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November 2014

## Metal Fabrication & Machining

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38 BLOWER TECHNOLOGY AT WEFTEC 2014





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# FROM THE EDITOR

## Metal Fabrication & Machining



We begin this issue with a profile of Hanover, PA based industrial distributor, C.H. Reed. I've known their Vice President, Dennis Reed, for many years and have always been struck by their offering of wet or dry finishing and fluid handling products using the compressed air generated by the system products they sell and service. This article highlights centrifugal compressors at Penn State University, rotary screw compressors at a container manufacturer and the use of shut-off valves reducing the leak load at another plant.

Watts Water's Franklin NH facility originally opened in 1959. It has undergone sixteen expansions more than tripling its square footage over the years. Compressed air powers cut-off saws, molding equipment, a sand mixing system, conveyor system, a pneumatic turntable and various hand tools. Kyri McDonough, from Parker Transair, shares a case study with us on how the use of aluminum piping helped this foundry with their latest 30,000 square foot expansion.

Metal fabricators and machining companies convened in Chicago at IMTS 2014. I once again donned my roving reporter cap and provide an article on what I saw in the compressed air booths. Good news for our industry was supplied by a capital spending survey, released by Gardner Business Media, predicting a 37 percent increase in metalcutting machine tool consumption in 2015.

What information should a factory have on file about their compressed air system? Don van Ormer, from Air Power USA provides us with an excellent example of the supply-side information provided to a client dedicated to metal fabrication and machining. The article also reviews the plants maintenance practices, or lack thereof, affecting several compressed air system components.

WEFTEC 2014 was held in New Orleans at the end of September convening over 20,000 registrants in the water industry. Wastewater management, both industrial and municipal, is the primary focus of this convention and aeration blower technologies receive significant exposure. I was pleased to visit the many blower booths and their enthusiasm for their new technologies and initiatives was quite contagious! I hope you enjoy our show report.

Thank you for investing in *Compressed Air Best Practices*®.

**ROD SMITH**

Editor

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# INDUSTRY NEWS

## Ingersoll Rand Wins Nestlé Supplier Award

Ingersoll Rand, a global leader in compressed air systems and services, power tools and fluid and material handling equipment, has received the 2013 North America Supplier of the Year award for Capital Equipment from Nestlé in North America. Nestlé cites Ingersoll Rand's ability to reduce the cost of equipment ownership, establish an innovative and consistent approach to the business relationship, and provide innovative equipment and service solutions for food and beverage manufacturing as the primary reasons they received the award.

"This is an important award for Ingersoll Rand as it recognizes the commitment and the continuing effort we've made to meet Nestlé's needs and to build our relationship with them as a key customer," said Richard Campbell, vice president of Ingersoll Rand compressed air systems in North America. "This award exemplifies the values we strive to deliver to each and every one of our customers — a deep understanding of their business and innovative equipment solutions supported by superb service that reduces the total cost of ownership."

The Ingersoll Rand Compressed Air Systems and Services team has helped Nestlé reduce costs, increase productivity and understand their energy issues while leveraging operating performance information to develop practical and effective solutions through the Ingersoll Rand PackageCare offering.

"What makes Ingersoll Rand different than other suppliers is the team's proactive engagement to bring new equipment solutions and new service solutions to Nestlé," Andy Murray, head of technical procurement for Nestlé North America. "After working together for a decade, our journey has now reached a great destination."

### About Ingersoll Rand

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**"What makes Ingersoll Rand different than other suppliers is the team's proactive engagement to bring new equipment solutions and new service solutions to Nestlé."**

— Andy Murray, Head of Technical Procurement, Nestlé North America

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Nestlé in North America consists of eight main businesses: Nestlé USA, Nestlé Canada, Nestlé Purina PetCare Company, Nestlé Waters North America, Nestlé Nutrition, Nestlé Health Science, Nespresso and Nestlé Professional. Committed to being recognized and trusted as the leading Nutrition, Health and Wellness company, Nestlé in North America provides nutritious, healthy food for every member

of the family at every stage of life: infants and toddlers, families, mature adults/grandparents, and pets. Key brands include Lean Cuisine®, Nestlé® Toll House®, Nestlé® Pure Life®, Poland Spring®, Gerber®, And Purina One®.

*For more information, visit [www.nestle.com](http://www.nestle.com)*

#### Sullair and Brabazon Expand Partnership

Sullair, an industry leader on the forefront of innovative compressed air solutions since 1965, has announced that it is expanding its relationship with distributor Brabazon Pump, Compressor & Vacuum to service customers across the Midwest. As part of this expansion, Brabazon recently opened a new 15,000 square-foot facility in Saint Peters, Missouri, and the

company plans to open an additional facility in Decatur, Illinois for the spring of 2015.

Brabazon is the Midwest's largest independent distributor of pumps, air compressors and vacuum equipment. In addition to selling Sullair air compressors, Brabazon provides design, engineering, installation and maintenance services that maximize reliability and uptime, while minimizing customers' operating costs.

Brabazon's new facility will house a wide inventory of Sullair air-compressors and OEM parts. Staffed by sales and service technicians, the new office will provide assembly and testing services, 24x7 customer support, and auditing services conducted by DOE-certified Compressed Air Systems AirMasters+ qualified specialists.

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## INDUSTRY NEWS

“Brabazon and Sullair have worked together since 1985, and during these 29 years, we’ve expanded our relationship into new territories on three different occasions,” states Brabazon’s CEO Heath Brabazon. “We continue to work with Sullair because they’re genuinely interested in minimizing our customer’s operating costs, and that’s not always the case with other air compressor manufacturers. Sullair’s broad portfolio enables us to customize solutions that meet the exact needs of our customers, and the reliability of Sullair’s technology is second-to-none.”

“Brabazon’s team not only possesses the service and maintenance expertise needed to keep our mutual customers happy, but they also bring to the table an aggressive and successful approach to finding new

business,” said Brent Mumford, Sullair VP and General Manager, Stationary Compressors and Aftermarket. “Brabazon is a perfect example for the type of partner we seek to work with, and we’re looking forward to expanding our efforts together in the Saint Louis area and throughout Southern Illinois.”

### About Sullair

Sullair is globally recognized as a leading manufacturer of portable air compressors, contractors’ air tools, stationary air compressors, compressed air treatment equipment and vacuum systems. The company will be celebrating its 50 year anniversary in 2015. Sullair is headquartered at 3700 East Michigan Boulevard, Michigan City, IN 46360. Telephone 219.879.5451. FAX 860.353.5779. Website: [www.sullair.com](http://www.sullair.com).

### Atlas Copco’s Water for All Initiative Celebrates 30 Years

*Atlas Copco USA Employees Raise More Than \$500K to Fund 15 Projects around the World*

Atlas Copco’s employee-run Water for All organization is celebrating 30 years of providing people in need with long-term access to safe, clean water and sanitation. Since the founding of Water for All in 1984, Atlas Copco and its employees have helped more than 1.5 million people gain access to clean drinking water.

Water for All is Atlas Copco’s main community engagement project, initiated and driven on a local level by Atlas Copco employees. In just the past four years, the Atlas Copco USA Water for All initiative has helped more than 10,000 people gain access to clean water and sanitation and has donated more than \$500,000 to 15 projects around the world.

“What started as a one-time project to raise money to combat drought-stricken communities in Peru has grown into a worldwide initiative that allows our employees to act on their commitment to global sustainability,” said Jim Levitt, president of Atlas Copco North America. “We are proud to support organizations that raise awareness and take action around the issues of unsafe drinking water and global water scarcity.”

In honor of the anniversary, Atlas Copco USA held a membership drive that resulted in a 10 percent increase in employee participation. Participants also voted for the next project the Water for All program will fund; employees chose to fund a \$50,000 project in the Tigray region of Ethiopia that will bring clean water to 2,500 people through the building of five community-drilled wells.

Atlas Copco’s Water for All program is supported by nearly 5,000 participating employees in 35 countries around the world. One hundred percent of employee donations

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go directly to water projects; employee donations are double-matched by Atlas Copco.

The 30th anniversary was on August 22, 2014. As part of the celebration Kurt Busch's No. 41 Haas Automation Chevrolet SS featured the Water for All logo during his 5th place finish in the NASCAR Sprint Cup Series race on August 23 in Bristol.

Learn more about Atlas Copco's Water for All program by visiting the website [www.water4all.org](http://www.water4all.org). There, you can watch a video from the two founders of the program as well as an animated video that shows how clean water changes lives.

**Atlas Copco** is a world-leading provider of sustainable productivity solutions. The Group serves customers with innovative compressors,

vacuum solutions and air treatment systems, construction and mining equipment, power tools and assembly systems. Atlas Copco develops products and service focused on productivity, energy efficiency, safety and ergonomics. The company was founded in 1873, is based in Stockholm, Sweden, and has a global reach spanning more than 180 countries. In 2013, Atlas Copco had revenues of BSEK 84 (BUSD 12.8) and more than 40,000 employees. Learn more at [www.atlascopco.com](http://www.atlascopco.com).

**Atlas Copco** operates 116 locations and employs more than 4,800 people in the United States. Globally, Atlas Copco had revenues of approximately \$12.8B in 2013. The United States represents the largest single-market for Atlas Copco globally. Learn more at [www.atlascopco.us](http://www.atlascopco.us)

### Endress+Hauser Inaugurates New Customer Center

Endress+Hauser inaugurates a new 80,000 square feet state-of-the-art Customer Center in Greenwood, Indiana. This 16 million dollar investment in infrastructure helps to optimize customer support and further underscores Endress+Hauser's commitment to the US market and its loyal customers in the Americas.

