Julian Grant is general manager **Chauvin Arnoux UK Ltd**

Monitor for higher profits

Many UK organisations will soon have to reveal their energy use and carbon emissions. *Julian Grant* believes portable power and energy loggers are essential to help ease this extra task for businesses

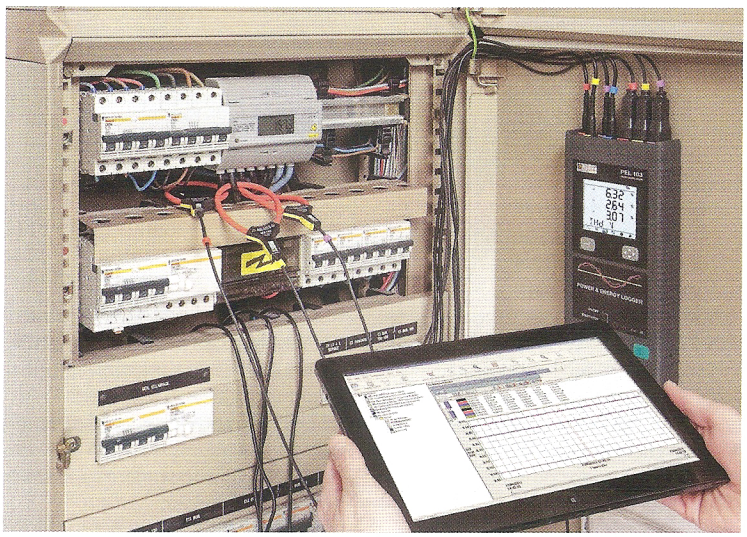
There has never been a better time to measure and monitor your energy use. Rising energy costs are having a serious impact on some businesses, and the imminent Streamlined Energy and Carbon Reporting (SECR) regulations, which take effect this year, will require some 12,000 UK businesses to make their energy use, carbon emissions, and energy efficiency actions, publicly available alongside some reference comparison metrics.

Monitoring power and energy usage in a facility or installation can often identify hidden issues that affect both operational and environmental quality, can pinpoint the reasons for higher than desired energy use, and can reveal the causes of more frequent equipment repair and replacement.

Measuring and recording the performance of energy-using equipment over time, and periodically monitoring critical machinery and high energy consuming building equipment to ensure proper operation, is the only way to verify whether the equipment or system performs optimally. Studies by the Carbon Trust show savings of up to 20 per cent can be achieved in this area through energy efficiency measures such as, but not restricted to, installing variable-speed drives for fans, pumps, and other motor driven systems.

Metering energy usage 24 hours a day throughout a typical week can identify out-of-hours usage, which accounted for 46 per cent of all energy consumption in 6,000 UK SMEs, according to a recent British Gas survey of smart meters. This included lighting, heating and IT equipment being left powered up in unoccupied offices, and car park lighting left on night and day all year round.

But, only by measuring and monitoring energy use can all of these things be identified and rectified, with before and after energy use figures available to calculate savings, and justify any necessary expenditure.



Measuring and recording energy-consuming equipment are key to optimum performance

Permanent monitoring

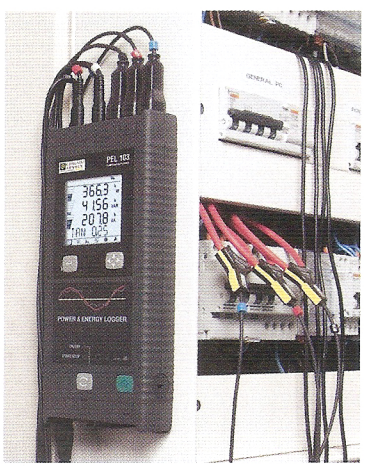
Apart from these efficiency measures, permanent monitoring of an installation also allows other parameters such as power factor to be measured and recorded, and there is an increasing trend in facilities unknowingly operating at poor power factor. The problem is that as they evolve and install new equipment over time, and as any previously installed power factor correction equipment slowly "wears out", which it does, their power factor decreases.

So, while business owners and accountants are worrying about energy prices, many are completely unaware that for the sake of some simple monitoring and correction equipment, their business may be seriously falling short of what is required to be electrically efficient. In fact, alarmingly, recent studies showed many examples where as much as 50 per cent of the electricity being consumed by some businesses was literally going to waste.

Other issues that can be identified and measured through the continuous monitoring of an installation include harmonic currents. These are on the rise due to increasing numbers of installed LED lighting and improved efficiency VSDs, which, while saving energy, can also introduce their own problems to the installation supply.

Thankfully, measuring energy consumption, including where and when it is being used, and monitoring other parameters such as power factor and harmonics, has never been easier thanks to portable power and energy loggers or PELs.

Modern PELs are compact, lightweight, electronic monitoring instruments used for collecting electrical data. They can be temporarily placed in distribution panels or around the facility without difficulty, and without the need to interrupt the mains supply or shut down the installation or office building first.



PELs gather data and calculate electrical parameters such as 3-phase current, voltage, power and energy, and are also able to indicate phase angle cos ϕ, tan Φ, power factor, THD and harmonic levels.

They are capable of storing millions of readings, and data can be retrieved locally or remotely via Bluetooth, USB or Ethernet. Combine a number of PELs together to track several consumption points around the facility, or multiple facilities, without the expense of having to travel to retrieve the data.

PELs can be moved around a facility for local monitoring of a piece of equipment, or department, where they can be connected by an electrician, with no intrusion into the electrical wiring, and therefore no need to interrupt the power.

Once any required local monitoring is finished, with super slim designs and magnetic backs, many PELs can be semi permanently stuck to the inside of a cabinet at the source of supply, where flexible current coils can be looped around the incoming phases, and magnetic voltage probes stuck to screw heads on MCBs, or wired in for added security of connection. These PELs can be self-powered from the installation they are connected to, and if plugged into the local network, a whole host of parameters can be monitored with alarms set to warn of any issues.

If a business requires permanently installed metering there are many issues as well as the cost of retrofitting an older installation with panel-mounted equipment. It will require the installation to be power down for some time and holes cut in metalwork. So the most cost-effective solution could be to semi-permanently install a PEL. ■

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1 Flagship Square | Shaw Cross Business Park | Dewsbury WF12 7TH | T: 01924 460494 | E: info@chauvin-arnoux.co.uk