

Three Phase Bespoke Voltage Optimisers from GW Energy Ltd

How does **eco-max-power** work?

eco-max-power optimisers provide a small reduction in voltage which is matched to the needs of your site and in doing so reduces your electricity consumption.

Here in the UK voltage supplied to any building can legally vary between 216V and 253V (230V +10/-6%). In order to maintain the supply on the network to all consumers, your electricity provider may have to supply you at a voltage in the upper end of this range. However, electrical equipment is designed to operate throughout the range.

If your supply voltage is higher than necessary then you will be consuming more power than you require. For example, equipment that is designed to operate at 230V will consume approximately 9% more power if supplied at 240V. These higher supply voltages also reduce the equipments life, in some instances by up to 45%, which increases the cost of ownership.

ECO-MAX optimisers reduce your unnecessarily high incoming supply voltage in a very special way and in doing so can **reduce your electricity bill and carbon emissions by up to 25%**.

eco-max-power - Options

ECO-MAX is not a one size fits all solution, quite the contrary, every ECO-MAX optimiser is manufactured specifically for its chosen application by using a range of unique add-on modules. This allows you to have a bespoke solution at an off the shelf cost.

Fixed Ratio (EMP)

This is our entry level power optimiser, offering exceptional value for money. Fixed ratio power optimisers are suitable for sites which have a relatively stable incoming supply voltage. As standard these units come with a number of fixed levels of voltage reduction. These levels are chosen specifically for your site based on the results of a detailed technical survey carried out by ourselves or one of our accredited installers. Any one of these levels can be manually selected during the commissioning process or at any time in the future if the need arises.

Fixed Ratio with "BrownOut" (EMPi)

On sites that experience occasional voltage dips during maximum demand periods we would recommend the **EMPi** variant, which continually monitors your incoming supply voltage.

If your incoming supply voltage drops below a predetermined level, optimisation is automatically inhibited allowing the full incoming supply voltage to be applied to the connected equipment. This ensures that your electrical equipment operates normally throughout the voltage dip. Optimisation is automatically reinstated once the incoming supply voltage has risen above a preset level for a predetermined amount of time.

As the **EMPi** system is based on the entry level EMP system it again offers exceptional value for money. Like the EMP system as standard it comes with a number of manually adjustable voltage reduction settings.

Staged Voltage Tracking (EMPs)

On sites which experience fluctuating supply voltages we can offer an intelligent option which provides a fixed output regardless of the incoming supply voltage, along with **"BrownOut"** as previously described. **EMPs** offers two distinct advantages over the F variants. Firstly and primarily they provided an added safeguard against fluctuating supplies that could cause equipment to be problematic if a fixed ratio optimiser was to be used. Secondly, in most instances the overall level of energy saving is higher than with a fixed ratio optimiser.

EMPs automatically selects the most appropriate level of voltage reduction from five predetermined levels, (again these predetermined levels are dictated by the results of the detailed technical survey). **EMPs** maintains its output to within -0V / +4V of the chosen output value, which is more than adequate for an energy saving control system.



True Bypass

The "TrueBypass" option gives you complete peace of mind and guarantees that you will not suffer any downtime. In the unlikely event of a fault within the ECO-MAX, throwing one simple switch, that can be operated by even none technical staff, places the optimiser into its "TrueBypass" mode. The optimiser is now electrically isolated from the circuit and the incoming supply is directly connected to the outgoing supply, allowing you to operate normally.

Metering

A full range of metering options can be provided. From the simplest of visual displays, all the way up to multifunctional metering and report generating, accessible from any PC in the world over the internet. Please let us know your requirements so that we can tailor this accordingly.

LV Distribution

Sometimes when taking a localised approach to voltage optimisation it becomes more cost effective to make slight modifications to the existing distribution system in order to rationalise the number of optimisers required. This generates greater levels of energy savings for lower equipment cost. To achieve this, ECO-MAX optimisers can be manufactured with integral LV distribution; including DB's and/or switched fused isolators.

Active Harmonic Filtration

Harmonic distortion is generated by certain types of electrical equipment which is then fed back into the electrical supply, causing power problems to other equipment on your electrical system. There are a number of problems caused by harmonics on your electrical system, including increased power losses, strong electromagnetic fields, interference and premature failures of equipment. Harmonic distortion is reduced as a consequence of installing

eco-max-power; however this is not the same as active harmonic filtration. Incorporating an active filtration module can dramatically reduce your power consumption, increase the efficiency, and the reliability of your equipment.



Standard Range

Rating	Weight	Dimensions (mm)			
		Height	Width	Depth (base)	Depth (doors open)
72kVA/100A	160Kg	1800	600	500	1100
90kVA/125A	170Kg	1800	600	500	1100
115kVA/160A	210Kg	1800	600	500	1100
143kVA/200A	240kg	1800	600	500	1100
215kVA/300A	390Kg	1800	800	600	1400
288kVA/400A	480Kg	1800	800	600	1400
359kVA/500A	640Kg	1800	800	600	1400
431kVA/600A	750Kg	1800	1200	800	1400
575kVA/800A	900Kg	1800	1200	800	1400
720kVA/1000A	1100Kg	1800	1600	1000	1800
860kVA/1200A	1290Kg	1800	1600	1000	1800
1000kVA/1450A	1470Kg	1800	1600	1000	1800

Note – weights & dimensions are indicative of the EMP optimisers, however as the Power Range are generally bespoke built, accurate sizes will be provided order by order

Active Power Factor Correction (**eco-max-pfc**)

Power factor is a way of describing how efficiently electrical power is consumed. The power that you drawn from your supply consist of two parts, useful power and reactive power.

Useful power is the power that equipment needs to achieve the task at hand. Reactive power is drawn in addition to useful power however it does not contribute to achieving the task. The combination of the two determines the total power drawn from your supply, (which is known as apparent power).

Power factor is the ratio of useful power against total power drawn from the supply. An ideal ratio is 1.0 (known as unity), which is a perfect match between power drawn from the supply, and useful power used for the task. A poor power factor results in more power being drawn from your supply than is required to perform the task, which can result in additional reactive power penalty charges.

Although your power factor will be slightly improved as a consequence of installing **eco-max-power**; this is not the same as active power factor correction (**eco-max-pfc**). Incorporating active PFC within your unit will bring your power factor very close to unity. This provides a number of benefits, it reduces the amount of apparent power drawn from your supply, it increases your supplies capacity, it can prolong the life of your electrical equipment, and, most importantly, it elevates any reactive power penalty charges in imposed by your electricity supplier, so can save you money.

GW Energy Ltd
ECO-MAX Works, Orgreave Road
Sheffield, S13 9LQ
Tel: 0114 293 9935
Email: sales@gwenergy.co.uk
www.gwenergy.co.uk

Local Stockist

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