Over the past few years, Endress+Hauser has continued to grow its market share in the United States and around the world. This growth is due to the high degree of trust customers have in Endress+Hauser to make their processes reliable, safe, efficient and environmentally friendly. Endress+Hauser answers to this development



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## INDUSTRY NEWS

with sustained investments into US infrastructure which allows the continual strengthening of its market presence. “We want to be close to our customers providing the best possible support,” underlines Matthias Altendorf, CEO of the Endress+Hauser Group, adding: “Our investments reflect both our commitment to customers in the process industry and our promise to sustainably generate outstanding value for them.”

In the last 5 years, Endress+Hauser will have invested approximately 150 million dollars into its US operations alone in order to expand its flow, level, pressure, analytical and temperature manufacturing capabilities as well as investments in support structures, projects, services and training organizations. This figure does not include expenses related to the recent acquisitions of SpectraSensors, Inc. and Kaiser Optical Systems, Inc., both specialized in advanced analyzer technology.

### Added Value for Customers

Endress+Hauser's dedication to its customers extends far beyond manufacturing and R&D. Demands on customers for higher productivity in the process control industry isn't changing. Today, customers are faced with an experienced workforce of operators and technicians retiring in coming years which means they will need to train their next generation of employees. Endress+Hauser's customer training program recognizes this trend and has built multiple PTUs (Process Training Units) nationwide to address this complex problem.

To help customers keep up with today's challenges, Endress+Hauser's new, state-of-the-art Customer Center is suited to greet visitors with



Endress+Hauser inaugurates a new 80,000 square feet state-of-the-art Customer Center in Greenwood, Indiana.

a top-notch certified training facility with multiple classrooms and its largest yet PTU controlled by Rockwell Automation’s PlantPAx system for real-world process simulation with over 120 measuring points.

Todd Lucey, Managing Director of Endress+Hauser Sales Center USA, believes that one of the keys to market success in the US is owed to heavy investments made in customer training — the new Customer Center being one of them. “Customers can send operators, maintenance personnel, engineers and other process people to our new Customer Center to get hands-on, real-world application expertise in a state-of-the-art customer training facility,” he said, adding: “Customers are increasingly faced with process and business issues and they can’t get this type of unique training anywhere else.”

Investments made in building the new facilities were to help stay ahead of increasing customer expectations. “5 to 10 years ago we had a handful of products at a typical customer plant site and the customer expected us to deliver high quality instruments,” said Lucey. “But today, the whole plant is full of Endress+Hauser instruments so expectations

are considerably higher on us in terms of our capability to support them and help solve complex customer problems. Frankly, the more complex problems we solve, the more complex problems we get from our customers which is really the position we want to be in — and we look forward to that challenge.”

The Customer Center allows Endress+Hauser to provide additional, tailored service and support to its customers, for example with factory acceptance testing. Training, repair, and calibration are now stationed under one roof for faster, more accurate and efficient customer service and turnaround — with additional space for increased customer technical support with technicians available around-the-clock to answer customer questions, needs and concerns.

**About Endress+Hauser in the US**

Endress+Hauser is one of the largest instrument manufacturers in the United States’ industrial automation industry. Endress+Hauser’s USA headquarters is located in Greenwood, Indiana and is one of the

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## INDUSTRY NEWS

Group's largest tailor made production and sales facilities worldwide. Endress+Hauser, a Swiss-based company, established a US business in 1970. Since that time, Endress+Hauser has continued to invest in its US operations investing an average of 10% of its annual revenues into its infrastructure — a total of 150 million dollars in the last 5 years. Today, Endress+Hauser employs a total of 1,355 people in the United States, including its external sales and service partners.

### About the Endress+Hauser Group

Endress+Hauser is a global leader in measurement instrumentation, services and solutions for industrial process engineering. The Group employs 12,000 personnel across the globe, generating net sales of approximately 1.8 billion euros in 2013. Founded in 1953 by Georg H Endress and Ludwig Hauser, Endress+Hauser has been solely owned by the Endress family since 1975. For further information, please visit [www.us.endress.com](http://www.us.endress.com) or [www.us.endress.com/newsroom](http://www.us.endress.com/newsroom).

### Energy Department Recognizes 11 Manufacturers for Energy Efficiency Achievements

Building on the Administration's efforts to double energy productivity and help American businesses save money by saving energy, the Energy Department today recognized 11 companies that have met ambitious energy-efficiency goals through the Better Buildings, Better Plants Program. Across the country, manufacturers spend more than \$200 billion each year to power their plants. Through the Energy Department's Better Plants Program, American manufacturers commit to improve their energy intensity by 25 percent over ten years, or an equally ambitious level for their sector.

"Through cost-effective energy efficiency improvements in their factories, American manufacturers are boosting their energy productivity, saving money and protecting the environment by reducing carbon emissions," said Secretary Ernest Moniz. "As a result, Better Plants Partners have avoided 18.5 million metric tons of carbon

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emissions to date, which is about the same as the annual emissions from close to five coal-fired power plants. These companies are demonstrating that significant energy savings can be achieved through smart investments that create jobs and strengthen the U.S. manufacturing sector.”

The Department also announced today that over the last four years, Better Plants Partners have improved the energy intensity of their operations — a measure of a facility's energy use per unit of output — by about 2.4 percent annually, far exceeding projected business-as-usual rates for U.S. manufacturers as a whole. Demonstrating leadership and showcasing initiatives and strategies that have proven successful, 11 Better Plants Partners recently met their goal to improve energy intensity:

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- Legrand North America
- Lennox International Inc.
- Patriot Foundry & Castings
- Procter & Gamble
- Texas Instruments
- ThyssenKrupp Elevator
- Toyota
- Verso Paper Corp.

More than 140 companies currently participate in the Better Plants Program, representing more than 2,300 manufacturing facilities and close to 11 percent of the total U.S. manufacturing energy footprint. Cumulatively, these companies have saved approximately 320 trillion British Thermal Units of energy — equivalent to saving nearly \$1.7 billion in energy costs. Earlier this month, the Department welcomed 23 new manufacturers to the Better Plants Program, representing a range of manufacturing sectors.

The Better Buildings, Better Plants Program is part of President Obama's broader Better Buildings Initiative to help American commercial and industrial buildings become at least 20 percent more energy efficient over the next 10 years. The Initiative also includes the Better Buildings Challenge through which U.S. companies, universities, school districts, multifamily housing owners, and state and local governments have committed to reducing energy use across their building portfolios by 20 percent or more. The accomplishments announced today are summarized in the Energy Department's Fall 2014 Better Plants Progress Update, released today and available at [www.eere.energy.gov/betterplants](http://www.eere.energy.gov/betterplants)

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# C.H. REED PROVIDES TOTAL SOLUTIONS TO COMPRESSED AIR APPLICATIONS

By Neal Lorenzi



*The project team standing in front of the 1500 horsepower FS-Elliott Polaris P-700 centrifugal air compressor at the Steady Thermal Aero Research Turbine (START) facility in State College, PA. Pictured are Kyle Wertman and Kris Wertman (C.H. Reed) and Mike Barringer (Penn State University).*

▶ As an industrial distributor for 65 years, C.H. Reed, Inc. has been providing ideas, concepts and sustainable solutions to help manage issues associated with three key areas of industrial plants: compressed air systems and equipment; assembly tools and ergonomic material handling; paint finishing and fluid handling equipment. Compressed air has always been a strong focus for C.H. Reed, and it's a common thread running through all of its product families.

Based in Hanover, PA, C.H. Reed strives to provide a “total solution” within its

product families — engineering, equipment, installation, commissioning, training, service, parts, accessories and consultation.

“Our capabilities start with designing and installing the complete compressed air system. This includes the generation, treatment and distribution system to efficiently provide clean, dry air to support our wet or dry finishing, fluid handling, assembly capabilities and related system components,” says Dennis Reed, vice president.

C.H. Reed, Inc. was founded in 1948 by Charles and Elizabeth Reed as a small auto

parts aftermarket supplier. The company later added spray equipment, power tools and small air compressors to its lineup. In the mid-1960s, C.H. Reed transitioned to an industrial and heavy commercial end-user customer base, leveraging prior expertise to offer industrial-grade products combined with system design and repair services.

Each of its product families has specially trained field application engineers and service technicians. “Management believes that sales must be accompanied by a well-trained service group. We can service all products



**“Based in Hanover, PA, C.H. Reed strives to provide a “total solution” within its product families — engineering, equipment, installation, commissioning, training, service, parts, accessories and consultation.”**

sold as well as most competitor’s equipment,” Reed adds.

Since 1948, the company has grown to include more than 100 employees in five locations servicing thousands of customers in the mid-Atlantic region. Full air compressor sales and service branch facilities are located in Milton, Erie and Pittsburgh, PA. C.H. Reed is still family-owned with many third and fourth generation people active in the business. The following case studies reflect the company’s total solutions approach to compressed air applications.

### Penn State Initiative

In June 2011, C.H. Reed was asked to participate in a project with Penn State University; FS-Elliott Co., Export, PA.; and the U.S. Department of Energy, National Energy Technology Laboratory to design a compressor-driven turbine testing facility: The Steady Thermal Aero Research Turbine (START) facility in State College, PA.

The facility was designed to test new, fuel-efficient, high-pressure turbine (HPT) system designs used on jet aircraft and land-based power generation turbines. Researchers evaluate leakage and gas-path flows along with new cooling technologies for the next generation of gas turbine engine designs to improve fuel efficiency and reduce gas emissions.

“One of the biggest challenges in the gas turbine engine industry today is the increase

in fuel costs,” says Michael Barringer, research associate at Penn State University, Mechanical and Nuclear Engineering Department. “It is imperative that gas turbine propulsion systems and land-based power generation systems become more fuel efficient.” To that end, research conducted at the START facility is aimed at reducing secondary air system flow leakages (via improved seal designs) using advanced turbine stage cooling designs.

