

Voltage Optimisation

Reduce energy consumption, save money
and save the environment



SVO & EVO

Standard and Enhanced Voltage Optimisation up to 3MVA

Make the most of your energySM

Schneider
ElectricTM

Our Voltage Optimisation solutions in summary:

Schneider Electric provides integrated solutions for commercial, industrial and infrastructure. The first step is to choose the right type of voltage optimisation solution which will typically depend on the following:



Customer electrical infrastructure
(access and ownership)



Infrastructure age
and type



Level of VO implementation

- MV/LV, LV/LV, LV final circuit or a combination



Critical power needs

When this has been assessed any of the following may be considered:

- MV/LV supply transformer tapping adjustment
- MV/LV replacement super low loss transformers with extended tapping range
- LV/LV Voltage Optimisation - SVO or EVO
- Final circuit Voltage Optimisation lubio
- Power conditioning - power factor correction
- Power conditioning - harmonic filtering
- LV circuit protection and communications
- LV circuit performance monitoring and communications
- Web based power monitoring
- Power monitoring software
- Energy and sustainability services
- Network consultancy services
- Installation and commissioning services
- Energy performance contracts and energy rebates
- Remote service platforms
- IPMVP (International Performance & Measurement Verification Protocol) evaluations



The Schneider Electric web calculator and iOS and android apps can help you see the opportunity for voltage optimisation. Optimise your costs, your network and your assets whilst saving energy and the environment.

To learn about even more about energy management visit Schneider Electric Energy University visit www.schneider-electric.com/vo/uk or email gb-powerquality@schneider-electric.com.



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Voltage Optimisation in context

In the face of rising electricity prices, the growing business cost of carbon taxation and the impact of meeting carbon emissions targets, businesses need simple, cost-effective, high impact energy efficiency solutions. Leading organisations who utilise the Marginal Abatement Curve to evaluate the most cost effective savings found that Voltage Optimisation comes out as one of the top energy efficiency measures to reduce a buildings energy consumption and carbon emissions.

As a global specialist in energy management, Schneider Electric provides measurement, automation, monitoring and service solutions to help you achieve greater energy efficiency. Our Voltage Optimisation solutions will help you to reduce energy consumption, save money and save the environment and with additional benefits such as dynamic voltage control, the opportunity exists to improve power quality, extend equipment lifetimes and potentially reduce equipment maintenance costs.

When combining Voltage Optimisation with protection, measurement, system connectivity and performance information, stakeholders will be reassured that the electrical system is performing at its most efficient; at minimum business operating cost with the best returns for the investment.

VO core

Most electrical equipment in Europe is designed and manufactured to run at 220V but buildings in the UK are supplied with a voltage which can vary between 207V and 253V with a norm of around 242V which is much higher than required and **which is on the increase**.

By reducing the difference between the voltage supplied to a building by and the optimal voltage for efficiently operating electrical equipment (220V) substantial energy savings can be achieved whilst maintaining installation performance.

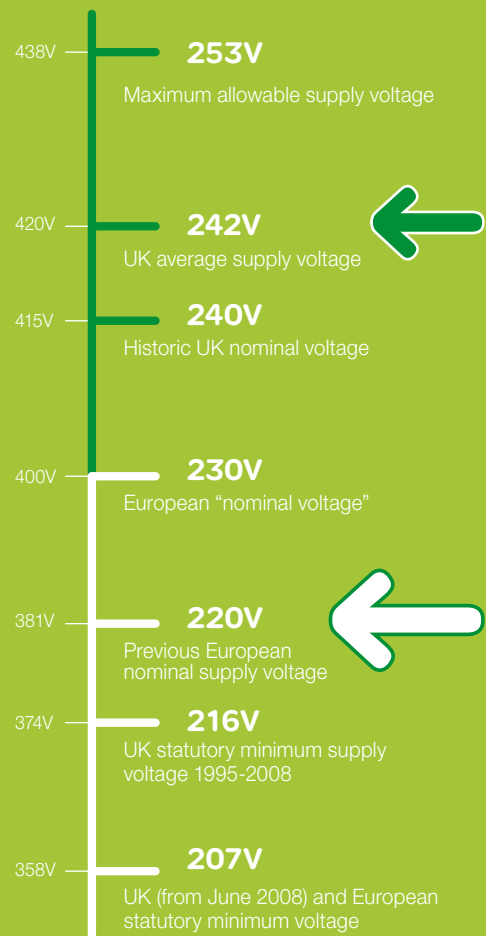
The larger the difference between supply and optimal voltage, the greater the opportunity for energy efficiency to be realised.

