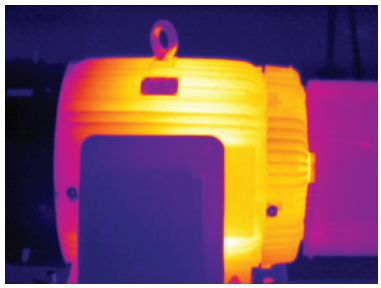
FLUKE®

# Extend motor service life with infrared inspection

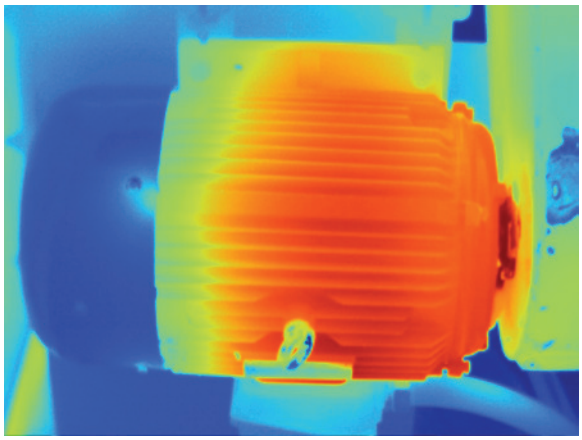
## Application Note

Motors take a lot of abuse in today's manufacturing and process plants. They are costly to replace, so preventive maintenance is critical to keeping them in top operating condition and extending their service life.



Overheating is one of the biggest factors in shortening that life. Operating at a temperature of ~10° over its rated value can cut in half the service life of a motor. Therefore, regularly checking motor operating temperature is crucial to ensuring reliable operation of production systems.

An infrared camera can help you find overheating in a running motor so you can address the problem before the motor is damaged. Fluke TiX580, TiX560, TiX520 and TiX500 Expert Series infrared cameras make it even easier with a 240° rotating lens that you can aim at the motor from above, below, or sideways. With the large 5.7 inch touchscreen you can view your target straight on before capturing the image. The high resolution (up to 1280 x 960 on the TiX580), excellent thermal sensitivity, advanced focus systems (LaserSharp® Auto Focus and MultiSharp™ Focus) and other enhancements included in Fluke Expert Series infrared cameras help to ensure that you get clear, crisp images from a safe distance.



**Top 4** Motor inspection applications

1. Overheated bearings and couplings
2. Hot spots in motor casings
3. Overheated cables and power connections
4. Overheated internal wiring

## Finding trouble spots in motors just got easier

Motors come in all sizes, and most facilities have hundreds or even thousands to maintain. The rotating lens, thermal sensitivity, and advanced focus system on Fluke TiX580, TiX560, TiX520 and TiX500 infrared cameras make it easier to scan many motors quickly and easily. High quality thermal imagers lead to high confidence in the quality of images and onboard diagnostic capabilities to find:

### 1 Overheated bearings and couplings

Poor lubrication or misalignment of mechanical components can cause motor bearings and couplings to overheat and vibrate, which can put undue stress on your motor and lead to early failure. With Fluke Expert Series cameras you can quickly zero in on overheated pillow block bearings, and maintain or replace them before they add stress that can damage the motor and result in much higher repair or replacement costs.

### 2 Hot spots in motor casings

A short-circuit in the internal iron core or winding of the motor due to aging insulation or insufficient ventilation can cause motor casings to overheat. Although you can't see the inside of a motor with an infrared camera, you can find an indication of a problem by detecting an above-average surface temperature on the motor.

### 3 Overheated cables and power connections

Unbalanced voltage, overloads, or degraded wires can cause cables to overheat. Once you find hot spots on cables with a TiX5XX camera you can connect up to five different Fluke Connect®-enabled wireless modules. This allows you to view other measurements at the same time, on the same screen as your infrared image. You can also share the measurements live with other team members, who have the Fluke Connect® mobile app on their smart phones, and save them to a central database for future reference or further evaluation and reporting.

### 4 Overheated internal wiring

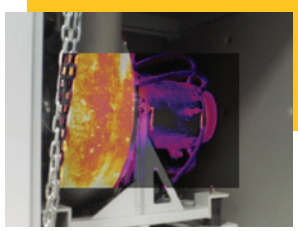
Typically, wire connections don't generate enough heat to create a temperature difference on junction box casings. However, a faulty wire connection due to a loose, oxidized, corroded, or overtightened connection can raise the temperature of that junction box casing higher than normal. You can quickly navigate around other equipment using the 240° rotating lens on the Fluke TiX5XX cameras to compare the temperatures of junction box casings of similar applications. If any show up hotter than the others, you can mark them for further examination.

