Smart Air Solutions and 12 innovations

Following a global sales event held in Antwerp, Belgium, from April 16 to 19, Atlas Copco Oil-free Air and Compressor Technique Service (CTS) divisions announced several product innovations for their low-, medium- and high-pressure markets. *MechChem Africa* talks to the South African delegates: CTS service manager, Ian Ainsworth and Pieter van Wyk, GM for Compressor Technique.

"Ian and I attended the excellent 'Smart Air Days' product launch event in Belgium during April to find out about the latest developments in our product range. Atlas Copco Compressor Technique is no longer simply selling compressors. We now talk about Smart Air Solutions and we strive to offer compressed air at the point of use that represents the lowest total cost of ownership (TCO) possible.

"Compressed air is expensive in terms of energy, which makes the electricity cost from the utility a significant component of the TCO. So anything we can do to make our solutions more energy efficient will reduce this cost significantly," Van Wyk begins.

Atlas Copco's Smart Air Solutions aims to reduce TCO through component and machine optimisation initiatives in three areas: reliability, energy efficiency and serviceability.

"The reliability and quality of our equipment has long been a given, but we have been tracking every component replaced during a service to give us a realistic indication of life expectancy. Using this information, we have been able to improve key components to extend service intervals and improve reliability. The new range includes several of these upgraded components, which ensure longer mean times between failure (MTBF)," explains Ainsworth.

From an energy efficiency perspective, Van Wyk points out that every initiative that reduces the pressure losses on a compressed air solution by 1.0 bar reduces energy consumption by 7%. "This is one of the realities that have been driving Atlas Copco designers towards this new range," he notes.

By developing and using more efficient filters for the internals of the compressor, for example, Atlas Copco has further reduced the internal pressure losses and so improved energy efficiency. "Also, though, the piping design has been completely redone so as to minimise friction and pressure losses. With these new innovations, we have taken a product that is already very efficient and squeezed every last drop of efficiency from them," Van Wyk notes, adding that the specific energy requirements and SER on the new Atlas Copco ZR and ZT oil-free compressors are market leading.

The new Atlas Copco MDG 450 rotary drum dryer is an energy-efficient solution for high quality compressed air at guaranteed dew points of -40 °C.

The third driver was to improve serviceability. "By reducing the number of actual hours needed to service a machine, we save on TCOs for our customers and make it easier for our own service technicians," continues Ainsworth.

The high-flow ZH centrifugal compressor range is now extended to include a 3 150 kW machine with a flow capacity of above 35 000 m³/h at 8.0 bar pressure.

Components inside the new compressors have been made much easier to replace, which reduces the downtime associated with servicing and leads to better utilisation and lower net costs.

"When I looked into the new machines, I was amazed by how accessible the internal components were. The old oil separator unit, for example, used to be one big filter basket, which was difficult and messy to remove. Now we have these beautiful and simple cartridges that can simply be unscrewed and quickly replaced, without any mess or trouble – and all of the drains and internal pipe connections have also been looked at to make sure our service technicians can complete service or repair tasks quickly and easily," he says.

Describing some of the new compressors, Van Wyk first lifts out the new GA90+ to 160+, which all use the new VSD+ motor drives. "The latest air compressor in Atlas Copco's smart AIR solutions portfolio, the GA 90+-160 (VSD+) oil-injected screw compressor range, is designed for reduced energy consumption and ease of installation and service. It features state-of-the-art compression elements with Smart Injection technology coupled with highly efficient oil-cooled IE4 and IE5 motors that require no service interventions. The new Elektronikon® Touch controller with integrated smart algorithms further reduce energy consumption and the units are available in water- and air-cooled versions, with fixed or variable speed drive and with an optional integrated dryer," he says.