Installing a high-performing air compressor was a key to the application. C.H. Reed, the local FS-Elliott distributor for Pennsylvania, was contacted by Penn State to size and quote a centrifugal compressor to drive the aircraft turbines being tested.

FS-Elliott performed numerous flow and pressure studies and provided performance curves for the two-stage machine at various off-design conditions. After a year of design

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## C.H. REED PROVIDES TOTAL SOLUTIONS TO COMPRESSED AIR APPLICATIONS



*The HydroThrift closed-loop cooling system — 2.705 Million BTU*

and testing, the Polaris P700 air compressor (1,500 hp, 11,000 cfm) unit met performance requirements. The unit was ordered and installed in late 2012. The air compressor was commissioned by Kris Wertman, C.H. Reed's senior project manager. Penn State has since ordered an identical compressor to double the design air flow required for Phase Two testing. This second compressor will be installed in November 2014.

"Penn State selected the Polaris unit for the project based on its simple aerodynamic, backward-leaning impeller design and horizontally split gear case and components. These design features allow for easy inspection and maintenance," says Pamela Wasielewski, FS-Elliott marketing specialist.

"FS-Elliott provided performance curves for the two-stage machine at various off-design conditions," says Barringer. "The team at FS-Elliott also was a valuable resource to

our graduate students as they furthered their research using the data collected during the test stand setups."

In addition to the compressor installation, C.H. Reed provided a HydroThrift closed-loop cooling system (2.705M Btu), test piping that was custom fabricated by Penn American, Muncy, PA, fast-acting (12 and 16 inch) valves to protect the compressor and test turbine, and a process gas chiller supplied by nanopurification solutions, Huntersville, NC. Nano was willing to commit to the design process and provide a chiller that met customer specifications, holding the air temperature to +/- 2 °F.

The HydroThrift cooling system removes heat generated by the compressor. "The compressor is so large that direct air cooling is not possible," says Bruce Williams, regional sales manager. "The cooling system transfers the heat to the coolant, which is pumped

through the fluid cooler outside of the building. This is an efficient, cost-effective method of removing heat."

The Nano system provides chilled water to the compressed air heat exchanger. "The system provides various air flows and temperatures for the testing facility," says Nick Herrig, business development manager. "The requirements were to dial in flows of 2,500 scfm at 100 psi maximum down to 100 scfm at temperatures ranging from 250 °F down to 41 °F."

C.H. Reed supported Penn State throughout the project and continues to do so during Phase Two. Wertman worked with Barringer and Karen Thole, Penn State head of mechanical and nuclear engineering, from design through installation and commissioning to bring the compressed air solution into operation.

The START project is a multi-year endeavor, which encompasses design and construction from 2011 to 2013, and testing and research

from 2014 to 2017. “We’re happy with the work completed thus far and the initial data that is being acquired is encouraging. We’ve been working closely with Wertman at C.H. Reed during the project, and he has helped us tremendously,” Barringer says.

### Air Compressor Upgrade

Earlier this year, C.H. Reed partnered with a local container manufacturer that needed to replace a number of old, unreliable reciprocating compressors along with older inefficient rotary screw compressors. The plant needed to reduce maintenance and energy costs associated with its compressed air system. In addition, production demands had to be met while improvements were being made.

To meet the customer’s goals, C.H. Reed proposed the installation of two Quincy QSI rotary screw air compressors with Power\$ync variable displacement control. After analyzing the plant’s demand profile, a variable-displacement machine was determined to be

as energy efficient as a variable-speed drive unit while realizing lower life cycle costs. A Hankison 3,000-cfm, water-cooled, refrigerated compressed air dryer also was recommended.

To simplify the installation process, Parker Transair aluminum piping was used to replace the steel and copper air lines within the compressor room. Two Quincy condensate/oil separators were installed to reduce the amount of contaminants in the wastewater stream, thus allowing for safe, environmentally friendly, inexpensive disposal. The QSI 200-hp and 300-hp units feature Quincy’s Power\$ync variable-capacity control technology, which allows the compressors to function at less than full capacity while maintaining energy efficiency.

“The Power\$ync control allows the two units to communicate with each other in real time while one operates as a base load compressor and the other as a trim compressor at the same target pressure for maximum efficiency without the need for a central controller,” explains Dennis Reed. “This arrangement allows the



Energy-saving Quincy QSI rotary screw air compressors with Power\$ync variable displacement control.

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## C.H. REED PROVIDES TOTAL SOLUTIONS TO COMPRESSED AIR APPLICATIONS



*Parker Transair aluminum piping installation in the compressor room.*

compressor system to match the plant air requirements with minimal power at an annual energy savings of \$100,000 compared to the previous system.”

### Fixing Air Leaks

A local manufacturer was experiencing air supply issues with production equipment. C.H. Reed initiated data logging to determine the operating profile of the existing compressed air system. Three compressors supplied the entire production area and other points of use throughout the facility from a central compressor room. A fourth machine was used for backup.

A total of 1,150 hp was available via two centrifugal compressors: FS-Elliott 150DA (350 hp each) and two rotary screw units. A 5,000-scfm, dual-mode, refrigerated air dryer was located in the central compressor room.

An average of 653 brake horsepower (bhp) was needed to run the compressed air system during normal production levels, providing an average of 2,692 cfm.

C.H. Reed performed data logging of the load/unload cycle during non-production hours in order to determine the extent of significant compressed air leaks in the system. The total leak load was estimated at 1,159 scfm, approximately 40% of the total normal production capacity of 2,962 cfm.

Data logging confirmed that the leak load was created by compressed air flow to machinery not in use. “Under normal operations, 8 of 17 production units were always idling,” Reed explains. “Shutting off air to this idling equipment would save an estimated 545 cfm and \$49,486 in annual electrical costs. Jorc Air Saver G2 automatic shutoff valves were installed on all pieces of equipment so

that compressed air was not consumed by machinery when not in use.”

The Air Saver valves, provided by Jorc Industrial LLC, New Castle, DE, were not used in the typical manner (i.e. to open and close the valves at set times). There was no set schedule as to when



*The Jorc Air Saver valve was used to shut-off idling equipment eliminating an estimated 545 cfm in compressed air demand and saving \$49,000 in annual electrical costs.*



**“The Power\$ync control allows the two units to communicate with each other in real time while one operates as a base load compressor and the other as a trim compressor at the same target pressure for maximum efficiency without the need for a central controller”**

— Dennis Reed, Vice President, C.H. Reed

production would be using any one piece of equipment, so it was not possible to use the timers in the normal fashion.

“With the help of the engineers at Jorc Industrial, we were able to provide a solution. We tied an open and close signal from a set of dry contacts on each piece of equipment to the controller on the valve to signal when to open and close,” Reed explains. “These pieces of equipment also had a hydraulic

system that needed one minute to come up to pressure, so the cycle time on the valve was not an issue. The entire project cost to the customer was \$15,000 for an ROI of less than four months.”

This is another example of how C.H. Reed goes the extra mile to provide total solutions to its customers — serving as a single-source provider of equipment while offering technical support throughout every project. **BP**

For more information please contact C.H. Reed, Inc <http://www.chreed.com/>

#### **AUTHOR BIO**

Neal Lorenzi is a freelance writer based in Mundelein, IL. He has covered a wide range of industries during his 25 years as a writer and editor.

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# WATTS WATER EXPANDS PLANT WITH ALUMINUM PIPING

By Kyri McDonough, Transair Marketing Services Coordinator, Parker Hannifin

*The 30,000-square-foot plant expansion needed to meet the strict federal and state mandates of the Reduction of Lead in Drinking Water Act. Transair's quick-connect interlocking system eliminated any need for using certain soldering materials, which may contain lead.*

► Throughout its history, Watts Water Technologies has prided itself on providing plumbing, heating, and water quality solutions that are in full compliance with federal and state mandates. With the Reduction of Lead in Drinking Water Act that took effect on January 4, 2014, Watts Water continued its commitment to compliance when it set to work planning a multi-million dollar lead-free foundry in Franklin, NH.

## Sixteen Plant Expansions Since 1959

The Franklin facility originally opened in 1959, and has undergone 16 expansions since then, more than tripling its square footage. This latest 30,000-square-foot expansion produces sand castings for many Watts Water brands. With thousands of suppliers worldwide, 80,000+ unique items offered in its catalogs, and customers in the residential,

commercial, industrial and municipal markets, it was “vital for Watts Water to meet the new lead-free standard,” says Cary Rosenberg, Watts Water’s Global Supplier Quality and Development Manager. The law establishes new limits on the lead content in every pipe, fixture, and fitting used to convey water for human consumption. The new foundry expansion produces lead-free products exclusively.

“There are hundreds of thousands of component level parts that go into making our products,” Rosenberg says. “In fact, the average household actually has about 40 of our products in it. With that kind of footprint, meeting the lead-free standard wasn’t a question. What it came down to was how we could do it in the most cost-effective manner without sacrificing quality.”



“There are hundreds of thousands of component level parts that go into making our products, In fact, the average household actually has about 40 of our products in it.”

— Cary Rosenberg, Global Supplier Quality and Development Manager, Watts Water

### Compressed Air Supports Multiple Processes

Compressed air is a critical element in the operations of the Franklin plant, which uses compressed air to power such equipment as cut-off saws, molding equipment, a sand mixing system, a conveyor system, a pneumatic turntable, and various hand tools. The addition needed to work seamlessly with the current facility, which already had a steel compressed air piping system in place. Due to the nature of the business, Watts Water was also facing an aggressive timeline to complete the expansion, so it needed a compressed air piping system that could be moved around easily and expanded as the new building was constructed.

Because steel is a familiar piping material to Watts Water, and its current system had a 6-inch header size, the company originally planned to install a steel compressed air piping system in the addition. However, steel systems are historically susceptible to corrosion and air leaks, which can lead to costly downtime and potential equipment damage down the road.

