

Variable speed drives save £20,000 on HVAC

Operators of the Omnibus building in Reigate, Surrey, report savings of £20,000 per year on HVAC energy costs since installing ABB standard variable speed drives.

Sited on a disused bus garage in the centre of the town, the building is a multi-tenant facility, with more than 65,000 sq ft of office space.

"We were approached by Econowise Drives and Controls to investigate our HVAC system and look at the scope for using drives to cut running costs," explains building manager Martin Dalgarno, of NB Entrust.

Dave Lapsley, owner and director of Econowise, says: "The energy appraisal revealed that the motors driving the [HVAC] system pumps were all running at full speed, with flow control by mechanical throttling. We calculated that putting drives on the application could save around £20,000 per annum."



The firm installed 12 ABB drives – six on the chiller pumps, rated at 15kW, four on the LPHW secondary heating pumps, also rated at 15kW, and two on the LPHW primary pumps, rated at 7.5kW.

Lapsley explains that Econowise opened all the valves and set the drives to maximum speed, reducing the speed until the water flow rate met the requirements of the building as detailed in the original commissioning information.

He also says that the building already had two variable speed drives operating an air handling unit, but explains that these were not running in speed control mode. So Econowise reprogrammed the PID controller on the exhaust fan drive to accept signals from a CO₂ detector and drive it at an appropriate speed.

The two drives were connected so that the supply fan was driven at a speed to match the speed of the exhaust fan, hence maintaining design pressures.

Says NB Entrust's Dalgarno: "The predicted savings of £20,000 a year have proven correct. With an investment of around £14,000, this gave us a payback of under nine months.

"We have also gained other benefits, such as reduced wear and tear on the motors, and have had no problems with maintenance since the drives were installed," he concludes.

Compressor cuts costs at oldest brewery

Weihenstephan brewery in Freising near Munich is reporting a 30% reduction in compressed air energy costs since installing a variable speed, oil-free compressor, from CompAir.

The brewery, established by the Benedictine monks in 1040, is believed to be the oldest in the world.

Gerd Abstreiter, engineering manager, says that, as well as electricity, nearly all this plant's processes require compressed air and steam. He also explains that the brewery's previous compressed air system comprised two CompAir oil-free piston compressors, supplying 7.8m³ and 10m³ of compressed air per minute respectively –

one operating at full load and the other at half load.

That worked for full capacity operations from Monday to Friday, but not when production was reduced for night shifts and at weekends.

"When the brew house and bottling plant are inactive, we only need around 1.5m³ of air per minute to maintain the system pressure and operate the pneumatic control elements," says Abstreiter. "As a result, the large compressors were spending a lot of time idling, which was uneconomical."

Abstreiter says the plant worked on repairing leaks – reducing the amount of air lost by 50% – while also installing a

new control system and compressor in the form of an oil-free, variable speed D22H RS unit, also from CompAir.

He explains that, with its PureAir technology, the compressor generates totally oil-free air, making it ideally suited for the brewery's hygiene requirements. Also, water is used to lubricate, seal and cool the equipment, meaning low compression temperatures of just 60°C.

Variable-speed drive technology now matches compressor flow to demand, he says, resulting in greater efficiency. He also reports that the new setup has improved production reliability; if one of the two larger compressors fails, there is still enough air to meet requirements.

The D22H RS was also integrated into the brewery's compressor control system, so allowing operators to monitor the demand for compressed air and review recent consumption trends.

"Together with CompAir, we measured the power consumption of the system and found that the combination of the new compressor and leak repairs has reduced our electricity consumption by around a third," confirms Abstreiter.



Ceramic liner is tougher than coal clinker

Material protection specialist Kingfisher says it has solved a problem of rapidly wearing surfaces at an unnamed power station, where two other firms' trial installations had failed.

Managing director John Connolly explains that the firm was called in by the power station plant engineer, following the failure of both cast basalt and hi-chrome castings as lining materials, for conveying hot, coarse clinker to an ash reception hopper.

The problem, he explains, was that, although the clinker was suspended and conveyed hydraulically, the internal surface of the pipeline was being subjected to severe abrasion.

Kingfisher recommended its 25mm K-ZAS ceramic lining, which was supplied in cylinder form, to ensure internal concentricity. Subsequent operation has shown that the liners considerably outperform the earlier systems.



"We know from experience that there is no 'one size fits all' solution in wear protection systems. Each application has to be considered individually. It has to be surveyed before a tailored solution can be arrived at,"

says Connolly.

Interestingly, K-ZAS is rated nine on the MOHS hardness scale and also has very high thermal shock resistance, making it ideal for high abrasion and high temperature applications within the power generation, bulk solids handling and mineral processing industries.

Chains need right lubricant



Tests by leaf chain manufacturer FB Chain reveal that the choice of lubricant, not just the frequency of greasing, has a dramatic impact on forklift truck chain performance.

The firm's Peter Church says getting this right is important, because forklift chains are wear items, so the cost of replacing a worn or damaged one is unlikely to be covered by your contract maintenance package.

"However, [choosing the lubricant] is not as straightforward as perhaps it should be – largely because most chain lubricants currently used were designed for transmission or motorcycle applications," he warns.

FB's study took three identical lengths of chain, coated them with three brands of chain lubricant – and found that the best performing oil outlasted the worst by nearly four times. In another test, the same three lubricants were applied to identical chains, before rinsing with water for one minute, then putting them through a salt spray test to assess corrosion resistance.

"The oil that had been the second best performer in the wear test did not come out of the corrosion test at all well," states Church. "That oil proved to have a low viscosity, which helps it to penetrate between the chain's pins and plates, but also allows it to be removed when washed. For equipment working outside, this brand would not stay in place long."

And he adds: "One clearly offered the best performance in both the corrosion and wear tests, and this is the brand that is applied to our leaf chain when it leaves our factory."

Peristaltics take on nasties

Surface treatment technologies specialist AHC Benelux reports that its peristaltic pump is working well, handling aggressive wastewater fluids at its Eindhoven plant. Luc Heldens, chemicals and R&M supervisor, explains that the firm has eight flexible production lines electroplating silver, gold, copper and tin, and processing electro-less nickel and synergetic coatings.

"Running these continuous operations produces wastewater that needs to be treated before disposal, in accordance with environmental regulations," he explains. But that means adding hydrochloric acid and caustic soda to maintain pH. Air-operated diaphragm pumps were considered for the task, but, as the wastewater contains 33% acid chloride, solids would have destroyed its membrane. Also, this pump type was unable to ensure adequate accuracy of dosing.

Hence the peristaltic pump – in this case, a 521F/REC close-coupled unit, from Watson-Marlow Pumps, which recently replaced a baseplate pump, from the same company, that had reached the end of its life. "We installed the pump, fitted with Marprene thermoplastic tubing elements, in February and it has since performed extremely well," comments Heldens.

He also comments that the pump is easy to operate and needs very little maintenance. "Another significant advantage of using tube elements is the longer lifetime of the tubing and the ease with which we can replace it," he confirms.

