes to build community and recognize all subscribers!

Zorn Compressor & Equipment is a family-owned company operating since 1965. It has eight locations in Wisconsin and Northern Illinois. Pictured here (left to right) are Todd Dunn, Vice President of Sales and Marketing, Matt Evenson, Account Representative and Sales Manager, and Frank Melch, Senior Sales Manager. Melch is retiring this month, and we congratulate him on an outstanding career. Visit https://www.zornair.com.

Treffco conducts accredited risk assessments on compressed air installations. It's based in Sweden, and also works in Denmark and Norway. They advise us it's the sole company accredited by ISO/IEC 17020:2012 specifically for compressed air risk assessments. Pictured here (left to right) are Anders Nilsson, Founder, Mattias Svensson, COO, and Johan Nilsson, CEO and Partner. Visit https://www.treffco.se.

We caught up with these gentlemen at the NPE trade show in Orlando, FL, earlier this year, and both are proud Compressed Air Best Practices *readers. On the left is Shannon de Souza, Regional Manager for FlexBlow, a family-owned company that makes two-stage PET blow molding systems. On the right is Tony Marlow, Sales Area Manager for ABC Compressors, a PET blow molding system specialist based in Spain. Visit https://flexblow.com and https://www.abc-compressors.com.*

Submission Guidelines

We invite our subscribers to send in pictures so we can see the people who read our Best Practices magazines! Those holding a recent magazine issue will receive first consideration. Please send a high-resolution picture as a JPG with a note describing the team and company to Troy Dreier at troy@airbestpractices.com.

Compressed Air Industry News

Hitachi Industrial Equipment & Solutions America Names Luis Torres New President, Will Foster Collaboration

Hitachi Industrial Equipment & Solutions America announced Luis Torres has been appointed as President. He succeeds Johan Chandra, who will transition to an advisory role within Hitachi Project Integration North America (HPIN), working on behalf of Hitachi Industrial Equipment Systems in North America.

Luis Torres has been appointed President of Hitachi Industrial Equipment & Solutions America.

Since becoming President in April 2021, Chandra has integrated multiple businesses, transforming Hitachi Industrial Equipment & Solutions America and laying a strong foundation for future growth. In his new role, he will foster collaboration among the various Hitachi Industrial Equipment Systems companies across North America.

Torres assumes leadership as North America becomes central to Hitachi's global strategy. As a hub for digital development, the region offers the ideal setting for cutting-edge advancements in industrial connectivity. Hitachi will continue to leverage its proprietary expertise in operations and connectivity, seamlessly integrating operational technology (OT) and information technology (IT) for a more sustainable and agile industry. Torres's appointment will be instrumental in driving this transformative vision forward from North America to global innovation.

"I am honored to take on the role of President and guide Hitachi Industrial Equipment & Solutions America into its next phase of strategic growth," said Torres. "Building on the foundation laid by Johan, I look forward to accelerating our delivery of digital and sustainable products and solutions that not only meet but exceed our customers' needs, driving impactful change across the industrial landscape."

Torres previously served as Vice President of Global Sustainability at Hitachi Global Air Power, leading sustainability and aftermarket initiatives. He also contributed to global sustainability efforts as a Senior Director in the Sustainable Management Strategy Group of Hitachi Industrial Equipment Systems Co., Ltd (HIES). Before joining the Hitachi Group, Torres held leadership roles at several companies, including Stanley Black & Decker. For more information, visit https://www.hitachi.com.

Ingersoll Rand Expands Portfolio by Acquiring Air Power Systems, Blutek and UT Pumps & Systems

Ingersoll Rand, a global provider of mission-critical flow creation and life science and industrial solutions, has acquired Air Power Systems (APSCO), Blutek and UT Pumps & Systems for a combined purchase price of approximately $135 million. These acquisitions add more than $50 million in revenue cumulatively acquired at a high-single digit multiple of 2024 estimated Adjusted EBITDA.

APSCO, based in the United States, is a leading provider of hydraulic and pneumatic products and engineered solutions serving diverse specialty work truck vehicles. For 60 years, APSCO has served its customers with comprehensive offerings across hydraulic coolers, systems and components in addition to pneumatic consoles, cylinders, valves and switches. The acquisition will expand Ingersoll Rand's leading position in the dry and liquid bulk markets with energy efficient, innovative solutions.

Blutek, based in Italy, specializes in the design and production of highly engineered solutions for compressed air and nitrogen generation in mission-critical environments. As a certified supplier to leading engineering, procurement and construction (EPC) companies, Blutek will increase Ingersoll Rand's ability to compete in high specification projects, adding technology capabilities, expertise and aftermarket potential in high-growth end markets including biogas and carbon capture. The business will join the IT&S segment.

UT Pumps is a leading Indian manufacturer of screw pumps and triplex plunger pumps. This acquisition adds new pump technology to Ingersoll Rand's portfolio. Its high-pressure pumps are mainly focused on attractive end markets including water, wastewater, food and beverage, pharmaceuticals, general industrial and chemicals. UT Pumps will join the Precision and Science Technologies (P&ST) segment.

"Investments in sustainability, innovation and aftermarket are core to our growth and today's announcement underscores our commitment to deploy capital in pursuit of this strategy," said Vicente Reynal, Chairman and CEO, Ingersoll Rand. For more information, visit https://www.irco.com.

2024 Better Buildings Initiative Progress Report Highlights Nearly $22 Billion in Energy Savings

The U.S. Department of Energy (DOE) has published the "2024 Better Buildings Initiative Progress Report," which highlights the achievements of DOE's Better Buildings public and private sector partners as they decarbonize and increase the energy efficiency of the nation's buildings, manufacturing plants and homes. The report shows that program partners – including 28 Fortune 100 companies and more than 90 state and local governments – have collectively saved nearly $22 billion through efficiency improvements and cut harmful greenhouse gas emissions by more than 220 million metric tons since 2011, an amount roughly equivalent to combined annual emissions of 29 million homes.

Through the Better Buildings Initiative, DOE is helping accelerate cost-effective decarbonization solutions across America's commercial, industrial and residential sectors.

"DOE's Better Buildings Initiative is helping organizations of all sizes from every corner of the country and every sector of the economy lower energy costs and save money – to the tune of $22 billion," said U.S. Secretary of Energy Jennifer M. Granholm.

Through the Better Buildings Initiative, DOE partners with public and private sector stakeholders to pursue ambitious portfolio-wide energy, waste, water and/or emissions reduction goals. Program partners publicly share their solutions, enabling other organizations to replicate their success. For more information, visit https://betterbuildingssolutioncenter.energy.gov.

The DOE has published the "2024 Better Buildings Initiative Progress Report."

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Compressed Air Industry News

Fluid-Aire Dynamics Relocates Headquarters to Itasca, IL

Fluid-Aire Dynamics, a leader in industrial compressed air and nitrogen solutions, celebrated the grand opening of its new headquarters in Itasca, IL. The 70,000-square-foot facility features a state-of-the-art testing and repair/rebuild center, and doubles the company's available office and warehouse space.

The facility marks a significant milestone for Fluid-Aire Dynamics, more than doubling the space of its previous Schaumburg location. "This move gives us room to grow and will allow us to serve our compressed air and nitrogen customers better," said Kevin Taylor, General Manager, Fluid-Aire Dynamics. "The new testing and repair/rebuild center gives us the space and specialized equipment we need to effectively service our customers in Chicagoland and the other markets we serve. And now we can stock even more new equipment to reduce delivery and installation timelines. It's part of our commitment to enhancing our capabilities and providing top-tier service to our customers."

Founded by Garth Taylor in 1983 in Franklin Park, IL, Fluid-Aire Dynamics has experienced rapid growth and expansion over the last decade. Specializing in industrial compressed air systems, it sells top-of-the-line rotary screw and reciprocating compressors and compressed air dryers from PneuTech. The company is also a master distributor for Unipipe, an all-aluminum piping system for compressed air, nitrogen, vacuum and high-pressure applications. Its 2023 acquisition of the Titus Company in Philadelphia added new capabilities and equipment lines in nitrogen generation.

The new facility will feature an expanded space with over twice the size of the previous location, a modern design, enhanced services, and increased inventory. For more information, visit https://fluidairedynamics.com.

The state-of-the-art 70,000-square-foot space supports continued growth and enhanced service for Chicago-area customers.

Atlas Copco Group Acquires Easy Filtration

Easy Filtration, an Italian company that distributes process filters and associated services, has become part of Atlas Copco Group.

Easy Filtration, located in Milan, was founded in 2013. The company has nine employees and provides filter cartridges for air, gas and process liquids, filter housings and clean-in-place systems. The main customer groups are present within the industrial coatings, chemical, cosmetics and pharmaceutical sectors.

The purchase price is not disclosed. The business becomes part of the Medical Gas Solutions division within the Compressor Technique Business Area. For more information, visit https://www.atlascopcogroup.com.

Compressed Air Industry News

ABB Pioneers Workforce Development Program with Arkansas Tech University

ABB is equipping the next generation of professionals for advanced technology manufacturing by partnering with Arkansas Tech University's Ozark campus to launch a career-readiness program. This collaborative workforce development initiative will offer a curriculum focused on automation technology, air conditioning and refrigeration.

ABB's Ozark motor manufacturing facility, the region's third-largest employer with over 250 employees, is a leading economic driver in the community. Each week, the facility produces 3,000 Baldor-Reliance industrial electric motors. These motors power fans, pumps, blowers and other systems that ensure the safe and efficient flow of air, liquid and data.

"This program is an effective workforce development initiative that has the potential to support the entire region," said Greg Dawson, Human Resources Business Partner at ABB's Ozark plant.

ABB intends to replicate this model in other universities near its manufacturing facilities. This program exemplifies ABB's ongoing commitment to nurturing future professionals in its communities. ABB has a long-standing partnership with the University of Arkansas – Fort Smith (UAFS). For more information, visit https://global.abb/group/en.

ABB is partnering with Arkansas Tech University's Ozark campus to launch a career-readiness program.

KAESER Compressors Canada Invests $20M in Boisbriand; Expansion Will Create 45 New Positions by 2026

KAESER Compressors Canada announced a $20 million investment to expand its operations in Boisbriand.

KAESER Compressors Canada is making a $20 million investment to expand operations in Boisbriand.

The company recently acquired facilities located at 3720 rue la Vérendrye, Boisbriand, formerly operated by Canada Goose. Aimed at meeting the growing demand for compressor-related services, this expansion project plans to create 45 new positions by 2026, with 25 positions filled within the first six months of 2024.

Over the coming years, the new building will be modernized to accommodate all operations of KAESER Compressors Canada and meet the needs related to the distribution of its compressors and other logistical requirements. A dedicated training space will also be set up to promote continuous personnel development.

"This expansion project marks a significant milestone for our company," said Patrick Grégoire, President of KAESER Compressors Canada. "With new facilities and teams of qualified professionals, we are well positioned to support our growth and maintain our leadership in the field of compressed air solutions in Canada. For more information, visit https://ca.kaeser.com.

Ozen Air Technology Introduces New Team Members, Focuses on Driving Innovation and Customer Success

Ozen Air Technology is excited to introduce its newest team members, a group of dedicated professionals committed to excellence in the compressed air and nitrogen generation industry. This dynamic team will guide the company's strategic direction, drive innovation and ensure OZEN continues to meet and exceed the expectations of its valued clients.

Camilo Villalobos, VP and General Manager – Villalobos is at the helm of OZEN's strategic direction, focusing on innovation and growth. His leadership experience positions Ozen Air Technology for success as it navigates the evolving market landscape.

Christopher Barfield, Regional Sales Manager – Barfield is responsible for managing the company's sales efforts and ensuring customer success.

Trey Weeks, SE Area Sales Manager – Weeks is focused on expanding OZEN's reach in the southeastern market.

Tim Burris, Service Manager – Burris brings a wealth of in service and technical expertise, ensuring clients receive exceptional support and solutions tailored to their needs.

Michael Zacharko, NE Area Sales Manager – Zacharko is dedicated to growing OZEN's presence in the northeast. His proven track record in account management and sales will be crucial. For more information, visit http://www.ozenairtech.com.

Donaldson Launches Filtration Services for Manufacturers in France, Germany and Austria

Donaldson Company, a leading worldwide provider of innovative filtration products and solutions, is expanding its presence in the food and beverage markets by launching its filtration services in France, Germany and Austria. This initiative reinforces the company's commitment to product and process integrity, with Donaldson specialists delivering their renowned innovation directly to customers' locations.

