powerstar®

GLOBAL LEADER IN VOLTAGE OPTIMISATION

The Powerstar Range

LITE **MAX** **HV MAX**

EMS600861 FS579032 MADE IN SHEFFIELD British Chambers of Commerce CE

TRUSTED BY LANDMARK SITES

Powerstar has been installed into landmark sites including the Palace of Westminster, London City Hall, the Cabinet Office, the House of Keys and the Welsh Assembly.


The Cabinet Office - London


Western Parliament - Australia


London City Hall - London


Emirates Towers - Dubai

CELEBRATING OVER 15 YEARS OF SUCCESS

Our global client list includes

AESSEAL · The University of Melbourne · Hilton · Woolworths · Brewers Fayre · Goody's · Metropolitan Police · Sheffield City Council · pwc

cineworld · IHG InterContinental Hotels Group · TENCATE · University of Surrey · Beefeater Grill · Investec · BT · Table Table

Neapolis University Pafos · npower · Holiday Inn · NHS · Transport for London · ASDA · defra · Pizza Hut

BIS Department for Business Innovation & Skills · TGI Fridays · Premier Inn · Mothercare · αλφαμεγα · Sheffield Hallam University · Carlsberg · Carrefour

The co-operative · 2 sisters Food Group · Swann-Morton · CabinetOffice · POLYFLOR · THANOS HOTELS · principal hayley

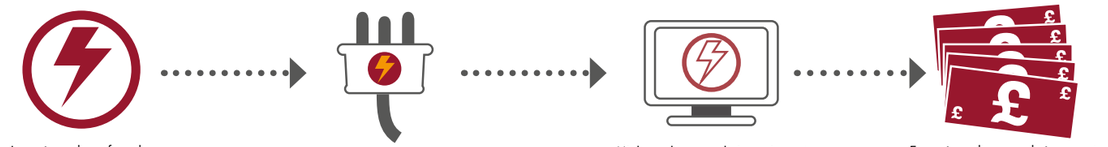
VOLTAGE OPTIMISATION

HOW IT WORKS

If a building is being supplied with electricity at a higher voltage level than needed, it will likely result in a mass of wasted energy, excessive levels of carbon emissions and higher than necessary electricity bills.

Voltage optimisation reduces the voltage of the electricity supplied to equipment, minimising consumption while remaining within the operating conditions specified by the equipment manufacturer.

NORMAL ELECTRICITY CONSUMPTION



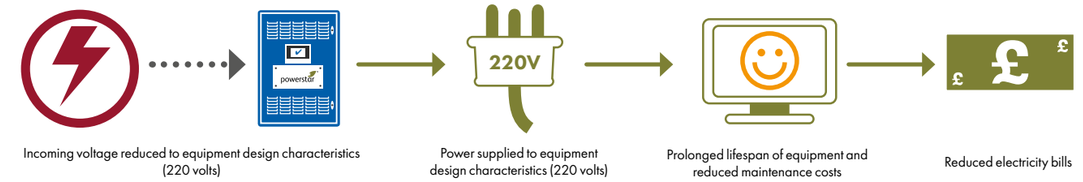
Incoming voltage from the National Power Grid

Power supplied (average 242 volts)

Higher voltage results in equipment being overpowered and thus shortens lifespan

Excessive voltage results in a greater kVA / power demand, increasing your electricity bill

powerstar CONTROLLED ELECTRICITY CONSUMPTION



Incoming voltage reduced to equipment design characteristics (220 volts)

Power supplied to equipment design characteristics (220 volts)

Prolonged lifespan of equipment and reduced maintenance costs

Reduced electricity bills

REPORT BY THE UNIVERSITY OF WARWICK

A report entitled 'Simulation Study for a Transformer Based Voltage Regulator' concluded:

1) The mathematical and simulation model presented in the report explains how the voltage regulator works.

2) The theoretic analysis and simulation results prove that the voltage regulator can lead to energy saving.

3) The overall power consumption is reduced because the negative power is induced and feedbacks to the power source. Virtually, this power can be considered as power "generated" from the load side.

4) The induced current or power can be measured using a separated power supply by using an ordinary transformer (not an autotransformer).

Professor Jihong Wang, University of Warwick,
'Simulation Study for a Transformer Based Voltage Regulator', 2011

POWERSTAR'S PATENTED DESIGN

Powerstar was established in 2001, and remains the only voltage optimisation system on the market with a patent on its design. The Patent number for the system is: UK PATENT 1014460.8.

The patent applies to the three phase voltage optimisation technology used in the HV and LV commercial and industrial systems. The patent ensures that no other voltage optimisation solution, although similar in principle and application is able to replicate the exact design specification of a Powerstar system. It is through this patented design that Powerstar is able to generate negative power feedback (back EMF).

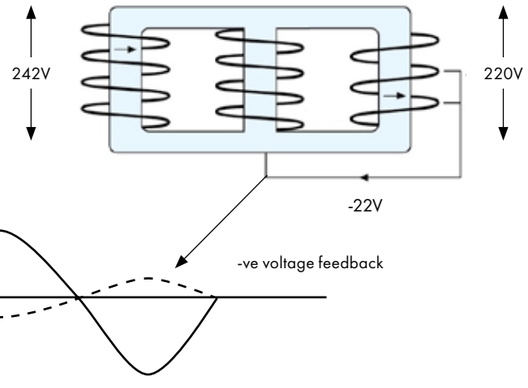
WHAT IS NEGATIVE POWER FEEDBACK (BACK EMF)?

Most VO systems

Traditional systems transform the entire power output from one voltage to another, and although they reduce voltage they also increase current.

