

iVolt®

Intelligent Power Optimisation

PHASE 1

INPUT VOLTAGE

OPTIMISED VOLTAGE

OUTPUT CURRENT

PHASE 2

INPUT VOLTAGE

OPTIMISED VOLTAGE

OUTPUT CURRENT

PHASE 3

INPUT VOLTAGE

OPTIMISED VOLTAGE

OUTPUT CURRENT

iVolt

iVolt

iVolt®

Intelligent Power Optimisation

iVolt® can save you **up to 30% more**
than any fixed voltage
reduction product.

Guaranteed.



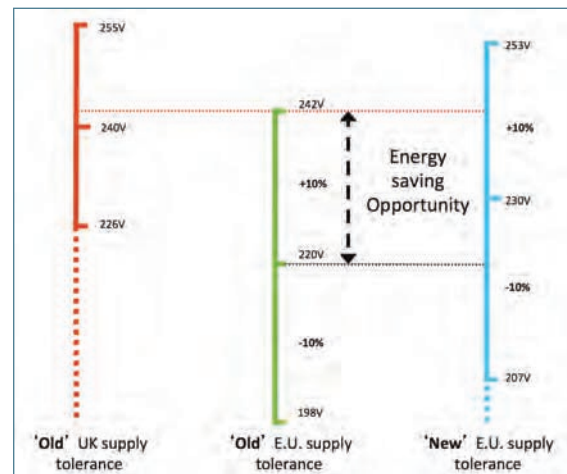
Saving more with iVolt®

Voltage levels provided by power companies are not typically matched to the optimum level for most electrical equipment. Voltage Optimisation can be used to save energy and maximise equipment efficiency. Using Voltage Optimisation with electrical equipment such as refrigeration or air cooling devices, 3-phase motors, high-intensity discharge or fluorescent lighting, will reduce energy consumption and create real financial savings. Voltage Optimisation also increases the service life of electrical equipment.

In the UK, generating companies are required to provide customers with a voltage between 216V and 253V. The average voltage across the UK is 242V, but levels can fluctuate significantly throughout the day on each site. Across Europe, the standard voltage has been historically 220V.

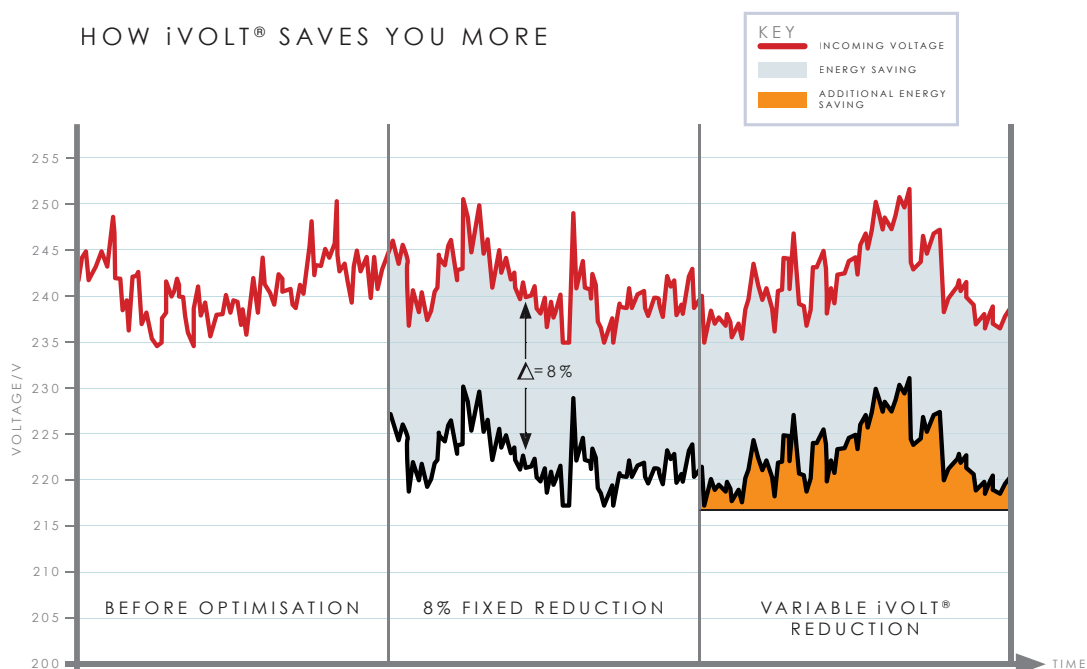
As a result, most electrical equipment is designed and specified to operate most effectively and efficiently at 220V. Providing equipment with higher voltages actually reduces efficiency and leads to wasted energy.

