

VÓRTEX

Raytek Infrared Thermometers: Indispensable Tools in Facility Maintenance



Temperature is the most widely used indicator for determining whether motors, boilers, bearings, electrical systems, and all types of operating equipment are functioning properly. If you're checking refrigeration lines or circuit breakers, monitoring supply and return vents or steam traps, or troubleshooting transformers or transmission lines, temperatures that are too high or low are usually a sign of developing problems.

Contact thermometers provide useful information, but they are slow to stabilize, and there simply may not be enough time to take all the readings needed. Your target may also be hard to reach. But today, slow readings or inaccessible targets are no longer a problem because more and more maintenance personnel carry the handy Raynger® infrared (IR) thermometer. It gives quick, accurate readings and is remarkably simple to use. You just point, shoot, and read. There's no contact with hot surfaces or moving parts. In fact, there's no better tool for helping you diagnose small problems before they become big ones.

Saving work-hours and preventing down-time has never been easier, faster, or safer. Raytek® has a complete line of reliable and accurate thermometers designed with your specific needs in mind.

Raytek Infrared Noncontact Thermometers are the professional's choice for:

- Preventive & Predictive Maintenance
- Machinery Inspection
- Equipment Audits
- Electrical Troubleshooting
- Utility Applications
- HVAC/R
- Energy Audits
- Vehicles & Fleet Diagnostics
- Process & Product Control
- Quality Control



Noncontact Thermometers—Indispensable Diagnostic Tools in Plant Maintenance



Transformers

Detect flawed windings and terminals.

If you're responsible for keeping a plant operating efficiently, you're under a lot of pressure. You have to keep machinery functioning and prevent unscheduled and costly shutdowns while ensuring safety. Performing these tasks successfully requires you to monitor dozens of different components, systems, and types of equipment—quickly, accurately, *and* safely. Monitoring an equipment's operating temperature is a critical component of a well-planned predictive/preventive maintenance program. The payback for maintaining your equipment at peak efficiency is the extended life of your physical assets. Often you have to quickly diagnose suspected problems in hot, hard-to-reach areas, or around moving parts. This can make a diagnostic analysis difficult, time-consuming, and possibly even dangerous. In all these cases, Raytek portable noncontact infrared thermometers will help you to quickly and conveniently measure surface temperatures from a safe distance. Raytek offers a wide range of infrared thermometers with a variety of features and specifications to meet any budget and application requirement. For the full list of our products and their basic features, please see the back page of this brochure.

How do I measure temperature with my IR thermometer?

There are three kinds of measurement techniques with a Raytek noncontact thermometer:

- **Spot measurement** determines the absolute surface temperature of an object, such as a motor or other stationary equipment.
- **Temperature differential measurement** compares two separate spot measurements against each other, such as connectors or circuit breakers.
- **Scanning measurement** detects changes along a wide area or continuous region target, such as a refrigeration line or a transformer housing.



Monitor Line Equipment

Check moving parts for wear and lubrication.

What are the benefits of using IR thermometers?

Cost effective problem prevention

Managing plant machinery and preventing down-time is one of the keys to your company's success; however, you also need to perform routine equipment checks in the most cost- and time-effective method available. IR thermometers are very cost-effective because they can provide you with fast temperature readings—most models take temperature measurement in a half of a second. In the time it takes to get an accurate reading on the joint of one section of ductwork using a thermocouple, you can read all the joints of the same duct with an IR thermometer. Since they are rugged, light (most weigh less than 10 ounces), and easy to holster when not in use, you can carry them as you walk through your plant and perform your daily tasks.

Accurate

Another advantage of IR thermometers is their accuracy, usually within one degree. This feature becomes particularly important in your predictive maintenance applications when monitoring parts deterioration, processing conditions, and specific events that precede equipment faults or failures. Because most facilities and plants run around the clock, 365 days, downtime equals lost revenue. To prevent such losses, all electrical equipment in the plant—circuit breakers, transformers, fuses, disconnect switches, bus, and panels—must be scanned for suspect hot spots. With an accurate IR thermometer you can quickly detect even slight variances from normal operating temperatures and start solving potential problems before they arise; therefore, reducing the cost and scale of repairs due to equipment failure.

