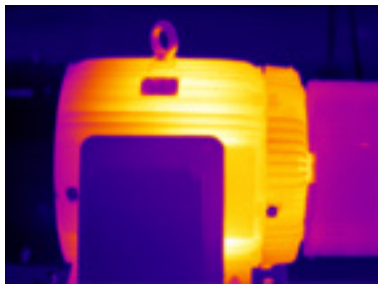
FLUKE®

Extend motor service life with infrared inspection

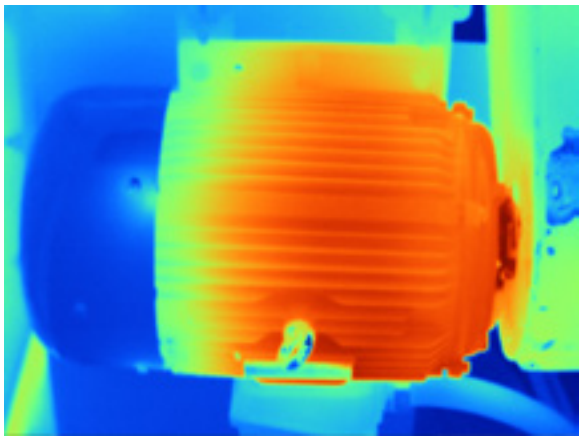
Application Note

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 TiX560 and TiX520 Expert Series infrared cameras make it even easier with their 180° articulating 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 640 x 480 on the TiX560), excellent thermal sensitivity, LaserSharp® Auto Focus, and other enhancements included in Fluke TiX5XX 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 articulating lens, thermal sensitivity, and LaserSharp™ Auto Focus on Fluke TiX560 and TiX520 infrared cameras make it easier to scan many motors quickly and easily and have high confidence in the quality of images and onboard diagnostic capabilities to find:

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 TiX5XX 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.

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.

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 from one to five different Fluke Connect™-enabled wireless modules for other measurements and view them at the same time on the same screen as the infrared image. You can 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.

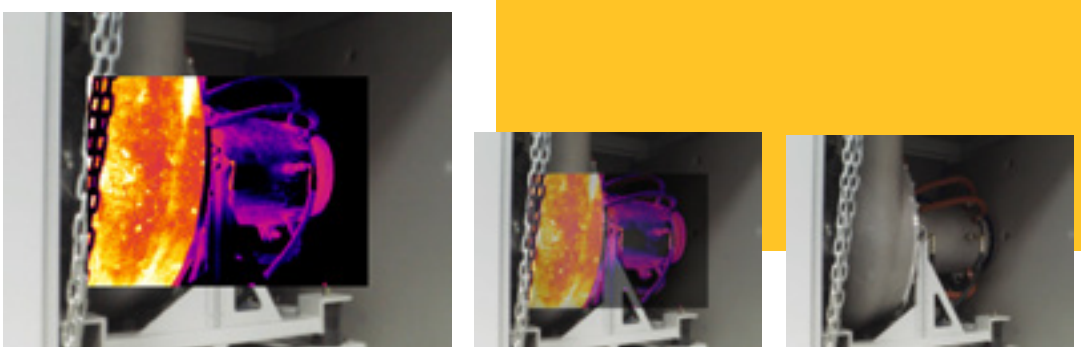
Overheated internal wiring
Typically, wire connections don't generate enough heat to create a temperature difference on junction box casings. However, a faulty wire connection due to a loose, oxidized, corroded, or overtightened connection can raise the temperature of that junction box casing higher than normal. You can quickly navigate around other equipment using the articulating lens on the Fluke TiX560 and TiX520 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 changing the color palette, blending the IR and visible light level, view in picture-in picture mode and adjust 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 TiX560 and TiX520 infrared cameras provide the first line of defense

The new Fluke TiX560 and TiX520 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 180° articulating 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 only 5.7 inch responsive touchscreen** in its class[1] delivers 150%[2] 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 increase 320 x 240 images to 640 x 480 in SuperResolution mode to find subtle anomalies faster.

4 **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.

5 **Image Sharpening** reduces fixed pattern noise to create sharper images, particularly in high temperature environments. (On TiX560 only)

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

7 **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.

8 **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.

9 **Fluke Connect™** wireless compatibility enables you to see, save, and share live video, still images, and measurements with team members who have the Fluke Connect™ mobile app on their smart phones. Just push the shortcut button to connect.

[1]Compared to industrial handheld infrared cameras with 320x240 detector resolution as of October 14, 2014.
[2]Compared to a 3.5 inch screen.

See and share more results at one time with Fluke Connect™ wireless capabilities

The Fluke TiX560 and TiX520 cameras are Fluke Connect–enabled so you can 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.

With SmartView® software, included with Fluke infrared cameras, you can run additional analyses and document findings in reports that include thermal and visible light images, and measurement data. You can adjust most parameters on the stored image, including emissivity, color palette, and level/span, just to name few.

Fluke Connect™ is not available in all countries.
*Within providers wireless service area.

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 TiX560 and TiX520 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/infraredcameras** for more information.

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

Fluke Corporation
PO Box 9090,
Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or Fax (425) 446-5116
In Europe/M-East/Africa +31 (0)40 267 5100 or Fax +31 (0)40 267 5222
In Canada (800)-36-FLUKE or Fax (905) 890-6866
From other countries +1 (425) 446-5500 or Fax +1 (425) 446-5116
Web access: http://www.fluke.com