

powerPerfector technologies

...intelligent energy saving and security

powerPerfector technologies from **iESCo**, *The Intelligent Energy Saving Company*



Unrivalled reliability record
energy & carbon savings Delivering cost, energy & carbon savings Delivering cost, energy & carbon savings Delivering cost, energy & carbon savings
power quality Improving power quality Improving power quality Improving power quality Improving power quality
unique technology protecting your supply
Unrivalled reliability record
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Our history



- 2000 - First of 1,500 Tesco installations at a store in Thornton-Cleveleys
- 2001 - Technology confirmed unique after 11.5% energy savings
- 2004 - **powerPerfactor** incorporated at Companies House
- 2005 - First major tender sees Land Registry buy 20 units
- 2008 - Launched second product, the **powerPerfactor Plus**
- 2010 - VPO® named 'Low Carbon Product of the Year'
- 2011 - Acquired the global rights to VPO® technology
- 2012 - Manufacturing begins in the UK
- 2013 - Second generation **powerPerfactor Plus** launched
- 2013 - Remote control for **powerPerfactor Plus**
- 2014 - Increased investment in R&D
- 2015 - Renamed to iESCo. The trusted **powerPerfactor** product & brand remains
- 2016 - Security and power conditioning become key market requirements
- 2017 - **powerPerfactor iQ** launched

powerPerfactor technologies intelligent energy saving...

- “...a more efficient, robust and reliable electrical supply”
- “...a key part of our Carbon Management Programme”
- “...a principal technology in our energy efficiency strategy”
- “I want to urge you to get one”
- “VPO® has an unblemished reliability in its thousands of installs”
- “...a critical part of our energy reduction strategy”
- “You don't need to know how it works. All you need to know is it worked for us.”



Full client testimonial document available at www.iESCo.co.uk

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iESCo

iESCo is the provider of the UK's only Voltage Power Optimisation technology, **powerPerfactor**.

The embedded power conditioning benefits make iESCo's VPO® unique, increasing business security and cost and carbon savings.

Our client testimonials illustrate our market leading position.

powerPerfactor at a glance...

- Improved site operating conditions (**increased savings**)
- Protection of electrical infrastructure from poor power quality and common voltage spikes (**increased protection**)
- Improved balance of the 3-phase supply to the load (**increased savings**)
- Reduced maintenance costs (**increased savings**)
- Releases capacity on the incoming supply and circuit breakers (**growth potential**)
- Attenuates harmonics to reduce transformer losses and wasteful neutral currents (**increased savings**)
- Improved power factor (**increased savings**)
- Reduced reactive power and maximum demands (**increased savings**)
- Risk-free technology (**increased site security**)

Since its introduction into the UK, **powerPerfactor** technology has helped its clients achieve massive combined savings in excess of...

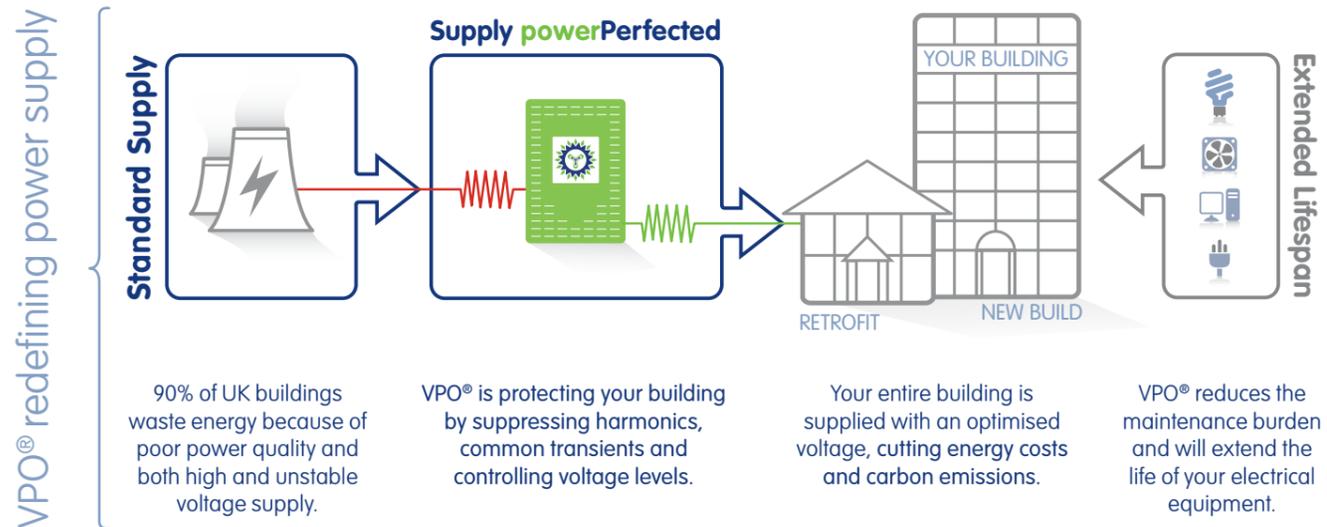
TOTAL Client Savings*
 kWh: 3,295,000,000+
 CO₂kg: 1,800,000,000+
 £: 275,000,000+

