

CASE STUDY

AUTOMOTIVE



CompAir helps Jaguar drive through energy savings with Quantima compressors

Just six months after installing new Quantima compressors from CompAir, Jaguar Land Rover's (Jaguar) Castle Bromwich plant is on target to achieve annual electricity savings in the region of 3 million kWh, with a payback on return on investment within two years.

Two Quantima compressors, a Q-52 and a smaller Q-43 model are installed in the main compressor house supplying air to the paint shop, 24 hours a day.

Application Details

For luxury car manufacturer, Jaguar, the rising cost of energy can have a major impact on profitability across its West-Midlands based plants. The company has set itself stringent environmental targets to reduce its carbon footprint through an ongoing programme of energy reduction.

This is especially the case at its Castle Bromwich facility, where the company's current range of XF, XK and XJ models are assembled and finished.

Overview



Client

Jaguar Land Rover



Location

Castle Bromwich plant, Birmingham, UK



Application

Luxury car assembly and finishing



Products

Quantima Q-52 and Q-43 with SmartAir master controller and ancillary equipment



Customer Benefits

3 million kWh annual electricity savings/
CO₂ reduced by 13,000 tonnes

Here, the paint process is a critical part of production and is one of the major users of compressed air. Interruptions in air supply or air quality issues will not only affect throughput in the paint shop, but can also impact on productivity elsewhere in the plant.

Assessing compressor options

The existing compressed air installation was coming to the end of its useful, economic life and Jaguar began to investigate the options available that would ensure both continuity of air supply and deliver significant energy cost savings.

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A cross-functional project team worked alongside CompAir, Jaguar's preferred compressed air equipment provider, to evaluate the options available.

CompAir engineers carried out an air audit on the existing compressors to determine compressed air usage and the potential savings that could be achieved with the installation of a new system. As a result, Jaguar chose to upgrade its network to incorporate Quantima's innovative technology, installing two new compressors and ancillary equipment. At just half the footprint of the existing units, the two new machines were also easy to install in to the existing compressor house.

Clean and dry air

The two compressors are controlled by CompAir's SmartAir Master control system to produce compressed air at 8 bar. The Q-52 unit provides the base load with the Q-43 machine coming on line when the pressure drops below 7.5 bar, helping to avoid any peaks or troughs in supply. The compressors also provide air to the XF trim and final assembly line.

Air blast chiller

Each Quantima unit is water cooled and served by a closed loop air blast chiller; a highly energy efficient way of cooling the water to the required intake temperature which is helping Jaguar to save over 11,000³m of water per annum.

The air is transported to a desiccant dryer and then passes through a series of CO₂ scrubbers to meet the required standards for high-quality breathing air. This part of the compressed air treatment is critical, as a proportion of the air is used for personnel breathing masks within the paint shop booth processes and Jaguar has to ensure complete safety at all times.

Paint shop

When the clean and dry air reaches the paint shop, it is used for a variety of applications across the 5.7 miles of conveyor line. Slave removal, where the car bodies are first placed on to the conveyor system, requires the full 8 bar pressure in order to lift the vehicles, especially on the heaviest of the models assembled at the plant, the XJ.

Benefits at a glance

- ▶ High energy-efficiency - reducing electricity consumption by 3 million KWh per annum
- ▶ Improved environmental impact - saving 13,000 tonnes of CO₂ a year
- ▶ Rapid return on investment - with an estimated 2-year payback period
- ▶ Continuous supply of air, 24/7, to avoid production downtime
- ▶ High quality breathing air eliminates any safety concerns

Compressed air is also used to control the valves operating the pneumatic paint dosing process and on both the underbody seal and the internal seam robots; an area of the process with the highest throughput.

Since the Quantima compressors have been installed, Jaguar is on target to achieve annual savings in the region of; 3 million kWh of electricity, 11,000m³ of water and 13,000 tonnes of CO₂. This accounts for twelve per cent of the Castle Bromwich plant environmental target and the company anticipates payback within two years.

Further information About Quantima

Quantima's Q-drive compression assembly has no gearbox, no oil, no contact and no mechanical wear; just a single moving part spinning in a magnetic field. This simple construction means there is no performance degradation over the life of the compressor. A variable speed drive enables Quantima to precisely match air output to plant demand, providing reduced electrical consumption and off load running.

Jaguar is also benefitting from the Q-life predictive maintenance package, with remote monitoring. This helps to prevent unscheduled downtime by tracking the compressors' operating parameters and predicating when components or parts may need servicing or replacing.