The patented Powerstar system

Due to the patented design of Powerstar, and the third control winding, Powerstar creates negative power (back EMF) whereby any excess voltage is subtracted and sent in the direction of the supply. This ensures only around a tenth of power is transformed, resulting in reduced voltage AND current.



Powerstar is a transformer-based system used to optimise the characteristics of the current supplied at the source (first current), according to current characteristics required at the load (second current).

1. The first current is typically an alternating voltage in which case the resultant voltage is increased or decreased, this transformation routinely results in excess transformed voltage
2. The supply current flows from the first winding into the second winding, wherein the magnetic flux causes the induction of a reverse current, which is a fraction of the supply current, typically 10%
3. This reverse current flows in the opposite direction to the supply current, wherein it is directed back to the electricity supply
4. Because this reverse current is real energy, which is distinct from apparent or reactive energy, there is a direct effect on the consumption of the load. This effect is a reduction of power consumed by a load, seen by actual kWh savings

IN SIMPLE TERMS, ANY EXCESS VOLTAGE ABOVE THE POWERSTAR SET-POINT IS SUBTRACTED FROM THE INPUT VOLTAGE, THIS RESULTS IN GENERATION OF NEGATIVE POWER (BACK EMF), WHICH FLOWS TOWARDS THE SUPPLY AND IS SUBTRACTED FROM THE INCOMING POWER.

BENEFITS OF THE PATENTED POWERSTAR DESIGN

Negative Power (back EMF) enables Powerstar to provide additional energy savings, a recorded demonstration has been carried out on a Powerstar system to explain the effect of Negative Power (back EMF) within the Powerstar unit.

Scan the QR code to view the short video showing the Powerstar negative power demonstration.

Powerstar voltage optimisation systems are able to deliver savings on LED lighting and Variable Speed Drives (VSD's), both of which are electrical loads that most alternative voltage optimisation solutions are unable to achieve savings for. A summary along with videos demonstrating the potential savings from Powerstar on these loads can be accessed below:

- The University of Melbourne in Australia carried out controlled testing on LED lighting in the car park at the universities estate, results of which concluded Powerstar achieved an 8.3% saving.

Scan the QR code to view the short video showing the testing of Powerstar on LED lighting.

- View an in house demonstration on a typical Variable Speed Drive (VSD) running at frequencies of 30Hz, 40Hz and 50Hz, both with and without Powerstar voltage optimisation connected. The results conclude that Powerstar is able to make savings on VSD's irrespective of the frequency.

Scan the QR code to view the short video showing the testing of Powerstar on a Variable Speed Drive (VSD) at a range of frequencies.

VIRTUE ENERGY STORAGE SOLUTIONS

UTILISING NEGATIVE POWER (BACK EMF)

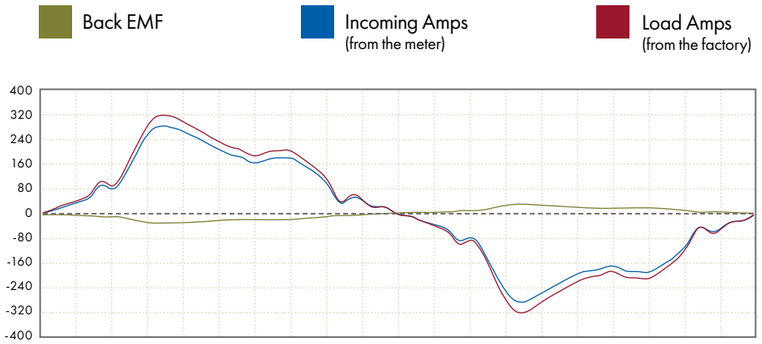
Due to the bespoke design of all Powerstar solutions, instead of the negative power (back EMF) working to simply subtract excess power and return it in direction of the supply (as shown on page 6), Powerstar HV MAX and Powerstar MAX have the capability to harness the excess energy and store it within a VIRTUE energy storage system.

By seamlessly integrating voltage optimisation with a VIRTUE energy storage system, clients are able to store energy generated during low tariff periods and come off-grid during peak demand periods, therefore making significant savings on electricity costs, maximising revenues through Demand Side Response (DSR) and reducing operational risks through an Uninterruptible Power Supply (UPS).

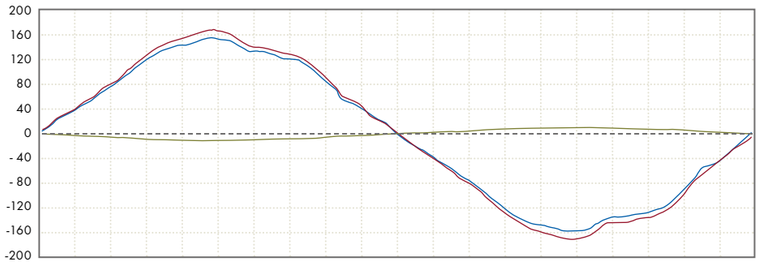
More information on VIRTUE is available on the Powerstar website: **www.powerstar.com/virtue**

VERIFYING SAVINGS FROM NEGATIVE POWER (BACK EMF)

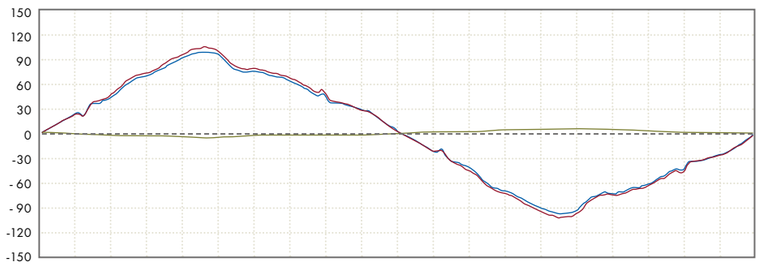
We provide a verification service which summarises the savings delivered through the negative power (back EMF) generated by the Powerstar voltage optimisation system. This verification process clearly highlights how the unique design of Powerstar is able to achieve maximum savings for clients through the generation of negative power (back EMF). The charts below are example snapshots taken from our verification reports.