*Savings correct as of 17 March 2016.

What is Voltage Power Optimisation?

VPO® is unique – it is voltage optimisation with integrated power conditioning. A best in class technology designed specifically for site security and the protection of your electrical equipment.

VPO® guarantees energy, cost and carbon savings by optimising a building's electrical supply. This allows electrical equipment to operate more efficiently and consume less energy.



- **Unique energy saving and security solution**

powerPerfector is unique because the power conditioning benefits, such as harmonic attenuation, common transient protection and improved phase balancing, are intrinsic to the technology's design, without the need for additional components or moving parts.

- **Greater savings, more benefits and complete reliability**

powerPerfector optimisers are manufactured in Europe from high quality materials to exacting standards and are designed specifically for energy efficiency and power conditioning. Our Voltage Power Optimisation units have a 100% 'NO FAILURE' record with over 5,000 installations in the UK and tens of thousands of installations worldwide.

powerPerfector units have no moving parts and are maintenance-free, with manufacturer's assessed life expectancy of over 100 years.

Why use Voltage Power Optimisation?

High and increasingly variable voltage supply together with diminishing power supply quality and rising energy prices. powerPerfector VPO® is the answer.

In one stroke you can cut energy consumption, reduce your costs and emissions, and protect your equipment – power conditioning has never been more important or profitable.

Did you know that you could be wasting up to 20 per cent of the energy you pay for?

Around 90 per cent of electricity consumers are wasting energy. Power supplied by the distribution network isn't at the optimum voltage, so your equipment is being over-supplied with subtle but significant consequences.

Why do you need to optimise your supply?

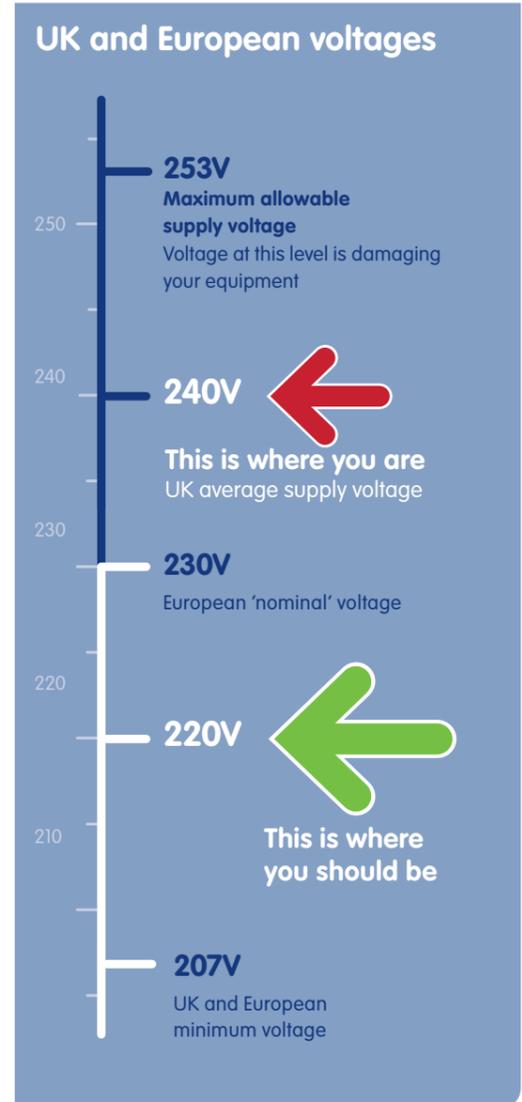
Electrical equipment (such as motors, HVAC and LED lighting) performs less efficiently when exposed to excessive voltage and poor power quality. For example, take a normal 230V rated lamp – when run at 240V, it will fail after 550 hours instead of 1000, drawing nine per cent more energy. Now imagine that problem spread across an entire site, with every single component failing faster and wasting energy. That's expensive and will be corrected with our technology.