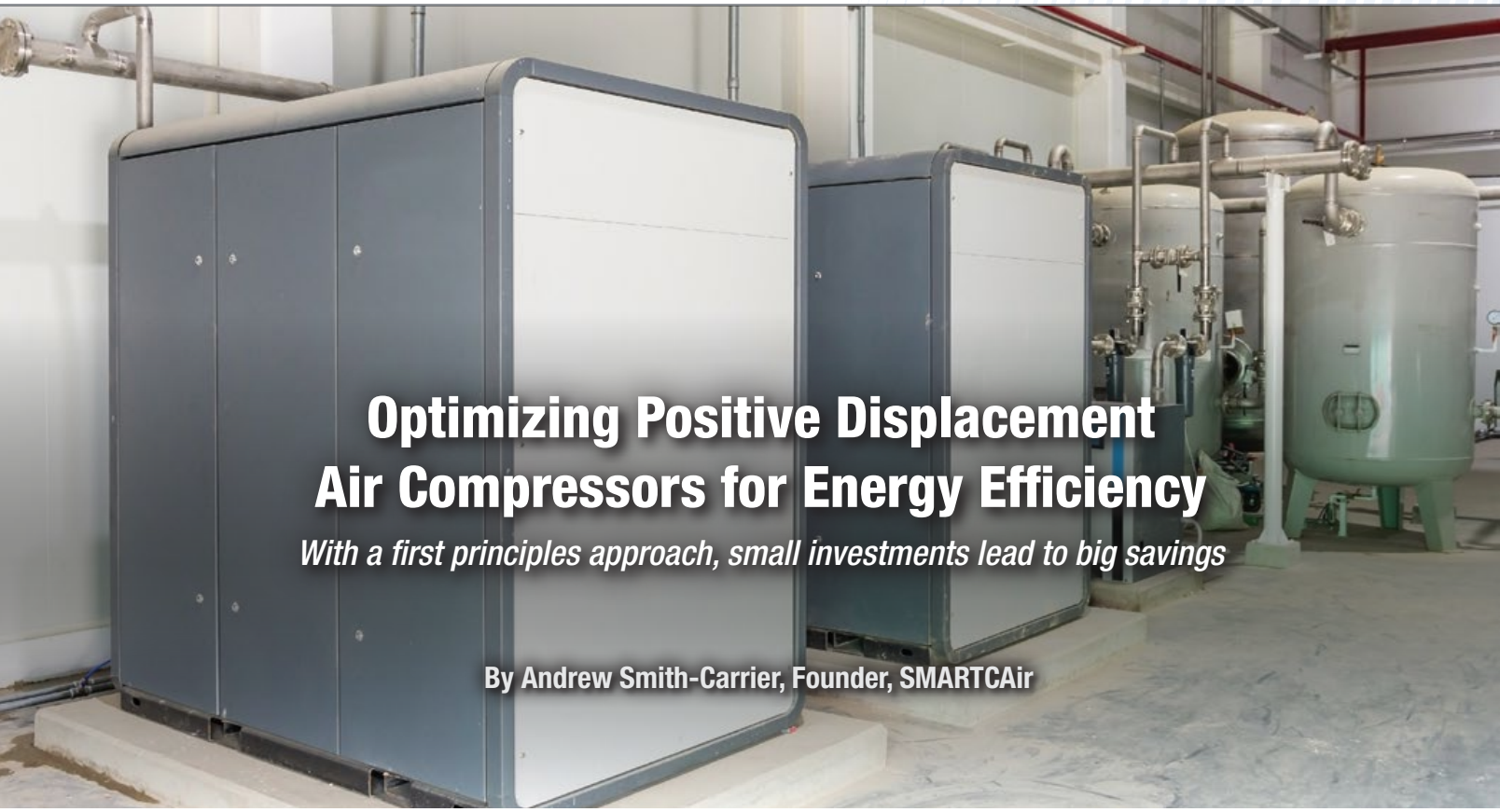
"Supporting our customers in achieving optimal process and product integrity is a key goal," said Veli Kalayci, Donaldson's General Manager, Global Food and Beverage. "Our filtration services provide manufacturers with the assurance that we are with them throughout their filtration system's life cycle, offering on-site support and tailored solutions to support their sustainability, efficiency and efficacy goals."

Services include sterile air and liquid filter integrity testing, equipment calibration, compressed air quality measurement (ISO 8573) and comprehensive filter management, including exchange, maintenance and commissioning.

"Our approach combines global expertise with a strong local presence," said Kalayci. "Our customers will benefit from our service teams working in close collaboration with Donaldson's extensive support network of over 1,000 engineers, scientists and technical specialists worldwide."

The launch of filtration services for food and beverage, and adjacent markets, in France, Germany and Austria is expected to set the stage for expanding this offering across Europe. For more information, visit https://www.donaldson.com.

Donaldson is launching filtration services for manufacturers in France, Germany and Austria in life sciences sectors, including food and beverage and adjacent markets.



Optimizing Positive Displacement Air Compressors for Energy Efficiency

With a first principles approach, small investments lead to big savings

By Andrew Smith-Carrier, Founder, SMARTCAir

Energy efficiency and decarbonization in industrial processes are becoming increasingly important priorities for businesses seeking to reduce operational costs, meet sustainability goals and maintain a competitive edge. Compressed air systems are essential in many industrial applications. However, these systems are known for high energy consumption.

Focusing on first principles and taking a holistic view of system performance can offer significant potential for cost savings. This article explores the importance of understanding the key system parameters driving the overall efficiency of positive displacement air compressor systems. We will also review two case studies to illustrate how low-tech, low-cost system improvements can lead to significant energy savings and performance improvements.

First Principles and Key Parameters

Table 1 highlights four key parameters that directly impact the efficiency, performance and, ultimately, operating cost of a positive displacement compressed air system.

Factors 1, 3 and 4 can be optimized without any upgrade to the air compressors in the system, however all of these factors should be considered when optimizing for energy efficient performance.

Optimizing the system **volumetric flow** will focus on decreasing actual air demand from the process requirements in the system, which will directly reduce the actual power required in a linear fashion. A 10% reduction in air demand will result in a 10% reduction in energy consumption. Common examples for reducing volumetric flow include identifying and repairing leaks, reducing un-necessary air use such as unregulated blow-off guns and eliminating, where possible, the use of compressed air completely such as implementing electric blowers in place of compressed air for drying applications. In addition, when we discuss reducing system generation pressure later on, we will highlight how reducing the system pressure also reduces the unregulated demand in the system. This further reduces the volumetric flow and power requirements in a linear manner.

Optimizing **isentropic efficiency** is only possible when selecting new air compressors. Isentropic efficiency is the ratio of actual

Table 1

Parameter	Description
Volumetric Flow	Total volumetric flow is dependent on the actual volumetric rate of flow required by the process, typically known in North America as actual cubic feet per minute (ACFM).
Isentropic Efficiency	The a measure of the efficiency of the air compression relative to ideal conditions; usually found on Compressed Air and Gas Institute (CAGI) performance worksheets.
Pressure Ratio	Pressure ratio, often known as pressure head or pressure lift refers to the ratio of the output generation pressure to the incoming inlet air pressure ratio.
Air Density	Positive displacement compressors are volumetric systems that compress a specific volume of air per unit of time, irrespective of the properties of the incoming air. However, the pressure developed in the system is determined by the mass of air that is delivered which is directly related to the air density. Air density, in turn, is impacted by the ambient inlet pressure, temperature and moisture content.

energy consumption required to ideal, zero-loss isentropic energy, and is a measure of how close the actual compression process comes to an idealized zero-loss compression process. An air compressor with higher isentropic efficiency will reduce the required input power across all flows and pressure ranges relative to a compressor with the same capacity but with a lower isentropic efficiency. This measure is comparable across pressure and flow levels and is a clearer indication of actual efficiency than the specific power (kW/100 acfm) values.

Optimizing the **pressure ratio**, pressure lift or head by reducing output or generation pressure relative to inlet pressure can deliver significant energy savings. Typically, this can be accomplished through improved controls and reducing the pressure drop within piping systems, as well as increasing the system volume to reduce the impact of short-term peak flow events. As will be discussed in the case studies, increasing system volume reduces the impact of pressure gradients in the system. This allows the system to avoid low pressure events related to peak flow events, which can then allow for lower overall system control pressures. Finally, it is important to consider the location and design of the inlet air ducting. Contamination of inlet air filters from dirt and dust, as well as poorly designed inlet air ducting causes pressure drops which lowers the actual inlet air pressure and increases the pressure lift the air compressor has to deliver. As discussed earlier, there is a bonus energy efficiency gain that comes from reducing the outlet generation pressure since this also reduces losses from unregulated demand in the system. Any output, including leaks, that uses compressed air at system pressure will consume less at lower system pressure.

Since positive displacement machines are volumetric flow devices in principle, they produce a certain volume of flow regardless

Optimizing Positive Displacement Air Compressors for Energy Efficiency

of the actual mass content per unit volume or density of the ambient air. However, pressure in the system is related through the ideal gas law to the mass of air being delivered to the system. Optimizing **inlet air density** means focusing on cooler and dryer inlet air and also reducing pressure drops at the inlet. Since the majority of input power to an air compressor is lost as heat, compressor rooms are typically warm. This measure is often implemented by routing the air inlet for the air compressors or the air compressor room outdoors to obtain cooler and ideally lower humidity air (ensure the air inlet for the air compressors is not located close to high humidity areas such as evaporative cooling towers). High ambient humidity results in more water vapor being entrained in the air flow which, when removed in the air treatment process, also reduces outlet pressure since part of the pressure is exerted by the water vapor.

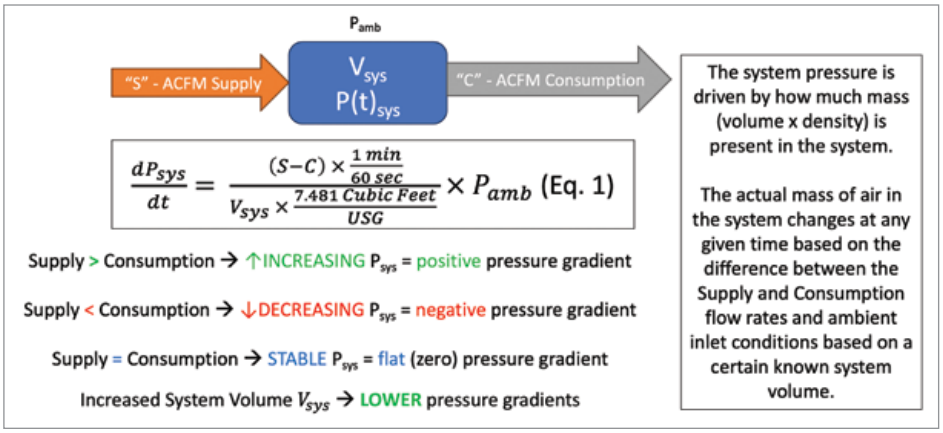


Figure 1: S is the supply of air flow in actual cubic feet per minute; C is the consumption of air flow in actual cubic feet per minute; P_{sys} is the pressure in the system; V_{sys} is the system volume in U.S. gallons (USG); P_{amb} is the ambient pressure

The Role of System Volume

One of the most critical, yet often overlooked, factors in optimizing compressed air systems

is the role of system volume, which refers to the total volume of the entire compressed air system, including receiver tanks and piping.

The relationship between pressure, system, volume and time can be derived from Boyle's law as shown in **Figure 1.** When the consumption of air flow by the process increases faster than the air compressors supply air to the system, the system pressure can drop quickly and trigger other air compressors in the system to start running causing unnecessary energy consumption. Figure 1 shows by increasing the system volume (usually by adding receivers or piping), the rate of change in system pressure over time can be permanently reduced or dampened, leading to a more stable operation.

We will look at the impact of system volume on improving the energy performance of compressed air systems in the following two case studies.

Case Study 1: Energy Reduction Through Additional System Volume

A facility used a 240-horsepower (hp), variable speed drive (VSD) air compressor and a 150-hp, fixed-speed, rotary screw compressor for 17 hours per day. The system experienced ongoing intermittent low-pressure events related to short-term peak air flow demand, which led to both air compressors operating when the capacity of the VSD was actually sufficient to satisfy system flow requirements. For much of the time, the 150-hp, fixed-speed machine shows intermittent and inefficient unloading behavior with the VSD air compressor running at the lower and less efficient range of its capacity. Essentially, both machines are trying to control the pressure in the system.

