

## CASE STUDY

# Data Logging Proves The Need For Variable Speed Compressor

### The Challenge

It's fair to say that the cost of energy is the dominant thought prevailing engineering managers, and this has driven the demand for energy recovery devices in all major plants. Airchannel has been looking at ways of working with customers to achieve levels of energy cost savings that will make a real difference to their bottom line, despite the rising charges.

Studies prove that better control, housekeeping and maintenance could save operators up to one third of the energy used across their compressed air systems (source The Carbon Trust). But Airchannel believes that there are many

ways for those in the manufacturing sector to reduce the impact of these rises by reviewing their compressed air systems.

One example of this is Henry Bell & Co (Grantham) Limited, a major supplier of flaked cereals, pulses and seeds to the animal and pet food industry. Following conversations with the Company, Airchannel was asked to conduct an air audit to identify weaknesses in its ageing air system. Their compressors were at least 20 years old and Airchannel believed they were inefficient and uneconomic, with no automatic control functionality.

### Airchannel's solution

The audit of the compressed air system was carried out using data logging equipment. An intelligent data logging device was attached to the system to monitor the quantity as well as the pattern of usage of compressed air over a working period. The data was analysed to produce a pattern of actual site demand.

The results of the audit were so conclusive that Henry Bell was determined to restructure its compressed air supply completely. Airchannel was awarded the turnkey contract to provide the best equipment in terms of low energy consumption and air availability, and at the same time offering significant advantages in its flexibility and economic performance.

For a system to operate energy efficiently, the supply of air from the compressor has to match demand, which will rise and fall over different shift patterns, and so Airchannel promoted the advantages of introducing a variable speed compressor, as the major single cause of energy wastage in compressed air systems comes down to air being generated but not used. A conventional fixed speed compressor producing zero compressed air can still be using 20 to 70% of full load power.

Airchannel proposed a Worthington Rollair® compressor from their V range of variable speed compressors. These can reduce compressed air production. Whatever the pressure requirement the Rollair ® V will precisely match load to demand by constantly varying the motor speed to ensure the most efficient use of energy - no offload running.



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The system balances air supply to meet fluctuations in plant demand, and provides the appropriate volume of air across the entire plant. The Worthington compressor is much simpler with fewer moving parts for easier maintenance and electronic controls reduce stress on the components, for even longer life.

One of the advantages of the Rollair® compressor is that the motor is placed directly under the cooling air turbine. This means the motor has a constant flow of cooling air across it, resulting in low motor temperature even at low speed. It contributes to a longer motor life. Moreover, air cooling turbine gives low rotational speed, superior air flow, 30% lower energy to a conventional motor driven fan, and a very low noise level.

Being small, the inverter is vertically integrated into the cubicle of a standard Rollair® canopy. Thus it has one of the smallest prints in the market today. Innovations in the field of electronics has lead to frequent improvement of components.

In addition to supplying the compressed air function, Airchannel also installed a Maxigas nitrogen generator, manufactured by Domnick Hunter, allowing Henry Bell to make their own gas on site, cost effectively satisfying their nitrogen gas requirements. All associated pipework was also provided under the contract.

## Results

There are financial incentives available and Airchannel maintains that the resulting energy cost savings means the new equipment is self-funding over a very short period. For Henry Bell & Co there was also the possibility of obtaining an interest-free loan under the Carbon Trust's energy efficiency programme. Airchannel researched this funding option, and obtained a four year interest free loan from the Trust.

Henry Bell is already benefiting from reduced down-time associated with changing Nitrogen gas cylinders through an on-demand high purity food grade supply. It is also safer than high-pressure containers as man-handling is eliminated, offering exceptional food grade nitrogen at a controlled flow, pressure and purity.

## Client Testimonial

Established since 1825, Henry Bell has always kept pace with innovation and technology, their state-of-the-art computerised mixing plant has enabled the Company to meet the increased production and specialist blend demands of their customers. So when Airchannel explained the huge potential savings that were possible with the new system, the Company was keen to embrace the new equipment.

Commenting on the success of the contract Mr. Thomas Lee, Managing Director, said: "The methodical way Airchannel went about demonstrating the potential savings we could make, through data logging, impressed us, and when they showed us the savings that could be achieved by changing our compressor, we change our air supply straight away and the results have been truly convincing."

