

CASE STUDY MANUFACTURING

Jaguar Land Rover gears up for compressor efficiency

When it came to selecting the compressed air system for its brand new, Engine Manufacturing Centre (EMC) in Wolverhampton, Jaguar Land Rover selected supplier Gardner Denver to provide a solution capable of high energy efficiency, low cost of ownership and reduced environmental impact.

Based on the proven Quantima compressor installation at the Jaguar Land Rover Castle Bromwich assembly plant, Gardner Denver has this time engineered a larger system capable of providing up to 8,000 m³/h of high-quality, oil-free air to the new AJ200 machine shop and assembly halls. The result is a highly-efficient compressor package with an intelligent control system, comprising three Quantima Q-52 centrifugal compressors and two DH110 RS machines, with variable-speed drives to match air output to plant demand.

Application Details

Drawing on its existing experience of the CompAir Quantima compressors installed at its Castle Bromwich site, which have saved over 13,000 tonnes of CO₂ per annum since their installation, Gardner Denver was selected to commission an energy-efficient solution for the site's compressed air requirements.

Overview

- ▶ **Customer**
Jaguar Land Rover
- ▶ **Location**
The new Engine Manufacturing Centre, Wolverhampton
- ▶ **Application**
Production air to supply the site's entire pneumatic circuits for the machine shop and assembly halls
- ▶ **Product**
Three Quantima Q-52 compressors, two DH110RS compressors, with intelligent control system, heat recovery and ancillary equipment
- ▶ **Customer Benefit**
High energy-efficiency and environmental performance. Zero oil in the compressed air network for maximum production uptime



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Oil-free, High-quality Air

Air quality is critical throughout the production process as the modern machine tools demand clean, dry and oil-free air. Any contamination could have an adverse effect on productivity and therefore, the compressors are optimised to provide completely oil-free air.

The Quantima compressor design avoids the need for a conventional gearbox, and therefore has no oil, no contact and no mechanical wear, meaning that there is no performance degradation over the life of the compressor. In addition, the two DH110RS machines are water-lubricated to ensure that there can be no oil in the compressed air network.

This oil-free air, which meets stringent ISO 8573.1 standards, is then transported to a refrigerant dryer and further energy-saving adsorption dryer before discharging in to the compressed air network.

Compressor Controls

An intelligent control system helps to minimise energy consumption by selecting the most efficient combination of compressors to meet plant demand for air. The larger Quantima Q-52 compressors act as the base load, with the smaller DH110RS machines coming on and off line to meet any peaks in production requirements.

Jaguar Land Rover will also benefit from the Quantima Q-Life predictive maintenance package with remote

Benefits at a glance

- ▶ **Highly energy-efficient, variable-speed drive technology - reduces electricity consumption and carbon emissions**
- ▶ **Lowest environmental footprint. Completely oil-free compressor design requires no oil lubrication**
- ▶ **Lowest physical footprint - up to 50 per cent of the size and weight of an equivalent machine**
- ▶ **Reduced noise pollution - lowest noise levels of just 69dB(A)**
- ▶ **Sophisticated compressor controls - maximise flexibility and provide additional power savings**

monitoring. This helps to prevent unscheduled downtime by tracking the compressors' operating parameters and predicting when a service may be required.

Heat Recovery

To further enhance the energy performance of the installation, each Quantima compressor is fitted with heat recovery to reuse the otherwise wasted heat from the compression process, which is then used for space heating in the adjacent North plantroom.

Compressed Air Distribution

The clean, dry and oil free air is then distributed through the machine shop and assembly hall network using lightweight aluminium pipework. Installed by Gardner Denver distributor, Shephard Engineering Services, the pipework is easy to maintain, corrosion resistant and with its smooth profile, provides low friction, helping to minimise pressure losses and therefore improving energy efficiency further.