REDUCING MAINS VOLTAGE TO SAVE ENERGY AND REDUCE COSTS



Voltage Optimisation can be achieved with fixed step-down transformers or variable voltage reduction solutions. Depending on site characteristics, step-down transformers are typically installed to reduce the voltage by a fixed percentage ranging from 4% to 8%. The iVolt® is an innovative variable voltage reduction solution that automatically adjusts the incoming voltage to ensure that the output voltage is always fixed on 220V ± 1.5%. The iVolt® will deliver a reduction of up to 12% whenever possible.

HOW iVOLT® SAVES YOU MORE



iVolt® features and benefits

| Features | Benefits |
|--|--|
| Active voltage stabilisation | Over 90% of UK sites would save more energy with an iVolt® compared to leading fixed reduction systems |
| Solid state thyristor technology | No moving parts in the power circuits, no annual maintenance required |
| Stabilisation over wide voltage range | Maximises energy and cost savings |
| Unique IRT Energy Monitor® technology (patent pending) | Measures and reports energy savings accurately |
| Independent 3 phase control | Active phase balancing, improved power quality to enhance equipment life |
| Maintains stable voltage even if site voltage drops to 220V | Minimises risk of "brown outs" and equipment failure |
| Removal of voltage spikes and surges, and elimination of harmonic distortion | Added protection for site equipment and improved power quality |
| In-built electronic failsafe mode design | Maintains continuity of supply to site |
| Manufactured with low loss component technology | The iVolt® is over 99.4% efficient at full load and maximises energy savings |
| Reliable and proven technology, and ISO9001 accredited facilities | All iVolt® transformer windings have a 15 year guarantee |
| Internal power parameter measurement and data logging | Tracking of product and site performance |
| RS485 and USB data communications | Fully integrable into building management software systems |

The iVolt® - designed to be 99.4% efficient.....

and up to **30% more effective** than

fixed reduction units.

More savings. Guaranteed.

Independent research shows that optimising the voltage supplied to electrical equipment reduces power consumption, increases equipment lifespan, reduces CO² output, and saves organisations money.

The iVolt® is a state of the art electronic voltage stabiliser. Taking measurements over 3,000 times per second, the iVolt® maximises energy savings by using unique microprocessor, thyristor and transformer technology to ensure that the output power to your facilities is stable and optimised for maximum energy saving.



Voltage optimisation comparisons:

| | Fixed step-down transformers | Mechanical servo systems | iVolt® | iVolt® benefits |
|--------------------------------|------------------------------|--------------------------|--------|---|
| Maximises energy saving | No* | Yes | Yes | Greater savings and faster project ROI |
| Microprocessor controlled | No | Sometimes | Yes | Improves stability of voltage |
| Maintenance-free | Yes | No | Yes | No ongoing maintenance costs |
| Reduces risk of undervoltage | No | Yes | Yes | Protects equipment against damaging voltage dips (brown outs) |
| Compensates for fluctuations | No | Yes | Yes | Creates a more stable voltage and maximises savings |
| Improves power quality | Yes | Yes | Yes | Reduced maintenance costs on electrical equipment |
| Integrated IRT Energy Monitor® | No | No | Yes | Real-time measurement and reporting of energy saving |
| Output voltage accuracy (+/-) | 8% | 0.5 to 2% | 1.5% | Increased voltage stability |
| Adjustable output voltage | No | Yes | Yes | Flexibility to reflect changing site conditions |

iVolt® Technical Overview

Voltage Stabilisation: At the heart of the iVolt® are independently controlled auto-transformers for each phase. There are 9 tap-settings for maximum accuracy, with thyristor-based switching between each tap. The iVolt® uses the latest in thyristor switching technology to ensure stability and reliability.

