

Case Study #30

Voltage Power Optimisation



Dynamic VPO[®] provides police protection ...and a 25% ROI

Why it is interesting: Voltage profiles vary from building to building, due to a number of factors. This case study outlines the importance of voltage logging during the design and specification of any voltage optimisation project to ensure the correct solution is applied.

Greater Manchester Police

Annual Savings

No. of units:	23
kWh:	7.71%
CO ₂ kg:	532,900
£:	78,150
ROI:	25%

Don't take our word for it...

"The savings are great and absolutely necessary in the current climate, but for GMP as an emergency service, having the extra protection that a powerPerfector unit affords is priceless."

Robert Hayes
Sustainability & Facilities Manager



Further information

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The history of statutory supply voltage in the UK is a familiar tale of European intervention, leading to inaction.

Since the introduction of European

Harmonisation in 1995 equipment marked 'Conformity of Europe' (CE) has been manufactured with a tolerance range of 230V +/- 10 per cent. Such a wide tolerance band ensures the same equipment can be supplied right across the European market therefore overcoming the problem of differing supply voltages across Europe.

This 'Harmonisation' is all well and good for the manufactures but what is the impact on the consumer?

The majority of Europe supplies voltage at the lower end of the 207 - 253V EU operating range so it is no surprise to find that CE equipment operates most efficiently and effectively at the lower end of the spectrum, more specifically at an optimum of 220V.

For the UK this raises a huge problem as with an average supply voltage of 242V our CE equipment is suffering the affects of over voltage to the highest degree in Europe.

The UK's over voltage problem is endemic and results in the UK consumer paying the cost for this wasted electricity. For forward thinking organisations Voltage Power Optimisation has become the trusted cure to this problem, providing instant savings and long lasting protection to their estate.

Fluctuating Voltage

Although too high, voltages in the UK are on the whole very stable. However, there are buildings which will see fluctuations to the



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voltage caused by a number of factors. These range from the changes at a grid level (such as a sudden loss of generation), unusually high or volatile levels of demands from surrounding homes and businesses and distance from the point of generation.

A fundamental part of the design and specification of a powerPerfactor system is an in-depth survey of equipment and consumption trends on site.

We measure the voltages on site for a period of 10 days taking in to account the voltage profile across a building. The size of these fluctuations determines whether a standard powerPerfactor unit (which optimises the site voltage by a fixed percentage) or a powerPerfactor Plus unit (which provides voltage stabilisation) is the most appropriate option.

The powerPerfactor Plus features dynamic Voltage Power Optimisation, in addition to the power quality improvements afforded by the standard unit.

Output voltage can also be manually adjusted online or through the unit's user interface. This makes the powerPerfactor Plus ideal for sites with critical equipment, or those which suffer from an unstable supply.

Extra Protection

The ability of the Automatic Voltage Controller to adapt to changing incoming voltage conditions provides extra resilience for our clients.

It was this extra resilience which prompted Greater Manchester Police to install powerPerfactor Plus technology at 19 of the 23 installed sites. Installed between October 2010 and March 2011, Voltage Power Optimisation has reduced electricity consumption by 7.71%, equating to £78,150 in annual electrical savings.

Where the voltage falls too low the units boost function (+2.7% or +3%) is able to lift the incoming voltage back to within the statutory range.

This added protection can be the difference between a loss of power or maintaining supply.

"The savings are great and absolutely necessary in the current climate, but for GMP as an emergency service, having the extra protection that a powerPerfactor Plus unit affords is priceless," said Robert Hayes, Sustainability & Facilities Manager.

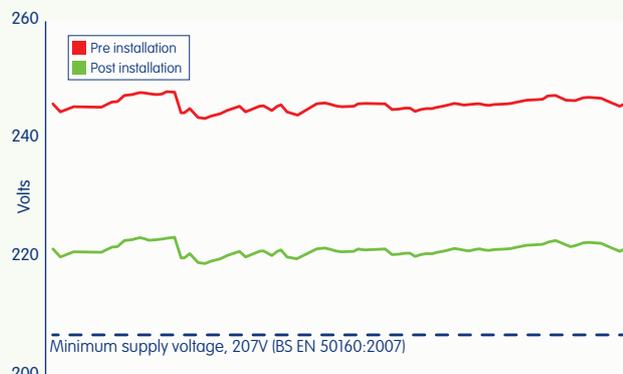
"We were suffering from brown outs at a number of sites which meant relying on onsite generation for, albeit short, periods of time. Since implementing the powerPerfactor rollout we have seen no repeat."

"In addition to these carbon and financial savings a number of our dynamic powerPerfactor Plus units have recorded under voltage and had to boost voltage back up to 220V to keep the site operational. This dual functionality of providing Boost as well as optimisation is extremely valuable and gives us the additional security we need to protect our critical operations at Greater Manchester Police".

How we determine the right solution

Voltage logging allows us to profile the voltage across the site and build a picture of the prevailing voltage. The graphs below indicate the very different voltage profiles we see on client sites.

Stable Voltage



Fluctuating Voltage