How else can this help my business?

We all know about the need for Corporate Social Responsibility and meeting carbon targets but less well known is that the power we receive in the UK is not as 'clean' as we would like it.

Inferior power quality leads to higher maintenance costs and shortened equipment life.

VPO® power conditioning prolongs the operational lifespan of resistive and inductive equipment.



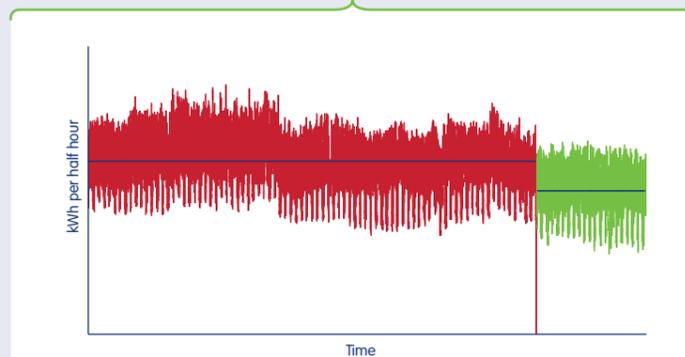
“Ofgem were suffering from voltage spikes which on numerous occasions damaged the lift controls... In the 1.5 years following the powerPerfector installation there has been no repeat.”

Kim Pivett
Ofgem

Voltage Power Optimisation – the benefits

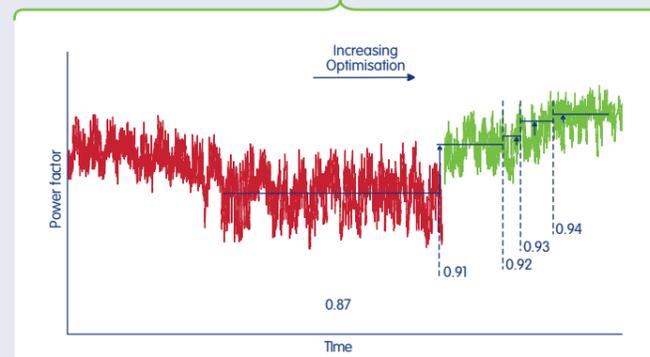
Voltage Power Optimisation offers cost and carbon savings. All of our clients are benefiting from the integrated power conditioning and security that our award winning VPO® provides. Electricity prices are increasing. **powerPerfector technology will reduce the cost to your business.**

Saves electrical energy



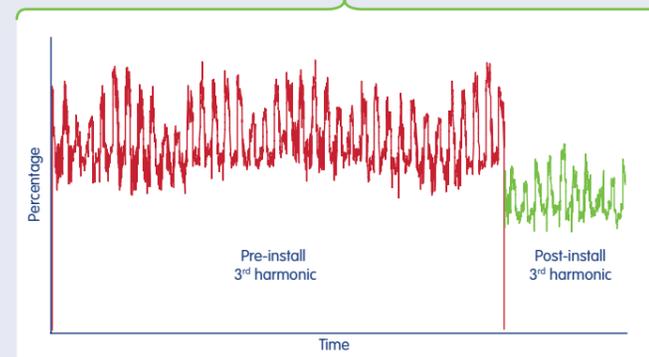
Thousands of sites in the UK have installed powerPerfector. Average savings in a typical building are six to twelve per cent of your electricity spend.

Improves power factor



Improvements in power factor of between five and ten per cent are immediate as our power conditioning reduces reactive power by up to 40%.