Through modeling of the system, adding an additional 800 USG of volume to the system

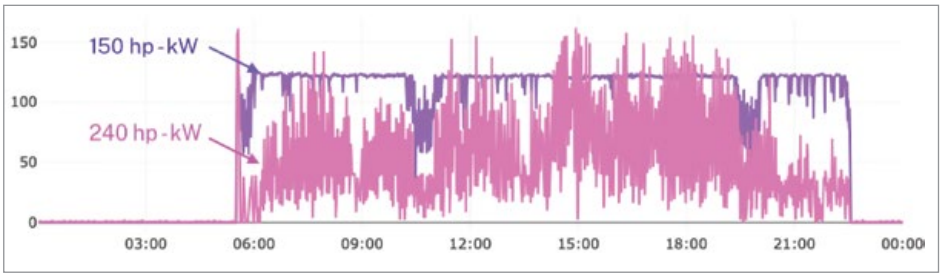


Figure 2, Case Study 1, Before

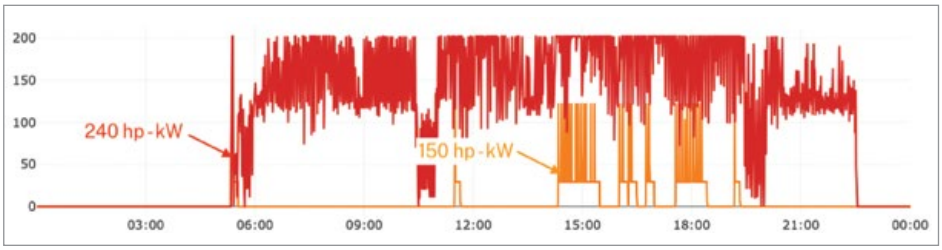


Figure 3, Case Study 1, After

Optimizing Positive Displacement Air Compressors for Energy Efficiency

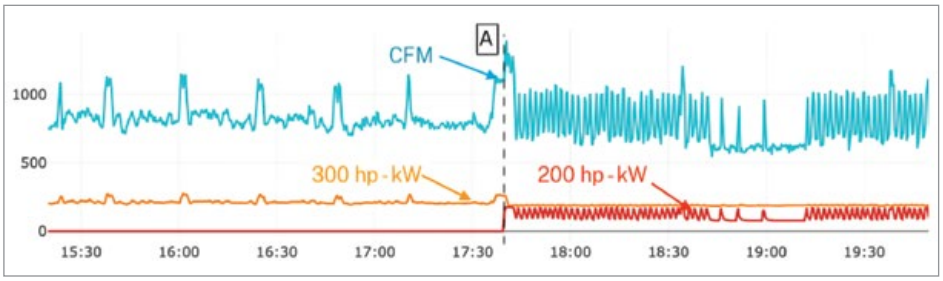


Figure 4, Case Study 2, Before

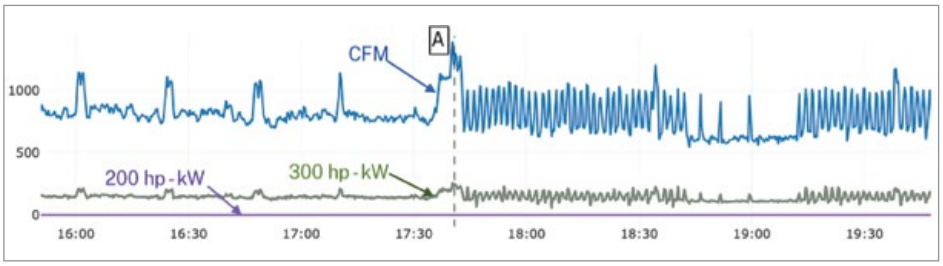


Figure 5, Case Study 2, After

was found to deliver a more stable pressure response. This allowed the 240-hp, VSD air compressor to handle 95% of the system demand within an appropriate pressure band, even during peak flow periods, without the need for the 150-hp air compressor to engage as often. As a result, the modeling showed a 5.3% reduction in energy use, a 5.6% reduction in demand and a 6.5% improvement in specific power. Annual cost savings were almost $38,000 (not including maintenance and equipment life savings from lower operating hours for the 150-hp machine). Conservatively estimating $7,000 for the purchase and installation of the 800 USG receiver would make the payback time less than three months.

The addition of volume also improved pressure control, eliminating low-pressure events, and suggesting average generation pressure could be lowered for further gains.

Case Study 2: Significant Cost Savings with Increased System Volume

The second case study involved a system with two rotary screw air compressors, one 300-hp and one 200-hp, both with inlet valve modulation control. The system started with a total volume of 900 USG, which included a 600 gallon receiver tank. During peak flow events (labeled "A" in Figures 4 and 5), system pressure would drop causing the 200-hp air compressor to engage unnecessarily. Both air compressors would then continue to operate in modulation mode, leading to inefficient operation and increased energy costs.

By increasing the system volume to 3,000 USG, modeling indicates the 300-hp air compressor would be able to handle the system's demand during peak events without driving the pressure below the load point for the 200-hp air compressor. The modeling indicates a potential 46.3% reduction in energy use since the 200-hp air compressor is now completely off most of the time, which would save the facility $160,000 annually. Additionally, there would be a 48% reduction in demand and a 45.8% improvement in specific power. Getting 3,000 USG of volume in the system would probably cost less than $30,000 installed, again offering a payback time of less than three months.

The increased system volume reduced the intermittent low pressure events observed in the base case data, allowing for a 6.1% reduction in system pressure, further contributing to the overall efficiency of the system. Wear and tear on the air compressors would be significantly reduced, leading to lower maintenance costs and extended equipment life.

Conclusion

Optimizing compressed air systems through the management of key parameters including the pressure ratio, actual volumetric flow use, inlet air density and system volume will drive improvements in energy efficiency, cost savings and system reliability. By focusing on the fundamental principles that drive system performance, compressed air users can often achieve significant gains without the need for costly equipment upgrades. BP

About the Author

Andrew Smith-Carrier is a Mechanical Engineer who has been working in industrial energy efficiency with a focus on compressed air for over 15 years, currently through SMARTCAir.

About SMARTCAir

SMARTCAir is a Simulation, Modeling and Reporting Tool focused on the application of a first principles approach to the timely, cost-effective and independent analysis of compressed air systems. For more information, visit https://smartcair.com.

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Aeronautics Giant Evaluates Oil-Free and Oil-Flooded Air Compressors

A longtime Quincy Compressor client selects between two options

By Troy Dreier, Senior Editor, Compressed Air Best Practices® Magazine

A Quincy Compressor customer, a leading aerospace engineering firm, sought a quote for a compressed air system for its new manufacturing plant. This firm, which already operates seven existing systems across its campus, was planning its eighth and turned to its longtime partner for a solution.

An in-house engineering team approached the company for a design and cost estimate for the new system, aiming to explore oil-free compressor technology.

Compressed Air Best Practices® Magazine spoke to Scott Stejskal, Regional Equipment Sales Manager – East, Quincy Compressor, about the project. The client's existing seven plants use oil-flooded air compressors, but for this facility the engineering team thought oil-free was a better option. The company delivered a quote for three 400-horsepower (hp), 125 psi (8.6 bar), variable speed drive (VSD), water-cooled, oil-free air compressors, three 1,800 cfm, cycling, refrigerated, compressed air dryers, three 1,800 cfm particulate filters, a 1,060 gallon, interior/exterior galvanized wet tank, one 2,560 gallon interior/exterior galvanized vertical dry tank, drains for both tanks and an air compressor system networking kit. The quote amounted to over $1 million.

The oil-free rotary screw air compressor option

The company is factory direct in this area, so it works with this client directly. In other geographies, it sells through a network of compressed air distributors.

Before the quote could be approved and the job moved forward, the aeronautics firm switched to a new in-house engineering team, and this second team had other ideas about the compressed air system. It thought purchasing oil-free air compressors was an unnecessary expense, and believed the firm could get nearly the same quality at far less cost with oil-flooded air compressors and proper dryers and filtration.

Are Oil-Free Air Compressors Required for Oil-Free Air?

The first engineering team wanted oil-free air compressors in order to have oil-free compressed air. The new engineering team believed that

Above: Quincy Compressor's manufacturing headquarters in Bay Minette, AL

with the proper dryers and filtration, oil-free compressed air was achievable with oil-flooded air compressors.

Other specifications changed, as well, as the second engineering team no longer wanted the same level of output. The quote for the oil-flooded system was for two 300-hp, 125 psi, oil-flooded, VSD air compressors, two 2,400 cfm, 1 micron and 0.1 ppm standard coalescing filters, two 2,100 cfm, variable speed refrigerated, compressed air dryers, two 2,400 cfm, polishing 0.01 micron and 0.01 ppm oil coalescing filters, two 5,300 cfm oil-water separators, a 1,060 gallon interior/exterior galvanized vertical wet tank, one 5,000 gallon interior/exterior galvanized vertical dry tank and drains for both tanks.

This option was quoted at just over half a million dollars.

The selling price was only part of the aeronautic company's consideration. It also needed to think about costs over the life of the two different air compressor technologies. Quincy offers a 10-year warranty for oil-flooded air compressors, and a market standard one-year warranty for oil-free air compressors. Costs for servicing are typically higher for oil-flooded air compressors, Stejskal said, since they include the cost of the oil, so while the purchase price for oil-free is higher, service costs should be lower. Importantly, oil-free compressors normally need to be rebuilt more often. Because the warranty for oil-free air compressors is shorter, there's the potential for greater repair costs over time,

The oil-flooded rotary screw air compressor option

Aeronautics Giant Evaluates Oil-Free and Oil-Flooded Air Compressors

but the actual costs experienced depend on the system's environment.

"It comes down to the application," Stejskal said. "From an equipment standpoint and upfront costs, oil-free is always going to be more expensive than oil-flooded. Then it comes down to, does the application really call for an oil-free air compressor or can you get similar results with oil-flooded air compressors and high-level drying and filtration? In some applications, some industries, the specifications simply dictate you must be oil-free. There's no ifs, ands or buts about it."

Supporting a Long-Term Relationship

Stejskal is the Sales Manager for both the oil-free and oil-flooded sales engineers. He oversaw both quotes to make sure his company gave the aeronautics firm the best solutions possible. Stejskal is based in the Atlanta, GA, office, and reports to Michael Campbell, President

Executive Profile: Michael Campbell

Michael Campbell, President and General Manager, Quincy Compressor and Chicago Pneumatic, has over 20 years' experience in the compressed air industry. For the past two years, he has steered the company toward continued success, leveraging his knowledge and expertise to ensure it remains a market leader in reliability, quality and innovation.

Michael Campbell, President and General Manager, Quincy Compressor

"Our designs have stood the test of time. We're still making products with the same principles we applied back in 1937," Campbell said. This commitment to quality has resulted in some rotary screw air compressors running for over 25 years, while its reciprocating QR model air compressors have operated for more than half a century.

While honoring the company's history, Campbell has also championed its evolution to meet modern demands. One of the most significant shifts he has witnessed is the industry's focus on energy-efficient equipment.

"Watching Quincy transition from a rugged, dependable machine to one that combines toughness with energy efficiency has been remarkable," Campbell said. "We've maintained our core identity while evolving to meet the needs of an energy-conscious market."

The company maintains its reputation for reliability by creating one of the best airends on the market, he noted. Improvements to the airend and bearing design allow airends to maintain durability while having a smaller profile, allowing for a more energy efficient product. The company was the first to offer 10-year warranties, Campbell said, and its current level of investment in research and development allow it to keep its unique edge.

Traditionally the company sold exclusively through third-party distribution. Over the last decade this model has shifted. Today, it sells both direct and through distribution. This model allows customers personalized service.

"I would venture to say our distribution network is probably larger than any other distribution network," Campbell said. "It's 50% of our business. We don't put limitations on our distributors. We look at our distributors as true partners who have access to all the same equipment and training as our employees."

The oil-free air compressor market has been an area of growth under Campbell's watch. Reflecting on his early years in the industry, he recalled how manufacturers were initially skeptical of oil-free technology. Today, Quincy and other companies invest heavily in oil-free air compressors, which have seen advancements in reliability and longevity.

"Oil-free air compressors are now a mainstream product, and while they still come at a premium, prices are becoming more competitive," Campbell said.

Throughout these advancements, Campbell has remained focused on his company's core mission: building reliable, high-performance air compressors that serve a broad range of industries. "We can cater to anyone who uses an air compressor," Campbell said.

A variable speed refrigerated compressed air dryer

and General Manager (see sidebar for more on Campbell).

"They were mirroring what they already do in an oil-free facility in another part of the country they were going to duplicate, but then after we presented them the second option of oil-flooded air compressors with high-quality dryers and filtration, they saw they didn't necessarily have to go with the oil-free route to meet their air quality requirements," Stejskal said.

After six months of discussions and evaluations, the aerospace company chose the oil-flooded system. The equipment has been ordered, delivered, and installed, though startup was delayed.

Once startup is complete, Quincy will provide maintenance for both the new system and the seven existing systems at the firm's campus. Building long-term relationships and helping customers find the best solution for their needs is more important than pushing for the largest sale.

