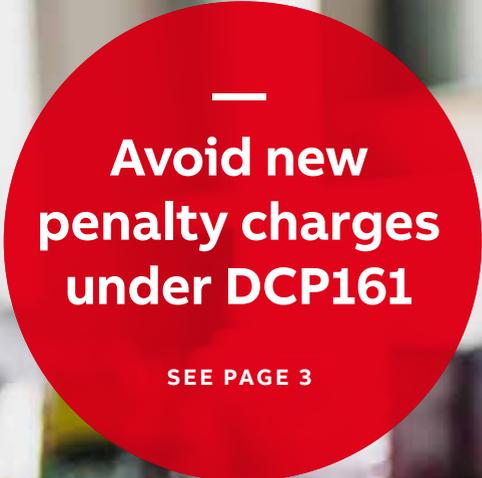

POWER QUALITY

Power factor correction

Don't pay the price for
poor power quality

A large red circle is positioned on the left side of the image, overlapping the coffee machine. Inside the circle, there is a small horizontal line at the top, followed by the text 'Avoid new penalty charges under DCP161' in white, bold, sans-serif font.

—
**Avoid new
penalty charges
under DCP161**

SEE PAGE 3



The power you buy comes in two distinct parts just like a frothy latte

Think of the coffee body as 'active power' that you can use to do work, while the froth on top is what we call your 'reactive power'. Some is useful, but too much reactive power is simply a waste – the same as the foam you leave behind in your glass.

Your power factor is the relationship between the active and reactive power on your network.

The good news is that ABB, like the best coffee shops, can help you get the balance just right – so you can enjoy the very best value from your power supply.

A frothy latte = Poor power factor correction



A perfect body = Good power factor correction



Latte glass = Capacity = kVA
Coffee = Useful energy = kW
Froth = Waste capacity

What are the other benefits of power factor correction?

Improve energy efficiency

Reduce system currents and kW losses.

Security of supply

Reduction in peak currents prevents fuse failure and loss of supply.

Release additional capacity

Take advantage of the full current capacity available in transformers, switchgear and supply cables. Increase system load without the need to invest in additional infrastructure.

Environmentally friendly

Reduced kWh losses mean that less power needs to be generated, so less CO₂ is produced, which contributes to your carbon reduction commitment (further details available on request from ABB).

Increase the service life of your infrastructure

The amount of heat generated within cables, switchgear, transformers and other equipment is reduced, helping increase the service life of your vital assets.

Minimize the impact of new excess charges under DCP161

Since April 2018 new excess charges apply when any business with a Half-Hourly (HH) metered electricity supply exceeds its agreed consumption level. Depending on the region and voltage, you might end up paying double the price or more. The vital first step to minimize the impact of these penalty charges is to check your power factor to ensure that you are using the electricity you buy as efficiently as possible. And if you do have a low PF then ABB's PFC solutions will help reduce your consumption.

Solving harmonics and system disturbance problems

A low power factor might only be one of the symptoms of a range of power quality problems that can reduce the reliability and efficiency of electrical equipment on your network.

A full ABB survey will detect any power quality issues such as harmonics, flicker and unbalanced load. We can then draw on our range of state-of-the-art equipment, including active filters, to provide the ideal cost-effective solution.

Poor power factor costs you money every time you pay your electricity bill

If you were 100% efficient in your use of electric power then your power factor would be 1 – it never is!

All UK electricity suppliers impose an excess reactive penalty charge where the average PFC is lower than 0.95 lag

What causes poor power factor?

Equipment such as AC motors, arc welders, furnaces, fluorescent lighting and air conditioning can cause a poor power factor. The more inductive loads you have on your network then the more likely it is that you will have a poor power factor.

How do you know if you have a power factor problem?

A simple check on your electricity bill will tell you. It must state clearly what your reactive power charge is and will probably indicate your power factor. If it is below 0.95 then you need to take action now.

What should you do?

Call in ABB to carry out a free, no-obligation, survey. We will then work with you to design and install the ideal PFC (power factor correction) solution for your site.

What will it cost?

The beauty of a PFC installation is that it delivers real savings on your electricity bills from day one. Typically payback periods are less than two years.