Reduces harmonics



The **powerPerfector** is able to deliver significant reductions to the 3rd, 5th and 7th order harmonics. It reduces currents flowing on the neutral by attenuating triple-n harmonics, and helps to balance the three phases supplied to your site.

Protects against common transients



powerPerfector will protect a site from common transient events. These voltage spikes can have a devastating effect on sensitive electronic equipment. Common transients are becoming more frequent as we move towards a more sustainable electricity network with more distributed generation.

De-risking your business

Mitigating risk is a fundamental part of running a successful organisation. Without your electricity supply, you are not in business. VPO® mitigates your three highest business risks:

1. Operational risk

- Power quality in the UK is deteriorating because of the increasingly diverse renewable power feeds to Grid supply that disrupt what was a uni-directional power supply and is now multi-directional. This is disrupting power quality by increasing voltage volatility, transients and harmonics the the network.
- **powerPerfector** is the only solid state technology that can homogenise this variable power output due to its power conditioning capabilities.
- Your supply needs this protection as we move to a more diverse power supplied network. (wind, solar, micro-generation).

“The low losses and additional features make the powerPerfector unit unique.”
EA Technology

2. Financial risk

- If your building loses its power source or your equipment ceases to work due to supply issues, you are out of business until reliable power is restored. The financial implications are huge.
- Energy price rises are an inevitability. Taking action now to reduce usage, increases bottom line profit and shareholder value.
- Will also reduce your carbon tax and capital replacement costs – further increasing profits.

3. Reputational risk

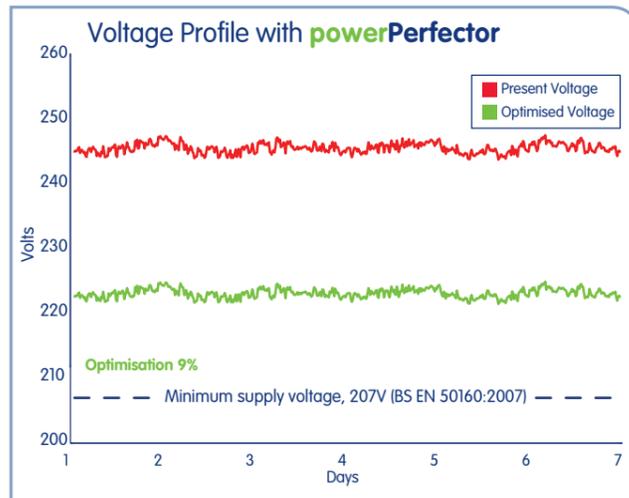
- Corporate Social Responsibility is now a major boardroom topic. Targets have been set, strategies signed off and budget set aside.
- Additionally, consider the damage to your reputation if your building is without power, not to mention the huge losses.
- Risk is not an option – VPO® is your guaranteed protection.

powerPerfector - VPO®

powerPerfector was conceived, designed and manufactured with energy efficiency in mind. It is a completely passive unit with no moving parts. It is made from ultra-high-purity materials which give it a 99.94% efficiency at peak loading.

It has a wide range of optimisations; from 4-11% and should you need a more drastic drop, we can have units custom-built to your specifications.

Being so efficient, **powerPerfector** units do not require cooling and run barely above room temperature.



Harmonic suppression, improved three phase balancing and common transient protection are embedded within the unit, without the need for bolt-ons or moving parts, which could be points of failure.

Just as important as the design, though, is the construction of the unit. **powerPerfector** units are hand built to order and have an enviable 100% reliability record in tens of thousands of installations worldwide. Our absolute commitment to quality is building on a history of British engineering excellence.



With VPO® you can fit and forget the technology with absolute confidence that the integrity of your supply will be improved, and your site will be running as efficiently as possible.

Further information and unit specifications can be found on our **powerPerfector** datasheet. Please contact: enquiries@iesco.co.uk if you need further copies.



powerPerfector iQ Responsive Power Optimisation

The fastest, most accurate and precise control technology on the market

powerPerfector technology has evolved, after a four-year research and development programme, from VPO® to RPO (Responsive Power Optimisation).

The result is the most advanced and precise electronic control technology for the balancing and stabilisation of three-phase supply voltage to your site available today.

Our new controller – named the “iQ” – can be retrofitted to your installed **powerPerfector** Optimiser to; increase savings by 30%, improve site security, reduce maintenance, extend equipment life and substantially reduce capital replacement costs.

