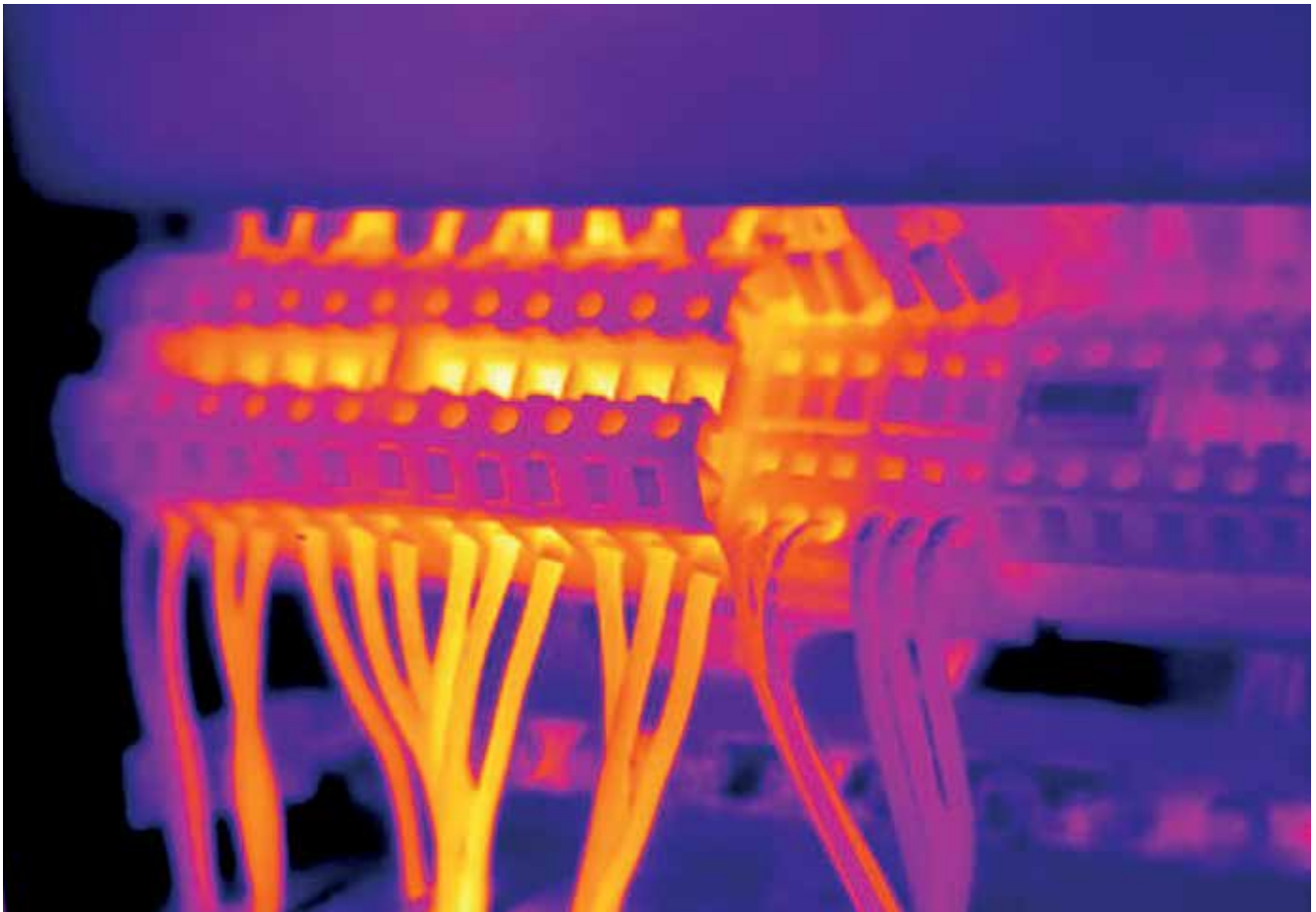
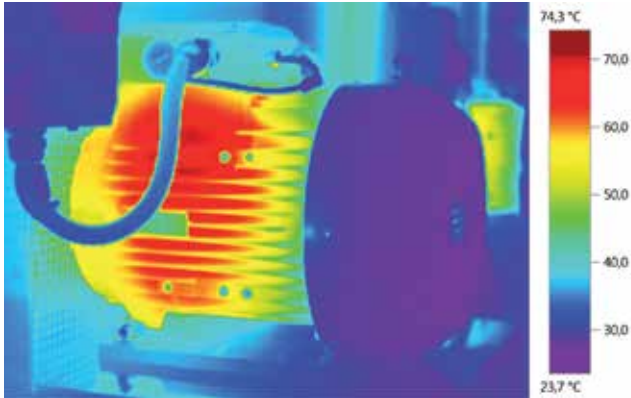


Ensure system availability, reduce costs and prevent fires. Use thermography.