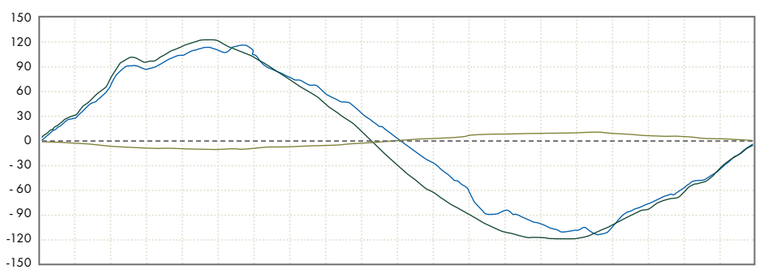
This chart shows the load is consuming 318.2A, this is reduced by 30.5A through negative power (back EMF), and therefore the meter only registers incoming current of 287.7A, making an instantaneous **saving of 9.6%**



This chart shows the load is consuming 157.6A, this is reduced by 10.5A through negative power (back EMF), and therefore the meter only registers incoming current of 147.1A, making an instantaneous **saving of 6.7%**



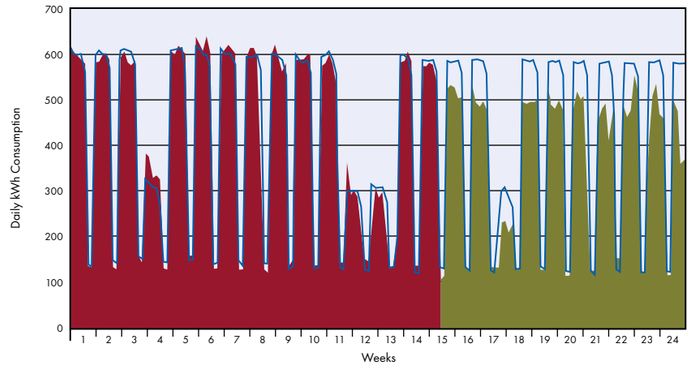
This chart shows the load is consuming 103.1A, this is reduced by 5.3A through negative power (back EMF), and therefore the meter only registers incoming current of 97.8A, making an instantaneous **saving of 5.1%**



This chart shows the load is consuming 125.8A this is reduced by 10.1A through negative power (back EMF), and therefore the meter only registers incoming current of 115.7A, making an instantaneous **saving of 8.0%**

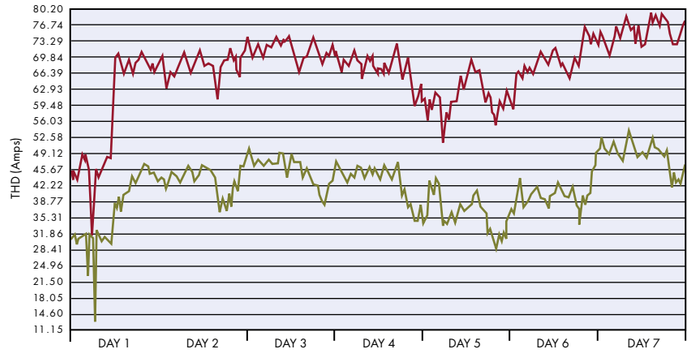
HOW YOU BENEFIT FROM POWERSTAR

REDUCES CONSUMPTION



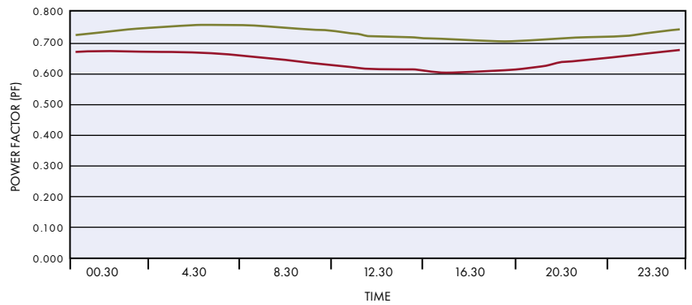
If a site is supplied with electricity at a higher voltage than is needed it could result in excess energy consumption and inflated electricity bills, due to some electrical equipment consuming more power at higher voltages. Voltage optimisation reduces the voltage of the electricity supplied to equipment, minimising consumption while remaining within the operating conditions specified by the equipment manufacturer, thus resulting in reduced electricity consumption and electricity costs.

REDUCES HARMONICS



Harmonics can cause a large load current, overheating of electrical supply transformers, high voltage, current distortions and false tripping of branch circuit breakers. The effect of reduced harmonic distortion is shown on the chart (left) at a printing machine electrical supply, where the two traces are measured concurrently either side of the Powerstar unit. Total current harmonic distortions were significantly reduced.

IMPROVES POWER FACTOR



Power Factor is a way of describing how efficiently electrical power is consumed. It is the ratio of delivered useful power to the total power taken from the supply. The ideal ratio is 1:0, Poor Power Factor has a negative impact on a site including drawing more power from the network causing losses at transformers, reducing effective capacity and incurring 'poor Power Factor' or 'reactive power' charges from the supplier.

Powerstar will reduce the resistive and inductive losses (known as impendence) reducing the apparent and reactive power vectors, resulting in smaller phase angle and therefore improving Power Factor.