"Every sales engineer wants to sell their units, everybody wants to make the bigger sale, but in the end it's what's best for the manufacturing plant and creating a dependable and trustworthy relationship," Stejskal said. "We're not here to tell people they should choose one option or the other. We're here to meet the specs the customers provide. We can coach them and lead them in the direction we feel is right, but in the end, it's the customer who makes the final decision." BP

About Quincy Compressor

Founded in 1920, Quincy Compressor is a leading designer and manufacturer of reciprocating and rotary screw air compressors, vacuum pumps and a full line of air treatment components. Headquartered in Bay Minette, AL, the company has built its reputation on quality and rugged reliability, building tough air compressors for the most demanding applications. For more information, visit https://www.quincycompressor.com.

To read articles about ***Air Compressor Technology,*** visit https://www.airbestpractices.com/technology.

For expert presentations on ***Air Compressor Technology,*** visit our webinar archive section at https://www.airbestpractices.com/webinars.

The Benefits of Compressed Air System Audits

When you need an audit and how to perform one

By John Molnar P.E., Air System Audit Manager, Rogers Machinery Company

"Without data, you're just another person with an opinion."

-W. Edwards Deming

Industrial plants have long used sensors and gauges to monitor and record data critical to plant operation. Sensors were installed permanently and integrated with complex SCATA, MODBUS and other plant-wide systems using computer servers and control rooms for monitoring. These systems provide critical data. However, after the system is installed, adding additional sensors for secondary energy analysis or troubleshooting of smaller systems, such as compressed air systems, can be cost-prohibitive.

In the last several years, advances in technology have reduced the cost and made it easier for engineers to gather massive amounts of data with temporary sensors in industrial plants.

With the data logger systems available, collecting data to find energy savings and solve problems with compressed air systems has never been easier.

What Is a Compressed Air Audit?

A detailed compressed air energy audit examines the function and energy performance of a compressed air system with data collection as a core feature. With some training and engineering experience, an individual can perform a compressed air audit. The existing system operation is examined and analyzed to create a system baseline. The baseline is the existing state of the system before any changes or upgrades are made. A baseline for your New Year's resolution to lose weight, for example, would be stepping on the scale on January 1st.

After the baseline system analysis is complete, the data is analyzed using statistical computer models to simulate new operational setpoints to predict energy savings through equipment upgrades. Some energy savings prediction software is readily available. Many energy auditors have built their own proprietary simulation models, including our audit team at Rogers Machinery Company.

The data is typically compiled into a report with the proposed solutions, and energy incentives (if available) are estimated.

When the changes have been made and the upgrades installed, data is collected once again to tune the system and verify the accuracy of the predicted energy savings.

The final step is to set up periodic checks or have permanent sensors installed to ensure the system's efficiency for years to come.

Determining Whether or Not You Need a Compressed Air System Audit

Usually, the plant engineers are the ultimate deciders of whether or not a site needs

Above: A trained compressed air system auditor can suggest ways to improve performance and save energy.

an energy audit, but utilities and power companies have their own goals for energy savings and will seek out industrial sites to introduce energy incentive programs for upgraded equipment. Air compressor salespeople will also facilitate energy audits to make customers aware of energy incentives to upgrade equipment. Substantial financial incentives are available in many areas to install new equipment with ongoing lowered energy usage.

While most energy audits are intended to determine ways to save energy, others are undertaken to find and resolve problems within the system.

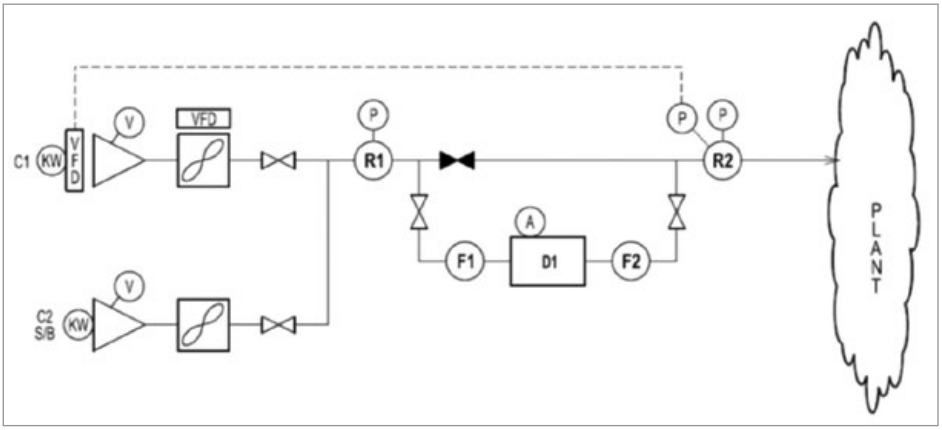
In one recent example, a piece of packaging equipment in the far corner of a manufacturing plant was having trouble with low pressure at odd times, while the rest of the machines in the plant seemed to operate fine.

The plant placed temporary sensors at several locations to record pressure levels and conducted data logging. The root cause of the pressure problem was determined to be a nearby dust collector consuming large amounts of air over short periods, causing a pressure drop to the area. The plant installed a 500-gallon receiver tank near the dust collector, resolving the packaging equipment's low-pressure issue.

Another recent example of a system problem happened at a corrugated box factory. The operators were complaining about low compressed air pressure during the night shift. The smaller air compressor used overnight usually provided plenty of air for the late night production crew. Data logging found low-pressure events occurred every two hours. A filter backflush diaphragm pump on a timer ran every two hours and was left on overnight in error.

Sometimes air compressor service departments have a problem they can't solve. The problem could be intermittent, occur in the middle of the night, on weekends or involve multiple pieces of equipment.

Heated desiccant compressed air dryers, for example, can take up to eight hours to complete a full regeneration cycle, and nobody wants to wait to see when they malfunction. Recording valve positions, heater and blower



Creating a drawing of a facility's compressed air system helps determine which sensors need to be used.

The Benefits of Compressed Air System Audits

operation, and tower pressure with data loggers can pinpoint when trouble happens and what's going on with the compressed air dryer.

Create a Plan for an Audit

Once the facility has decided the need for a compressed air audit, it's time to carry it out. The process can be broken into several steps: make a plan, collect data with sensors and data loggers, analyze and present the data, and implement the solution.

The first thing needed is a plan. Determine project goals and clarify the questions you want to answer. Are you trying to save energy, fix problems or find reasons to upgrade equipment?

Determine Data Logging Equipment Needed

Next, do a system walkthrough to determine the required data logging equipment. Gather nameplate data of all the relevant equipment into a list, make a system sketch and tally the number and types of sensors and data loggers needed, as well as where they should be installed.

One sensor commonly used to perform energy audits is a transducer. A transducer takes a

A transducer measures energy in milliamperes (mA).

A split-core or clamp-on current transducer.

physical or electrical signal and generates a calibrated electrical signal which a data logger records. Transducers are typically supplied with an AC to DC power supply and are wired into a 4-20mA current loop datalogger. A typical pressure transducer converts a 0-150 psig (0-150 barg) input to a 4-20 mA output.

Here's a crash course on which sensor types you'll need based on what you're trying to measure:

Amperage is measured using a current transducer or CT. It's typically split-core/clamp-on or ring installed around a wire to record the amperage. Split-core CTs are preferred because they can be installed around the wire without needing to disconnect one end of the wire.

Power or kilowatts can be calculated with only amps, but assumptions must be made for voltage and power factor, which can lead to erroneous calculations unless a spot check of true kW is made at different operational points. The power factor can vary from 0.89 on a fully loaded air compressor to 0.4 with the same air compressor in an unloaded state. If only amps are recorded, and the power factor is assumed to be constant, significant errors will be present in the kW calculations if the air compressor frequently runs unloaded.

Kilowatt (kW) meters/transducers record power in kW. True kW meters give the best power data because they measure amperage and voltage, and calculate the actual power, power factor and apparent power. The disadvantage of measuring kW is the cost of the meter and the added difficulty of installing voltage probes, which require additional safety considerations in electrical panels. If you ever install a power or amp meter, make sure to locate it upstream of any adjustable speed drives.

Temperature can be recorded with an analog thermocouple sensor. A thermocouple's resistance varies with temperature. Thermocouples do not require an external power supply but need to be paired with a datalogger specific to the purpose. Temperature transducers are also available with 4-20mA outputs.

Flowmeters are used to measure compressed air flow. Thermal dispersion flowmeters are the most commonly used sensor type for compressed air. They use stainless-steel probes inserted into the compressed air stream through a hole or a threaded port in the pipe. The probe has a heated element and a sensor element. The meter records the amount of heat transferred between the elements to measure the mass flow. Sensors are calibrated for pipe size and type of gas.

Measuring in kilowatts (kW) gives the best power data, but these meters can be difficult to install.

A thermal dispersion flowmeter installed on piping in a plant.

Thermal dispersion flowmeters require care in installation: the air temperature must be within the proper range. They must be installed after a compressed air dryer, as entrained water droplets in wet air can disrupt the heat transfer between the probes. Flowmeters must also be installed in a straight section of pipe with a specified minimum number of pipe diameters upstream and downstream from the flowmeter to minimize turbulent air flow.

A dewpoint sensor is used to record the pressure dewpoint, that is, the amount of water present in the compressed air. A malfunctioning compressed air dryer or leaks can lead to problems with compressed air dewpoint. These problems could be localized to one area, or they might impact the entire system. Moving a dewpoint sensor to different locations during the data logging process will determine if the problem is in one place or throughout the system.

Choosing Data Loggers

Once you have identified the necessary sensor types and locations, you'll need one or more data loggers to record data from the sensors. A variety of data loggers are available. Consider cost, flexibility, durability and data storage capacity before making a purchase.

Most data loggers require downloading with a USB cable when they reach capacity. Depending on the number of sensors connected and the data logging interval, the data logger can have several weeks to several months of data logging capacity.

For troubleshooting in rapidly changing systems, recording one- to three-second intervals provides detailed data. For long-term data logging, 15-second to one-minute intervals reduces data download frequency. Some data loggers have SIM cards and can be downloaded remotely or can be connected to Wi-Fi.

The Benefits of Compressed Air System Audits

Decide How Long to Record Data

The decision of how long to data log is often a conundrum. For energy projects, energy use is typically averaged and projected out as a yearly kWh or yearly dollar cost. However, data logging for an entire year isn't practical. If the plant is stable all day, every day, only one day's worth of data is needed to show annual operation. If the plant has seasonal demands, such as a fruit processing facility, data logging could be done twice to record trends at each operational point, with weighted averages applied to calculate yearly energy and compressed air consumption. For normal plants, two to three weeks of data logging during normal plant operation typically works well.

Analyzing Compressed Air Audit Results

Once collected, data is presented in chart form, and hourly averages are used to compare pressure, power and compressed air flow. Different chart views are beneficial. Putting one week on a single page shows daily changes in compressed air demands and pressure, but without much detail. Additional views with shorter time frames, such as three hours, helps show air compressor operation during transitional times, such as day to night shift.

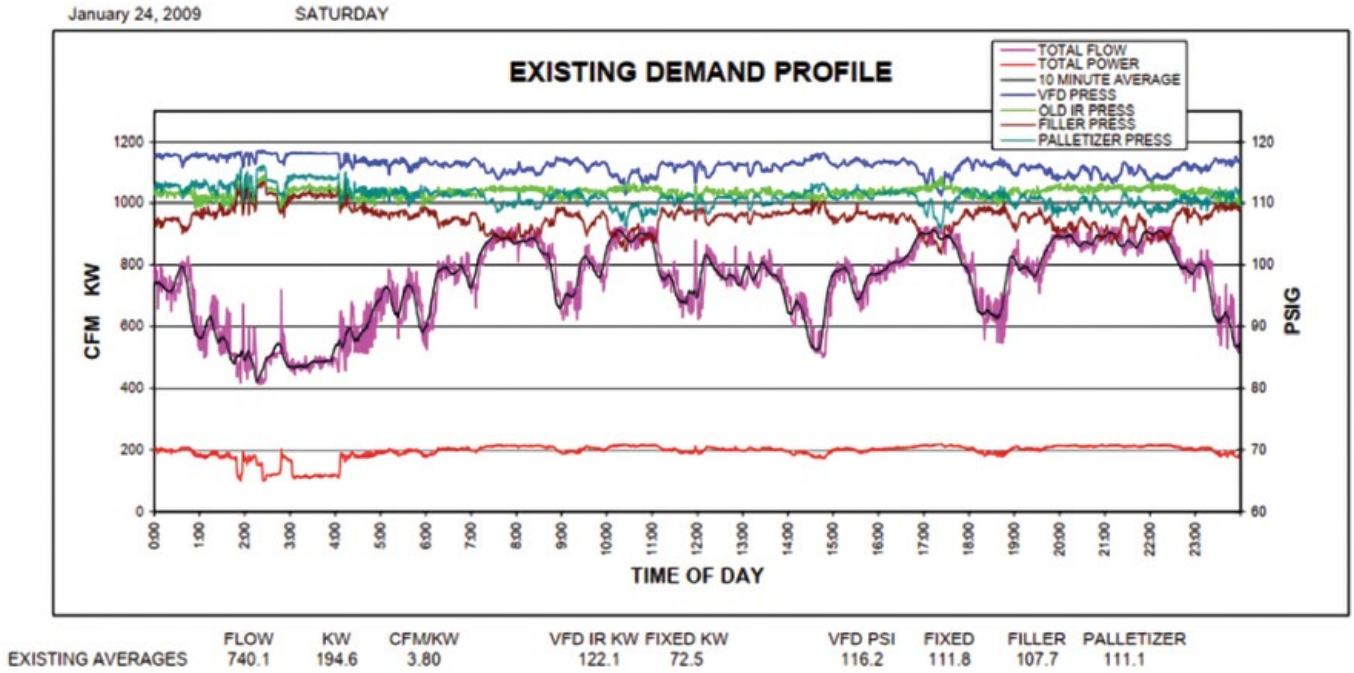
Once trend charts are analyzed, interesting events will emerge. For example, one particular plant usually had low flow from noon to 1 p.m. for the lunch hour. But on one Friday, flow was low for 90 minutes. The plant manager told us a safety meeting was scheduled for 1 p.m. that lasted 30 minutes before production resumed.

