

Voltage optimisation



Voltage Optimisation is a broad term for the application of techniques and associated technologies used to improve the energy efficiency of electrical equipment. It can also be referred to as voltage stabilisation, voltage regulation, voltage power optimisation and voltage reduction. Voltage optimisation systems are typically installed at the incoming electricity supply point when the supply voltage is higher than the optimal working voltage needed for the premises.

How does it work?

Mains electricity in the UK is delivered at around 242V. Because most equipment is designed to operate on 230V, this creates an opportunity for savings. Excessively high voltage can also reduce the lifespan of equipment.

In essence, the voltage optimisation/ reduction equipment (effectively a highly efficient transformer), is installed in series with the incoming electricity supply, allowing all the electrical equipment downstream of the voltage optimisation unit to benefit from a reduced supply voltage. Voltage stabilisation/ regulation units contain supplementary control systems to automatically adjust for naturally occurring supply voltage variations to provide a fixed output voltage.

Because electrical power is a multiple of voltage and current, then by reducing the voltage, the proportional amount of power used is reduced.

Further information is available on...

Further information is provided in the Carbon Trust document 'CTG045 Voltage Management'.

Key considerations

- Make sure you understand the site dynamics.
- Is the supply voltage significantly high enough for sufficiently long periods?
- Is there enough electrical equipment on site which would offer sufficient power savings?
- Could other energy efficiency initiatives be employed prior to/ instead of voltage optimisation?
- What would be the most appropriate technology to ensure the on-going safe operation of the site?
- Certain electrical equipment, notably electronic devices or thermostatically controlled equipment (resistive loads which are temperature/time related), would not benefit from voltage optimisation as their operation would automatically compensate for a lower supply voltage.

Safety warning

Voltage Management is not simply reducing voltage. Electrical equipment is designed to safely operate between certain operating parameters, which must be maintained. It is essential to ensure all relevant factors are considered to ensure the safe and appropriate implementation of suitable energy saving technology.