Advantages of improved Power Factor include reducing power demand from the network (which will result in lower electricity bills), prolonging lifespan of equipment, reducing losses in supply transformers and increasing the effective capacity of your electrical network.

CASE STUDIES

Scan the QR code to view our latest case studies online

London City Hall

London City Hall is one of the UK's most prestigious buildings and is home to the Greater London Authority (GLA), it accommodates the Mayor of London, the London Assembly and over 600 permanent GLA employees. Following the installation of Powerstar London City hall has benefited from annual reductions in energy consumption of **13.6%** and significantly reduced carbon emissions and electricity costs.

NHS

NHS is the National Health Service of the UK and Powerstar has been installed into a wide range of NHS managed healthcare facilities including hospitals, clinics, medical centres, acute care facilities, doctors surgeries, care homes and high-security psychiatric hospitals. The installations have provided an average **12.0%** savings in energy consumption across NHS healthcare estates along with reducing costs of maintaining lighting, plant and IT equipment in several of the facilities.

Carlsberg (Photos Photiades Breweries Ltd)

Photos Photiades Breweries Ltd is a dynamic brewery which produces and distributes Carlsberg beer throughout Europe. It also distributes a number of other renowned brands of beers, spirits, wines and beverages to Cyprus and Greece. The brewery is benefiting from annual reductions in energy consumption of **17.0%** with improved efficiencies in equipment at the production facility due to Powerstar.

Sheffield Hallam University

Sheffield Hallam University had previously implemented a number of energy efficiency initiatives at the student union building to tackle high energy consumption and frequent light tube failures.

Following the installation of Powerstar energy consumption has been reduced by **16.0%** per annum. Crucially over an 18 month monitoring period the university also saw a 75% reduction in light bulb failures.

Trelleborg

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. The companies UK facility was looking to further reduce its carbon emissions and overall energy efficiency having already implemented a number of other solutions such as T5 fluorescent lighting and large inverter drives. Powerstar was able to provide an additional **11.2%** saving on annual energy consumption on top of current reductions.

Emirates Towers

The Emirates Towers are one of the most stunning architectural highlights in the Dubai skyline and facilities include 400 fully furnished rooms and suites and state of the art meeting room and business facilities.

Following installation of Powerstar annual energy consumption savings of **9.2%** have been achieved.

SAVE ELECTRICITY COSTS

PROTECT CORPORATE SOCIAL RESPONSIBILITY AND REPUTATION

REDUCE FINANCIAL RISK INCREASE BOTTOM LINE AND CUT CAPITAL REPLACEMENT COSTS

CUT CARBON FOOTPRINT

"We found Powerstar to be both professional and proactive in their awareness of the installation requirements during business operational hours, which ensured minimum disturbance for our guests. The carbon savings are fantastic, a great result for our company."

CHRIS GEORGE
HEAD OF ENERGY AND ENVIRONMENT | **WHITBREAD HOTELS & RESTAURANTS**

"We have experienced no issues or problems with the Powerstar equipment we have had fitted. The kit is robustly manufactured and electrically sound."

PETER GARDINER
M&E MANAGER | **LINCOLNSHIRE CO-OPERATIVE**

"We would highly recommend Powerstar voltage optimisation systems. Powerstar voltage optimisation has shown that significant savings can be achieved without compromising the operations of the hospital."

MARK O'GRADY
MANAGING DIRECTOR | **MITIE ENGINEERING (NORTH) LTD**

"We have been very pleased with the quality and workmanship – the energy savings have been higher than forecast and the Powerstar team have been very flexible in working around our operational systems to ensure full services are maintained. I have no hesitation in recommending Powerstar voltage optimisation and we are pleased with the full service provided."

STUART HARRIS
HEAD OF ENERGY AND CARBON OPERATIONS | **BT TECHNOLOGY, SERVICE & OPERATIONS**

"Powerstar voltage optimisation has been a major part of our comprehensive energy efficiency programme. It is perhaps the simplest and most effective way to instantly save energy and therefore we would highly recommend Powerstar systems."

MARK ORPIN
HEAD OF ENERGY MANAGEMENT | **ASDA SUPERMARKETS**

"Powerstar's estimated savings were not only met but surpassed. We also measured the harmonics and Power Factor and again they surpassed expectations. We now have Powerstar installed across the majority of our larger office portfolio and are showing savings every day."

DAVE HORTON
SUSTAINABILITY AND CAPITAL INVESTMENTS MANAGER | **RWE NPOWER**

COMPANIES WITH AROUND **100 SITES** CAN EXPECT TO ACHIEVE SAVINGS IN THE REGION OF **£1,000,000 PER YEAR** IF POWERSTAR IS ADOPTED ACROSS THE WHOLE ESTATE