Costs associated with installation labor and man-hours were also a concern. The plans for the system included the installation of some 2,200 feet of pipe at varying diameters, so the installation process of a steel system would require bringing on experienced fitters who could use the bulky and heavy tools to do the job.

### Considering an Aluminum Piping System

In an effort to give Watts Water a value-added solution and reduce labor costs, the project's contractor, Granite State Plumbing & Heating of Weare, N.H., recommended an aluminum compressed air piping solution. Aluminum is lighter and easier to manage during the installation process, and doesn't require any soldering or welding, thus eliminating the need

for the installation team to have those skills. After considering several companies, Granite State chose Parker Hannifin's Transair product. The project's distributor was F.W. Webb Co. of Bedford, MA.

“We had many discussions about flexibility and cost, and that's what it really came down to for us,” Rosenberg says. “[Aluminum] is something very new for us. As a 140-year-old

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## WATTS WATER EXPANDS PLANT WITH ALUMINUM PIPING



company, we have some current systems in place and we were not thinking of something like this. But in the end, we were able to complete the project and make it compliant with the government regulation in half the anticipated time.”

During the planning process, the technology and concept of Transair appealed to Watts Water, “particularly in our brand new building,” Rosenberg says. Ultimately, it was Transair’s flexibility and durability that sold Watts on the product. Known throughout the industry for its high performance and used in a wide range of industries, the fast, flexible, and easy to modify Transair system proved to be an ideal fit for the project.

### Reduced Installation Costs and Time

With no need to solder, thread, or weld the pipe, man-hours for the installation were reduced by 50% from what they would have been with a steel installation. Transair’s quick-connect interlocking components allowed for easy and immediate layout modifications throughout the project, and the system was able to integrate seamlessly with the existing steel network. The easy installation proved to be a real cost benefit for Watts Water, as Transair systems typically account for just 20% of installation costs, compared to the 50-80% of such costs associated with traditional steel or black iron piping. By decreasing the budgeted man-hours by half, Granite State balanced the higher material cost and finished the installation in six weeks, well ahead of schedule.

Because of the fast installation time, Watts Water requested an additional 200 feet of



*Aluminum piping is designed to be a durable, lightweight alternative to traditional piping, making installation fast, easy, and flexible. Unlike traditional steel systems, it does not require experienced fitters or bulky, heavy tools to do the job.*

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## WATTS WATER EXPANDS PLANT WITH ALUMINUM PIPING



“As an added value, Transair eliminated the risk of lead being used during the installation, as certain soldering materials may contain lead.”

— Kyri McDonough, Transair Marketing Services Coordinator, Parker Hannifin



168mm header to the system in the existing building. Watts Water cut the ribbon to the plant on June 21, 2013. As an added value, Transair eliminated the risk of lead being used during the installation, as certain soldering materials may contain lead.

The only concern was the facility's ambient temperature. During the casting process in the plant, the temperature typically reaches up to 160 °F, and Watts Water was concerned that the aluminum piping wouldn't be able to cope with the heat as well as steel. Because of Transair's ability to maintain its integrity in high heat or below-zero temperatures, Granite State determined the atmosphere wouldn't be a detriment to the system.

“We've not had any issues with this system,” Rosenberg says. “I don't know of any downtime for that system at all.” 

For more information contact Kyri McDonough, Marketing Services Coordinator, Parker Transair, tel: 480-830-7764, email: [kyri.mcdonough@parker.com](mailto:kyri.mcdonough@parker.com), [www.parker.com/Transair](http://www.parker.com/Transair)

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Using Transair allowed Watts to reduce its projected man-hours by 50% and complete the project in six weeks, well ahead of schedule.

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# SHOW REPORT

## COMPRESSED AIR SYSTEMS FOR METAL FABRICATORS AT



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► The 30th edition of IMTS — The International Manufacturing Technology Show 2014 was the fourth largest IMTS in history and the largest six-day show ever with registration of 114,147 representing 112 countries. This was a 13.9 percent increase over IMTS 2012. IMTS covered more than 1.282 million net square feet of exhibit space and hosted 2,035 exhibiting companies.



Mike Tiedt (A-1 Air Compressor) and David Andrews (Sullair Compressors) were excited about the new 10-Year Diamond Warranty and product launches in the pipeline for Sullair rotary screw compressors.



Dorothy Samuel, Mike Infelise, Robert Geiger and Jerry Geenan from Atlas Copco next to their truly innovative and remarkably small GA15 VSD+ rotary screw compressor.

### Significant Orders Booked During IMTS

The show had a remarkable display of new and emerging technologies that will continue to revolutionize the manufacturing world. These innovations, including digital data integration, automation/robotics, in-line quality assurance additive manufacturing, and traditional equipment, offer solutions to all manufacturers who seek increased productivity and lower cost. Sold signs could be seen throughout the show.

Hydromat Director of Marketing Kevin Shults said this, “We are ecstatic about the results we are seeing. We had a really good show in 2012 and this was even better. We sold a \$1 million plus twin spindle machining center during the show and left with a large number of quality leads to carry us into 2015.”

Multi-spindle machines, multi-tasking machines, automation/robotics, digital data integration, in-line quality assurance and additive manufacturing technology were stars on the show floor.

“During IMTS 2014 there was a universal vibe among exhibitors, visitors and even students, that manufacturing is now THE place to be,” said Peter Eelman, AMT Vice President – Exhibitions and Communications. “Media from all over the world covering the first-ever 3D printed car build created this one-of-a-kind feel, and the entire community was caught up in the excitement.”



Chase Marshall, Peter Thompson and Brad Barger, from Suburban Manufacturing, presented their Tsunami air dryer (truly tailored for the automotive aftermarket industry) and the Moisture Minder condensate drain.

Even more exciting to exhibitors was the fact that customers came with buying intentions and a confidence that has not been seen in the manufacturing industry in many years. The evidence is clear in a capital spending survey released by Gardner Business Media Sept. 8, the opening day of the show, which predicts a 37 percent increase in metalcutting machine tool consumption in 2015.

### Co-Located Shows Enhanced the Value of IMTS for Both Visitors and Exhibitors

There were two co-located shows at IMTS: Industrial Automation North America (NA) and Motion, Drive & Automation North America (MDA NA). Deutsche Messe AG partnered with AMT - The Association For Manufacturing Technology to introduce MDA NA at IMTS 2014. Industrial Automation NA made its debut as a pavilion at IMTS 2012 and returned in 2014 as a co-located show.

Industrial Automation NA and MDA NA doubled floor space over the 2012 inaugural event to more than 50,000 square feet. "This year's IMTS and our co-located events, Industrial Automation North America 2014 and Motion, Drive & Automation North America 2014, were a huge success," said Larry Turner, CEO of Hannover Fairs USA. "Our two co-located trade shows highlighted the latest automation and motion drive technologies and trends. Many exhibitors across the show floor mentioned the noticeable increase in attendance, as well as attendee excitement about investing in the new technologies showcased specifically across our co-located events.

### See you in 2016

IMTS is a bi-annual show. IMTS 2016 will be held at Chicago's McCormick Place, Sept. 12-17, 2016. Visit [www.IMTS.com](http://www.IMTS.com)

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Frank Langro, from Festo Corporation, educated me on their Water Saver Circuit able to reduce the water consumption of robotic welding systems. Festo is also making it easy to measure differential pressure, flow and regulate pressure on production machinery.



Tim McDonald, Marty Christiansen, Steve Scherschel and Barry Schoenborn, from Thermal Transfer Products, presented their BPSW Series of brazed plate stainless steel heat exchangers.



Michael Fleming, from Spectronics, reported that sales to the compressed air industry are strong for their Marksman™II ultrasound leak detectors and Oil-Glo fluorescent dye oil-leak detection kits.



Michael Camber, Grayson Atkinson, Laurel Loch, Tracy Carter and Steve Dagovitz, from Kaeser Compressors, noted strong booth attendance and interest in standard rotary screw compressors and aluminum piping systems.



# THE COMPRESSED AIR SYSTEM ASSESSMENT

## Compressed Air Supply at a Metal Machining Plant

By Don van Ormer, Air Power USA

► This metal fabrication and machining facility produces high-quality precision-built products. Over the years, the plant has grown and there have been several expansions to the current location. The company currently spends \$227,043 annually on energy to operate the compressed air system. This figure will increase as electric rates are raised from their current average of 9.8 cents per kWh.

The set of projects recommended, as a result of the system assessment, could reduce these energy costs by \$89,092 or 39%. In addition, these projects include a centralized control system that will help plant staff maintain efficient compressor sequencing and monitor key system performance indicators on an ongoing basis. Estimated costs for completing the projects total \$156,000, representing a simple payback of 22 months.

The objective of this paper is to provide readers with an example of some of the information gathered, during a system assessment, *BEFORE* any conclusions or recommendations are made. This is information that any factory would do well to know and have on file.

### Measurements Set the Baseline

The following actions were taken to establish the baseline for flow, kW and pressure in the compressed air system.

1. Temperature readings were taken on all units with an infrared surface pyrometer. These were observed and recorded to relate to the unit's performance, load conditions and integrity.

2. Critical pressures including inlet and discharge were measured with Ashcroft digital calibrated vacuum and pressure test gauges with an extremely high degree of repeatability.
3. All units had the input kW measured with a Fluke motor analyzer and logged with a Hawkeye recording kW meter. Data goes to an MDL multi-line data logger.
4. The same basic measurement and logging activity was carried out for system pressure using an Ashcroft pressure transducer and the same multi-channel MDL data logger.

