ULTIMA: The latest innovation to meet customer demands in the Food & Beverages Industry

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Two key trends have emerged in recent times from organisations using compressed air systems. First of all, businesses are demanding higher quality, more efficient and compact compressor units, designed to deliver the highest standards of air purity and performance. Secondly, companies are seeking effective means of managing and optimising compressed air usage, to ensure they are consistently improving productivity while reducing energy consumption. Here, CompAir discusses the latest innovations available to meet these demands.

The Ultimate Compressor Solution for Food & Beverage Industries

For those seeking the latest compressor technology, CompAir has introduced Ultima, a revolutionary new, water-cooled oil-free compressor, offering up to 12 per cent improved energy efficiency compared to a conventional two-stage machine with a 37 per cent smaller footprint.

Launched as part of the company's PureAir range, Ultima is available in models from 75 kW to 160 kW and is designed for best in class performance, for applications that demand the highest levels of air quality and purity.

Unique Drive Optimisation - No Gear Box Required

Unlike standard oil-free compressors, which have a single motor and mechanical gearbox design to drive the low and high pressure air ends, Ultima uses the U-Drive

concept - two, high-efficiency, permanent magnet motors which replace the gearbox and single motor. These variable-speed motors, powered by an inverter, can achieve speeds of up to 22,000 rpm and deliver efficiencies greater than IE4.

While conventional variable-speed machines are already well proven in numerous applications and deliver high energy efficiency, the two stages of compression are linked mechanically, meaning they need to speed up and slow down at the same time.

Ultima, however, is different. By removing the gearbox and single motor entirely and replacing with two U-Drives powered by two separate inverters, each airend stage is now driven directly and independently, for even greater performance. An intelligent digital gearbox design then monitors and adjust the speeds of each aired continuously, ensuring maximum efficiency and pressure ratios at all times.

In addition, the design of the compressor achieves hugely reduced friction, resulting in an oil-free compressor with the highest levels of efficiency throughout its full turndown range.

Ulrich Thomes, Senior Technical Engineer from CompAir, who led the engineering team responsible for Ultima's unique design said, "From the outset we had clear requirements for the specification of Ultima's drive unit and found that no current-generation motor was able to deliver the efficiencies required. U-Drive is a true, next-generation motor and the result of three years' development. We believe that this is one of the most advanced compressor drive technologies available to customers today and ideal for a pioneering product such as Ultima."

Ultima™ – The real deal

The unique patented design delivers numerous benefits to compressed air users in Food, Beverages & Pharma:

- 100% oil and silicone free and meet ISO 8573-1 Class Zero (2010),- Highest levels of air quality.
- Highest efficiency levels - Low running costs.
- Low noise design - Installation at point of use.
- LP & HP airends individually driven - Energy efficient across the flow range.
- Very efficient heat recovery - Most efficient machine.
- Easy installation - No ducting required
  On-board monitoring - Very user-friendly.
- Available with iConn remote monitoring - IoT connected.

Maximum Energy Recovery

Around 94 per cent of compressor energy is converted in to heat, which, unless it is captured, is vented in to the atmosphere as wasted energy. Ultima uses a bespoke, closed loop water cooling system to ensure that the maximum amount of energy can be recovered from the complete compressor package, taking heat directly from the major components, including the motors, inverters, airend jackets and the oil circuit.

This results in up to 12 per cent better overall heat recovery than a standard two-stage oil-free compressor, for even greater levels of efficiency. Furthermore, Ultima also acts as a high-efficiency water heater, heating the cold water that enters the compressor, which can then be used for other applications.

Superior Cooling and Ventilation

For maximum efficiency, the air entering a compressor should be as cool as possible, so Ultima is engineered to ensure that no warm air is vented in to the compressor room. Instead, this warm air is processed within the machine enclosure and, using a heat exchanger, the air is cooled and then recirculated via the base frame around the compressor. As a result, no heat is wasted, no dust or particulate matter enters the compressor and the inlet air stays cool.This also helps to reduce installation time and expense significantly as there is no requirement for additional ducting.

With a noise level of only 69 dB(A), Ultima is extremely quiet, meaning that Ultima can be installed easily at the point of use, rather than housed in a separate compressor room, eliminating the need to install and maintain pipework, to maximise efficiency further.

Energy Optimised

Ultima's engineering team have considered energy consumption at every stage of the design, to create a compressor which, in idle mode, uses 45% less energy than a conventional 2 stage compressor. This can require as little as 8kW of electricity to power a 160kW compressor when idling.

Elsewhere, an intelligent control concept has eliminated the need for an air unloader valve, effectively eliminating the pressure drop that occurs as a result of a compressor controlling the volume of air entering the aired. This also improves maintenance efficiency, as it is one less component to service and replace routinely.

Design Excellence

Ultima uses approximately 20 per cent less parts than a standard oil-free compressor, helping to reduce maintenance requirements and compressor reliability.

iConn – Smart Flow Management

As Industry 4.0 is driving manufacturers to share and analyse asset data, customers are demanding more intelligent insights into their compressed air performance that will remove risks, improve productivity and reduce energy consumption. As a result, CompAir has launched iConn, a cloud-based, air management platform that enables operators to manage, optimise and improve compressed air-based services.

The CompAir iConn has been developed to meet this requirement by delivering advanced analytics, which enable operators to stay in control of their installation. The system can provide historic, real-time, predictive and cognitive analytics, enabling users to rectify potential issues before they happen.

Managing performance

The iConn cloud platform is particularly beneficial for businesses with multiple, remote sites or unmanned installations. It enables users to monitor compressor performance from a single location, via their mobile device, tablet or PC. iConn helps minimise fault incidences for increased uptime, and also provides detailed machine parameters and over-time trend analysis to enable plant managers to optimise system performance.

Compressor or ancillary asset data can be transferred securely via GSM, Ethernet or Wi-Fi to a wide range of connected devices. iConn's secure cloud-based services allow users to view real-time analytics or access data via open APIs. CompAir experts can also access the information to help customers make informed choices around compressor air optimisation, maintenance schedules and energy performance.

iConn is available as standard on all new CompAir machines and can be retrofitted to existing compressor installations. The system will also support ancillary and non-CompAir based products, providing a one-stop digital experience for managing an entire compressed air system.

David Bruchof, Product Manager for Industrial Compressors at Gardner Denver, said: "Launched only last year, our Ultima compressor has been installed on sites around the world, quickly establishing itself as a proven and trusted oil-free technology from the CompAir brand. There is no question that Ultima continues to deliver high levels of air quality and purity, due to its highly innovative design and the fact that so many conventional models still rely on the traditional gearbox and single motor set-up."

"For those operating in production sensitive environments, such as the food and beverage industry, electronics manufacturing or pharmaceuticals sector, you need to be confident that you can invest in a system that offers assured air quality and purity. Ultima meets this need and continues to drive the oil-free compressed air market forward."

Rastgar Air Compressors is authorized distributor of Ultima Air Compressors in Pakistan with complete aftermarket support service and spare facilities all over Pakistan.

For more information on both Ultima and iConn, please visit www.rastgar-co.com.◆