



# When variable speed drives don't fit

Don't view variable speed drive compressors as an energy-saving panacea says Andy Jones. It's essential to make sure the compressor closely fits the application

If a business uses compressed air in its manufacturing processes, electrically driven air compressors usually account for around 10 per cent of the total electricity costs, but this can rise to 30 per cent in some industries. Therefore, when looking to purchase a new compressor, either to replace an existing machine or to serve a new demand, energy efficiency must be the top consideration. Over recent years, variable speed drive compressors have become a popular choice for saving energy – but they mustn't be treated as a panacea, as they aren't the right solution for every application. In manufacturing environments, ensuring a compressed air system is as efficient as possible is key to saving energy, especially when we consider that the electricity consumed during a compressor's operation over a five-year period actually accounts for approximately 75 per cent of the total cost of ownership, including the capital expenditure.

### Overall lifetime costs

So, when choosing a new compressor, it's important to remember that the initial capital outlay actually makes up a very small part of the total lifetime costs. The main cost will always be the energy required to produce the compressed air – so we suggest the decision should be largely based on this factor.

For some time the compressed air industry has been working hard to make compressors more efficient, to help manufacturers reduce their energy costs and carbon emissions. And a major advancement was the introduction of variable speed drive compressors.

Variable speed drive compressors are able to adjust air supply according to demand, in contrast to conventional, fixed speed compressors which give a



Compressors are under close scrutiny as industry looks to cut costs

constant air supply. By precisely matching power consumption to the required load profiles, variable speed drive compressors reduce energy losses, typically producing savings of 30 per cent or more (based on Mattei's Optima variable speed drive compressor).

Therefore, they have been seen as a key solution for companies looking to cut the cost of producing compressed air. But while they have undoubtedly helped many manufacturers to dramatically reduce energy consumption, they shouldn't be seen as a universal remedy – as they aren't going to be the right solution for every application. It must be remembered that an energy-efficient compressor can only be efficient if it actually suits the application.

Variable speed drive compressors will only save energy if there are peaks and troughs in the demand for air – this sounds obvious but it's surprising how many are installed in applications with constant demands. Unfortunately, many manufacturing companies

believe, or are told by their compressor supplier, that their compressed air demand is variable, so invest in this type of machine – assuming it will automatically save them energy and money.

But in reality, this isn't always the case. The only way to confirm if a company requires a variable or fixed speed compressor is to obtain an accurate understanding of air demands. Before a company invests in a new compressor, Mattei always recommends a preliminary data logging exercise, which evaluates compressed air needs and the efficiency of the system by recording and measuring air consumption profiles over a seven-day period. This is usually followed by discussions to identify any unusual patterns or planned process changes.

Obviously data logging only gives us a snapshot of compressed air activity, but, providing it's a typical week (although allowances can be made if there are higher or lower demands than usual), it is extremely insightful.

It is undoubtedly the best way to identify whether a company has highs and lows in the demand for air, or whether requirements are more constant.

Once we have an understanding of air demands, we can then make informed recommendations. Data logging often reveals that a company does have a need for a variable speed drive machine – and in the right application, this can prove to be a very energy-efficient solution.

A typical scenario might be a factory with variable shift patterns, which results in inconsistent demands for compressed air. Even if the compressor actually needs to run 24/7, in these circumstances, a conventional fixed-speed compressor operating at full power to always meet the peak demand would be inefficient, and would therefore waste energy and money.

But equally, data logging might reveal that a conventional, fixed-speed compressor is more appropriate, and a variable speed drive machine would be an inefficient option. There are, after all, many manufacturers that rely on 24/7 compressed air, delivered at a constant flow.

As industry endeavours to reduce its energy consumption, lower operational costs and help the environment, compressors have come under close scrutiny – leading manufacturers to develop new energy saving solutions. Being able to adjust supply according to air demands, variable speed drive compressors have become a key solution, but we must ensure they are only specified when they are actually going to reduce a business' energy consumption and costs. ■

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