INDEPENDENT REPORTS INTO POWERSTAR'S EFFICIENCY

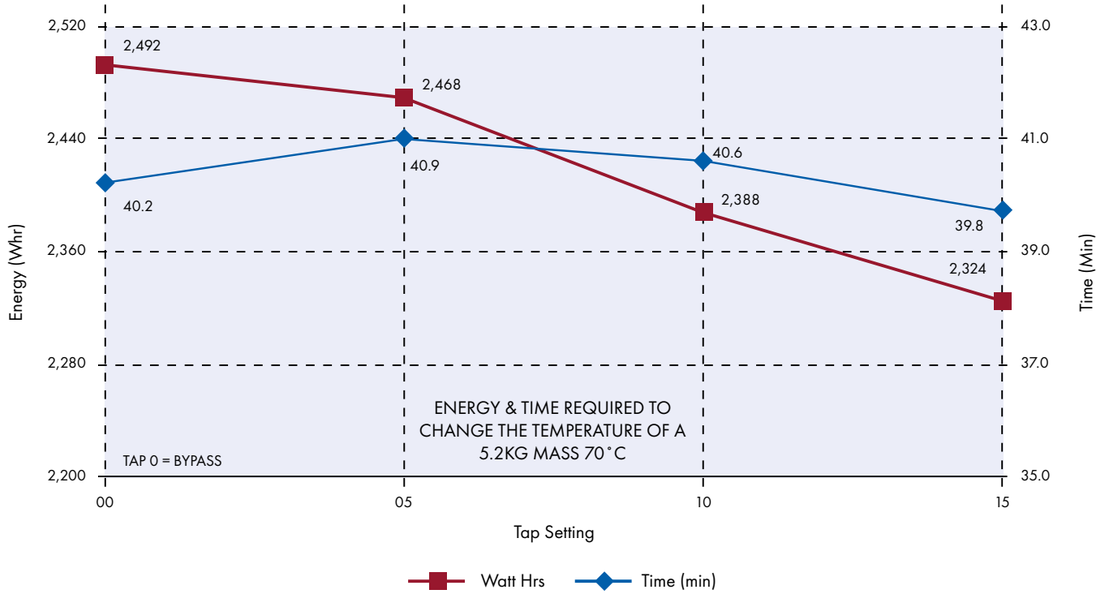
As a market leading manufacturer of voltage optimisation technologies, we welcome the opportunity for our systems to be independently tested and verified. Not only does this allow us to indisputably quantify the savings and efficiency potential of Powerstar solutions, it also accurately demonstrates the correct applications and approach to voltage optimisation, in order to achieve maximum savings and efficiencies from the technology.

The design and specification of Powerstar voltage optimisation systems is unique. We hold a patent on its design which ensures that other voltage optimisation systems, whilst similar in application and principle, are unable to replicate the exact design specification of Powerstar systems.

Independent tests and reports on Powerstar voltage optimisation systems have been completed by a number of organisations including universities, large corporations, associations and industry specialists all of which underline the potential of Powerstar and how the patented design leads to additional savings and efficiency benefits.

AEP AMERICAN ELECTRIC POWER

AMERICAN ELECTRIC POWER (AEP) INDEPENDENT TEST INTO SAVINGS AND EQUIPMENT EFFICIENCIES



The most recent independent test on a Powerstar system was carried out by AEP at the renowned Dolan Research Center in Ohio, USA. A Powerstar was tested under laboratory conditions in order to verify the effect the system had on both electricity consumption and efficiencies on compressors and pumps.

A summary of some of the compressor testing results are shown on the above chart, these highlight that not only did Powerstar achieve kWh savings of 6.7% at a 15V reduction, but with the Powerstar in circuit it took the compressor less time to achieve the same output from the same input conditions.

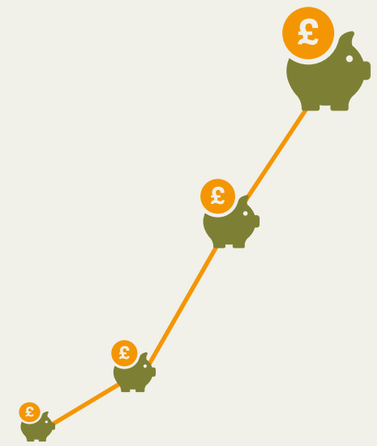
Therefore confirming that using Powerstar to run the equipment tested at its design characteristics not only reduced its energy consumption but also improved the efficiency of the equipment.

Scan the QR code to download the full AEP report which includes a summary of all tests carried out and subsequent results

powerstar 100% SAVINGS GUARANTEE

SAVINGS FROM ALL POWERSTAR SYSTEMS ARE 100% GUARANTEED

AS ENERGY PRICES CONTINUE TO RISE EFFICIENCY SAVINGS FROM POWERSTAR WILL INCREASE OVER TIME



ANALYSIS IS BASED UPON IPMVP AND IS CARRIED OUT VIA THE STEPS BELOW.

STEP 1

Compares 28 days pre install kWh data against 28 days post install kWh data

STEP 2

Compares 28 days post install kWh data against the same dates a year previous (pre install)

STEP 3

Compares 84 days (12 weeks) post install kWh data against the same dates a year previous (pre install)

STEP 4

Involves a regression analysis. An accurate model is created based upon pre install kWh consumption data and variables such as temperature

STEP 5

A verification providing a snapshot of the savings achieved from the negative power (back EMF) generated through the patented Powerstar design

SAVINGS EXAMPLE

Proposal states 10% saving worth £15,000 per annum giving a payback of 2.8 years	Actual energy savings achieved = 8% worth £12,000	Shortfall = £3,000	We issue a one-off payment to the client of £3,000 x 2.8 = £8,400 so the return on investment is guaranteed

OPTIMISE AT HV SIDE OR LV SIDE

Voltage optimisation is needed to correct the supply issues caused by the high voltage (HV) infrastructure.

If your company operates its own HV/LV (distribution) transformer then perhaps the most effective option is to install a Powerstar HV MAX system. This will produce savings on both the transformer side as well as the load side (depending on the voltage profile, business operation and type of equipment on site). If your company has a low voltage (LV) supply only, then the Powerstar LITE or Powerstar MAX systems will be the most appropriate.