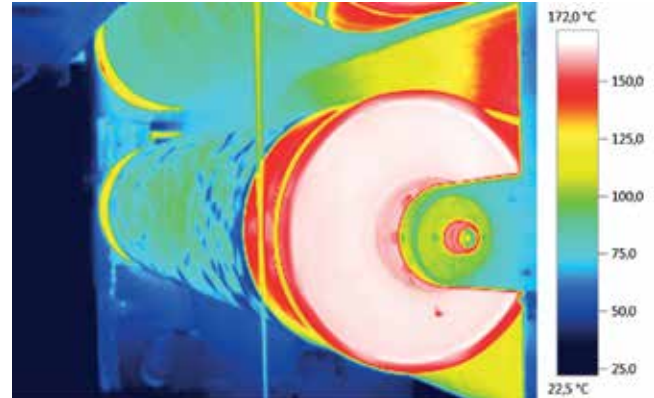


In the global competition for market shares, industrial companies depend on machines that run reliably and on efficient manufacturing processes. Maintenance plays a key role in this: those in charge bear the responsibility for ensuring the permanent availability of production facilities. Thermography serves as a valuable diagnostic tool.

Problems with electrical and mechanical installations usually become evident at an early stage due to thermal irregularities. Thermal imagers visualise these status changes and weak spots – and they do this in a non-contact, non-destructive manner. The next few pages outline how high-end infrared measurement technology from Testo can help you to perform typical preventive maintenance tasks more reliably, easily and safely.



Infrared image of a motor under load.



Temperature monitoring of a production plant in plastics production.

The challenge.

Industrial companies invest heavily in high-quality production facilities. However, their follow-up and operating costs are many times higher than the purchase price. In order to remain competitive, the systems engineering must run as smoothly as possible, without interruption. Therefore their specialist maintenance departments have to ensure the permanent availability of the production facilities. These departments are at the forefront when it comes to minimising downtimes and reducing energy costs, preventing damage to mechanical components and electrical installations and fully exploiting the level of equipment utilisation.

Those in charge need to keep everything up and running, initiate improvements, delegate tasks to employees, and use training to make sure they are qualified for their tasks – all for a reasonable price. They are constantly being pulled in different directions, and on the surface it appears as if their department only generates costs, without making any yields. However, if they do not fulfil their task then machines stop running, and the consequences of production bottlenecks for the company can go so far as to damage relationships with customers. If errors lead to fires or work-related accidents, then this could have even further-reaching consequences. Following industrial accidents, profitable production can no longer be guaranteed due to the stringent requirements of the authorities, and insurance companies penalise any incidents by raising premiums. Compliance exerts additional pressure: in their work, service engineers are confronted with numerous national and international laws and regulations, not to mention the standards of employers' liability insurance associations or trade associations.

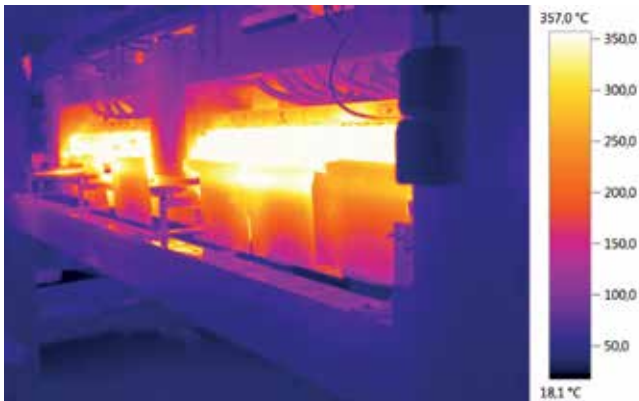
The basic maintenance objective of optimising system availability and preventing downtimes must be accomplished using a range of different strategies. In order to detect and eliminate any potential damage before it occurs, reactive measures are not sufficient: service engineers only step in when a problem becomes evident, with a system breakdown usually already imminent. Then again, maintenance during scheduled periods of downtime is inefficient. Instead of having to choose between breakdown risk and inefficiency, what those in charge really need to do is to opt for better maintenance technologies. Thermography-based technologies are available for typical tasks that are carried out in industry.