"The latest oil-free rotary screw air compressor from Atlas Copco, the ZR 90-160 VSD+, delivers up to 35% energy savings for a fast return on investment," he continues. "The new ZR is available with or without an integrated dryer. Ideal for applications in the food and beverage, electronics, automotive, textile and pharmaceutical industries, the water-cooled ZR 90-160 VSD+ is equipped with two high-efficiency permanent magnet motors, state-of-the-art compressor elements, a new cooler design and an improved monitoring system – and this plug-and-play compressor is housed in a compact, soundproof enclosure." Van Wyk adds.

"ZT and ZR oil-free machines are also certified to ISO 22000, which is a food and beverage standard that guarantees no contamination levels in the supplied air. As far as I know, we are the only compressor company to have been awarded this certification for oil-free compressors," Van Wyk adds.

In addition, Atlas Copco's ZH oil-free centrifugal air compressor range has been expanded with designs to meet the needs for a larger centrifugal air compressor delivered in a standard package. The most compact air compressor in its range, the virtually silent ZH 1000-3150 provides the optimum combination of high flow and low energy consumption.

Moving onto the low pressure high-flow 'blowers', Van Wyk says that the ZB and ZM centrifugal products as well as the ZS rotary screw and ZL lobe blowers have also been refined and refreshed. Most notably, these are now more compact with a smaller footprint to suit customers that are pressed for space.

"A smaller footprint is very important when multiple machines have to be installed in rooms with tight dimensions. The serviceability aspect also helps in this regard. While we used to need service access space all around the machine, the new service-friendly designs on the blowers and other compressors means that machines can now be packed alongside each other, needing only front and back service access," Ainsworth adds.

Above: *New service-friendly ZS4 blowers and other compressor designs means that machines can now be packed alongside each other.* ***Left:*** *Atlas Copco's Optimizer 4.0 is a central point of control for the whole compressed air network, ensuring optimum energy-efficient performance.*

Also integral to the Smart Air Solutions idea is Atlas Copco's latest Industry 4.0-ready Optimizer 4.0 central control and monitoring solution. "Our new Optimizer 4.0 range replaces Atlas Copco ES controllers. With all the basic functionality of the older version, this unit adds Industry 4.0 connectivity, data collection, monitoring and analysis options," notes Van Wyk.

With the ability to connect and manage up to 60 compressors from a single unit with up to three different operating pressure bands, Atlas Copco's Optimizer 4.0 can automatically produce financial, maintenance and utilisation reports directly from the data collected.

"And these units can learn from the data being monitored. Over a 24-hour period and a seven-day week, compressed air demand will vary considerably. Optimizer is able to trend the plant-wide demand curve and it can learn to anticipate high and low demand periods," Ainsworth points out.

As well as Optimizer, all new-range Atlas Copco compressed air systems come with SmartLink devices built in. "Customers do not have to adopt Optimiser 4.0 to connect their compressors to the Internet. Our SmartLink devices will record and collect data from a variety of important parameters and send them to us and/or to customer devices such as smartphones or tablets. This helps to add value to our offering through early detection of impending problems, resulting in better reliability for the customer," Van Wyk suggests.

"We are already receiving 500 automatic notifications per day," continues Ainsworth. "Via dashboards, weekly results are being shared with our service and sales teams to help them to better complete the services scheduled for that week, plan services for the coming months and to identify and proactively respond to problems before they become breakdowns," he notes.

Completing the product launch, three new quality air products were introduced: a new range of innovative MDG rotary drum dryers, which guarantee a dewpoint of -40 °C, while minimising energy consumption; a new space-saving twin filter design; and a new activated carbon tower range.

"The downstream components such as low-pressure air filters, dryer and equipment such as nitrogen generators are vital in ensuring the best possible air quality. These have also been improved for space saving, pressure reduction, reliability and reduced costs.

"Atlas Copco offers state-of-the-art to compressors and compressor services. In addition, though, we offer air solutions and packages that deliver the correct quality air at the point of use – at the lowest possible cost. This is what we mean by Smart Air Solutions," Van Wyk concludes. ❑