### The Existing Air Compressors

*All air compressors are in good working order and have performed reliably over time.*

**Area 1** compressed air is supplied by two Atlas Copco single-stage, lubricated, air-cooled rotary screw compressors. One is a GA90

constant speed, two-step controlled unit. This machine is a 125-hp class producing 498 cfm at 125 psi. The other GA90 is a variable-speed drive control (125-hp class), producing 549 cfm at 100 psig set discharge pressure.

**Area 2** compressed air supply consists of three Atlas Copco units. Two machines are GAU809 single-stage, air-cooled, lubricated rotary screws. They are 100-hp class producing 465 cfm at 125 psig rating. The third compressor is identical to the Area 1 variable-speed compressor.

**Area 3** compressed air supply has three Atlas Copco GA30 single-stage, lubricated, air-cooled rotary screw machines. These units are 40-hp class, producing 180 cfm at 125 psi discharge pressure.

The current system has controls on all but the GA90 VSD. The GA90 VSD is a 2-step load/no-load control. The variable speed

MEASURED AIR COMPRESSOR OPERATING DATA						
COMPRESSOR UNIT	GAU809 #1	GAU809 #2	GA90 VSD	GA90 VSD	GA90	GA30*
Model	Area 1	Area 1	Area 1	Area 2	Area 2	Area 3
Inlet Air Temp °F	47	OFF	48	48	47	70
Inlet psia	14.1		14.1	14.1	14.1	14.1
FL Flow (acfm)	465	465	549	549	498	180
Capacity Control Type	2-step	2-step	VS	VS	2-step	2-step
Discharge Pressure (PG) (psig)	95-100	—	101-104	101-104	101-104	89-92
Discharge Pressure (TG) (psig)	NA	NA	101-104	NA	NA	NA
Set Point (FL) (psig)	NA	NA	106	108	101	89
H <sub>2</sub> O In °F / H <sub>2</sub> O Out °F	—	—	—	—	—	—
Calculated Full Load kW	91	NA	107	107	95	—
Measured Full Load kW	91	OFF	104	103	95	35
PKG Discharge Air Temp °F	89	—	88	85	71	82
Air End Discharge Air Temp °F	—	—	171	178	172	—

\*The other two GA30 units in Area 3 were OFF.

units can vary their speed from 600 rpm to 3,260 rpm. The current units have capacity controls capable of translating “less air used” into a comparable reduction in electric cost. These controls will not work effectively with the current piping and air receiver storage situation.

The normal operating band of the compressed air supply is 10 psig. The effective storage capacity is created by the location where this band is neutralized. The current sequencer system for the two GAU809 units does not appear to benefit the system. This system assessment will recommend a central control system working off a target pressure set-point; with interface with the company-wide enterprise energy monitoring system.

### Non-Existent Maintenance of the Desiccant Dryers

Key features of the plant’s current dryers are displayed in the table below. According to plant personnel, the three heatless desiccant dryers are not required for an acceptable dewpoint. These three dryers consume 265 scfm of compressed air for regeneration (purge air). The expected dewpoint from these dryers is in the -40 °F PDP range, as compared to the dewpoint of a refrigerated non-cycling dryer of +40 °F PDP.

All equipment requires maintenance and compressed air dryer maintenance has been non-existent. This was evident during our site visit. The three desiccant dryers were functioning, yet certainly not delivering the design dewpoint due to the maintenance neglect.

- The purge air mufflers are coated with oil and oil vapor was evident coming out during purge. Maintenance issue; likely desiccant replacement needed, prefilters need to be maintained and mufflers changed.
- On one DH560 unit, water and oil have twice been drained out of the prefilter trap and the afterfilter manual drain. This situation indicates that the desiccant in all likelihood is coated with oil and also

receiving liquid water — the desiccant will only adsorb water vapor. Maintenance issue; filter drains must be maintained or replaced and the desiccant must be replaced.

- We drained the desiccant dryer main header several times from a drain leg and removed significant continuing amounts of liquid water. If the dryers were delivering air at -40 °F, the pipe would be dry.

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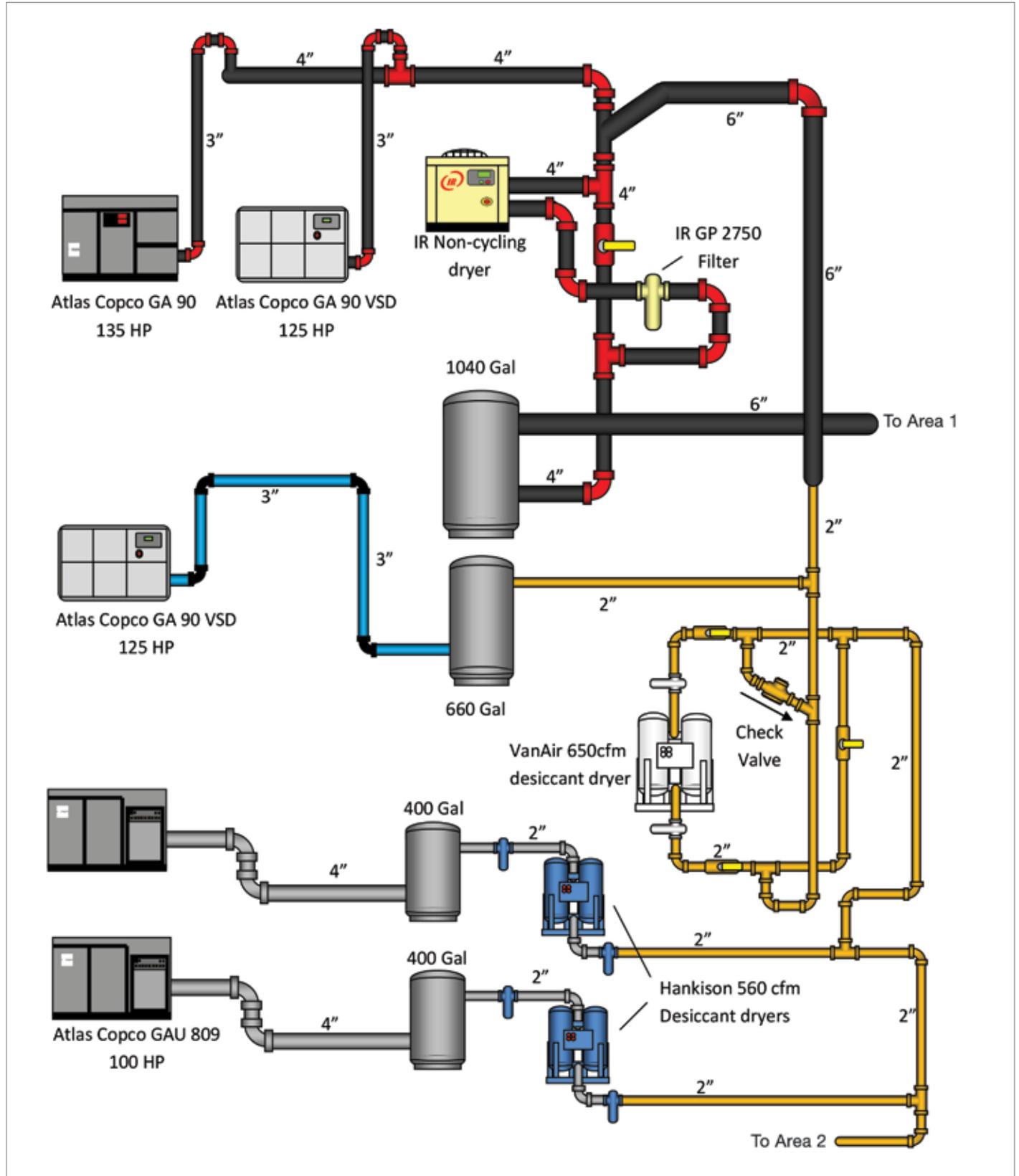
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Areas 1 and 2 Compressed Air Supply

### Refrigerated Dryers and Condensate Drains

The refrigerated dryers have also not been maintained. This was most evident when looking at the condensate drains. Area 1 uses a non-cycling refrigerated dryer rated for 2,479 cfm air flow (IR TS13A). It uses a timer drain which appears to be working although it shuts off while a significant amount of liquid condensate is still being expelled. This again is a maintenance issue. It is probable that the liquid condensed water vapor is not being completely removed and is contaminating the system. There is evidence of oil and/or water leaking from the discharge line of the 1,040-gallon dry receiver.

We could not measure the pressure dewpoint of the system because high moisture/liquid levels would damage the probe. It is not necessary to measure pressure dewpoint when visible water is present. The pressure dewpoint is at least as high as the room air (65-70 °F).

Production, nevertheless, appears to be normal with no identified moisture problems — even with these high pressure dewpoints. The receiver, filter, and piping are keeping the liquid water away from the critical processes.

The MotivAir dryer in Area 3 was not working on this visit. It was working correctly on the first visit. More standard maintenance issues. When the dryer is off and air is flowing, the wet air is placing liquid condensate into the compressed air system. The moisture present in the piping of Area 3 will have to be evaporated in the future by dry air coming into the system.