On the right is a typical example of an electricity bill highlighting key data and actual charges for:

- Power factor average peak kVA
- Average power factor
- Reactive power factor
- Chargeable capacity

Call ABB to book your free, no-obligation PFC survey on +44 (0)151 357 8400 or email abbep@gb.abb.com

Your poor power factor results in extra costs from your electricity supplier. It passes them on to you in the form of power factor penalties – you can see these on your bill as the ‘reactive power charge’ or ‘exceeded capacity charges’.

Energy and use of system charges breakdown						
Total kWh:	1414782.5	Power Factor @ Peak kVA:	0.900	Maximum kW:	2583.0	occurred on 27/10/2008 @ 17:00
Total kVArh:	734241.5	Average lagging Power Factor:	0.888	Maximum kVA:	2856.0	occurred on 16/10/08 @ 18:30
Load Factor:	73.62	Chargeable Capacity kVA:	3500	Maximum contract to date:	2586.0 kW	2856.kVA

Energy Description	Quantity	Unit of Charge	Rate (£)	Period Charge (£)
Energy Consumption (billed in GMT)				
0406 All Year Mon-Sun 0700-2400	1130278.0	kWh	0.065740	2856.0
0795 All Nights 0000-0700	284504.5	kWh	0.043220	2586.0 kW
			ENERGY SUBTOTAL	86.600.76

Distribution Use of System	Quantity	Unit of Charge	Rate (£)	Period Charge (£)
Charges based on metered volumes, billed in clock				
Capacity/Availability	3500.0	kVA	1.040000	3640.00
Consumption				
0405 All Year Mon-Sun 0000-0700	280852.5	kWh	0.000500	140.43
0406 All Year Mon-Sun 0700-2400	1135410.5	kWh	0.001700	1930.20
Fixed Charge				
Reactive Power	26.7383.0	Annun	1,401.36	116.78
		kVArh	0.002400	641.67
			DISTRIBUTION SUBTOTAL	6,469.08

Transmission Use of System	Quantity	Unit of Charge	Rate (£)	Period Charge (£)
Charges based on GSP level, billed in clock				
Infrastructure Demand Loss Adjusted (Estimated)	2803.8	kW	12.02	2,809.90
			TRANSMISSION SUBTOTAL	2,890.90

Settlement & Agent Charges	Unit of Charge	Rate (£)	Period Charge (£)
Data Collection Charge	MP/Ann	315.00	52.50
		SETT. & AGENT SUBTOTAL	52.50

Total		TOTAL (EXCL LEVY)	95,932.24
Total subject to FFL			95,932.24
Fossil Fuel Levy @ 0.00%			0.00
		TOTAL (EXCL VAT)	95,932.24

ABB – the total Power Quality solution



ABB offers a total Power Quality solution based on years of practical experience across a wide range of industrial and business applications.

ABB's Power Quality solution covers the full spectrum from LV (low voltage) service to HV (high voltage) networks. The process starts with a full site survey by one of our highly trained engineers and will cover any existing PFC equipment, regardless of the original manufacturer.

We will then recommend the most appropriate and cost-effective solution for your specific needs, drawing from our wide range of power quality products.

Our engineers will ensure the correct installation and commissioning of your power quality equipment so that the benefits of an improved power factor are realised as soon as possible. Our equipment comes with full service backup ensuring maximum return on your investment.



Solving power factor problems

ABB's dedicated PFC equipment is based on capacitors that provide a source of reactive power to help increase your network's power factor.

Your penalty charges will drop instantly and could even be eliminated completely.

Power factor correction equipment is an easy and cost effective solution to install. It starts paying back on your investment immediately, with typical payback times from 12 to 24 months. See examples to the right.

Ceramics manufacturing company	
Max demand (kW):	665
Power factor:	0.78
Cost of PFC including installation (£):	8k
Potential savings in reactive power charges and authorized supply capacity (ASC) (£ per annum):	5.2k
Payback (years):	1.6

Ceramics manufacturing company	
Max demand (kW):	675
Power factor:	0.85
Cost of PFC including installation (£):	5.8k
Potential savings in reactive power charges and authorized supply capacity (ASC) (£ per annum):	3.3k
Payback (years):	1.3

Power hungry solutions

ABB helped the McCain Food site at Scarborough to make more efficient use of its existing power network by installing PFC equipment. It was then able to handle the power demand of its new Home Fries production line without needing a major investment in new network infrastructure.

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