LITE

MAX

HV MAX

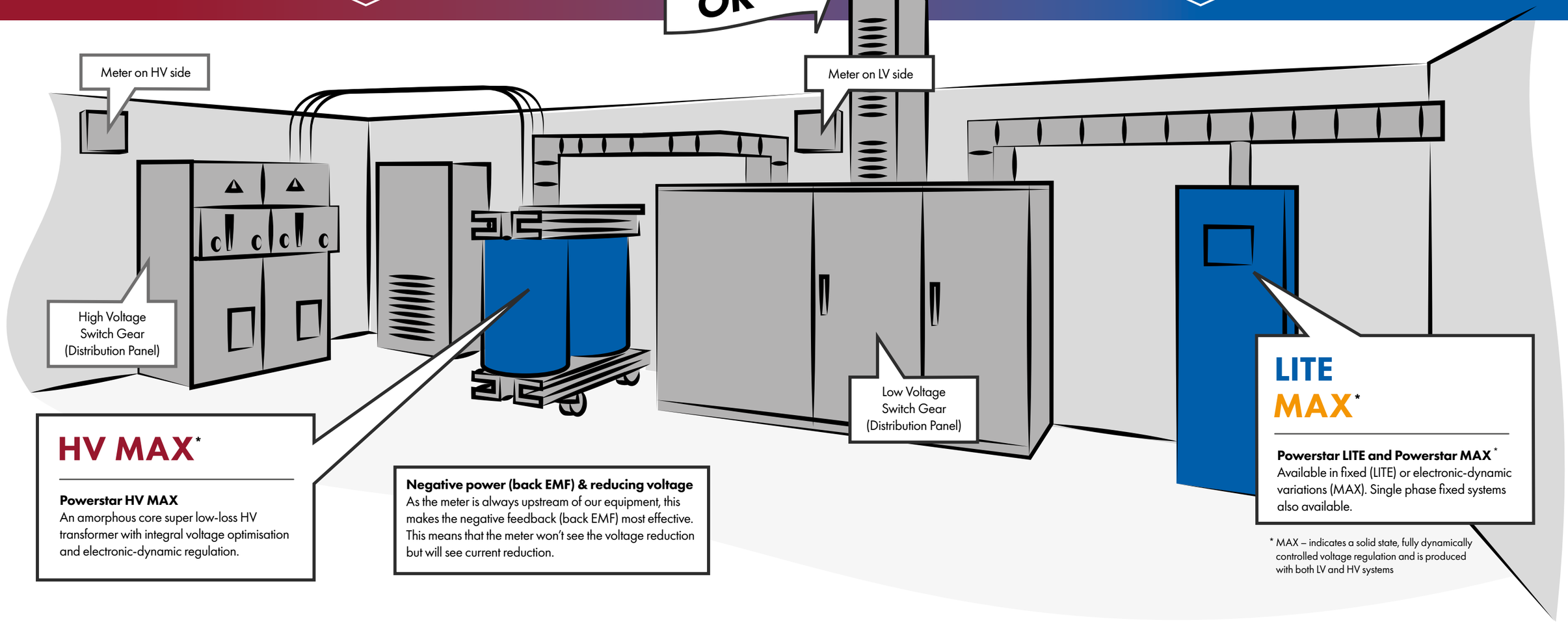
VIRTUE
ENERGY STORAGE SOLUTIONS

Powerstar **MAX** or Powerstar **HV MAX** voltage optimisation systems can be integrated with the **VIRTUE** energy storage system. To find out more download our VIRTUE brochure at **www.powerstar.com**

HV SIDE

OR

LV SIDE



HV MAX*

Powerstar HV MAX
An amorphous core super low-loss HV transformer with integral voltage optimisation and electronic-dynamic regulation.

Negative power (back EMF) & reducing voltage
As the meter is always upstream of our equipment, this makes the negative feedback (back EMF) most effective. This means that the meter won't see the voltage reduction but will see current reduction.

LITE
MAX*

Powerstar LITE and Powerstar MAX*
Available in fixed (LITE) or electronic-dynamic variations (MAX). Single phase fixed systems also available.

* MAX – indicates a solid state, fully dynamically controlled voltage regulation and is produced with both LV and HV systems

HV SYSTEM

HV MAX

A COMBINED SOLUTION
TO TWO COMMON PROBLEMS

APPLICATION

Powerstar HV MAX provides a combined solution to two common problems, combining a super low-loss amorphous core HV/LV transformer with integrated electronic-dynamic voltage optimisation technology, allowing for 11,000V input (other inputs available) and regulated 380V or user defined output.

EXCEEDS ECO DESIGN 2021 EFFICIENCY SPECIFICATIONS:
PROVIDING A MORE EFFICIENT TRANSFORMER THAT DELIVERS GREATER SAVINGS AND ROI OVER ITS LIFESPAN

