

Power Factor Correction from GW Energy Ltd The Easy Way To Save Power, Save Money & Help Save The Planet



- ✓ **Reduced power consumption**
- ✓ **Lower electricity bills**
- ✓ **Improved power quality**
- ✓ **Power Stabilisation**
- ✓ **Less heat**
- ✓ **Less current**
- ✓ **Extra kVA from existing supply**
- ✓ **Reduced transformer and distribution losses**
- ✓ **Voltage drop reductions in long cables**
- ✓ **Increased supply capacity**
- ✓ **Increased life expectancy of electrical equipment**

So what is Power Factor Correction (PFC)?

Power factor correction denotes the introduction of capacitors to an inefficient system (basically the shock absorber of the power system). The capacitors, whether static or automated, reduce current and improve the power factor of a system, bringing it as close to unity as possible. Power factor correction technology increases electrical capacity by reducing the maximum kVA drawn on an electrical system. This results in reduced electricity charges and prolonged life of electrical equipment.

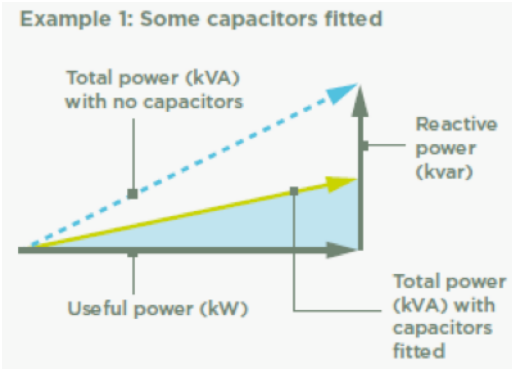
Poor power factor adds costs in three main ways:

- ◆ Additional reactive charge from utility company
- ◆ Unnecessary current drawn from the network
- ◆ Reduction in electrical equipment life expectancy

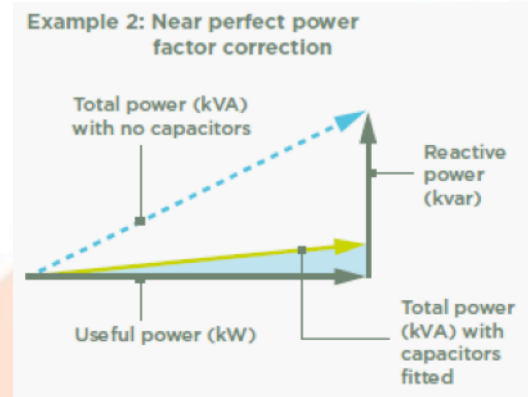
Main features & functions of ECO-MAX PFC Controllers:

- ◆ Options for RS232, RS485, USB ports and Ethernet communications
- ◆ High accuracy TRMS measurements
- ◆ Connection in single or three phase lines and co-generation systems with 4-quadrant operation with dedicated set point cosphi
- ◆ Wide selection of electrical measurements, including voltage and current THD with harmonic analysis up to 15th order
- ◆ Wide voltage measurement range (50-720VAC)
- ◆ Balanced use of stages with same power rating, extends the life of the capacitors
- ◆ Reactive power measurement per step installed
- ◆ Capacitor over-current protection
- ◆ Stage failure alarm
- ◆ Maintenance counter in hours and number of operations for the stages
- ◆ Programming from panel front, from PC or from tablet/smartphone using separate Wi-Fi dongle
- ◆ 2-level password protection for settings
- ◆ Compatible with Xpress configuration and remote control software, Synergy energy management software and Sam APP, (all sold separately)

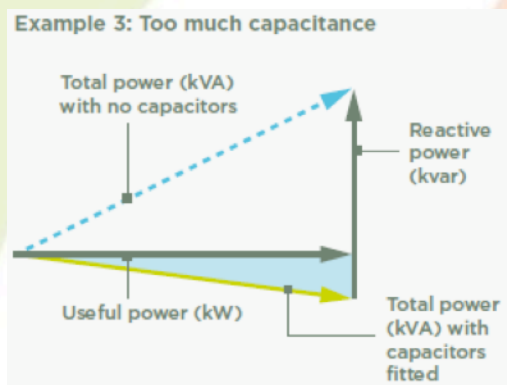
Effects of capacitors on power factor:



Example 1 – The angle is reduced; therefore the total power drawn from the supply is less. However, there is still a 'lagging' power factor.