With the collected baseline data understood to be a valid sample, energy simulation can be performed to improve the system. Software can duplicate the baseline compressed air flow with different air compressors and setpoints to predict energy savings. Data is then presented in a report and approved by the customer. With the help of some energy incentives (hopefully), the project is completed.

After the system has been upgraded, the data logging process is repeated to verify energy savings and tune the system setpoints. To ensure continuing system efficiency, consider adding permanent data loggers or performing yearly checks. Once the system air use to power consumption is more proportional, lowering compressed air demand by repairing leaks and eliminating inappropriate compressed air uses will save even more energy.

The Cost of a Compressed Air Energy Audit

The cost and value to the end user of a compressed air energy audit can vary greatly.



This graph shows the compressed air demand profile of a plant.

In many instances, compressed air vendors perform them for free if new equipment is likely to be purchased. Power companies and energy incentive programs also pay for energy audits with low or no cost to end users. When purchased outright, energy audits are usually billed as a fixed cost based on an hourly engineering rate plus travel expenses. Small to medium jobs can cost $5,000. Large jobs at refineries or paper mills can cost $20,000 or more for a complete system assessment with leak detection. The level of detail and engineering quality can vary greatly, as well.

Becoming a Compressed Air Auditor

Several programs are available to train compressed air energy auditors. The Compressed Air Challenge and the Department of Energy have classes and are the industry standard for compressed air energy audit training. *Compressed Air Best Practices® Magazine* and Compressed Air & Gas Institute (CAGI) have many articles, webinars and classes on the subject.

How to Find a Compressed Air Auditor

Many local compressed air vendors have on-site energy auditors or can bring in resources from other areas. Energy-focused consulting engineers also have compressed air audit capabilities. The information, people and equipment are readily available with a bit of research to help a site achieve its system improvement goals. An energy audit with data logging is a proven and powerful tool to solve complex problems and save energy, with positive results directly impacting the bottom line. BP

About the Author

John Molnar has been conducting compressed air energy audits since 2004. He holds a Bachelor of Science in Mechanical Engineering from Washington University in St. Louis, MO, and is a registered Professional Engineer in the State of Oregon. He has attended level 1 and 2 Compressed Air Challenge and has performed hundreds of compressed air energy audits resulting in substantial energy savings. He authored several articles and conducted many training seminars on compressed air systems.

About Rogers Machinery Company

Rogers Machinery Company, founded in 1949 by World War II veterans Ned Rogers and Walter M. Novak, is dedicated to providing high-quality process and utility equipment including compressed air, vacuum and pump systems and services. Rogers has a dedicated Engineered System Solutions team capable of designing and building customized systems. With a nationwide presence and branches in 13 states, Rogers Machinery has been committed to innovation, excellence and unmatched customer service for the past 75 years. For more, visit https://rogers-machinery.com.

To read articles on ***Compressed Air System Assessments,*** visit https://www.airbestpractices.com/system-assessments.

For expert presentations, visit our Webinar Archive Section dedicated to ***Compressed Air Measurement*** at https://www.airbestpractices.com/webinars.

Tools for Detecting Compressed Air Leaks

Take a structured approach to save money and boost efficiency

By Menno Verbeek, Sales Director, VPInstruments

Compressed air is an essential energy source in most factories, but its misuse can lead to high costs, production downtime and energy inefficiency. Unfortunately, many companies overlook leaks and pressure drops, which are major contributors to these problems. Luckily, there are simple and cost-effective techniques to manage leaks and sustainably boost the efficiency of compressed air installations. Don't let inefficiencies and downtime drain profits. Act now to manage your compressed air system effectively and save costs.

This article discusses methods and techniques to increase the efficiency of a compressed air installation in both the short and long term. Start by identifying and repairing compressed air leaks, which can result in a decrease in energy use and a savings in operating costs.

There are various methods for detecting and quantifying leaks. Simple methods provide a rough indication of the leakage level. But, if you want to take it more seriously, you will need leak detectors and flow meters, as well as the budget and manpower to carry out leak detections and repairs. Repairing leaks is rewarding both financially and for production efficiency. Companies immediately see a reduction in costs, and workers on the floor are motivated by the improved performance of the compressed air system, which reduces the likelihood of production disruptions.

Quick Tests for Compressed Air Leaks

One of the oldest and simplest methods of identifying leaks in a compressed air system is measuring the load time (T1) and offload time (T2) of the air compressor in minutes.

After obtaining these two values, calculate the percent of leakage using the following formula:

Total leak rate (%) = [(T1x100)] / [(T1+T2)]

If the result is higher than 10%, the compressed air system is leaking.

Another quick and proven method to verify whether or not there are leaks in the compressed air system is the pressure drop test. This test should be carried out during downtime when no compressed air is being used. If the air compressor starts frequently, there are likely leaks in the system. To estimate the total level of leakage, first bring the compressed air system up to operating pressure. Then, turn off the air compressor. Stand next to the pressure gauge

Above: A technician calibrating a flow meter.

and use a stopwatch to measure how long it takes for the system to drop 15 or 30 psi (1 or 2 bar). The faster this goes, the greater the number of leaks.

Apart from the fact the plant must be shut down for both tests, another disadvantage is these measurements do not take into account the inefficiency of the air compressor itself. Even when an air compressor appears to be working normally, there may be wear and internal leaks (especially with older air compressors). Also, both methods do not provide information about the specific location of leaks in the compressed air system and these tests are not suitable for factories that operate 24/7 due to the necessary shutdown. The advantage, however, is both tests do not require any financial investments.

Ultrasonic Leak Detection

Once a significant level of compressed air leakage has been identified, locate and measure the size of all leaks as soon as possible. To accomplish this, ultrasonic leak detectors can be used. These detectors identify any air leaks, even those not audible to humans. While acquiring an ultrasonic detector requires some investment, the savings will quickly cover the costs. With ultrasonic leak detection systems, the precise location of a leak, as well as the degree of leakage, can be determined. This allows the financial loss of each leak to be calculated as well as the return on investment based on repair costs. Leaks with the highest ROI can be addressed first, resulting in significant savings achieved quickly.

Leakage Management Based on Data with Flow Monitoring

A reliable way to manage air leakage in your compressed air system is by using flow

Using an ultrasonic leak detector to identify the source of a compressed air leak.

Tools for Detecting Compressed Air Leaks

meters. Install one or more flow meters in the compressed air network, such as in the main pipe after the buffer tank or in branched pipes per production department. This gives you insight into the compressed air consumption as well as the leakage level for the total factory and per department. Based on the data collected, you can then work on leak detection in a more targeted manner. It's best to install flow meters before repairing leaks, as this gives you a clear picture of the savings made after repair. The newly measured value of total consumption then becomes the new baseline consumption level. If your compressed air consumption unexpectedly increases during production, it could indicate the presence of new leaks. Installing more flow meters in your factory can help you pinpoint the location of abnormal increases. Once you identify potential leak sites, use ultrasonic detectors to examine the area.

These 4-in-1 flow meters monitor flow, pressure, temperature and total flow.

Continuously monitoring compressed air consumption and detecting and repairing significant leaks is essential to prevent high costs in the long term. New leaks appear over time, making early discovery and repair crucial to minimize losses. Once you've fixed all the leaks, you can gradually reduce the frequency of leak detections to avoid unnecessary rounds and costs. Using flow meters to measure not only flow but also pressure, temperature and total flow is recommended for better optimization. This combined approach can result in energy savings of up to 30%.

Real-time monitoring systems store system data and allow for easy trend discovery.

Bi-Directional Flow or Leaks?

If you suspect leaks, keep in mind there may instead be abnormal system behavior such as bi-directional flow. This means compressed air unexpectedly moves through the system in the opposite direction, giving the appearance of compressed air loss (such as leakage). If your system has bi-directional flow meters, you can immediately detect this behavior. Also, it's essential to check the system pressure critically. The higher the pressure, the more compressed air will escape through leaks. Keep in mind that a lower system pressure is not only valuable for this reason, but also because every 14.5 psi (1 bar) reduction results in 7% energy savings.

Energy and Compressed Air Monitoring

Compressed air systems experience a decrease in efficiency due to various factors, including leaks. To monitor and improve the system's performance, use power, flow, pressure, temperature and dew point sensors. This approach provides both qualitative and quantitative information about the entire compressed air system, including the air compressors, compressed air dryers and filters. Real-time monitoring systems, like VPVision, are especially useful as they store system data and allow for trend discovery. This information is presented by a dashboard and in reports, providing a clear picture of the compressed air system's progress. Factories operating 24/7 can particularly benefit from monitoring as it allows for continuous analysis and immediate intervention in case of any deviations.

Energy use can be measured for major energy consumers such as air compressors, generating valuable energy management reports over longer periods. Even after repairing leaks, it's important to continue monitoring energy use to ensure optimal performance. By doing so, you can promptly intervene when necessary, and monitor the effectiveness of actions taken such as pressure reduction or leak repairs. In this way, you can establish a sustainable, economical and optimally performing compressed air system. BP

About the Author

Menno Verbeek has been the Sales Director at VPInstruments for over 12 years, bringing extensive expertise in industrial energy monitoring solutions. His commitment to helping companies optimize their energy use has been instrumental in driving innovation.

About VPInstruments

Founded in 1999, VPInstruments offers easy-to-use solutions for industrial measurement worldwide, helping businesses gain insights, save energy and optimize their processes. Its VPFlowScope flow meters are designed for a wide range of applications, from supply to demand. When paired with the VPVision energy monitoring system, they provide a clear view of where, when and how much energy can be saved. For more information, visit https://www.vpinstruments.com.

To read more ***Compressed Air Leak System Assessment*** articles, visit https://www.airbestpractices.com/system-assessments/leaks.

Visit our Webinar Archives to listen to expert presentations on ***Compressed Air Leak System Assessments*** at https://www.airbestpractices.com/webinars.

HydroThrift Debuts Advanced Cooling System Control Panel

Closed-loop cooling system control panel enables performance monitoring and troubleshooting

By Troy Dreier, Senior Editor, Compressed Air Best Practices® Magazine

Based in Massillon, OH, HydroThrift specializes in closed-loop cooling systems including evaporative, dry, chilled water and heated water systems. It also creates heat recovery systems. The company was formed in 1973, and provides system design, engineering and fabrication.

In September, the company debuted a new control panel for accessing its systems. This release delivers a variety of advanced features, including a touch screen, remote monitoring and an audit trail.

When it came time for the update, the company's engineering team listened closely to what customers requested.

"What we heard from customers was they wanted the ability to get as much data as they could out of the system," said Jeremy Remus, Chief Engineer. "They wanted to be able to monitor their system from a control room. They wanted to be able to see the overall view of how the system was running. The bigger thing on the backend – especially for us from an engineering perspective – was being able to do better troubleshooting and helping them without the need to be onsite."

Above: HydroThrift's headquarters in Massillon, OH

Diagnose Problems Faster

"The biggest thing we're giving users is the ability to do a heat balance on the unit," Remus said. "With the flow meter, they'll see the flow coming in on their unit, and they'll have the temperatures entering and leaving the heat exchanger."

Before this panel was released, customers could see when temperatures were different than anticipated, but they wouldn't know why. Was the system not running hard enough? Was it not balanced right? Was the heat transfer equipment dirty? With the advanced panel, they'll have a better idea.