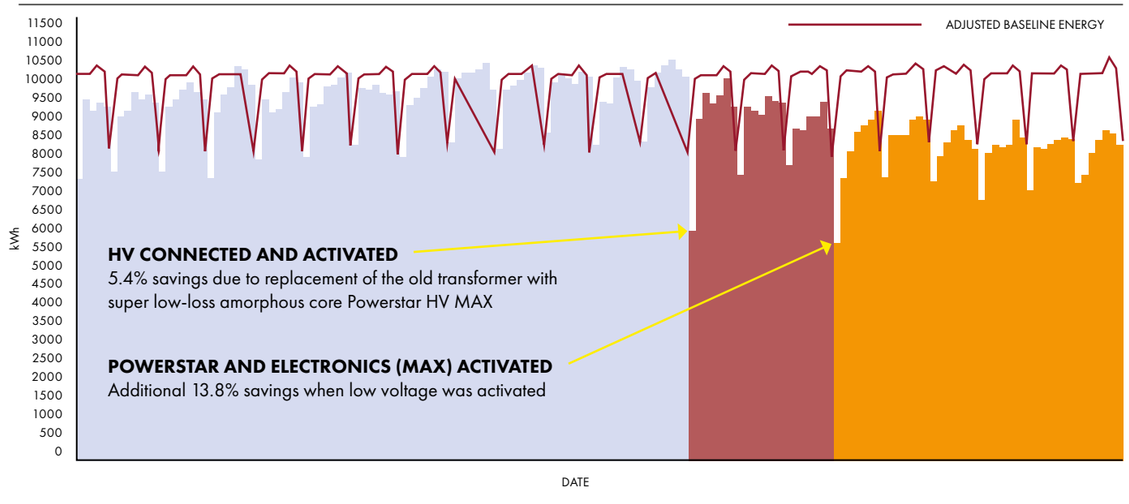
100% SAVINGS GUARANTEE WITH THIS SYSTEM

Features and benefits of Powerstar HV MAX

- The super low-loss amorphous core transformer is 99% efficient, therefore will provide up to an additional 3% savings on total electricity consumption than traditional HV transformers
- The integrated electronic-dynamic (MAX) voltage optimisation technology may offer a further 10% saving
- Typical savings of 13% of annual electricity consumption can be expected
- Environmentally friendly with low greenhouse emissions
- Guaranteed safety, security and reliability
- Reduced temperature rise of the core and reduced magnetising current
- Provides voltage stabilisation and protection against spikes and surges
- Output accuracy of +/-1.25V single phase LV output
- Capacity 315kVA to 3000kVA
- Online remote monitoring capabilities for 24/7 visibility of asset performance

Example of savings achieved at ASDA (part of the WAL•MART family)

Project Tracking: Daily Date: Actual vs Forecast



Replacing HV/LV transformer

The reason you need to optimise voltage is to correct problems caused by the HV infrastructure.

Unless your HV/LV transformer is brand new, it is more efficient to correct the issues at source. This can be achieved by optimising the voltage at the HV supply by simply replacing the inefficient HV/LV transformer with the Powerstar HV MAX super low-loss amorphous core.

Powerstar HV MAX Savings

Majority of the savings continue to come from the negative power feedback (back EMF), due to the system's patented design. However, you can also expect around 10% of the total savings to be achieved from improved transformer efficiency and additional savings from improvements to equipment efficiencies, on applicable loads.

Installing an amorphous core transformer

- The Powerstar HV MAX transformer uses amorphous alloy with superior magnetic characteristics
- It is a non-crystalline structure with atoms randomly arranged and easy magnetisation
- Ability to switch magnetisation at a quicker rate significantly reduces losses
- Amorphous metal uses thin ribbons of metal at 0.025mm thickness

The chart (right) shows that for a 1,000kVA system at 75% load typical annual consumption savings are 52,867kWh, with financial savings of £6,344 and a reduction in carbon emissions of 29.3 tCO_2.

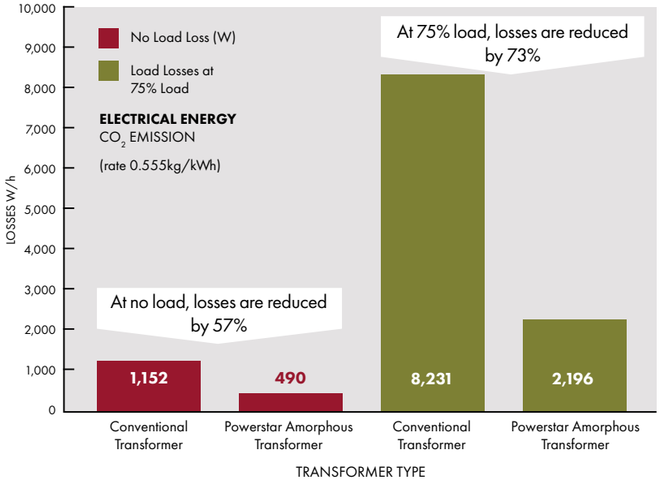
Over 15 years (warranty period of the system), typical financial savings are therefore £95,160 with carbon reductions of 439.5tCO_2. These are savings from reduced transformer losses alone.

Savings figures show typical estimation. Financial figures based on 12p/kWh. CO_2 figures based on 0.000555t CO_2/kWh

Replacing the existing transformer with the super low loss amorphous core Powerstar HV MAX transformer can yield significant savings depending on the age, load characteristics and type of transformer installed.

YEAR	ANTICIPATED SAVINGS
1950	3%
1955	3%
1960	3%
1965	3%
1970	2.5%
1975	2.5%
1980	2%
1985	2%
1990	1.5%
1995	1.5%
2000	1%
2005	1%

Load Loss Comparison For 1,000kVA Powerstar HV MAX



powerstar

LV SYSTEMS

LITE

MAX

POWERSTAR LITE & MAX
COMPARISON

APPLICATION

For clients with sites operating a low voltage (LV) supply only, both fixed and electronic-dynamic voltage optimisation solutions are available. Our LV voltage optimisation range ensures our clients have access to the correct application and the ideal energy saving solution for their sites, with systems suitable for single site small businesses through to large commercial multi-site premises.

15 YEAR WARRANTY PROVIDED WITH BOTH SYSTEMS

BOTH SYSTEMS CARRY A **100% SAVINGS GUARANTEE**

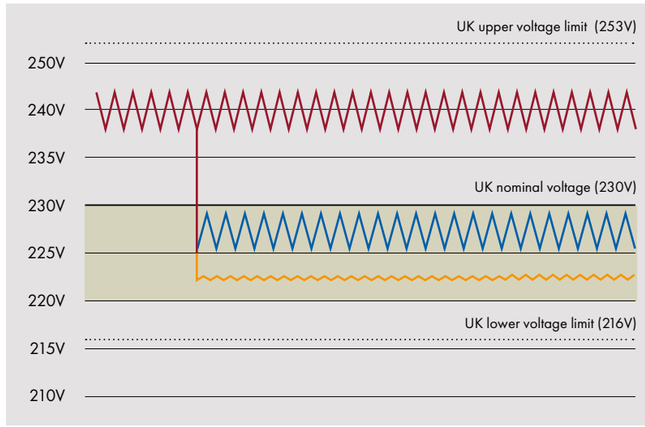
Powerstar LITE is a fixed voltage optimisation system which provides a set level reduction across a pre defined tap range.