The solution.

Thermal imagers convert thermal radiation in the infrared range into electrical signals and make them visible. This offers a precautionary glimpse of future conditions: due to thermal irregularities, which can be pinpointed efficiently and in sufficient time, the professional application of infrared thermography enables faults in electrical installations, problems with production facilities and wear of their mechanical components to be anticipated. This extension of the range and function of human vision is akin to having a sixth sense. Service engineers use thermal imagers to detect concealed defects, damage and anomalies before they turn into proper malfunctions and endanger the reliability of supply.

Versatile and flexible to use

The scope for thermographic applications in industry is huge. In electrical installations, thermographic measurement methods are possible at all voltage levels.



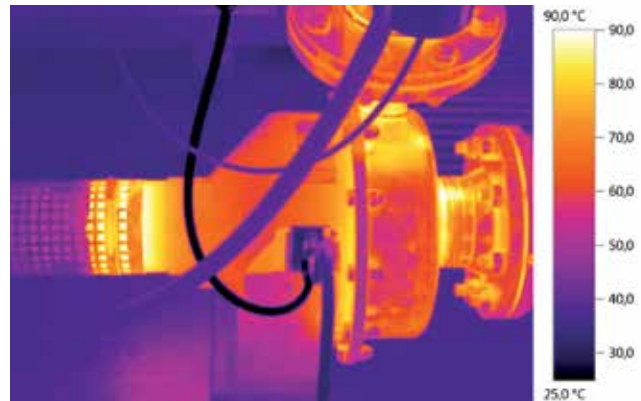
Even installations operated within a high temperature range can be monitored using a thermal imager.

This means that electrical resistance in switching cabinets can be visualised, while medium, high and ultra-high voltage installations can also be inspected. One out of three fires in industrial companies can be attributed to electrical components overheating, with minor defects such as overloaded capacitors, loose terminals or damaged cables often the cause. Carrying out thermographic inspection for just a second time reduces a system's rate of failure by 80 percent and provides an added safeguard against fire. Insurance companies reward the regular inspection and documentation of electrical installations with lower premiums.

Faulty thermal insulation of ovens or flue gas ducts in refineries, in the petrochemical or cement industry could result in massive process disruptions and sharply increased primary energy costs. As well as inspecting insulation, you can also use thermography to detect internal deposits in pipelines and containers.

There is practically no end to the range of applications in other areas: whether it's a question of finding leaks of hot or cold media or in compressed air lines, servicing control and regulation systems, inspecting process valves, pumps or conveyor belts.

One major advantage of using thermography as a technology for the maintenance of electrical and mechanical installations is that it involves non-contact measurement – which can be carried out at a safe distance away from live components or moving parts. Even less experienced staff can be entrusted with carrying out straightforward, standardised test procedures, while the legal compliance of relevant occupational health and safety and accident prevention regulations is maintained.



Thermal image of the overloaded shaft of an industrial motor.

Quick return on investment

Alternative methods may be cheaper to purchase, but they are not necessarily more cost-effective. Thermal imagers indicate problematic areas instantly and clearly on the display. This enables those responsible for maintenance to make informed decisions at the right time. Using a pyrometer could cause them to miss that crucial detail. The service life of industrial installations depends on these functioning smoothly. Reducing the risk of breakdown over the lifespan has a positive impact on the “Total Cost of Ownership”. The savings made will also impress the Buying Centre, particularly as high-quality thermal imagers are entirely affordable these days. Lots of companies whose business is going extremely well opt for this innovative technology – in order to ensure future success.

Place your trust in the global market leader

Testo AG is one of the world's leading manufacturers of portable, innovative measuring instruments and thermal imagers. With an infrared resolution of 320 × 240 pixels, the testo 885 professional thermal imager is the flagship instrument for high-level, universal applications. The testo 890 high-end system's 640 × 480 pixel detector will satisfy even the most demanding of requirements on a professional level. Testo SuperResolution improves the quality of each recorded infrared image, making it a cut above the rest: the patent-pending technology produces four times as many readings and a usable geometric resolution that is 1.6 times higher. The excellent temperature resolution (NETD) of < 30 mK (testo 885) or < 40 mK (testo 890) makes even the smallest temperature differences visible.



Key advantages of thermography

- Safety during measurement, precision and reliability of measurement results
- Fulfilment of requirements and compliance, reliable documentation of all work
- Cost and time efficiency

More information.

For more information and answers to all your questions about thermography in preventive maintenance at www.testolimited.com



The thermal imager testo 885.