SUMMARY OF INSTALLED COMPRESSED AIR DRYERS					
MANUFACTURER	VANAIR	HANKISON	HANKISON	MOTIVAIR	IR
Model	HL-650	DH560	DH560	DCE1200	TS13A
Unit Type	Desiccant	Desiccant	Desiccant	Refrigerated	Refrigerated
Design Dewpoint	- 40 °F	-40 °F	- 40 °F	+ 40 °F	+ 40 °F
Rated Flow @ 100 °F/100 psig	650	560	560	1,200	2,479
Purge: scfm kW	97.5	84	84	NA	NA
Full Load Refrigerated kW	NA	NA	NA	5.7	19.67
Full Load Blower kW	NA	NA	NA	NA	NA
Total Full Load kW	NA	NA	NA	5.7	19.67
% Load w/ Dew Point Demand Control or Cycling Refrigeration	100%	100%	100%	30%	100%
Net Electric Demand (kW)	NA	NA	NA	1.7	19.67
Total Annual Cost (\$/yr purge air)	\$14,063	\$12,116	\$12,116	\$1,459	\$16,886

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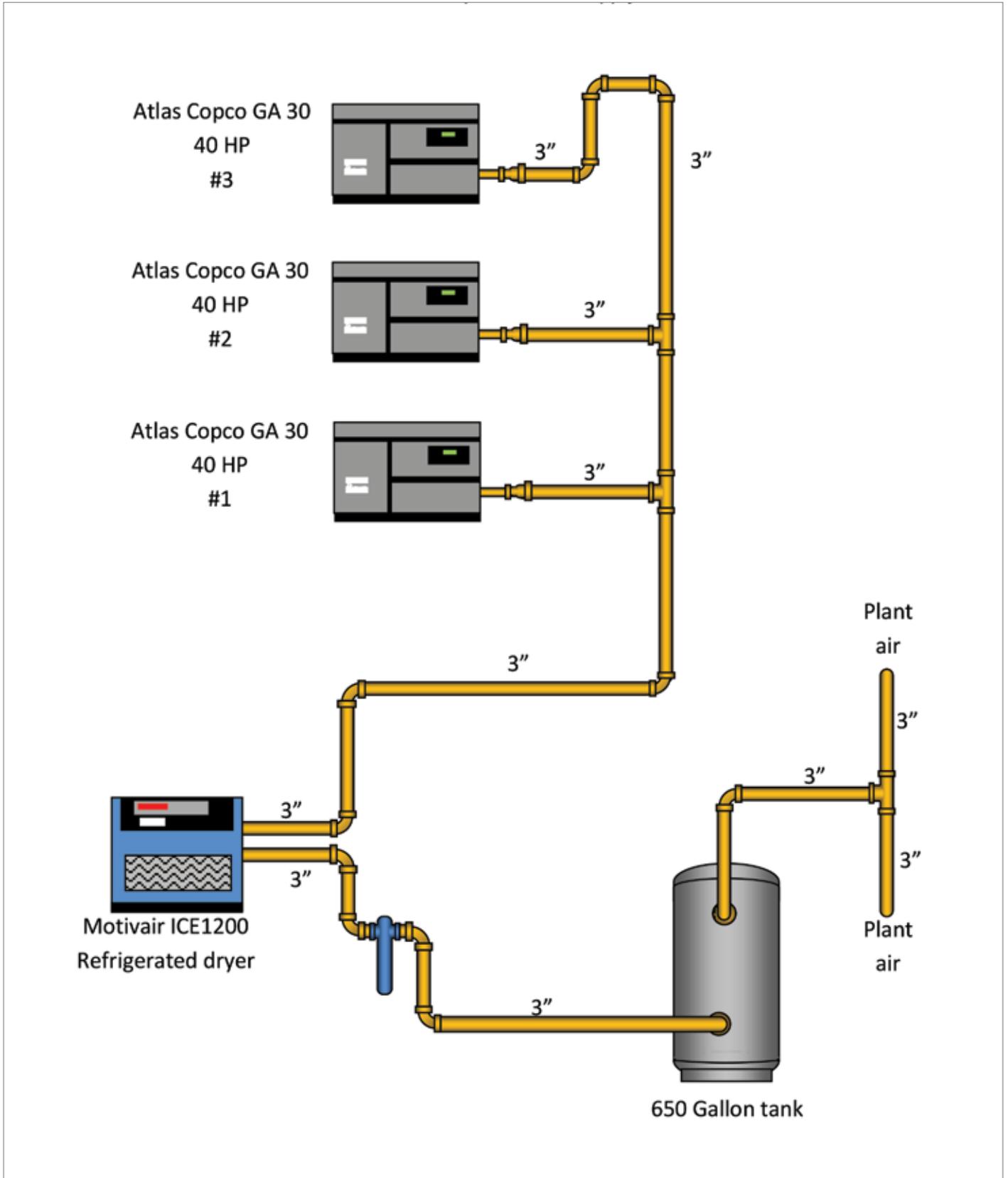
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# THE COMPRESSED AIR SYSTEM ASSESSMENT | Compressed Air Supply at a Metal Machining Plant



### Establishing the Current System Demand and Energy Baseline

Annual plant electric costs for air production, as running today, are \$209,058 per year. If the electric costs of \$18,345 associated with operating ancillary equipment such as refrigerated dryers are included, then the total electric costs for operating the air system are \$227,403 per year. These estimates are based on a blended electric rate of \$0.098 /kWh.

The Area 1 and Area 2 compressed air system operates 8,760 hours a year and the Area 3 compressed air system operates 6,240 hour per year. The load profile of the Area 1 and 2 systems is not relatively stable during all shifts. According to plant personnel, this is the average production profile of Areas 1 and 2:

#### Areas 1 & 2 Demand Profile

Production hours with air on	6,240 hrs
Non-production hours with air on	2,520 hrs
Total hours	8,760 hrs

#### Areas 1 & 2 Production Lines:

10% of the hours -- Three production lines	624 hrs
50% of the hours -- Two production lines	3,120 hrs
15% of the hours -- One production line	936 hrs
25% of the hours – Lines Idle	1560 hrs
Total hours	6,240 hrs

With these production profiles, there are no production lines running (in Areas 1 and 2) 47% of the total year or 4080 hours (2520 hours + 1560 hours) out of 8760 total hours.

MEASURE	1 LINE	2 LINES	3 LINES	NON-PRODUCTION	AREA 3
Average System Flow	1,140 cfm	1,690 cfm	2,155 cfm	428 cfm	121 cfm
Avg Compressor Discharge Pressure	103 psig	101 psig	95 psig	70 psig	95 psig
Average System Pressure	100 psig	99 psig	92 psig	70 psig	95 psig
Input Electric Power	274 kW	351 kW	430 kW	83 kW	28 kW
Operating Hours of Air System	936 hrs	3,120 hrs	624 hrs	4,080 hrs	6,240 hrs
Specific Power	4.16 cfm/kW	4.81 cfm/kW	5.01 cfm/kW	5.15 cfm/kW	4.32 cfm/kW
Electric Cost for Air /Unit of Flow	\$22.64 /cfm yr	\$63.50 /cfm yr	\$12.20 /cfm yr	\$77.54 /cfm yr	\$141.50 /cfm yr
Electric Cost for Air /Unit of Pressure	\$125.66 /psig/year	\$536.60 /psig/year	\$131.45 /psig/year	\$165.93 /psig/year	\$85.61 /psig/year
Ann'l Elec Cost for Compressed Air	\$25,133 /year	\$107,321 /year	\$26,295 /year	\$33,186 /year	\$17,122 /year
Annual Elec Cost — All Shifts	\$209,058				

\*Based on a blended electric rate of \$0.098 per kWh, 8,760 hours/year.

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# THE COMPRESSED AIR SYSTEM ASSESSMENT | Compressed Air Supply at a Metal Machining Plant

## Data-Logging the Individual Air Compressors

All the air compressors are working reliably and as they were designed to perform. The issue here is the gradual plant expansions have made all the interconnecting air compressors not work together as originally planned. This

is a common occurrence in growing factories. Below is a summary of our observations gathered from data logging the individual air compressors.

When One Production Line is Operating:

- GAU809 Unit #1 at part load at 51 kW average (40% load)

- Area 2 VSD GA90 at minimum load @ 25.5 kW average
- Both Area 1 compressors at full load
- Pressure at 103 psi according to plant personnel.

When Two Production Lines are Operating:

- GAU809 Unit #1 at part load and 67 kW average
- Area 2 VSD GA90 at part load — higher load — 82 kW average
- Both Area 1 compressors at full load
- Pressure at 101 psi.

When Three Production Lines are Operating:

- GAU809 Unit #1 / Unit #2 turns on — both at part load
- Area 2 VSD at part load — 82 kW
- Both Area 1 compressors at full load
- Pressure fell to 95 psig.

## Conclusion

Factories often outgrow the design of their compressed air systems. The individual components perform well, if properly maintained, but the new “add-on” systems no longer allow each air compressor to operate optimally. The objective of this article is to encourage factories to gather the above data (and drawings) of their compressed air systems if they believe this may be their situation. In any event, this is information any owner of a compressed air system would do well to maintain up to date and on file. **BP**

For more information contact Don van Ormer, Air Power USA, tel: 740-862-4112, email: don@airpowerusainc.com, www.airpowerusainc.com

To read more **System Assessment** articles, visit [www.airbestpractices.com/system-assessments/compressor-controls](http://www.airbestpractices.com/system-assessments/compressor-controls)