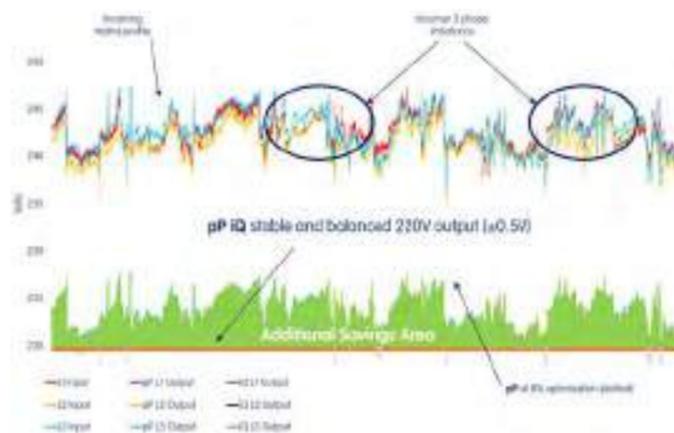
What does a powerPerfector iQ do?

It puts the control of your voltage and power quality into your hands, for the first time and gives you security and savings at the most critical point in your site as it;

- Allows you to set incoming voltage at the most efficient level e.g. 220V (+/-0.5V).
- Gives a superfast response (<250ms) to correct incoming voltage to your set level.
- Reduces or increases incoming voltage variance of up to +/- 11% to your set level.
- Balances three-phase voltage to within 0.5V of each phase in <250ms.



Realtime 7 day voltage profile pre and post iQ activation



A powerPerfector iQ installation on your incoming supply;

- Increases existing **powerPerfector** savings by up to 30% (retrofit).
- Achieves kWh and cost savings of 6% – 15% at most sites (new installation).
- Eliminates voltage instability and fluctuations.
- Substantially improves efficient operation of site equipment.
- Protects all your investment in electronic and electrical equipment.
- Protects your site from harmful voltage dips, sags, intervals and swells.
- Future proofs your building.
- Achieves a 30% or better ROI in most cases.
- Enables Wi-Fi monitoring, measurement and intelligent control.
- Opens a gateway to Demand and Frequency Control revenues in the future.

For each and every customer we undertake a full analysis of the energy consumption to establish the technology which would be best suited to your business, with the payback period clearly in mind. Therefore, we always recommend an initial conversation to help clarify which is best for your business. **Contact our friendly team who will be able to help you.**

Four steps to cost and carbon saving

When protection is paramount

To find out how **iESCo** and our **powerPerfactor VPO®** technology will benefit your organisation, talk to us today to discuss your free evaluation.

“Our historic buildings now have modern day problems: “Bearing in mind the importance of the site and therefore security of supply, we can report the working of the site has been perfect.”

Tony King
Tower of London

Annual Client Savings

kWh:	11%
CO ₂ kg:	168,000
£:	26,555

Appraisal



Send us some basic data for your site(s) so we can prepare a preliminary investment case

We'll need the past year's data on:

- The maximum demand for each incoming electrical supply
- The total kWh consumption for each of the incoming supplies
- The cost of supply, including the Climate Change Levy and your kWh price for the next year

If you like the indicative financial benefits, we will send you a plug-in logger to record your voltage profile for a week, which you return to us for analysis.

Validation



We survey your site(s) and provide a more detailed proposal

We'll complete:

- A full load assessment of your equipment on site
- A site installation proposal

This allows us to confirm the installation costs more precisely and evaluate the savings from your **powerPerfactor**. We send you a comprehensive proposal that outlines the business potential that **powerPerfactor** technology can bring to your organisation.

Implementation



We then deliver and install your unit(s)

This is arranged:

- At a time that suits you
- Generally out of office hours

Our experienced PRINCE2 qualified Project Management team will coordinate the installation with one of our approved installers. Pre-works are completed without disruption to your site and final integration in to your supply normally takes from two to four hours.

Verification



We then have your savings verified

We'll need one year pre and 3 months post installation data:

- To evaluate savings on site
- To demonstrate that we have met your predicted savings

Three months after your installation, we will review your energy use and provide a savings report.



