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Seeing the Invisible: How Thermal Imaging Prevents Electrical Failures

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Electrical failures are a costly safety issue and one of the leading causes of business downtime – yet many faults remain hidden until they cause disruption, even with statutory electrical testing in place. Jonathan Mackie, Manging Director of phs Compliance, looks at how regular thermal imaging is helping its FM customers identify electrical issues before they escalate.

While statutory inspections, such as fixed wire testing (EICR), are essential for compliance, they only provide a snapshot in time. An electrical fault can easily develop in the weeks or months between inspections.

Thermal imaging moves the benchmark in electrical safety, offering an essential layer of protection between statutory inspections that highlights issues that would otherwise remain invisible and undetected.

Thermal imaging translates infrared energy into visible heat patterns. This flags pre-failure electrical signals before they escalate, allowing facilities managers to act proactively, ensuring safety, reliability and uninterrupted operations.

Thermal imaging works by testing under their normal loads. This enables identification of issues that only appear when the current is flowing, such as loose or high resistance connections, overloaded circuits, imbalanced phases and failing terminations. These faults may past traditional ‘dead’ circuit testing but would be picked up through thermal imaging.

Together, fixed wire testing, routine inspections and thermal imaging give a comprehensive view of electrical health.

Facilities managers who embrace thermal imaging can move from reactive troubleshooting to proactive risk management. This saves time, money, and most importantly, it prevents potentially dangerous incidents.

It is also an important part of the FM toolkit for energy saving as thermal imaging detects heat loss too.

Spotting invisible dangers

Overloaded circuits are one of the most common electrical risks. When a circuit carries more current than it was designed for, components heat up, often long before any visible signs of a fault appear.

Thermal imaging cameras detect these hotspots instantly, allowing FM teams to rebalance loads or upgrade circuits before they fail.

For example, a thermal scan of a switchboard can reveal a circuit consistently running hotter than others. Early intervention can then prevent repeated tripping of breakers and unnecessary downtime.

Loose connections are also deceptively dangerous—they may not trip breakers, but they can generate enough heat to ignite fires. Thermal imaging identifies subtle temperature differences that indicate loose terminals or worn contacts in distribution boards.

Components that are failing often run hotter than normal too. Thermal imaging allows FM teams to pinpoint and replace overheating motors or HVAC components before they fail completely, avoiding unexpected equipment shutdowns.

Add thermal imaging to the FM toolkit

Thermal imaging surveys are quick and convenient. They are also non-invasive. The cameras can easily detect temperature differences through walls and behind other obstacles.

The digital images precisely locate and record hotspots as well as areas of heat loss. They can detect any temperature differences in the building’s fabric to locate air leaks, thermal bridging or cold bridging.

Inadequate insultation, air leaks and moisture intrusion can lead to energy loss and costly structural damage.

By integrating routine thermographic inspections into a regular maintenance program, facilities managers gain a predictive maintenance tool that reduces risk, increases safety and keeps buildings running smoothly and efficiently.

With over 50 years’ experience, phs Compliance is fully accredited by all leading industry regulatory bodies and has the largest team of specialist statutory testing and operators in the industry with over 400 engineers. Each year it carries out around 14 million compliance inspections nationwide.

phs Compliance provides statutory electrical services including testing (including PAT/EET and fixed wire electrical tests), commercial thermographic inspections and surveys, fire safety testing, maintenance and remedial work.

It also provides specialist electrical and mechanical project services, including design, supply and

installation for everything from power to lighting.