- The optimised voltage will match the incoming voltage profile albeit reduced by a set amount
- LITE systems are available from 100Amp for small commercial systems up to 3MVA systems available for larger commercial premises
- This system is ideal for sites with a stable yet high level of incoming voltage
- Details of single phase & small three-phase range available on request

Powerstar MAX is an electronic dynamic (variable) voltage optimisation system which takes the incoming voltage and optimises it to a constant level.

- The stabilised voltage output is achieved through the use of intelligent electronic controls that automatically adjust and maintain the voltage to create a stable profile
- MAX systems are suitable for commercial premises and are available in sizes from 28kVA through to a maximum of 3MVA
- This system is ideal for sites with fluctuating voltage, high night loading or critical equipment requiring additional security
- MAX systems include online remote monitoring capabilities to enable visibility of key performance characteristics at all times from anywhere with a secure internet connection

LITE v MAX Voltage Reduction Comparison



SUPPLY VOLTAGE

OPTIMISED VOLTAGE FROM A POWERSTAR **LITE** FIXED VOLTAGE OPTIMISATION SYSTEM

ADDITIONAL SAVINGS WITH THE POWERSTAR **MAX** ELECTRONIC-DYNAMIC VOLTAGE OPTIMISATION SYSTEM

UK RECOMMENDED OPTIMAL VOLTAGE LEVEL

LITE v MAX Benefits Comparison

	LITE	MAX
Patented Design	✔	✔
Achieves 10% Average Savings	✔	✔
Additional Savings Opportunities		✔
Reduces Harmonic Distortions	✔	✔
Improves Power Factor	✔	✔
Improves Phase Balancing	✔	✔
Increases Lifespan of Equipment	✔	✔
Secure online remote monitoring capabilities	✔ Option	✔
No Moving Parts	✔	✔
Guaranteed Savings	✔	✔
Manufactured in UK	✔	✔
Electronic-Dynamic (Variable) Optimisation		✔
Incorporates Modern Technology to Regulate Voltage Output		✔
Suitable for Sites with Fluctuating Voltage		✔

UK MANUFACTURING

Powerstar systems are designed and manufactured in the UK. As a result our clients can be assured that the solutions we provide represent the most efficient and highest quality systems on the market, which are engineered to recognised international manufacturing standards. In addition, with full R&D, design, engineering, manufacturing and assembly facilities in-house we can offer our clients short lead times and a crucial differential of flexibility, as all our systems can be tailored to meet the unique requirements of the client, including designing bespoke engineered solutions to tackle whatever challenges our clients face.

Powerstar works to particular quality standards and processes, these include being certified by a number or industry organisations including; ISO 9001 and ISO 14001 quality and environmental management standards, in addition to being accredited with the acclaimed 'Made in Sheffield' mark of excellence on all products.

15* YEAR WARRANTY

50 YEAR LIFESPAN

*15 year warranty applies in the UK only, in all other countries a 10 year warranty applies. Warranty includes parts and labour but excludes damage due to overloading of the system.

AWARDS AND ACCREDITATIONS

Powerstar has been granted a number of awards and accreditations in relation to the product and the manufacturing, installation, project management processes, procedures, systems and supply chains used. Key accreditations include:

bsi. ISO 14001:2015 Environmental Management EMS600861

bsi. ISO 9001:2015 Quality Management FS579032

MADE IN SHEFFIELD

British Chambers of Commerce

UL

CE

European Utility Week

Care4Air Awards Winner

Private Business Awards 2012

Smart Funding Innovation

FLEXIBLE FINANCE OPTIONS

ENJOY THE BENEFITS OF POWERSTAR WITH NO UP-FRONT COSTS

Customers in the UK can purchase and install Powerstar voltage optimisation systems for their sites with no capital expenditure through a range of finance packages, these enable organisations to:

- Choose from a range of repayment options to meet your business needs
- Get the benefits of Powerstar today, with no capital outlay
- Benefit from fixed regular payments
- Enjoy the tax benefits of the finance options
- Free up working capital for projects core to your business activities
- Improve profitability of the project from day one with repayments set lower than energy savings
- Benefit from the **100%** guaranteed savings

OUR FINANCE PACKAGES INCLUDE

- POWERSTAR AS A SERVICE
- ENERGY PERFORMANCE CONTRACT
- HIRE PURCHASE & LEASING AGREEMENTS
- RENTAL OPTIONS

VISIBILITY OF ASSET PERFORMANCE

Powerstar's secure online remote monitoring platform provides users with detailed information regarding the system's operation and performance, in real time.

View key performance data through a secure password-protected portal including:

- Energy savings
- Current per phase
- kVA per phase
- Total kVA
- Harmonics - (both voltage and current)
- kWh per phase
- Total kWh consumption
- Voltage per phase
- kVAr per phase
- Power factor per phase
- Automated alarms and alerts
- Additional technology performance, including energy storage and smart transformers

In addition to voltage optimisation, the remote monitoring platform can be integrated to show the performance data of other technologies, including energy storage, smart transformers and on-site generation

Trend analysis can highlight opportunities for further optimisations to be made

Dedicated remote support team provides complete peace of mind

/powerstar

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UK 29.08.19