## Some additional helpful tips

It is a good practice to schedule a regular infrared inspection of all critical motors. You can upload those images to a central database or to your computer and compare subsequent images to the baseline to more easily determine whether a hot spot is normal. You can also scan motors after a repair to confirm that the repair worked.

When inspecting motors with a Fluke TiX5XX infrared camera, remember to note the load and ambient temperature of the motors that you are scanning. You can save those notes in camera memory as text and voice annotations. The large on-camera data storage capacity on the TiX5XX cameras allows you to create a comprehensive file for each asset to include additional visible light images of the motor, motor name plate, VFD or power source, and text and audio notes about the issues related to that asset.

You can also edit images on the TiX5XX infrared cameras or in the software by changing the color palette, blending the IR and visible light level, viewing in picture-in picture mode and adjusting the level and span to help identify more details. You can set alarms for high or low temperatures in infrared or set up the camera to take images at certain time intervals for trending.



**Identify the extent of the problem and exact location with AutoBlend™ and picture-in-picture.**


# Fluke TiX580, TiX560, TiX520 and TiX500 infrared cameras provide the first line of defense

**The Fluke TiX580, TiX560, TiX520 and TiX500 Expert Series Infrared Cameras provide a unique set of capabilities to help you quickly identify potential issues and keep you up and running.**

1 **Ergonomic 240° rotating lens** gives you maximum flexibility and makes it easy to navigate over, under, and around objects so you can see the image before you capture it. It allows you to verify that the image is in focus before you record it, unlike a pistol-grip camera that can be very difficult to focus when you're in an awkward position. This allows technicians to work in more ergonomically agreeable positions for all day use.

2 **The 5.7 inch responsive touchscreen** Delivers 150%[1] more viewing area to make it easy to see even subtle changes and details right on the camera. Quickly finger scroll through saved thumbnail images on the screen, zoom in and out, and access shortcuts to save time and increase productivity.

3 **Enhanced image quality** and temperature measurement accuracy allow you to double image resolution with SuperResolution mode to find subtle anomalies faster. On 320 x 240 resolution cameras, this moves up to 640 x 480, and on 640 x 480 resolution cameras, this moves an image up to 1280 x 960.

4 **Advanced focus systems** enhance image quality and the make it easier to capture the best possible infrared shot. ***LaserSharp***® Auto Focus at the touch of a button takes the guesswork out of precision focus. The built-in laser distance meter calculates the distance to your designated target and then automatically focuses to produce the optimum image. ***MultiSharp***™ Focus[2] takes multiple images from different focal distances and combines them into one clear image. The system reduces the need to take multiple images of individual targets that are in the same field of view. With the press of a button, all objects within the field of view come into focus.

5 **Filter mode** achieves Noise Equivalent Temperature Difference (NETD) as low as 30 mK to detect very slight temperature differences.

6 **Hot and cold spot markers** highlight the hottest and coldest pixels on the image and displays their temperature values at the top of the screen for quick identification of anomalies.

7 **On-camera storage, editing, and analysis** allow you to store thousands of images in memory and bring them up in the field to edit, add digital images, text or voice annotations, and analyze right on the camera.

8 **Fluke Connect**® system allows you to wirelessly sync images directly from your camera to a mobile app. You can edit, analyze and email images to colleagues from the field to collaborate in real time, as well as generate reports on the go. Just push the shortcut button to connect.

[1]Compared to a 3.5 inch screen
[2]Not available on all models

## See and share more results at one time with Fluke Connect®

The Fluke TiX580, TiX560, TiX520 and TiX500 cameras are Fluke Connect–enabled, so you can easily edit and analyze your images. transmit images and measurements from the cameras to smart phones or tablets that have the Fluke Connect* mobile app. In so doing you can share results with authorized team members and thus enhance collaboration and help resolve problems faster.

## Fluke Connect Mobile App

Wirelessly sync images directly from your camera to the Fluke Connect system. Email images to colleagues from the field to collaborate in real time. Edit and analyze images and generate reports on the go.

## Fluke Connect Smartview® Software for your Desktop

Powerful, new Fluke Connect Smartview software for your Windows desktop computer makes it easy to optimize images, perform advanced analytics, generate quick, customizable reports and export images to the format of your choice. A comprehensive and connected software platform that represents the future of integrated equipment maintenance.

*Fluke Connect SmartView analysis and reporting software is available in all countries but Fluke Connect system is not. Please check availability with your authorized Fluke distributor.

## Work faster and easier

Unexplained hot spots could mean trouble for your operation. A high resolution infrared camera is the fastest way to get a clear, accurate view of those problems. Fluke TiX580, TiX560, TiX520 and TiX500 Expert Series cameras deliver the image resolution, thermal sensitivity and accuracy, and ergonomic design to help you find those hot spots before they cause major damage.

To find out more, consult your Fluke sales representative or visit **www.fluke.com/infrared** for more information.

**Fluke.** *Keeping your world up and running.®*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