Quantima™ News from CompAir

Continental gives the green light for new Quantima technology

Thanks to the new Quantima compressor from CompAir, the Continental AG factory based in Regensburg, Germany can now ensure that air production runs at optimum capacity for maximum productivity, with high energy efficiency.

Electronic components now make up as much as 20% of a vehicle's value, with many cars containing several dozen electronic control systems and an array of on-board electrics comprising more than 2000 metres of cabling.

In response to this, the Regensburg-based Continental AG factory has grown considerably over recent years - becoming the company's largest electronic automotive components' factory in a production network that encompasses more than 60 sites around the world.

A high demand for air

A factory of this size requires a considerable amount of compressed air and the largest consumers are the twenty assembly lines, comprising a total of around 75 PCB assembly machines, which pick up and position components pneumatically or using a vacuum. In addition, the Logistics Centre also requires compressed air for automated conveying technology – as does the Development department's test equipment, such as the new turbocharger test bench that was installed recently.

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As the factory has expanded, so too has the amount of compressed air required. According to Wolfgang Stich, who is responsible for the refrigeration and compressed air supplies in the Technical Building Management department, “We use seven compressors located at four different sites for the compressed air supply. This ensures that we remain flexible and are able to disconnect individual production areas from the central pipeline.

Two of the seven compressors feature variable speed control, and since the compressed air is mostly required for electronics production, we always demand the highest quality, oil-free air to ensure purity.

Using oil-free compressors also eases the burden in terms of treatment work. Refrigeration dryers take care of treatment centrally and smaller, distributed absorption dryers or filters are added where necessary.”

Specifying the new Quantima system

The factory’s existing network, comprising six compressors, was able to supply a volumetric flow of 160 m3/min, with around 30% redundancy factored in. However, when the production team realised that capacity limits would soon be reached, they decided to purchase a seventh unit.

According to Robert Kistenpfennig, who is responsible for the Technical Infrastructure department, “The aim of purchasing the new compressor was not only to achieve better performance in terms of the air supply, but also to ensure consistent supply levels throughout the compressed air network.

Other factors had to be taken into account, such as product changes, the initial start-up and conversion of equipment, plus the rebuilding and relocation of entire production lines.

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Any air compressor chosen must be able to meet the additional air requirements and be able to adapt to changing production requirements.

Robert Kistenpfennig says, “If the Production department is planning a new system, we must have the infrastructure ready within a maximum of fourteen days – and that includes the compressed air supply.”

Giving the green light for new technology

CompAir proposed a Quantima Q-43 with a 250 kW drive and volumetric flow of 42.4 m3/min.

At the heart of this compressor is the Q-drive compression assembly. This high-speed motor incorporating direct-driven compression impellers operates with the rotor levitated by active electromagnetic bearings and spinning at up to 60,000 revolutions per minute.

Unlike conventional compressors therefore, Quantima’s Q-drive assembly has only one moving part, the rotor shaft, which has no contact and no wear. In addition, Quantima’s induction motor design and high frequency inverter mean that no gearbox is required and that the compressor can operate without any oil lubrication.

Minimal energy consumption during off-load operation

Another advantage is the extremely low energy consumption, thanks in part to the rotor’s frictionless operation. In addition, Quantima’s simple construction ensures that the compressor performs consistently throughout its entire service life, with no friction and no wear.

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The variable-speed drive matches air output automatically to plant requirements to minimise off-load running. This means that even when the unit does need to run off-load, it still provides very low power consumption, at just 2.5% or 7 kW, helping Continental to limit energy use when the process does not require compressed air.

According to Robert Kistenpfennig, “We determined lifecycle costs on the basis of procurement, service and energy costs, and the Quantima compressor produced excellent figures in this respect. That’s why we decided this machine was the right one for us.”

Compact dimensions and straightforward operation

The machine room designated to house the compressor is soon to be fitted with new refrigeration technology, meaning that the unit had to be as compact as possible. In addition, because the machine needed to be installed on the sixth floor, transportation and installation needed to be taken into account.

The compression and drive system used by Quantima compressors consist of just a single moving part making the machines highly compact, requiring less than 50% of the installation space when compared with a conventional compressor supplying the same amount of air.

This results in a 250 kW machine, supplying 42.4 m3/min of air, with dimensions of just 2400 x 1600 x 1850 mm.

Production staff have been impressed with Quantima’s ease of operation. A touchscreen with clear menu structure requires only minimal familiarisation and the operator receives an immediate overview of the compressor’s performance, and can access records and trend analyses of key parameters.

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