The heat balance of a liquid-to-liquid cooling system shows heat coming in and being picked up by the cooling medium. If cooling water use increases significantly and more water is needed to provide the same amount of cooling, the operator will know there's a problem. It could be a leak or fouling that interferes with the heat transfer. If it's a shell-and-tube heat exchanger, it might need to be sent out for cleaning.

Expert Support a Phone Call Away

Remus thinks the new trend lines will be especially useful. Rather than having to export data, open it in Excel and plot points, the

The advanced control panel mounted to a pump and control skid

operator will find all that done for them. At HydroThrift's own plant, monitoring trend lines revealed when someone had changed settings that shouldn't have been changed.

These new features help HydroThrift troubleshoot problems, something it's seeing a greater need for. Post-Covid, there's been a high turnover at factories, noted Robby Strock, Design Engineer, with many experienced maintenance providers either retiring or transitioning to other roles. Their replacements may not have as much experience with the technology.

"What spurred a lot of my work behind the scenes with the advanced control options is providing people with less technical skills the ability to give us the information we need to tell them what's wrong," explained Strock. "If someone's trained, they could do all this maintenance and planning on their own, but even if they don't have that training, they could call in and we could give them more accurate interpretations of what's actually happening in their cooling system."

The ability to monitor data from a control room means customers can now set their own warnings. If the leaving temperature from a cooling system is too high, an air compressor relying on it for cooling could shut down. Thanks to the ability to monitor temperatures from a control room and set warnings, operators can see when temperatures rise and take action ahead of time. For example, they could clean the heat exchanger during scheduled downtime.

The advanced control panel was in development for a year, and is now rolling out to customers. The engineers welcome feedback.

"This whole process has been centered around trying to make a better offering for the customer to make their life as easy as possible," Remus said. BP

About HydroThrift

Since 1973, HydroThrift has steadily grown into a world-wide supplier of packaged, closed-loop cooling systems. Its experience with a wide variety of industrial equipment cooling applications has enabled HydroThrift to become a specialist in the design, engineering and fabrication of custom cooling systems. For more information, visit https://www.hydrothrift.com.

A sampling of the advanced control panel's data

To read articles about ***Cooling Controls,*** visit https://coolingbestpractices.com/technology/cooling-controls.

For expert presentations on ***Chillers and Cooling Towers,*** visit our Webinar Archive Section at https://coolingbestpractices.com/magazine/webinars.

Best Practices 2024 EXPO & Conference Show Report

Sharing knowledge to execute industrial-sized energy efficiency and water conservation projects

By Troy Dreier, Senior Editor, and Brooke Jones,
Digital Content Editor, Compressed Air Best Practices® Magazine

From October 29-31, 2024, professionals who operate, maintain and design industrial compressed air, vacuum, blower, nitrogen generation, process cooling and HVAC systems gathered at the Cobb Galleria Centre in Atlanta, GA, for the 6th annual Best Practices 2024 EXPO & Conference. The event featured two tracks of conference presentations and panels, a new Hard Hat Compressed Air Workshop & Lab for hands-on facility engineers and maintenance professionals, the CAGI Certified Compressed Air System Specialist (CCASS) exam, a two-day Compressed Air Challenge Level 1 workshop and a Women in Compressed Air, Vacuum & Cooling Networking Group Breakfast.

The EXPO floor – the heart of the event – was a hive of activity for its two days. This year's event recorded nearly 1,000 registrations, many of whom came to discover new technologies and find new vendors to support their regional compressed air and cooling system sales and service companies.

This year's event also drew a large number of manufacturing plant personnel, who enjoyed being able to shop a variety of technologies and also get direct OEM answers to questions and technical issues they are experiencing in their plants.

"We've talked to Bobcat, Kaeser Compressors and Ace Compressor. We've talked to a lot of different vendors on instrumentation," said Chris Rohman, Utilities Building Maintenance Tech, Bio Products, Archer Daniels Midland Company, after the event's opening day. "We look forward to going back on day two and getting more contacts."

"The Best Practices conference shows a lot of different innovative products," added Jesse Scott, Facilities Engineer, MAGNA. "I've found many energy and sustainability items I will be pursuing to implement in our plant operations."

Above: The EXPO floor of the Best Practices 2024 EXPO & Conference.

Roderick M. Smith, Publisher, Compressed Air Best Practices® Magazine (right), presented an Energy Treasure Hunt Raffle prize to Oscar Torres, Baxter Healthcare (left), who came with a team from Puerto Rico!

The annual in-person meeting of the Women in Compressed Air, Vacuum & Cooling Networking Group.

Cale Farnsworth, West Fraser Timber, got information from Nathan Eisel, SMC Corporation of America.

Bill Smith and Erik Klingerman from the Best Practices EXPO & Conference.

Lance Frederick, Unipipe, met with buyers from G3 Industrial Solutions.

Hundreds of attendees picked up Energy Treasure Hunt Raffle Cards to try for a daily prize. The raffle was open to distributors/reps, engineering firms and manufacturing personnel. To participate, attendees needed to collect a stamp from at least 10 Energy Treasure Hunt sponsor booths. Employees of Baxter Healthcare, Fluor Corporation, ADG Concepts, Atlantic Compressors and Goldfin Consulting took home cash prizes of $250 or $500!

Wednesday saw the 2nd annual in-person meeting of the Women in Compressed Air, Vacuum & Cooling Networking Group, whose members

New Products Debuted at the Best Practices 2024 EXPO and Conference

Global Product Debuts

- Compressor Master Meter CM 500, CS Instruments
- LC 600 Leak Detector, CS Instruments
- VA 526 and VA 530 Flow Meters, CS Instruments
- Scroll Air Compressors, GlobalVac & Air

Products Exhibited for the First Time

- BMP Medium-Pressure Air Compressors, Bauer Compressors
- ii500, ii905 and ii915 Acoustic Imagers, Fluke
- NU AIR Air Compressors, FNA America
- Toledo Tools Air Compressors, FS-Curtis
- VIBWORKS LT Vibration Data Collector, Ludeca
- HD8 Vacuum Pump, NAVAC
- SONASCREEN 2 Acoustic Camera, Sonotec
- SP11 Air Compressors, Sullivan-Palatek

The FNA America booth saw the U.S. introduction of the NU AIR air compressor product line.

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enjoyed a breakfast sponsored by Ingersoll Rand and Hitachi Global Air Power. Keynote speaker Charlene Vance, APU General Manager, Thermo King Americas, opened up about her personal experiences during her presentation "Purpose, Passion, Focus: Winning for You and Your Team" and encouraged the group to work toward their goals and win their personal championships.

Best Practices 2024 EXPO & Conference Sponsors

CAGI – the Compressed Air and Gas Institute – is a longtime partner of the Best Practices EXPO & Conference, and this year administered its Certified Compressed Air System Specialist (CCASS) exam multiple times during the event. It organized a session on maximizing compressed air efficiency, with speakers from Kaeser Compressors, Ingersoll Rand, Atlas Copco Compressors and Gardner Denver, a standing-room only presentation! It also organized a presentation on the Department of Energy's upcoming regulations on oil-flooded air compressor isentropic efficiency, with speakers from Sullivan-Palatek and Quincy Compressor. "This isn't like consumer appliances such as air conditioners or refrigerators where they make a million of them all the same," said Bruce McFee, President, Sullivan-Palatek. "Air compressor companies have a lot of variation, so we're responsible for many, many items. This potentially could have the impact of pulling some of the customized models off the market."

Neil Mehltretter, Kaeser Compressors, leading a CAGI-sponsored standing room only presentation on maximizing compressed air efficiency.

Gary Stauffer, SPX Cooling Technologies, gave a presentation on sustainability and reliability for cooling towers during a CTI-sponsored presentation on cooling towers in industrial plants.

CTI – the Cooling Technology Institute – is celebrating its 75th year of educating equipment owners and helping shape government regulations. This year, CTI held an opening day session titled "Cooling Towers in Industrial Plants," featuring representatives from Baltimore Aircoil Company, Buckman Chemical, SPX Cooling Tech and L S Enterprise. Jon Cohen, Digital Innovation Fellow, Buckman Chemical, spoke about reusing water from cooling towers, while Jason Heilbrunn, Applications Lead – Industrial, Baltimore Aircoil Company, told attendees how to save time and money with closed-loop cooling solutions.

Air Compressor Technology

BAUER COMPRESSORS chose the Best Practices 2024 EXPO & Conference for the first public showing of its BMP line of medium-pressure air compressors. The line includes 12 options, which range from 20 to 125-horsepower (hp), 33 to 175 scfm and 435 to 1,450 psig (30 to 100 barg). All models are two- or three-stage, oil-lubricated, air-cooled reciprocating air compressors, and all work with the BAUER CONNECT IoT system, which lets operators monitor and control their air compressor systems from anywhere in the world using a phone or laptop. "It's a direct-driven, air-cooled system built for continuous duty operation in strenuous environments," said Tony Corletto, Sales Manager, BAUER COMPRESSORS.

Bobcat's primary goal at the event was letting customers know it's back in the industrial air compressor space. Building on its 100-year history, it recently re-entered the industrial air compressor market and today has 19 models in its Industrial Air line, ranging from 10 to 300-hp. Models are distinguished by their heavy-duty design and premium components. A 100-hp, 440 cfm, 125 psi (8.6 bar), oil-flooded, variable speed drive, rotary screw air compressor dominated the Bobcat booth. "Customers can count on us for rugged, durable products, expectation-exceeding customer support and long-term distributor relationships," said Patrick Jakeway, General Manager, Bobcat Industrial Air.

Kaeser Compressors showed off multiple items at its booth, including its ability to provide engineered Kaeser Air System Enclosures (KASE) for customers in standard configurations. They are also able to build custom-engineered enclosures or skids for plant, process or instrument air. Kaeser also showed its line of Kaeser Measurement Technology instruments measuring flow, pressure, temperature and moisture in compressed air systems. The sensors can connect to the company's Sigma Air Manager master control system for on-premises or remote monitoring and maintenance. Marketing Services Manager Michael Camber said the Best Practices 2024 EXPO & Conference was an excellent place to attract buyers: "People who want to learn about improving their compressed air system are our best customers."

BOGE showcased its EO N Series of oil-free scroll air compressors. Displayed at the booth was an EO 23 N model, which is a modular unit. The EO Series is available from 5.5 to 40-hp and offers compact construction and low noise levels. "We're looking for new distribution in the U.S. We're growing fast and we'd love to see people interested in selling product for us," said Kevin Miller, Sales Director, BOGE.

FS-Elliott and FS-Curtis displayed their oil-free centrifugal air compressor and oil-flooded rotary screw air compressor product lines. FS-Curtis's new Toledo Tools line offers rugged, oil-flooded, air-cooled rotary screw air compressors for price-conscious buyers, including woodworking shops and commercial printers. The line runs from 5 to 50-hp and comes in base mount, tank mount or UltraPack (tank mount and refrigerated compressed air dryer) configurations. The Toledo Tools line is built to last, with large, slow-speed airends and a five-year extended warranty. "Some of the distributors we met this week said

Paul Cenzon, Eric Phelps, John Mirabelli and Tony Corletto of BAUER COMPRESSORS (left to right) with a model from the BAUER BMP medium-pressure air compressor line.

The Bobcat booth featured a 100-hp, VSD rotary screw air compressor from the Bobcat Industrial Air line.

Kevin Miller of BOGE with an EO 23 N scroll air compressor.

Joe D'Orazio, Bill Mehall, Rob Williams and Frank Mueller of Kaeser Compressors (left to right) with a custom-engineered Kaeser Air System Enclosure.

Best Practices 2024 EXPO & Conference Show Report

they would keep some as rentals, since they're well priced," said Tony Montalto, Director of Technical Product Management, FS-Curtis."

GlobalVac & Air announced the launch of its new scroll air compressor systems. Each system is customized to the application and the medical systems are fully NFPA-99 compliant. The oil-less scroll compressors run between 2 to 10-hp, with up to 10 compressors able to be joined in a system. "There's a dedicated motor for each compressor, which adds another level of redundancy," said Andrew Thompson, Product Manager, GlobalVac & Air. The company also showed off its industrial vacuum systems, including a duplex, 6-hp vacuum system for industrial applications and a lab vacuum system, vertically stacked for a space-saving footprint.

Last year, Hertz Kompressoren released the two-stage, rotary screw Impetus VSD Series in larger units, from 125 to 430-hp. Earlier this year, the company expanded the range to include 30 to 100-hp units. On display was a 60-hp, two-stage, oil-flooded, air-cooled, rotary screw air compressor that can supply up to 291 cfm at 125 psi (8.6 bar). "It's driven by a permanent magnet motor, which gives you at least a 5% higher efficiency than the highest efficiency on IU-4 motors. The Impetus offers an additional two-stage compression, so when we launched these products, we achieved around 10 to 15% higher efficiency when compared to single stage units," said Mert Alpagut, Vice President, Hertz Kompressoren USA.