A programmable micro-controller system controls the tap switching. Measuring the incoming voltage over 3,000 times per second, it selects the appropriate tap by activating the thyristor switch. The micro-controller also measures the

frequency of the mains supply and compensates accordingly. This means that the iVolt® will work automatically over a frequency range of 45 - 75Hz and down to as low as 30Hz for short periods to help cope with diesel generator loading problems.

This combination of controllable auto-transformers and a micro-controller system results in a voltage stabiliser which has no moving parts and responds quickly to voltage variations, providing a stable output voltage at 220V.

Integrated IRT Energy Monitor® technology **accurately**
measures your energy savings

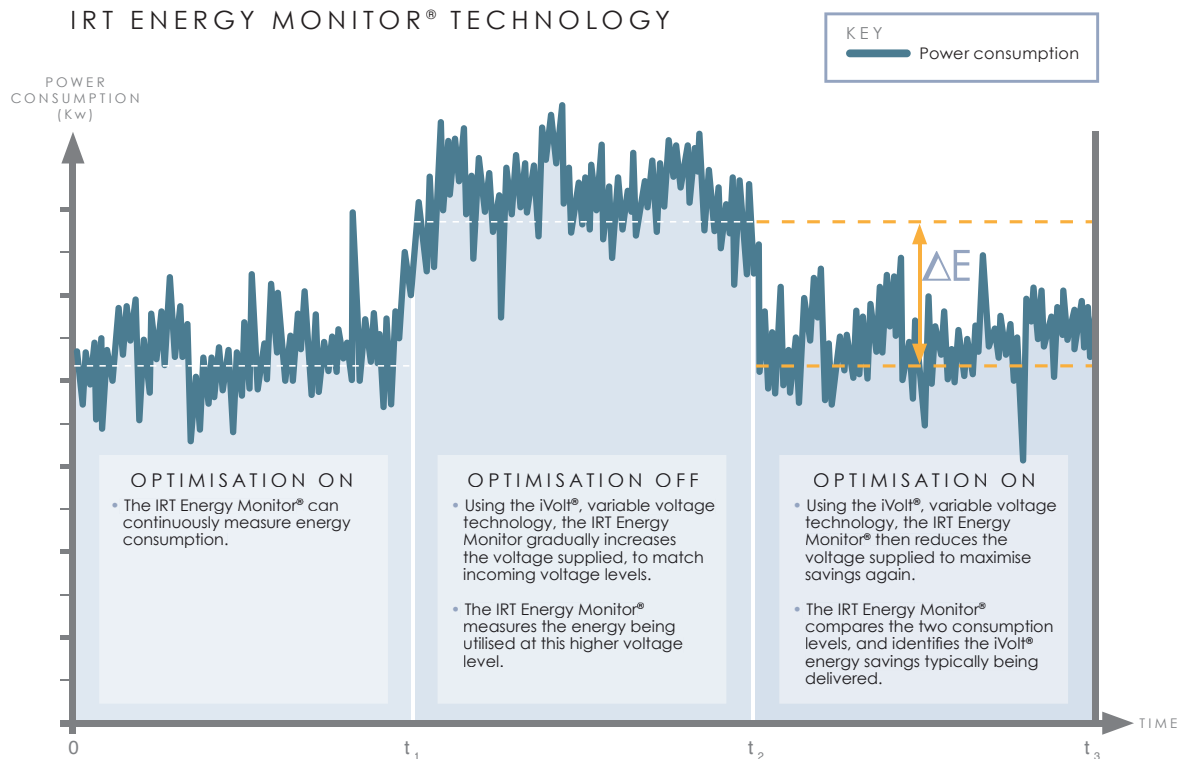
Real Time Energy Measurement: Integrated into every iVolt® is the unique **IRT Energy Monitor®** technology (patent pending), that enables accurate tracking of energy saving. This is the only voltage optimisation device on the market that can accurately show in real time what savings are being achieved at any given time.