COMPRESSOR USE PROFILE — CURRENT SYSTEM							
UNIT #	COMPRESSOR: MANUFACTURER/MODEL	FULL LOAD		ACTUAL ELEC DEMAND		ACTUAL AIR FLOW	
		DEMAND (KW)	AIR FLOW (ACFM)	% OF FULL KW	ACTUAL KW	% OF FULL FLOW	ACTUAL ACFM
1 Production Line: Operating at 103 psig discharge pressure for 936 hours							
1	Area 1 VSD	107	549	100%	106	100%	545
2	Area 1 GA90	95	498	100%	96	100%	498
3	Area 2 VSD	107	549	21%	23	0	0
4	Area 2 GAU 809	91	465	44%	49	20%	93
5	Area 2 GAU 809	91	465	OFF			
<b>TOTAL (Actual):</b>				<b>274 kW</b>		<b>1,140 acfm</b>	
2 Production Lines: Operating at 101 psig discharge pressure and 3,120 hours							
1	Area 1 VSD	107	549	100%	105	100%	549
2	Area 1 GA90	95	498	100%	95	100%	498
3	Area 2 VSD	107	549	76%	82	75%	411
4	Area 2 GAU 809	91	465	76%	69	50%	232
5	Area 2 GAU 809	91	465	OFF			
<b>TOTAL (Actual):</b>				<b>351 kW</b>		<b>1,690 acfm</b>	
3 Production Lines: Operating at 95 psig discharge pressure and 624 hours							
1	Area 1 VSD	107	549	100%	102	100%	549
2	Area 1 GA90	95	498	100%	93	100%	498
3	Area 2 VSD	107	549	76%	80	75%	411
4	Area 2 GAU 809	91	465	88%	80	70%	325
5	Area 2 GAU 809	91	465	92%	75	80%	372
<b>TOTAL (Actual):</b>				<b>430 kW</b>		<b>2,155 acfm</b>	
Non-Production/Weekends: Operating at 70 psig discharge pressure and 4,080 hours							
1	Area 1 VSD	107	549	78%	83	78%	428
2	Area 1 GA90	95	498	OFF			
3	Area 2 VSD	107	549				
4	Area 2 GAU 809	91	465				
5	Area 2 GAU 809	91	465				
<b>TOTAL (Actual):</b>				<b>83 kW</b>		<b>428 acfm</b>	
Area 3 Plant: Operating at 7 psig discharge pressure and 6,240 hours							
1	Area 3 GA30	35.5	180	79%	28	67%	121
2	Area 3 GA30	35.5	180	OFF			
3	Area 3 GA30	35.5	180				
<b>TOTAL (Actual):</b>				<b>28 kW</b>		<b>121 acfm</b>	

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# SHOW REPORT

## AERATION BLOWERS AT

# weftec® 2014

the water quality event™

By Rod Smith, Compressed Air Best Practices® Magazine

► WEFTEC continued to solidify its reputation as the world-class water quality event by setting new records during its latest event held September 27-October 1, 2014. A total of 20,385 registrants and 1,027 companies, using 303,075 net square feet of exhibition space, participated at the New Orleans Morial Convention Center. As the host of thousands of water professionals and water companies from nearly 100 countries, WEFTEC 2014 — the Water Environment Federation's (WEF) 87th annual technical exhibition and conference — is officially the largest showing for WEF in the famed Crescent City.

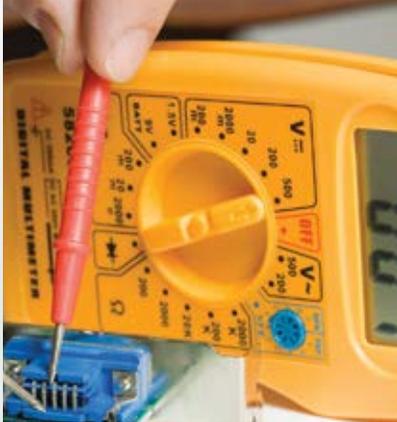
“The notable showing in New Orleans says that WEFTEC is an important industry event but also speaks to the value and importance of water as a big picture issue that links to all aspects of modern society,” added

WEF Executive Director Eileen O'Neill. “WEF understands that and has worked hard to stretch ourselves beyond what has traditionally worked, which demonstrates our willingness to change to meet the evolving needs of our members, attendees, and the entire water sector.”

Reinforcing this concept was the Opening General Session, which officially kicked off the conference on Monday, Sept. 29. Built around a central theme of embracing change in a disruptive age, the program featured complementary and inspiring remarks from Ralston and best-selling author and transformative change expert, Luke Williams.

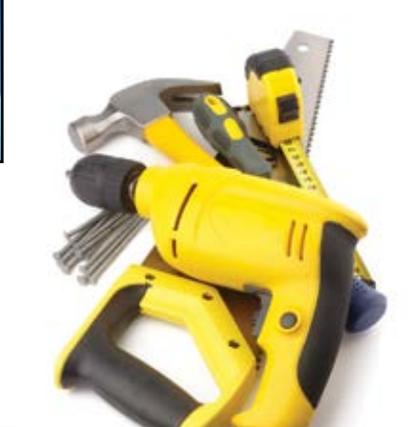
Later that morning, conference attendees were further encouraged to learn from the past but focus on the future during the Great Water Cities Session. Featuring opening remarks from EPA Administrator Gina

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## SHOW REPORT: AERATION BLOWERS AT WEFTEC® 2014



Gregory Kist, Diane Willms and Mark Trimeloni from Q-Vac Priming Systems.



Paul Mosier, Karl Jacobsen, Tony Dorsey, Shawn Boynton, Craig Stokes, John Troyer and Rick Nash from Gardner Denver.



Sebastian Bidault, Lee Ann Hellums and Zachary Azra from Atlas Copco.

McCarthy, the panel of water leaders from France, New Zealand, and New York shared examples of how their cities are coping with natural disasters, extreme weather events, and future growth. McCarthy led the call for an increase in partnerships and collaboration among all sectors and nations to help solve our world's water situations.

Another important opportunity explored at WEFTEC 2014 was the connection between water and the economy. Three high profile press events, featuring national and local luminaries such as Administrator McCarthy and New Orleans Mayor Mitch Landrieu, highlighted this connection and examined both the national and local benefits of investing in our nation's water infrastructure, including job creation and stronger international competitiveness.

### Aeration Blower Technology

The blower market, focused on industrial and municipal wastewater markets, is in a very dynamic state. Component technology and vendors are in a constant state of change as new blower, sensor, mixing and diffuser technologies are introduced to meet the growing demand in this market. As population growth accelerates putting pressure on both energy and water supplies, industry and municipalities (who also face physical space challenges) are forced to improve the efficiencies of their wastewater systems. Fortunately, as they say, we have the technology!

The Gardner Denver team struck me this year as particularly energized. Their extremely deep product line-up of positive displacement blowers (helical screw and tri-lobe, straight tri-lobe and lobe) offers flows to 16,800 cfm, pressure to 20 psi, vacuum to 17" HG and wet vacuum to 24" Hg. This PD line-up has now been complemented by the integration, into the Gardner Denver line-up, of the Robuschi Robox oil-free screw blower. This rotary screw blower line has recently been expanded and now goes from 40 to 600 horsepower and to pressures up to 36 psi.

Atlas Copco has completed the integration of HSI and now offers clients access to all major blower technologies including multistage centrifugals, high-speed turbos with air bearing and oil-free rotary screws. The company is celebrating the five-year anniversary of having introduced their rotary screw blower product line offering all the efficiencies, control configurations and packaging we're familiar with from the air compressor side.

# 2015 ENERGY SHOWS

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## GLOBALCON™ *Energy, Power, & Facility Management Strategies & Technologies* 2015

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GLOBALCON, presented by the Association of Energy Engineers, is designed specifically to help energy managers, facility managers, VP's of operations, building owners, property managers, energy engineers and directors of utilities get up to speed on the latest developments in the energy field, explore promising new technologies, compare energy supply options, engage energy management initiatives and learn about innovative and cost-conscious project implementation strategies.

### June 3-4, 2015

Long Beach Convention Center, Long Beach, CA  
[www.energyevent.com](http://www.energyevent.com)

The WEST COAST ENERGY MANAGEMENT CONGRESS, is the largest energy conference & technology expo held on the U.S. West Coast specifically for business, industrial and institutional energy users. It brings together the top experts in all areas of the field to help you set a clear, optimum path to energy savings and retrofit strategies.

WEST COAST  
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Energy Management Congress



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Now in its 38th year, the WORLD ENERGY ENGINEERING CONGRESS, is recognized as the most important energy event of national scope for end users in all areas of the energy field. A comprehensive forum where you can assess the "big picture" and see exactly how the economic and market forces, new technologies, regulatory developments & industry trends all merge. Concurrent programs include GreenStreet and FemWorks (Federal Energy Management Workshops).

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## SHOW REPORT: AERATION BLOWERS AT WEFTEC® 2014



*Aerzen's Performance<sup>3</sup> campaign represents their ability to offer turbo, hybrid and positive displacement blowers.*



*Glenn Schultz and Manuel Diaz from Piller TSC.*



*Ashley Delrosso, Nikki Purser, Vic Miolee, Sam Cameron, Wiekert Miolee and Al Nevins from United Blower.*

Aerzen USA, led by President Pierre Noack, has been on a notable run. They informed me that their LEED Certified headquarters, inaugurated only a few years ago, is already undergoing a significant expansion (including a new testing facility) and are recruiting service technicians nationwide. Their Performance<sup>3</sup> marketing campaign is resonating with users who are offered a choice of three technologies; high-speed turbo blowers, hybrids (some using rotary screw and others twisted rotors) with VFD drives, and positive displacement blowers. Most important is the application engineering process they walk customers through to find the optimal technology application. Sometimes the right answer is a PD blower for the base load and a turbo for trim.

Kaeser had their very important launch of their new line-up of rotary screw blower packages. The EBS and FBS Series blowers offer a flow range from 530 to 2366 cfm and pressures from 4.4 to 15 psig. The power saving Sigma Profile rotary screw airend and the Sigma Control 2™ controller that we know from the air compressors are standard features with Wye delta starters or VFD drives. Kaeser continues to offer the rotary lobe blower and is coaching clients on when to use which technology (or when to combine the two) with the rotary screw VFD excelling in variable load (trim) applications.

GE Roots really caught my attention with their centrifugal blowers featuring optimized Inlet Guide Vanes coupled with variable speed drive controls. This is a company worth watching as some technologies appear to be imminent in the pipeline. Gardner Denver's Hoffman & Lamson's team had an impressive booth and is introducing "Next Generation Control" featuring VSD control on their multistage (up to 4 stage) centrifugal blowers offering pressures to 14.7 psi and vacuum to 29.9" Hg.