PneuTech and Unipipe Solutions are a part of the Fluid-Aire Dynamics family. PneuTech showcased its range of RKHD Series rotary screw air compressors with a 40-hp, VSD, lubricated, air-cooled compressor on display along with a 225 cfm, refrigerated compressed air dryer. The company highlighted nitrogen technology in both PSA (pressure swing

Russell Warner, David Sleeman, Tony Montalto, Justin Johnson and Greg Owen of FS-Curtis/ FS-Elliott (left to right) displayed their centrifugal and rotary screw air compressors.

Andrew Thompson of GlobalVac & Air with a duplex, 6-hp vacuum system.

Mert Alpagut, Clark Beal and Walt Pitts of Hertz Kompressoren (left to right) with a two-stage Impetus VSD Series 60-hp, rotary screw air compressor.

Dan Schopf and Michael Heine of PneuTech (left to right) with an RK-40VSD-115B rotary screw air compressor.

absorption) and membrane dryer air filtration systems. Unipipe displayed its larger pipe system, UnipipeEZ – offered in 6, 8 and 10-inch diameters – a factory-formed coupling system with a spigot and a socket that fit into one another. "Unipipe doesn't require any special tools, crimping, grooving or anything like that in the field. It locks together with a clamp that's much lower cost than a large coupler," said Michael Heine, Director of Marketing, PneuTech and Unipipe Solutions.

Sauer Compressors USA showed one of the biggest air compressors on the EXPO floor, a five-piston, five-stage, reciprocating air compressor from its Orkan line. This 147-hp model is capable of producing up to 7,200 psi (496.4 bar), and works with air, nitrogen or compressed natural gas (CNG). Orkan models cool and separate gasses at each stage, allowing them to achieve higher pressure with cleaner results. Operators can block off one or more stages if they aren't needed. Optional filters let operators filter particulates down to .001 micron. Orkan models can be purchased with a lifetime warranty. "If we did nothing else but build Orkan for the CNG and helium market, we would sell them as quickly as we could build them," said Sean Dempsey, Southeast Regional Sales Manager, Sauer Compressors.

Sullivan-Palatek featured a model from its SP11 line of oil-flooded, air-cooled, rotary screw air compressors. The line runs from 25 to 40-hp and produces 100 to 175 psi (6.8 to 12 bar). This redesigned line replaces the company's UD Series with a more energy efficient construction. Engineers looked at pressure drops in the inlet flow and separator tank, making improvements designed to keep pressure loss to a minimum. Target buyers include body shops and cabinet makers. "It's dependable, reliable and it is available. We have them in stock," said Bob Groendyke, Senior Product Marketing Manager, Sullivan-Palatek.

Lance Frederick, Holly Wysong, Derrick Taylor and Joe Burke of Unipipe (left to right).

Josh Wamser of Tamsan-USA with the TVK-15S in a package configuration

Crystal Wilson, Sean Dempsey, Anthony Harris, Eduardo Yris Hernandez and Nicholas Beach of Sauer Compressors (left to right) with an Orkan air compressor.

Josh Ward, Bob Groendyke and Gerrett Tengblad of Sullivan-Palatek (left to right) with an SP11 air compressor.

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Tamsan-USA debuted the latest model in its S Series, the TVK-15S. Equipped with a servo drive for energy efficiency, this 15-hp, oil-flooded, air cooled, VSD rotary screw air compressor delivers 125 or 145 psig. Its Auto Auditor feature monitors atmospheric conditions and sends alerts if conditions lead to sub-optimal performance. It's Auto Technician feature monitors performance at part-load operation. Tamsan-USA backs the S Series with a lifetime airend warranty. The model shown was in a package configuration with a storage tank and refrigerated dryer. "Package units are great options to provide the customer a clean, dry compressed air system that doesn't take up a whole lot of space," said Josh Wamser, President, Tamsan-USA.

Compressed Air Treatment and Condensate Management

BEKO Technologies had a large and well-trafficked booth at the Best Practices 2024 EXPO & Conference, and the booth's highlight was the recently announced QWIK-PURE oil-water separator. Both intelligent and modular, the QWIK-PURE uses a cartridge system so it can be easily adapted for the cfm of any air compressor system. Owners can add up to six cartridges to a base unit. When cartridges are full, maintenance technicians can remove them with no mess. Cartridges weigh 50 lbs when full, said Rusty Welch, Central Regional Manager, BEKO. The QWIK-PURE is WiFi-enabled and can be monitored and controlled from anywhere.

Altec AIR displayed several items from its compressed air treatment line. The company's refrigerated dryers have models for 25 to 2,000 cfm, while its desiccant dryers have models that can handle 0.4 to 9,000 cfm. At the booth was an RHT Series non-cycling, refrigerated compressed air dryer using R-134a refrigerant. The company also displayed a HBS Series single tower, heated, blower purge compressed air dryer. "It's good for applications in single shift facilities. At night it goes into regeneration

Rusty Welch of BEKO Technologies showed the Qwik-Pure to customers from ADG Concepts.

Gregg Lesniewski, Chris Foster, Jim DiMaiolo and Joe Rodenbucher (left to right) of Altec AIR with a single tower, heated, blower purge compressed air dryer.

Molly Powers, Scott Scheuerlein, Bill Peters and Chad Timmer of Clean Resources (left to right) with the CRP Series and IDC Series of oil-water separators.

Ben Laiweneek of Walker Filtration with a SmartSep oil-water separator.

mode. It isolates itself from the system and regenerates the desiccant, ensuring it's ready the next day," explained Jim DiMaiolo, Sales & Market Manager, Altec AIR.

Clean Resources has developed new condensate filters for oil-water separators, designed to remove precious metals and heavy metals. On display was the CRP Series and IDC Series of oil-water separators, as well as the Auxiliary Discharge Pump. The CRP Series ranges from 75 acfm at 15-hp to 10,000 acfm at 2,000-hp and the IDC Series ranges from 75 acfm at 15-hp to 600 acfm at 125-hp.

Walker Filtration highlighted several products at its booth, among them the SmartSep line of oil-water separators. Models in the line accept airflows of 32 to 6,621 scfm. The two smallest models are single use, disposable products, while the others (from 132 scfm and up) are serviceable. Units include a filtration bag that floats when empty but sinks when full, causing a visual indicator to rise. They're capable of reducing oil content to 5 ppm.

Compressed Air Measurement and Leak Detection

CS INSTRUMENTS USA launched multiple products at the Best Practices 2024 EXPO & Conference, among them the Compressor Master Meter CM 500, a meter with a venturi probe and a differential probe for accurate metering in wet air. The CM 500 has no moving parts and offers an accuracy of under 0.5%, noted General Manager Martin Zeller. Because it's an inline meter and not easy to remove, it includes an integrated drain for releasing built up water. It also includes left and right shutoff valves, letting the operator isolate the sensor while it's running, remove it and swap it out for a pre-calibrated sensor in minutes.

Martin Zeller of CS INSTRUMENTS with the Compressor Master Meter CM 500.

Zhimei Li and Ray Fang of Comate Hong Kong (left to right).

Nikki Smith, Alec Thompson and Brett Greenlee of Trace Analytics (left to right).

Chase Sasser, Mackenzie Lesley and John Archer of UE Systems (left to right) with the Ultraprobe 15,000, FLIR Si2-LD and Ultraprobe 3,000.

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Comate Hong Kong displayed a variety of compressed air measurement and monitoring systems including its Vortex flow meter series, PTF520 differential pressure flow meter and TGF460 thermal mass flowmeter. "The Vortex flow meter offers more durability and accuracy due to its design, which has no moving parts," said Ray Fang, International Sales Director, Comate Hong Kong.

Trace Analytics, a third-party accredited lab, is helping compressed air users determine whether they have clean, dry and oil-free air that meets ISO 8573 standards with its testing services. While having quality air has been of high importance for food and beverage and pharmaceutical manufacturers for some time, the lab has noticed a trend in providing quality air for equipment health. "We're seeing a growing need for air quality to be of high purity for equipment, in order to protect it for longevity, sustainability and risk transfer," explained Brett Greenlee, Key Account Representative, Trace Analytics. During the conference, Nikki Smith, Air Quality Leader, led a presentation on regulation and risk in food-safe compressed air.

Mike Kinnucane, Mikropor, gave the presentation "Understanding the Air-to-Nitrogen Ratio to Maximize Savings" at the New Technology EXPO Classroom on the EXPO floor.

UE Systems displayed a variety of acoustic imaging cameras, including the Ultraprobe 3,000 (frequency range of 35 to 45 kHz), Ultraprobe 15,000 (frequency range of 20 to 100 kHz) and FLIR Si2 (frequency range of 2 to 130 kHz). "The Si2 will find any compressed air or really any gas leak and quantify it on the screen for you, telling you how much you lose in cfm and dollar amount," said Chase Sasser, Regional Operations Leader, UE Systems. The company also hosted a workshop at the conference on creating leak surveys and leak programs for facility maintenance personnel.

Nitrogen Generators, Pneumatics, Motors and Drives

In addition to displaying their high-capacity refrigerated and desiccant compressed air dryer product lines, Mikropor America highlighted its MNG Pro Series of nitrogen generators, which was introduced in January 2024. By changing the way the nitrogen generator intakes air – drawing from the bottom rather than the front – and adding a conical diffuser to better use the carbon molecular sieve, Mikropor has improved the nitrogen ratio by 40%. That means customers use less electricity to generate the same amount of nitrogen. The series includes both twin tower and compact modular designs. "Our nitrogen generators can go anywhere from fractions of a cubic foot per minute up to as high as 2,000 cubic feet per minute," said Mike Kinnucane, Area Manager, Mikropor.

Energy efficiency was the focus at the SMC Corporation of America booth showcasing pneumatic products designed to make factory automation

Cleyton Hinterholz, Caroline Dix, Valone Gomes, Steve Fabich, Bryan Richardson, Shannon Chiles, Craig Langmeyer of WEG (left to right) with the Hydrowash and rolled steel motors.

Jon Jensen and Nathan Eisel of SMC Corporation of America (left to right).

more energy efficient and reduce demand on compressed air systems. "We can often find a 50% savings in a factory by implementing some of these particular solutions," said Jon Jensen, Energy Efficiency Team Manager, SMC North America. SMC is also ramping up chiller production at its U.S. headquarters in Noblesville, IN. Getting its start with small thermos chillers, the company is bringing in new sizes each month. Its chillers, designed for energy efficiency and accuracy, can be used in applications where liquids need to be a precise temperature, such as pharmaceuticals or food production.

WEG, a Brazilian manufacturer of electric motors and controls, showcased a variety of products including rolled steel motors for compressor specific applications, as well as controls. This includes starters, drives and soft starts – the parts that run the motor in an air compressor. The Hydrowash motor was on display, which is a washdown motor capable of being sprayed down with water. It was designed to meet the requirements of industries where there's a constant need for hygiene and cleanliness. They're available from fractional horsepower to several hundred horsepower. "All of our products are designed and manufactured by us from the ground up. We're vertically integrated in our manufacturing process, meaning we build everything in the motor except the bearings and grease," said Shannon Chiles, Manager of Low Voltage Product Marketing and Management, WEG.

Chillers and Cooling Systems

HydroThrift showcased its approach to closed-loop cooling systems for air compressors. Each system is custom designed, tailored to the project's location, climate, equipment mix and cooling needs. "The systems we use and supply are industrial duty, designed to operate 24/7/365. It's not unusual for our systems to last in excess of 15 years. Usually, with good maintenance, our systems will last somewhere around 20, 25 years," said Mike Wlodarski, Regional Sales Manager, HydroThrift. The company recently launched the Advanced Cooling System Control Panel, providing enhanced performance monitoring and troubleshooting.

Industrial Water Chiller, a division at TJ Snow Company, has more than 300 chillers in stock, ranging from half ton to 50 ton, at its Chattanooga, TN, facility, which is helping cut down lead time. It has chiller options in stock with automatic bypass already built in. To meet regulation changes on the horizon, the company has begun bringing R-454B and R-513A refrigerants into stock. "We started the chiller division at TJ Snow Company in 2019. We've probably grown over 400% in just that short amount of time, and we're continuing to grow. We can sell a half ton chiller and, right now, we're working a project

Mike Wlodarski of HydroThrift.

Hamilton Terrell and Paul Bush of Industrial Water Chiller (left to right).

in Georgia with five 150 ton chillers," said Hamilton Terrell, Sales Manager, Industrial Water Chiller.