Safety

Safety is one of the most important benefits of IR thermometers. Unlike contact thermometers, IR thermometers are able to safely read hard-to-reach or inaccessible objects. As long as you have a clear line of sight, you can take a reading of any target within the instrument's range. Noncontact temperature measurements can be taken in areas where it is unsafe or difficult to take contact readings, such as, around steam traps and boilers; they negate the risk of burned fingers from inadvertent contact with a hot surface. Determining the precise temperature of a supply and return register 25 feet overhead is as easy as if it were within arm's reach. And since most Raytek IR thermometers come with laser sighting to easily identify a targeted area, your job is even easier.



Motor Bearings

Check for worn bearings before they fail.

What are the main areas where I can use my IR thermometer?

Electrical Maintenance

Infrared thermometers are proven money-saving tools for inspection and diagnosis of electrical equipment. Using IR thermometers, you can instantly troubleshoot problems in electrical connections, and verify the functional status of Uninterruptible Power Supplies (UPS) by identifying hot spots in the output filters on DC battery connections. You can check components in battery bank and power panel terminations, ballasts, switch gears, and fuse connections that may be draining energy due to heat created by loose connectors or buildup. Also, an IR thermometer helps isolate nuisance tripping of circuit breakers or monitor electric motors. Regular scans of transformers for hot spots can detect flawed windings and terminals.

Equipment Maintenance

Temperature change can be a key indicator of developing problems in many types of equipment, from ovens and boilers to freezers. Enormous costs can result from any shutdown needed to repair faulty equipment. Routine temperature audits of generators and their bearings can prevent expensive repairs. Moving parts in motors and gear work can be easily scanned for hot spots caused by excessive wear.

Building Controls-HVAC/R

Monitoring HVAC components for changes in temperature is a fast, easy, and efficient method of detecting problems that can impact your personnel, manufacturing, or energy consumption. A noncontact thermometer eliminates the need to carry a ladder to measure hard-to-reach targets, such as ceiling vents or steam traps. It makes finding the source of the problem easier and safer. Whether in a crawl space, the attic, or on the roof, energy audits and room balancing can be accomplished in a short time.

Vehicle/Fleet Maintenance

Temperature variance is a predictor of many vehicle problems. It is a vital indicator of how well cooling systems are performing, or whether friction, vibration and other conditions are creating wear in braking systems and bearings. IR thermometers can help you to troubleshoot engine problems, such as low compression, ignition system problems, or clogged fuel injectors.

Process/Product Control

With IR portable thermometers you can monitor process line equipment such as conveyor belts, ovens, or cooling systems. The temperature of different products on production lines can also be checked, from rubber tires, to plastic and cellophane wrapping, to chocolate bars.

For a more detailed discussion of Electrical, HVAC/R, or Automotive applications for the Raytek noncontact thermometer, please request a copy of the application notes for these specific applications from your local Raytek representative or distributor.



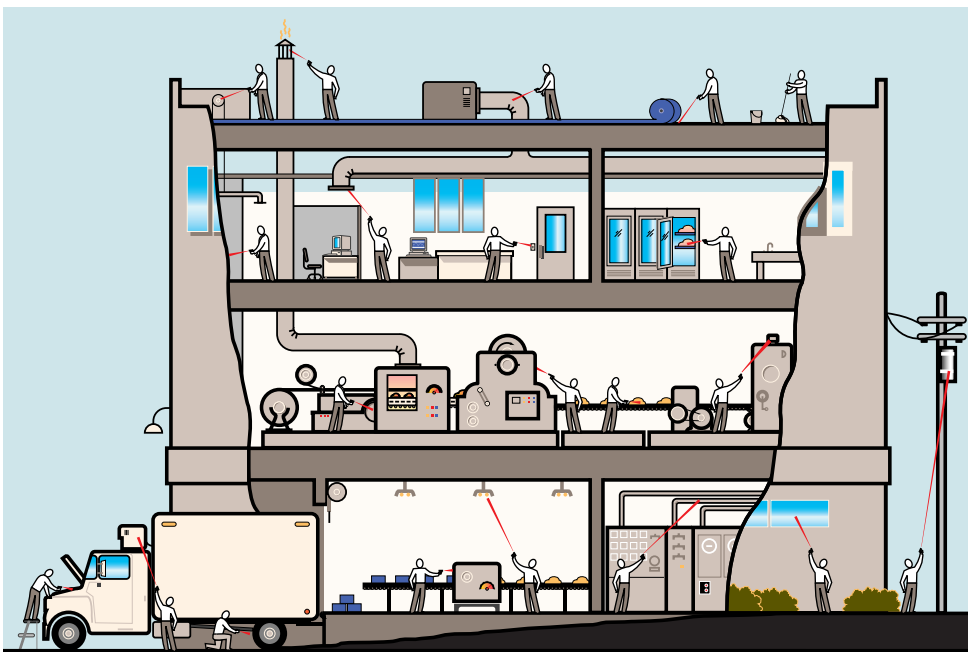
Electrical Maintenance

Safely diagnose electrical equipment.