United Blower is a Georgia-based company led by owner and industry veteran Vic Miolee. They have recently introduced a high-speed direct-driven turbo blower completely "Made in the USA." The 75-300 horsepower product line uses airfoil bearings and permanent magnet motors. Air flows range up to 7,500 scfm with pressures up to 15

psig. This line complements their traditional “Quiet Pulse” range of PD blowers.

Sulzer’s ABS HS2 turbo blower featuring magnetic bearings has been growing significantly in sales. Dave Parsons reports the overall package efficiency is gradually replacing more traditional technologies used in wastewater applications. Eurus Blower also exhibited and report they have quietly and steadily built a nice business over the past five years focusing primarily on blower packagers. Industry veteran Glenn Schultz discussed the growth of Piller TSC in the U.S. with their Pill Aerator turbo featuring magnetic bearings which is adding new models to the line-up.

Last but far from least, I learned a lot from Q-Vac Priming Systems. Their vacuum pumps reduce pressure in the water pipes to flood centrifugal pumps that need to be flooded before start-up. One Q-Vac pump can be used to prime multiple pumps and maintain them ready to perform. The company also helps users replace air knives and vacuum venturis with de-centralized blower/vacuum systems.

**About WEF**

Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit technical and educational organization of 36,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. WEF members, Member Associations and staff proudly work to achieve our mission to provide bold leadership, champion innovation, connect water professionals, and leverage knowledge to support clean and safe water worldwide. To learn more, visit [www.wef.org](http://www.wef.org).

**See you in 2016** BP

Continuing the two-city rotation between Chicago and New Orleans, WEFTEC 2015 is scheduled for September 26-30, 2015 at McCormick Place in Chicago, Ill. In anticipation of a successful showing next year, 848 companies have already reserved more than 303,000 square feet of exhibit floor space for 2015. Visit [www.weftec.org](http://www.weftec.org)

To read more **Blower Technology** articles visit [www.airbestpractices.com/technology/blowers](http://www.airbestpractices.com/technology/blowers)



Dave Parsons and Edward Paro from Sulzer.



Peter Werhahn, Stephen Horne, Kim Pulford and Michael Camber from Kaeser.



George Hubbard and Ronnie Underwood from Gardner Denver Hoffman & Lamson.



# RESOURCES FOR ENERGY ENGINEERS

## TECHNOLOGY PICKS

### New FS-Elliott Polaris+ Centrifugal Air Compressors

FS-Elliott Co., LLC, a leading manufacturer of centrifugal air and gas compressors, recently launched their Polaris+ series. Building on the design of FS-Elliott's original industrial compressors, the Polaris+ line incorporates several new product advancements developed to increase reliability and efficiency while maintaining the lowest cost of ownership in the industry. The new Polaris+ series consists of five models with flows ranging from 900 to 11500 icfm, 250 to 3000 hp, and pressures up to 150 psig.



Polaris+ air compressors introduce mechanical and aerodynamic improvements that provide a step-change in compressor performance, reduction in mechanical losses, and enhancements in package reliability. Patent-pending technology and industry-leading aerodynamic components ensure that plant operators realize reduced power consumption, resulting in lower energy costs.

Internal and external surfaces of the Polaris+ units feature enhanced coatings designed to further extend product life and resist corrosion

in both standard and extreme operating conditions. Recent package improvements include the flexibility for future upgrade consideration and allow for simple and compact installation at facilities with space limitations.

Customers can now select from a wider variety of compressor control modes with the R1000, the latest controller in the Regulus Control System series designed specifically for Polaris+ units. "Powerful new energy-saving and convenience features have been developed for the R1000 to complement and extend the capability of our proven control algorithms. As a result, customers can expect significant energy savings over traditional control technology," explains Ed Klimek, Manager System Controls Engineering. As an added benefit, the R1000 features the industry's first standard 9-inch full touch-screen display, resembling the user interface of a tablet device.

"The Polaris+ series represents our commitment to continually delivering best-in-class efficiency, lowest downtime when maintenance is necessary, and the lowest life cycle cost. From a user perspective, this means with FS-Elliott they are always staying one step ahead of traditional compressed air technology," added John Badini, Senior Product Engineer.

To learn more about Polaris+ air compressors, please visit [www.fs-elliott.com](http://www.fs-elliott.com)

### About FS-Elliott Co., LLC

FS-Elliott Co., LLC, is a leading manufacturer of centrifugal air and gas compressors with sales, service, and manufacturing locations around the world. First introduced to the market over 50 years ago their energy-efficient machines incorporate the latest aerodynamic and control system technologies to ensure optimum performance. For more information, visit [www.fs-elliott.com](http://www.fs-elliott.com)

## TECHNOLOGY PICKS

### Trillium CNG and Holiday Stationstores Open New CNG Station

A grand opening ceremony was conducted at the Holiday station located at 3931 West First Street in Duluth, Minnesota. This marks Holiday's first compressed natural gas (CNG) product offering to its customers. Trillium CNG™ designed, built and will maintain the public access fast-fill CNG station.

The ribbon cutting ceremonies included remarks from representatives from Trillium CNG, Holiday and local government officials. The event also featured a CNG fueling demonstration, equipment tour and open house.

"We are honored to be working with an innovative and respected fuel marketer like Holiday Stationstores who recognizes the importance of making CNG available in the Duluth area," said Mary Boettcher, president of Trillium CNG. Boettcher added that fleet operators know we stake our reputation on delivering a great fueling experience to our customers — fast, safe and reliable.

According to Brian Ochocki, vice president of finance for Holiday, "CNG is a lower-cost solution with much more stable retail prices than gasoline or diesel, due to the lower supply cost of natural gas when compared to other petroleum products. Natural gas also offers a variety of environmental benefits including lower greenhouse gas, carbon dioxide and particulate-matter emissions."

The public access CNG station will have easy access for heavy-duty fleet trucks and will be open 24 hours a day, seven days a week. The dual hose dispenser will allow two trucks to fuel at the same time, and will feature Trillium CNG's proprietary fast-fill hydraulic intensifier compressor.



#### About Holiday Stationstores

Holiday Stationstores, a Minnesota-based privately owned company, has 496 corporate and franchise locations in 10 states throughout the upper tier of the United States and Alaska.

#### About Trillium CNG

Trillium CNG, a subsidiary of Integrys Energy Group, Inc., is a leading provider of CNG to fleets. They offer complete facility design, construction, operation and maintenance services. The company focus is on providing fueling assistance to heavy-duty fleets that require high performance solutions. For more information, visit [www.TrilliumCNG.com](http://www.TrilliumCNG.com).

#### About Integrys Energy Group, Inc.

Integrys Energy Group, Inc. (NYSE:TEG) is a diversified energy holding company with regulated natural gas and electric utility operations (serving customers in Illinois, Michigan, Minnesota and Wisconsin), an approximate 34 percent equity ownership interest in American Transmission Co. (a federally regulated electric transmission company) and nonregulated energy operations. For more information, visit [www.integrysgroup.com](http://www.integrysgroup.com).

## RESOURCES FOR ENERGY ENGINEERS

### TECHNOLOGY PICKS

#### DENT Instruments Launches All-New PowerScout 3037 Power Meter

DENT Instruments, a global leader in the design and manufacture of power and energy measurement instruments, announced the introduction of the all-new PowerScout 3037 Revenue-Grade Networked Power Meter. The PowerScout 3037, which replaces all models of the PowerScout 3 Plus, monitors voltage, current, power, energy, and many other electrical parameters on single and three-phase systems.



The PowerScout 3037 is equipped with several key new features including a USB port for quick setup, optional display for diagnostics and reading real-time values, and DIN rail mounting. In addition to Modbus and BACnet communications, Serial RS-485 and Ethernet communications are now available in the same unit. Easily toggle between communication methods, protocols, and other parameters in the field using the USB port and ViewPoint software.

Christopher Dent, President of DENT Instruments said, “The PowerScout 3037 is our most flexible submeter yet. Instead of having one specific meter for a job, the PowerScout 3037 can adapt to nearly any project requirement. Settings for communications and CTs are easily changed in the field, thanks to the new USB port. The PowerScout 3037 works with a broad range of current transformers, including flexible R0Coils for large amperage loads. All PowerScout meters are line-powered and operate on any voltage service from 80-600VAC.”

The PowerScout Series networked power meters are designed to provide timely and accurate consumption data to gain the upper hand on electrical costs in today's escalating energy market. PowerScout meters can capture kWh/kW energy and demand data as well as virtually all relevant energy parameters for diagnostics and monitoring on three-phase or single-phase circuit installations. The PowerScout's flexibility, size, and ease-of-use make them ideal tools for gathering detailed consumption data in commercial, industrial, government, and retail environments.

DENT Instruments is a leading supplier of an array of precision measurement instrumentation and analytical software in the field of energy management.

Visit [www.DENTinstruments.com](http://www.DENTinstruments.com)

## TECHNOLOGY PICKS

### Specialized Ashcroft High Static, Low DP Switch

Measuring a low differential pressure across a restriction in a high pressure line requires both a sensitive elastic element and a heavily-constructed containment vessel. The Ashcroft® DDS-Series differential pressure switch combines both attributes, enabling it to control differential pressures from 0/6 to 0/150 Inches of Water on pressure lines up to 1500 psi. UL Listed NEMA 4 water-tight and NEMA 7 explosion-proof versions are available with a choice of electrical switches, wetted materials and setpoint options. Encased in a cast-aluminum housing, DDS pressure switches employ a near frictionless switching mechanism for superior repeatability.

Visit [www.ashcroft.com](http://www.ashcroft.com)



## COMPRESSED AIR BEST PRACTICES® www.airbestpractices.com

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Company	Page	Web Site
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Atlas Copco	Inside Front Cover	<a href="http://www.atlascopco.us">www.atlascopco.us</a>
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