Example 2 – The addition of more capacitance brings the total power down to almost a perfect power factor.



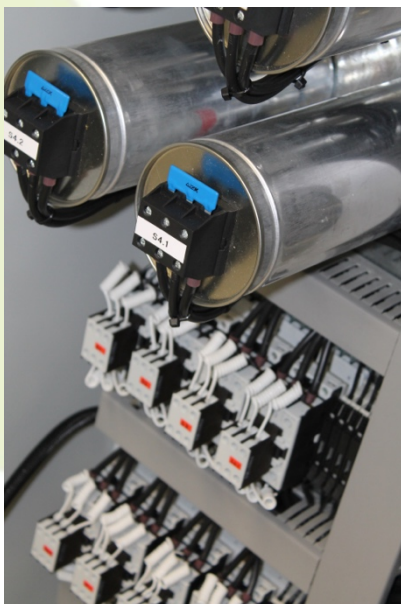
Example 3 – Too much capacitance can lead to over-correction and, again, excess power drawn from the network. This is called a 'leading' power factor.

ECO-MAX Product Codes & Dimensions:

CODE	STAGE DESCRIPTION	DIMENSIONS
EM25KVAR	2 x 12.5 kvar	600(H)x600(D)x300(W)
EM50KVAR	2 x 25 kvar	600(H)x600(D)x300(W)
EM75KVAR	3 x 25 kvar	800(H)x600(D)x300(W)
EM100KVAR	4 x 25 kvar	800(H)x800(D)x300(W)
EM150KVAR	3 x 50 kvar	800(H)x800(D)x300(W)
EM200KVAR	4 x 50 kvar	1000(H)x800(D)x300(W)
EM250KVAR	1 x 100, 3 x 50 kvar	1000(H)x800(D)x300(W)
EM300KVAR	2 x 100, 2 x 50 kvar	1000(H)x1000(D)x300(W)
EM350KVAR	3 x 100, 1 x 50 kvar	1000(H)x1000(D)x300(W)
EM400KVAR	3 x 100, 2 x 50 kvar	1200(H)x1000(D)x300(W)

All our Power Factor Correction solutions are bespoke and tailored to a specific site's requirements. Our units are manufactured in the UK, using quality components and steel enclosures to prevent corrosion and exposure to harsh environments. They can be installed on large plant equipment as well as the incoming mains.

Capacitor Technical Specification:



Rated voltage:	UN	230 - 800 V
Frequency:	fN	50/60 Hz
Standards:		IEC 60831-1+2, EN 60831-1+2, UL No. 810,
GOST 1282-88, VDE 0560 46+47		
Max overvoltage:	U _{max}	UN + 10 % (up to 8 hours daily) UN + 15 % (up to 30 minutes daily) UN + 20 % (up to 5 minutes) UN + 30 % (up to 1 minute)
Overcurrent (according to above standards):	IS	1,5 - 2,0 * I _N
Capacitance tolerance:		-5 / +10 %
Test voltage, terminal/terminal:	UTT	2,15 * UN, AC, 2 s
Test voltage, terminal / case:	UTC	UN < 500 V: 3000 V AC, 10 s
UN > 500 V: 2 x UN + 2000 V AC, 10 s		
Inrush current:		Max 400 x I _N
Dielectric losses:	tan δ	cca 0,2 W/kvar
Statistical life expectancy:		150 000 - 200 000 hours (depended on voltage, temper.)
Degree of protection:		IP 20, on request IP 54
Ambient temperature category:		-50 °C / D - maximum is 65 °C - highest mean over any period of 24 h is 45 °C - highest mean over any period of 1 year is 35 °C natural or forced
Cooling:		
Permissible relative humidity:		95 %
Max above sea level:		4 000 m above sea level
Mounting position:		any
Mounting:		Stud M12 at the bottom
Case:		Aluminum
Dielectric:		MKP - metallized PP film
Impregnant:		Dry type, inert gas N2
Discharge resistors:		Included - 50 V, 1 minute or 75 V, 3 minutes

GW Energy Ltd

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