HVAC/R

Check supply and return registers.



The illustration shows how the Raytek non-contact IR thermometer can be used as a diagnostic and preventive maintenance tool in every aspect of facility maintenance. From roof to basement, inside and out, the IR thermometer will cut downtime, boost efficiency, and save money by creating a more cost-effective maintenance routine.

MiniTemp™ • At Home, At Work, Anywhere

If you're looking for a basic noncontact thermometer for a variety of applications, MiniTemp is the tool for you. It's priced to fit any toolbox and is small enough to fit in your pocket. Choose between MiniTemp MT2, without laser sighting, or MiniTemp MT4 with laser sighting.

- Temp Range -18 to 260°C (0 to 500°F)
- Response at 95% 500 mSec
- Accuracy $\pm 2\%$ of reading or $\pm 2^\circ\text{C}$ ($\pm 3^\circ\text{F}$) whichever is greater
- D:S 6:1



MT

Raynger® IP™ • Compact Close-Focus Plug-in

Measure temperatures of small targets—as small as 2.5 mm (0.1 in). Ideal for measuring extremely small targets. The IP is designed to plug into your thermocouple meter and offers a choice of J or K output.

- Temp Range -18 to 260°C (0 to 500°F)
- Response at 95% 1 Second
- Accuracy $\pm 2\%$ of reading or $\pm 2^\circ\text{C}$ ($\pm 3^\circ\text{F}$) whichever is greater
- D:S 4:1



IP

Raynger® ST Pro & ProPlus™ • The Professional's Choice

The Raynger ST is the most popular noncontact thermometer in the world. It offers an ideal combination of precision and value for the technical professional. Available in four models—ST20, ST30, ST60, or ST80. Most models feature circular laser sighting. The ST is accurate, compact, reliable, and easy to use—just what a professional needs.

- Temp Range
ST20 Pro -32 to 400°C (-25 to 750°F)
ST30 Pro -32 to 545°C (-25 to 950°F)
ST60 ProPlus -32 to 600°C (-25 to 1100°F)
ST80 ProPlus -32 to 760°C (-25 to 1400°F)
- Response at 95% 500 mSec
- Accuracy $\pm 1\%$ of reading or $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) whichever is greater
- D:S ST20 Pro, ST30 Pro = 12:1; ST60 ProPlus = 30:1; ST80 ProPlus = 50:1
- Special Features ST60 & ST80 feature contact probe input and data logging capacity



ST20
ST30



ST60
ST80

Raynger® MX™ • For Those Who Demand Maximum Performance

The Raynger MX features an optically matched coaxial laser sighting system, which precisely and accurately outlines the target measurement area. With its unique combination of features and DataTemp® software, the MX can adapt to any work environment. Choose from three models—MX2, MX4, and MX4+. Also available is the **MX Close Focus (MXCF)** special purpose model which will measure very small targets. (D:S 50:1, 6 mm target @ 30 cm, 25 in. target @ 12 in.).

- Temp Range -30 to 900°C (-25 to 1600°F)
- Response at 95% 250 mSec
- Accuracy 0.5% of reading $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) whichever is greater
- D:S 60:1
- Special Features MX4 & MX4+ feature contact probe input and data logging capacity



MX

Raynger® 3i™ • Superior Performance in Specialized Applications

The Raynger 3i is practically made-to-order for your speciality applications. Choose the temperature range, laser sighting, D:S, and scope option that work for you. The scope and scope-with-laser models are ideal for applications requiring long range temperature measurement, or for use in bright light. The 3i offers the only scope and laser combination on the market today.

- Temp Range -30 to 3000°C (-25 to 5400°F)
- Response at 95% 550 mSec to 700 mSec
- Accuracy $\pm 1\%$ of reading or $\pm 1^\circ\text{C}$ ($\pm 1.5^\circ\text{F}$) whichever is greater
- D:S 25:1 to 180:1



3i



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