



Business

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Voltage Optimisation

What is voltage optimisation? Voltage optimisation (VO) is an electrical energy saving technology which is mainly installed in series with the main electricity supply to systematically optimise, regulate and clean the incoming power to bring the voltage supplied into a building in line with what is required by equipment, machinery and appliances. In the UK, the average electricity supply is around 240Volts, which is high compared to other countries.

Electrical appliances with the CE mark must be capable of working across a wide voltage range; anywhere between 207-253Volts. Typically, voltage optimisation can improve power quality by balancing phase voltages and filtering harmonics and transients from the supply, although not always.

How does it work? Voltage optimisers are essentially transformers used to deliver power at a reduced voltage from the raw mains supply. The mains voltage is reduced to around 220 Volts, a level that allows the electrical appliances in a building to operate more efficiently. The energy savings are achieved by reducing the losses in the equipment being supplied, and vary according to the type of equipment. If the load is linear, a reduction in voltage from 240 to 230 will reduce the energy consumption by 8%, while a reduction to 220 Volts will yield a saving of 16%.

Why do I need it? Supplying appliances at higher than 220Volts, wastes energy. As well as getting larger bills and the negative environmental impact, appliances deal with the extra voltage by generating heat or vibration, which means they wear out faster. VO is beneficial when the electricity supply to a site is at a higher voltage level than needed, resulting in excessive energy consumption and high electricity bills. The equipment will still operate correctly at the reduced voltage, if it is still well within the statutory limits, (i.e. 220 Volts) and there will usually be benefits of increased life and reduced maintenance of the equipment.

Is voltage optimisation suitable for my building? Every building is different, so the level of savings will vary, however any building that uses electrical appliances and lighting should be considered for voltage optimisation. Checks should be made to establish the existing mains voltage supply level.

Whilst the UK supply is typically around 240Volts, some properties could be lower and therefore voltage optimisation may not always be suitable. The make-up of the electrical load should also be checked, as not all electrical appliances will benefit from voltage optimisation.

Variable-speed inverter drives, high-frequency lighting ballasts and switch-mode power supplies for example will generally not yield significant savings at reduced voltage, because the voltage fed to the load is generated electronically and is not affected by the supply voltage. Temperature-controlled heating is another type of load where no energy saving will be obtained, as the heater will still need to consume the same amount of energy to perform its required function.