Other systems have to rely on theoretical 'modelling' assumptions, such as production output, weather and other factors to verify savings, with data collected over several months to create a representative sample. However, the IRT Energy Monitor® uses real-time data to determine the energy savings being achieved

and results are significantly more accurate than modelling.

Using in-built electronic circuits, the iVolt® is able to measure energy consumption levels as accurately as data generated by meter readings. Using sophisticated software algorithms and the iVolt® variable voltage technology, the IRT Energy Monitor® adjusts the voltage output to compare energy consumption, with and without optimisation over a defined period. The energy-saving data from the IRT Energy Monitor® can be transmitted via the optional iVolt® communications module for use in remote building energy management systems.

IRT ENERGY MONITOR® TECHNOLOGY



Spike Protection: The iVolt® helps protect electrical equipment from damaging voltage spikes and surges, achieving this in two ways. Firstly, it is fitted with combined class I & II heavy duty surge arrestors at the input. In addition, it is designed with metal oxide varistors fitted directly to the transformer taps. These two design features have the joint function of protecting

both the iVolt® and also all site equipment. Secondly, further Metal Oxide Varistors are fitted on each power input to the circuit board, to protect the iVolt®'s low-voltage circuitry. The combined effect is a significant reduction in the risk of damage to site equipment, a highly reliable unit and a further improvement in power quality.

iVolt® Specifications

| Specification | |
|--------------------------------|---|
| Technology | Microprocessor controlled transformer tap selection using thyristors |
| Capacity | 32A to 3200A |
| Efficiency | 99.4% at full load |
| Response time | 15ms |
| Input voltage range | 253/438 volts down to 220/380 volts |
| Output voltage range | 220/380 volts, adjustable |
| Output accuracy | ± 1.5% |
| Phase control | Three phases balanced independently |
| Frequency | 47Hz to 75Hz |
| Waveform distortion | <0.25% |
| Transformer materials | Low loss electrical steel core with high purity copper conductors |
| Conductor Insulation class | Class H |
| Temperature class | Class B |
| Operating temperature | 0 - 55° C |
| Operating humidity | 95% non-condensing |
| Ingress protection | IP21 |
| Overload capacity | 150% for 4 minutes |
| Standards | BS EN 61558-1 2005, EN61000-6-4, IEC 61000-4-3, IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-11 |
| Expected Service life | >25 years |
| Warranty | 15 years (parts and labour) on all transformer windings and electronic control boards |
| Options | |
| Circuit breaker(s) | Input and/or output circuit breakers |
| Manual bypass | Manual bypass including isolation |
| Auto bypass | Auto bypass including circuit breaker for isolation |
| High level surge protection | Class 1 and 2 spike and surge protection Protection L - N: 25kA @ 10/350µs Protection N - PE: 100kA @ 10/350µs Voltage protection level: 1.5kV |
| Remote monitoring system | Connection to energy management or building management systems |
| Harmonic reduction transformer | Reduced power harmonics from supply and load |

