

# What is voltage management?

*There are many types of voltage management system available. Does it make much difference which one we choose, asks Craig Needham*

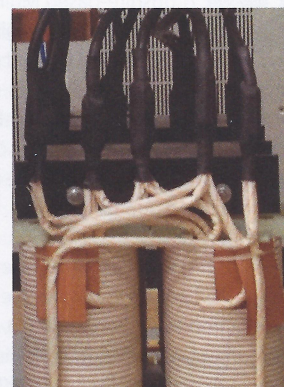
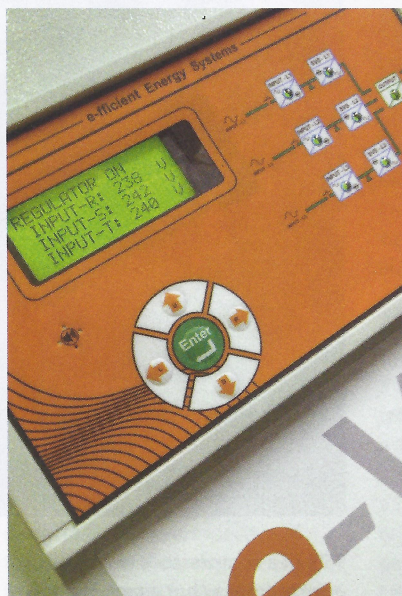
**I**n the age of energy efficiency and reduction most people are aware that voltage management in its many forms: voltage optimisation, voltage power optimisation and voltage optimisation plus regulation, can deliver valuable savings.

However, too much focus has been applied to the hard sell of these products using guaranteed savings as the driver, rather than whether the product specification and technology employed is appropriate to the needs of the user. The result is, in many cases, the products supplied have failed to deliver the 'promised' savings and the opportunity to maximise energy savings has been missed.

A good first place to start is to ask about transformers – one of the key components in all voltage management systems to help reduce and optimise the incoming voltage. But all transformers are not alike and understanding the workings of the transformer will enable the purchaser to make more of an informed decision. The key element is whether the transformer has a single tapped point or multiple taps.

Why is it important to know the number of tapped points on a transformer? A single tapped point on a transformer – also known as a fixed ratio or step-down transformer – will only provide a set amount of voltage reduction with no control or real voltage management. These are typically set to save 4%, 6% or 8% – reducing the incoming voltage by this fixed ratio. Simple in design, they can deliver fixed savings but little else.

More advanced voltage management systems incorporate multiple tapped points on the transformer – enabling the output voltage to be more closely controlled as the mains voltage fluctuates. This is known as voltage



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regulation. The greater the number of tap settings, the more control the voltage management system has over delivering an optimised and regulated voltage. This extra control increases the opportunity to reduce electricity usage and the most advanced systems enable the user to regulate the voltage to the most appropriate level for the electrical equipment on their site. Typically this is set at 220V.

The majority of systems in the UK use a variation of this principle to reduce the over voltage being supplied by the National Grid. But the UK also suffers from under voltage at times and true voltage regulation is achieved when the mains voltage is controlled not just when there is 'over voltage' but also in 'under voltage' scenarios. This is known as buck and boost voltage regulation – true voltage management.

Buck and boost voltage regulation incorporates two associated transformers per phase. A buck transformer for voltage reduction and regulation and a boost transformer for boost voltage regulation. In order then to identify

the transformers that can provide the greatest energy saving you need to know how many transformers there are per phase and the amount of tapped points per transformer for the real voltage regulation and control and voltage management. This intelligent technology addresses the limitations of single tap transformers – guaranteeing a consistent output voltage and ensuring the user a continuity of supply.

e-efficient Energy Systems has recently introduced its latest intelligent systems using its eVO+R voltage optimisation plus regulation technology, which addresses the many shortfalls of the old fixed transformer VO equipment bringing buck and boost technology available to all.

To find out whether voltage management can help you reduce your electricity usage and carbon footprint, e-efficient Energy has launched a free site survey scheme to encourage companies to see if it will work for them.

*Craig Needham is managing director of e-efficient Energy Systems*

[www.e-efficientenergy.co.uk](http://www.e-efficientenergy.co.uk)