Voltage reduction can be possible via MV/LV infrastructure modifications or replacement using low loss transformer in particular. When used in combination with voltage optimisation technology system losses can be minimised whilst maximising energy savings.

Increased Efficiency by voltage reduction

On Load Voltages

Ph-Ph Ph- Neutral



For communications, hardware and software, our solutions include:



Energy Management

Power Distribution & Control

Building Management Systems

Internet On-line Services

Integrated through our highly flexible and scalable StruxureWare™ platform

VO application

Voltage optimisation may be considered for any type of installation it is highly efficient and reliable due to its in-line direct connection.

It can improve energy efficiency in a variety of loads even if associated energy efficiency measures have already been implemented. Typical examples of these are:

- Chillers and air conditioning with or without variable speed drives
- Lighting without ballast, magnetic ballast or electronic ballast
- LED lighting
- Motors with or without variable speed drives
- Uninterruptable power supplies
- IT Equipment
- Process control equipment
- Charging equipment



In order to assess the application, opportunity, business case and performance evaluation for Voltage Optimisation, the following steps should be carried out:

- 1 Initial site evaluation – spot voltage measurement and basic consumption data collection
- 2 Web, iOS or Android app voltage optimisation calculator high level evaluation
- 3 Site audit including – on-site voltage logging and half hourly data collection
- 4 VO technology and selection assessment
- 5 Procure and install VO technology
- 6 IPMVP measurement and verification pre-implementation phase
- 7 IPMVP measurement and verification post-implementation phase

VO implementation

MV/LV transformer tapping adjustments can be considered when there is access to the transformer infrastructure. MV/LV super low loss transformers can be considered independently where there is a potential change or addition to the network infrastructure with a viable energy efficiency business case.

SVO (Standard Voltage Optimisation) provides one of the simplest and most effective means to decreasing energy consumption by reducing the LV supply voltage within your installation by a fixed percentage. With very low losses, very high reliability and the ability to change the settings off-line, SVO delivers energy consumption reduction in an efficient and reliable way which is adaptable to future installation changes.

EVO (Enhanced Voltage Optimisation) incorporates all the benefits of an SVO unit and includes dynamic voltage control where the normal low voltage supply exhibits unacceptable variations. This is achieved by using electronics which enable voltage reduction and boost.

Ready to Install solutions incorporating voltage optimisation, incoming and outgoing circuit protection metering and communications connectivity measuring the performance of your voltage optimisation solution and connecting this through our remote service platform can enable you to find even more energy savings.



Standard Voltage Optimisation (SVO)

unit for sites with consistent over voltage

- Fixed percentage voltage step down
- Standard voltage optimisation (size range – 70kVA to 3000kVA)
- Choice of voltage optimisation settings (4,5,6,7; 6,7,8,9; and 8,9,10,11)
- Eff. ≤99.94%



Enhanced Voltage Optimisation (EVO)

unit for sites with volatile voltage supply

- Dynamic voltage control
- Enhanced voltage optimisation unit (size range - 70kVA to 2000kVA)
- Automatic Voltage Controller (AVC) responds to voltage fluctuations to maintain voltage within a fixed range
- Boost up to 4% to correct under-voltage
- Eff. ≤99.94%

For power quality improvements including power factor improvement and harmonic mitigation, our solutions include:



Power Factor Correction Units

for sites with low power factor < 0.95 lagging

- Standard offer (Range 9 to 1150 kVAr)
- Detuned offer (Range 9 to 1150 kVAr)
- Voltage range 230 V to 690 V, 50 and 60 Hz
- Fixed and automatic (Dependent upon rating)



Active Harmonic Filters

for sites with high levels of harmonic distortion ThdV upto 5%

- Harmonic mitigation up to 50th harmonic
- Power factor correction
- Range 30A to 300A single units
- Voltage range 200 V to 690 V, 50 and 60 Hz



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As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation and data centres/networks, as well as a broad presence in residential applications.

Focused on making energy safe, reliable, efficient, productive and green, the company's 150,000 plus employees achieved sales of 24 billion euros in 2013, through an active commitment to help individuals and organisations Make the most of their energySM.

We are changing our brand names and becoming one Schneider Electric. You'll get the same great quality products, but from one name you can remember and trust. This provides you and your customers with the reassurance associated with Schneider Electric.

Some of our market leading brands have already become Schneider Electric including **Merlin Gerin, Telemecanique, Square D, GET, Mita, Sarel, Himel, Thorsman, Tower and TAC.**

Working as one Schneider Electric makes it clearer that our ranges are highly compatible for integrated solutions.

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