iVolt® Dimensions - single phase systems

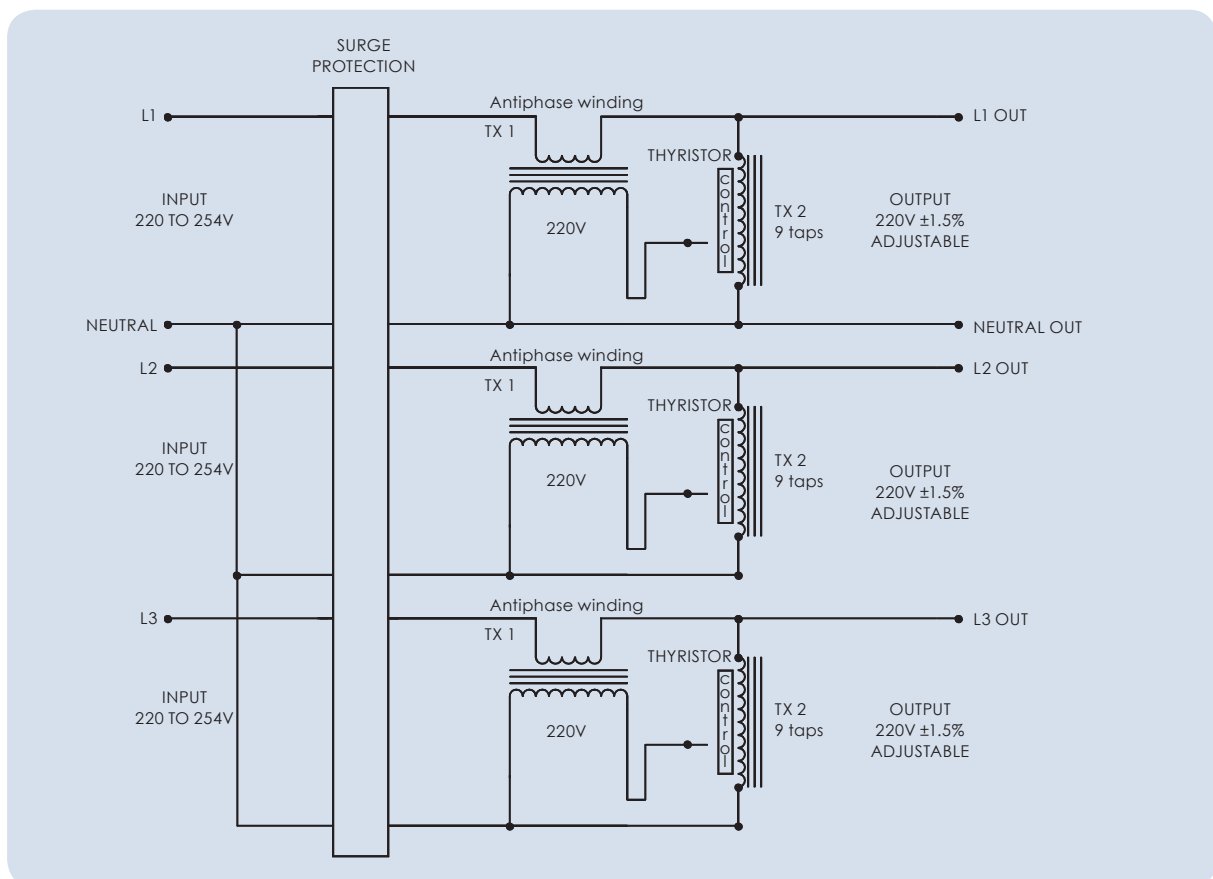
| iVolt Model | Amps | kVA | Width (mm) | Depth (mm) | Height (mm) | Weight(kg) |
|-------------|------|-----|------------|------------|-------------|------------|
| IVO32-12-2 | 32 | 7 | 300 | 300 | 350 | 30 |
| IVO63-12-2 | 63 | 14 | 395 | 370 | 490 | 50 |
| IVO100-12-2 | 100 | 22 | 395 | 370 | 490 | 70 |
| IVO200-12-2 | 200 | 44 | 450 | 500 | 700 | 140 |