The Best Practices 2025 EXPO & Conference will next take place October 21-23, 2025, in Kansas City. Thanks to the positive environment they found in Atlanta, many 2024 exhibitors secured 2025 booth space before the show was over. The 2025 conference promises to be another record year. The staff of *Compressed Air Best Practices® Magazine* wishes to thank everyone who made the 2024 event a valuable and memorable occasion. BP

To learn more about the ***Best Practices 2025 EXPO & Conference*** in Kansas City, visit https://cabpexpo.com.

To read similar ***Compressed Air System*** articles, visit https://www.airbestpractices.com/technology/air-compressors.

Compressed Air Technology News

nano Launches GEN2 MINI Nitrogen Gas Generators

nano is proud to announce the launch of its innovative GEN2 MINI range of nitrogen gas generators, engineered specifically for low-flow, high-purity applications. With a typical return on investment between six to 24 months, this new line offers cutting-edge performance with enhanced reliability, ensuring efficient and sustainable nitrogen generation tailored for industries requiring compact, high-performance solutions.

Using PSA (pressure swing adsorption), the range delivers unparalleled nitrogen purity and reliability from clean, dry compressed air. Key features and benefits include:

- Compact design: Small footprint for easy integration into any workspace
- High purity: Delivers consistent nitrogen purity levels up to 99.999%
- Low flow rates: These are ideal for low-demand applications, providing efficient nitrogen generation with optimized output for small-scale operations
- Energy-efficient: Advanced controls and lower air consumption
- User-friendly: Easy installation, simple maintenance and minimal operational requirements

nano has launched GEN$_2$ MINI Nitrogen Gas Generators for low-flow, high-purity applications.

nano's GEN2 MINI nitrogen generators provide an environmentally sustainable and cost-effective alternative to traditional nitrogen delivery methods, such as high-pressure cylinders. With its modular, compact design, businesses of all sizes can benefit from on-demand nitrogen without the logistical hassles of external supply chains. Reducing carbon footprint is achieved by eliminating gas delivery, which positively impacts sustainability targets. For more information, visit https://www.nano-purification.com.

Unipipe Solutions Introduces UnipipeEZ Aluminum Piping System for Compressed Air, Oil, Coolants and Water

Unipipe Solutions, an innovative leader in the industrial piping sector, proudly introduces the UnipipeEZ Aluminum Piping System, specifically designed for compressed air applications as well as oil, coolants and water. This advanced system provides a durable, cost-effective solution that guarantees high air quality and leak-free performance, with a pressure rating of 232 psi (15 bar). The UnipipeEZ system is remarkably simple to install, requiring neither specialized tools nor skilled labor.

Unipipe Solutions has launched the UnipipeEZ Aluminum Piping System for compressed air applications.

Unipipe systems boast the most secure fittings in the market. Like all Unipipe systems, UnipipeEZ features a proprietary stainless steel clamp ring that bites into the aluminum pipe, creating a connection rated for over five times the pressure of other systems. This clamp ring ensures 100% contact around the pipe, tightening further as pressure increases.

The unique design facilitates quick and secure installation without the need for special tools, crimping or grooving. The installation process takes half the time of traditional piping options and is significantly faster than copper piping. The system's lightweight nature – 75% lighter than iron pipe – allows for single-person installation of systems up to 6 inches in diameter.

UnipipeEZ delivers the same pressure and resistance performance as the standard Unipipe line but with even easier installation. To connect standard-length UnipipeEZ pipes, simply insert the factory-formed male end into the female end and secure it by attaching the all-aluminum UnipipeEZ hinged coupling, locking it in place with a single bolt. For shorter pipe lengths, cut the pipe, insert the stainless steel ring, block with a block ring, then attach the UnipipeEZ hinged coupling and tighten the single bolt.

Unipipe systems are ideal for ultra-clean environments and available in a wide range of diameters, from ¾ inch to 10 inches.

UnipipeEZ and all other lines of Unipipe are universally compatible with each other and with most other aluminum systems currently on the market, ensuring a seamless integration process. For more information, visit https://www.unipipesolutions.com.

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Compressed Air Technology News

Siemens Announces SINAMICS G220, a Multi-Purpose, Adjustable Speed Drive With Clean Power Technology

With SINAMICS G220, Siemens is launching a new high-performance drive to join the SINAMICS drives family and recently introduced it to the North American market. SINAMICS G220 is an innovative multi-purpose adjustable speed drive with built-in Clean Power technology, which reduces harmonics by up to 97% without the need for an AC line reactor or DC choke. SINAMICS G220 is significantly more efficient in terms of space usage and operation. SINAMICS G220 makes the system engineering and its integration into a production or processing machine much easier.

The SINAMICS G220 drives are the first drives in the SINAMICS family to join the Siemens Xcelerator portfolio, the open digital business platform that enables machine builders and machine users to accelerate their digital transformation.

SINAMICS G220 is also the first drive to join the Siemens Xcelerator portfolio, the Siemens-wide business platform for digital transformation. SINAMICS G220 drives are an integral part of the TIA Portal and feature a digital twin in Startdrive, the drives commissioning tool from Siemens. This allows the behavior of the drive to be tested and optimized before the hardware is available.

SINAMICS G220 has an integrated webserver for commissioning, which eliminates the need to install software or an app on a PC or mobile device. This saves time and makes drive setup very intuitive and extremely user-friendly.

These new drives are also equipped with an IIoT module. This means SINAMICS G220 can easily be integrated into cloud and edge applications, which increases the transparency of the applications and makes remote monitoring and accessibility of the drive system possible. Machine availability can even be optimized, and system uptimes can be further improved.

In the area of cybersecurity, SINAMICS G220 comes standard with state-of-the-art security integrated, providing highly secure communication, integrity and authenticity checks to protect against tampered firmware.

SINAMICS G220 ensures the improved sustainability of processes through robust, safe, secure and efficient design and operation. This new drive contributes to a sustainable future throughout its entire lifecycle from design to delivery thanks to the carbon neutral production sites and paperless delivery system. This new drive is suitable for all industries. For more information, visit https://www.siemens.com.

Proportion-Air Launches Pump Controller, a Turnkey System to Avoid Run-Dry Situations

Ensuring air-operated double diaphragm pumps run consistently and optimally through long cycles is easy with Proportion-Air's new Pump Controller.

Many AODD pumps operate with just a ball valve and shop air. This can lead to inaccurate, inconsistent material flow. The Pump Controller is a turnkey system that eliminates these issues. Run-dry situations can be avoided, saving diaphragms from unnecessary wear.

The Pump Controller uses the accurate, repeatable performance of a proportional electro-pneumatic regulator coupled with a volume booster for enhanced flow capabilities. A NEMA 4X-rated enclosure protects against unwanted dust, liquids and other particulate matter.

The new unit is easy to install and operate. Offering both automatic and manual modes, the device is connected to the supply line the same way a single regulator would be installed. Automatic mode allows for remote control from a PLC or other controller. A knob on the faceplate provides control in manual mode.

Maximum inlet pressure is 125 psi (8.6 bar), meeting the needs for most of the AODD pumps on the market. The 110 VAC power is compatible with standard outlets. For more information, visit https://proportionair.com.

Easily maintain the optimal operational flow rate for most air-operated double diaphragm pumps on the market with Proportion-Air's new turnkey system.

Manchester Tank Introduces 1000-Gallon Air Receiver; Offers Reduced Footprint, Simple Pressure Options

Manchester Tank announced the launch of its latest innovation in the air industry: the 1000-Gallon Air Receiver. This new product marks a significant advancement in the company's offerings, designed to meet the evolving needs of customers with enhanced efficiency and quality.

Historically, the 1060-Gallon Air Receiver has been a staple in the industry. Manchester Tank has taken a bold step forward by replicating the design of its 1000-gallon horizontal propane tank. This strategic decision enhances quality control and offers several key benefits:

Reduced footprint: The tank's diameter has been decreased from 48" to 41", making it more space efficient. This is particularly beneficial in environments where space is limited, facilitating easier installation and better use of available space.

Simplified pressure options: Manchester Tank now offers a single high-pressure option that meets all industry requirements. This simplification streamlines its product line, making it easier for customers to select the right product for their needs.

Streamlined inventory: With just one part number to manage, Manchester Tank can maintain consistent stock levels, ensuring customers always have access to the products they need.

"By focusing on quality, service and simplicity, we are confident this new product will not only strengthen our competitive edge but also support sustainable growth. We are committed to meeting our customers' needs with innovative solutions that drive efficiency and value," said Joe Luthman, Director of Sales for Compressed Air, Fire and Refrigerants, Manchester Tank.

This strategic initiative underscores Manchester Tank's dedication to delivering top-notch products and services. It looks forward to continuing to serve customers with excellence and innovation. For more information, visit https://mantank.com.

CRYSOUND Launches CRY8120 Series Acoustic Imaging Cameras for Gas Leaks and Partial Discharges

CRYSOUND is introducing the CRY8120 Series Acoustic Imaging Cameras, a breakthrough in industrial inspection capabilities. These cutting-edge devices revolutionize the detection of gas leaks, partial discharges (PD) and mechanical deterioration with unmatched speed and precision.

The CRY8120 Series detects leaks and mechanical issues over 10 times faster than traditional methods, ensuring equipment integrity and safety. It excels in gas leak detection by rapidly pinpointing leaks and assessing potential losses, which is critical for industries facing safety and environmental risks. Additionally, its real-time PRPD chart display aids in identifying electrical discharge types, allowing for proactive maintenance decisions to enhance operational efficiency and prevent problems.

Impressive technical specifications include 200 microphones, a 100 kHz bandwidth and enhanced computing power. The camera can pinpoint even the smallest and most distant leaks with exceptional precision. The test distance has also been extended by up to 200 meters, expanding the device's range and versatility.

CRY8120 Series Acoustic Imaging Camera

It also supports infrared modules. The thermal imaging camera module is a significant enhancement in industrial inspection technology, offering simultaneous thermal and acoustic imaging displays. This dual capability greatly improves testing efficiency by eliminating the need to switch between thermal and acoustic imaging cameras.

Despite its powerful capabilities, the CRY8120 Series weighs only 1.4 kg, making it highly portable. Bluetooth and Wi-Fi connectivity enable wireless data transmission and quick report export, which is ideal for various industrial settings. The camera features an 8-inch display with 1920x1200 resolution and 13 million pixels, providing a clear and detailed view even in bright sunlight.

The CRY8120 Series Acoustic Imaging Cameras from CRYSOUND are a groundbreaking advancement in industrial inspection technology. With their advanced features, user-friendly interface and comprehensive reporting software, these cameras are set to revolutionize equipment monitoring and maintenance, setting new standards for efficiency and accuracy. For more information, visit https://www.crysound.com.

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Real-World Installations & Maintenance

Edited by Troy Dreier, Senior Editor, Compressed Air Best Practices® Magazine

There's much we can learn from real-world compressed air, vacuum, chiller and cooling tower installations. This column asks readers to share lessons learned from system installations and maintenance practices they encounter in the real world.

Combining Oil-Flooded and Oil-Free Air Compressors

Eduardo Lopez is an Engineer with Baja Design Engineering in Mexicali, Baja California, Mexico. Visit https://bdefp.com.

Sometimes, lubricated air compressors can get added to systems that use oil-free air compressors. When that happens, the remedy is time-consuming and possibly expensive.

Lopez sent in this picture from a Mexican pharmaceutical company that used an oil-free air compressor to supply clean rooms. When the company expanded and more compressed air outlets were needed, a second air compressor was added – an oil-flooded air compressor.

When the company realized its problem, it hired Lopez's firm to replace the compressed air piping and drops, and to recommend a new air compressor.

To keep clean rooms clean, avoid using both oil-free and oil-flooded air compressors in the same compressed air system.

Neglecting routine maintenance can lead to over-burdened filters and less-than-ideal performance.

Ensure Clean Ambient Conditions

Ruthie Carlo is the Industrial Marketing Coordinator for Northwest Pump, based in Portland, OR, with branches across the Western U.S. and Mexico. Visit https://www.nwpump.com.

The facility that owns this refrigerated compressed air dryer had recently grown. Its priority was finishing the construction being done at the new building next door, so it set aside improving the poor ambient conditions the compressed air system operated in. To keep this dryer's condensing unit from clogging and having the refrigeration compressor trip off due to high temperature, it felt it necessary to install a large panel filter in front of the unit.

Refrigerated compressed air dryers require a good supply of clean, cool ambient air to pull across unobstructed condensing units. Appropriate ambient temperatures and cleanliness are required to maintain optimal operation of the refrigeration circuit.

Submission Guidelines

We invite subscribers to share stories and photos of remarkable system installations they've come across. Email Troy Dreier at troy@airbestpractices.com. Please send a high-resolution image as a JPG or GIF file and a note describing the installation. If we publish your submission, we'll thank you with a $25 Amazon gift card.

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