

## Power Quality

The need to reduce costs, improve efficiencies and reduce CO<sub>2</sub> emissions has never been more demanding. Improving your network power factor can help with all of the above and will typically recover the initial outlay within a two year period.

The increasing use of electronic loads such as IT equipment and variable speed drives is creating problems in today's electrical networks. The non-linear current drawn by these loads is causing significant current and voltage distortion. This in turn is leading to overheated equipment, shortened equipment life, disruption to electronic hardware and increased downtime.



## Our capabilities

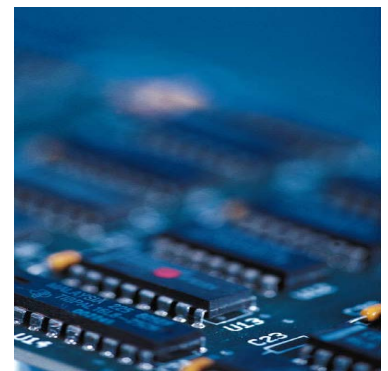
We can provide complete solutions comprising one or more of the following:

- ⇒ Power Factor Correction Surveys
- ⇒ Harmonic G5/4 Compliant Surveys
- ⇒ Electrical Disturbance Monitoring Surveys
- ⇒ Load Profiling Surveys
- ⇒ Active Harmonic Filtration
- ⇒ Passive Filtration
- ⇒ Harmonic Reducing Transformers
- ⇒ Contactor-Switched Power Factor Correction
- ⇒ Transient-Free and Real Time Power Factor Correction



## Typical applications

- ⇒ G5/4 compliance for new and existing sites
- ⇒ Power factor savings and CO<sub>2</sub> emission reduction
- ⇒ Identify Power Quality issues
- ⇒ Identification of harmonic mitigation equipment required
- ⇒ Commercial building neutral current reduction
- ⇒ Reduction in equipment failure due to harmonic distortion
- ⇒ Identify energy saving opportunities



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## Overview

### Standard Automatic Power Factor Correction

- ⇒ For use on networks with less than 20% non-linear load
- ⇒ Free standing enclosures up to 400kVAR
- ⇒ Microprocessor controller with digital PF display
- ⇒ Small step sizes to match load fluctuation
- ⇒ Inrush limiting devices fitted to each contactor
- ⇒ Fast discharge resistors
- ⇒ Environmentally friendly, dry self-healing capacitors
- ⇒ Very low losses
- ⇒ Natural ventilation



### Detuned Automatic Power Factor Correction

- ⇒ For use on networks with less than 50% non-linear load
- ⇒ Free standing enclosures up to 480kVAR
- ⇒ Microprocessor controller with digital PF display
- ⇒ Small step sizes to match load fluctuation
- ⇒ Detuned to prevent network resonance (189Hz)
- ⇒ Low-loss iron cored reactors
- ⇒ Fast discharge resistors
- ⇒ Environmentally friendly, dry self-healing capacitors
- ⇒ Natural ventilation
- ⇒ Easy installation and commission



### Real Time & Transient-Free Power Factor Correction

- ⇒ For use on fast fluctuating loads
- ⇒ Up to 20ms response time
- ⇒ Thyristor switching technology
- ⇒ Absence of ON-switching transient
- ⇒ Absence of OFF-switching transient
- ⇒ Low maintenance
- ⇒ Voltage flicker control



## Harmonic Reducing Transformer

- ⇒ For use on systems rich in switch mode power supplies
- ⇒ Parallel connected
- ⇒ Reduces triple-n harmonics in the neutral
- ⇒ Reduces THD(V)
- ⇒ Reduces neutral-earth potential
- ⇒ Reduces voltage flat topping



## LCL Passive Filter

- ⇒ For use with VSD's and UPS systems
- ⇒ Series connected
- ⇒ In-line reactors to prevent overloading
- ⇒ Reduces THD(I) to less than 10%
- ⇒ Reduces THD(V)
- ⇒ Improves power factor levels



## FR Series Passive Filter

- ⇒ Global harmonic filtration
- ⇒ Series connected
- ⇒ Individual reactors can be tuned to specific frequencies
- ⇒ Reduces THD(I)
- ⇒ Reduces THD(V)
- ⇒ Improves power factor levels



## Active Filtration

- ⇒ For use in both commercial and industrial applications
- ⇒ Free standing or chassis mount
- ⇒ Parallel connected
- ⇒ Three or four wire versions
- ⇒ Selection of individual harmonic frequencies
- ⇒ Load balancing
- ⇒ Provide real time power factor correction if required



## Hybrid System Filtration

- ⇒ For use on heavily polluted networks
- ⇒ Free standing bespoke enclosure
- ⇒ Parallel connected
- ⇒ Three or four wire versions
- ⇒ Passive filter removes dominant harmonic
- ⇒ Active filter removes remainder of the harmonic spectrum
- ⇒ Advantage of active system at a reduced cost
- ⇒ Power factor correction



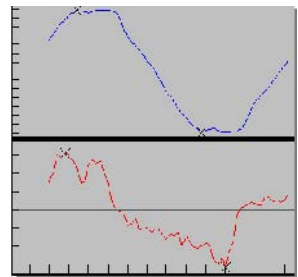
## Power Factor Controllers

- ⇒ Microprocessor-based, utilizing FCP System
- ⇒ Range of applications covering 'Real Time' & 'Transient-Free'
- ⇒ Available in 3, 4, 6, 8, 12 & 14 stage options
- ⇒ Panel or DIN rail mounting options
- ⇒ Multi-function display
- ⇒ Harmonic overload protection available



## Power Quality Analysis

- ⇒ Load profile surveys
- ⇒ Power factor surveys
- ⇒ Harmonic 'spot-check' surveys
- ⇒ ENA - G5/4 harmonic compliant studies
- ⇒ Harmonic network modelling
- ⇒ Voltage flicker measurements
- ⇒ Power quality audits (using IEC 61000-4-30 Class A analysers)



## Maintenance Services

- ⇒ Annual PFC maintenance (all manufacturers)
- ⇒ Annual harmonic filter maintenance
- ⇒ Extended warranty contracts
- ⇒ 'One-off' maintenance visits
- ⇒ PFC repairs (all manufacturers)
- ⇒ Reduce electricity consumption
- ⇒ Lower electricity costs
- ⇒ Reduce CO<sub>2</sub> emissions
- ⇒ Maintain harmonic distortion limits