iVolt® Dimensions - three phase systems

| iVolt Model | Amps/ Phase | kVA | Width (mm) | Depth (mm) | Height (mm) | Weight (kg) |
|----------------|-------------|------|------------|------------|-------------|-------------|
| IVO3x100-12-2 | 100 | 66 | 1000 | 550 | 1620 | 250 |
| IVO3x150-12-2 | 150 | 99 | 1000 | 550 | 1620 | 300 |
| IVO3x200-12-2 | 200 | 132 | 1000 | 550 | 1620 | 450 |
| IVO3x300-12-2 | 300 | 198 | 1000 | 550 | 1620 | 500 |
| IVO3x400-12-2 | 400 | 264 | 1430 | 735 | 1620 | 650 |
| IVO3x500-12-2 | 500 | 330 | 1430 | 735 | 1620 | 750 |
| IVO3x600-12-2 | 600 | 396 | 1430 | 735 | 1620 | 800 |
| IVO3x800-12-2 | 800 | 528 | 1550 | 735 | 1820 | 1100 |
| IVO3x1000-12-2 | 1000 | 660 | 1550 | 735 | 1820 | 1200 |
| IVO3x1200-12-2 | 1200 | 792 | 1800 | 735 | 2060 | 1450 |
| IVO3x1500-12-2 | 1400 | 924 | 1800 | 735 | 2060 | 1800 |
| IVO3x1600-12-2 | 1600 | 1056 | 1800 | 735 | 2060 | 2000 |
| IVO3x1800-12-2 | 1800 | 1188 | 1800 | 735 | 2060 | 2500 |
| IVO3x2000-12-2 | 2000 | 1320 | 1800 | 735 | 2060 | 3100 |

Different sizes available upon request. All weights and sizes are approximate. Specifications are subject to change without prior notice.

iVolt® Technical Schematic



Installation

All iVolt® units are installed by our technically qualified and approved installation teams. They are all NICEIC approved electrical contractors who have been trained by iVolt® engineers to the highest standards.

As part of the installation process, our engineers carry out a detailed site survey.

The iVolt® survey includes full 3- phase power logging to assess your power quality needs. Based on this, we can provide you with a full cost benefit analysis of your project and also identify the savings that you will achieve, backed by the iVolt® 100% savings guarantee.

The iVolt® Guarantee

We understand that your power supply is critical to your business and a project investment needs to deliver the benefits promised. That's why every iVolt® installation comes with our unique guarantee.

- We guarantee to save you up to **30% more** than any fixed voltage reduction product.
- Following a full site survey, we will commit to **deliver 100%** of the projected savings. We guarantee that you will **achieve the agreed ROI** (return on investment) for your project, or we will refund the difference.
- iVolt® installations are carried out by **approved iVolt® engineers**.
- The iVolt® is designed and built to relevant **CE standards**.
- We offer a **15 year guarantee** on all transformer windings and electronic control boards.

Over **90% of UK sites** would save more energy with an iVolt®

Finance options

Public Sector



The Salix Energy Efficiency Loans scheme provides interest free loans to the Public Sector to finance up to 100% of the costs of the energy savings projects.

Private Sector



Energy Efficiency funding is available to all kinds of businesses and organisations from terms 1 to 7 years, subject to carbon trust energy saving assessment.

The Sollatek Group

iVolt Ltd. is a wholly-owned division of the Sollatek Group, focusing on leveraging Sollatek's three decades of expertise in Voltage Power Stabilisation.

Sollatek is a world leading designer and manufacturer of voltage stabilisation devices and power solutions for a large number of industries.

Founded in the UK in 1983, Sollatek has grown rapidly to become a truly global company with a \$30m turnover. Now with offices in 14 countries and an active distribution network in 24 more, Sollatek has an impressive list of blue chip clients in the UK and internationally.

Sollatek continues to invest heavily in R&D with a UK-based design and development team. The company's global manufacturing facilities are certified to the latest ISO9001 quality standards.

Sollatek has successfully manufactured and installed thousands of voltage stabilisers in major infrastructure projects, both in the UK and globally. As Sollatek's products have been designed to operate in some of the most challenging industrial environments around the world, the technology has always been geared towards high reliability, with no moving parts and no maintenance required.



www.sollatek.com



Our international Clients





iVolt[®]
Intelligent Power Optimisation

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