Historic Royal PALACES



Build quality

Attention to detail, unique design and build quality mean that hand wound **powerPerfector** units achieve a peak efficiency of 99.94%. Greater efficiency means greater savings.

Custom built

Our **powerPerfector** VPO® units are handmade at **iESCo's** manufacturing facility.

iESCo's manufacturing partner is Tamura Corporation, one of the world's leading companies in the design and manufacture of hand wound power components – supplying the likes of the Ministry of Defence and the Rail Network.

Secure supply chain

iESCo's manufacturing partnership with Tamura Corporation allows production flexibility and ensures it can meet even the most challenging installation programmes.

No maintenance

powerPerfector optimiser units come with a 15 year warranty and, aside from standard wiring checks, **powerPerfector** systems are designed to be maintenance-free.

Reliability as standard

powerPerfector products are designed to withstand the toughest environments and provide years of safe, reliable operations. For example, VPO® has a useful life of in excess of 100 years and an operating temperature range of -10°C to +50°C. It has been designed and proven to at least match the withstand capability of the sites incoming electrical infrastructure, typically 50kA.

“**powerPerfector** has an unblemished reliability record in its many thousands of installations.”

Laurent Mineau
EDF Energy

Engineering excellence

Installing any technology on the mains incoming supply to your building carries a risk. Our wealth of experience gained over the years has seen us develop industry leading processes to mitigate this risk for clients.

PRINCE2 project management

We embrace PRINCE2 as a minimum standard for Project Management, meaning that your VPO® project is in expert hands and will be delivered safely, on time and on budget. Our process is scalable and we have installed up to 60 units a week.

Approved installers

Our **SAFEcontractor** accreditation is testament to our engineering processes and ability to manage our installers. Our highly trained NICEIC approved electrical engineers have each installed a minimum of 100 **powerPerfectors** and have been trained, assessed and are audited under the **powerPerfector** Low Voltage Safety Management System. We regularly audit the quality of their work to ensure they meet the exacting quality and health and safety standards we demand for our clients.

Secure supply chain

From manufacturing to installation we have strict control of our units, which allows us to meet even the most challenging installation programmes with the help of our dedicated supply and logistics team.

Operational support

Our regional field engineers are on call 24/7 and work very closely with our approved installers. Our delivery partners are experienced in positioning units in the most challenging locations.



“**In the current climate it is very hard to ignore a technology that can be fitted so easily into a site that gives such immediate savings.**”

Bill Doodson
Frederic Robinson Breweries



The powerPerfected

A small selection of those who are benefiting from our award winning technology.
View multiple case studies and testimonials on our website www.iesco.co.uk



Don't just take our word for it...

To view more of our client testimonials, email enquiries@iesco.co.uk to request a copy of our testimonial booklet.

 "After trialling a powerPerfector unit in 2010 the Environment Agency successfully installed the technology to a number of sites that met our payback criteria. By 2012 we had over 30 units installed at various sites. In 2018 we trialled the new iQ technology and we are seeing further power savings."

Keith Solts
Asset Standards and Engineering (MEICA)

 "Since the first installation at one of our sites in 2010 we have continued to work with iESCO and install powerPerfector technology as standard into our new build estate. We have been so impressed with the team and the technology that we have also retrofitted into a large number of sites in our estate and the total number of powerPerfectors in our portfolio is now close to 300 and growing!"

Andy Kershaw
Marstons Inns

 "Whitbread have installed powerPerfector technology into 125 buildings in just over 18 months. We are happy with the results and continue to work closely with the iESCO team. We have been also trialling the new iQ technology by upgrading standard optimisers we have across the UK and are looking into installing as standard into our new builds as we are extremely pleased with the results we are achieving."

Matt Dolan
Premier Inn and Restaurants UK

 "In addition to the energy savings, we have noticed a marked improvement in the longevity of our lighting. The powerPerfector project at our Eastbourne site was selected for a global EHS excellence award within the company. The iESCO team have been knowledgeable and professional throughout. We are now looking ton further projects with iESCO."

Gary Reynolds
TEVA Pharmaceuticals Industries Ltd

Recognition and associations





powerPerfactor technologies from **iESCO**, *The Intelligent Energy Saving Company*

iESCO Ltd

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