

High-Definition **Digital Infrared**

High-definition infrared imaging is a proactive, non-contact, non-destructive method of detecting temperature variations in equipment.

How can your company save money?

Have you calculated your potential lost revenue in the event of an electrical failure?

Regularly scheduled infrared imaging is a vital part of your predictive maintenance program. With early detection of problems, equipment can be repaired or replaced before failure, saving your company countless dollars in emergency repairs and downtime.

What equipment should be inspected?

- Electrical Service Panels
- Disconnects
- Motor Control Centers
- Distribution Cabinets
- Motors
- Bus Bars
- Transformers
- Wire Connections

How do I request service?

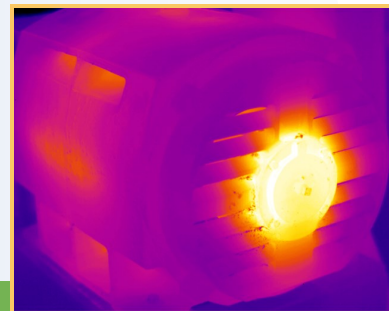
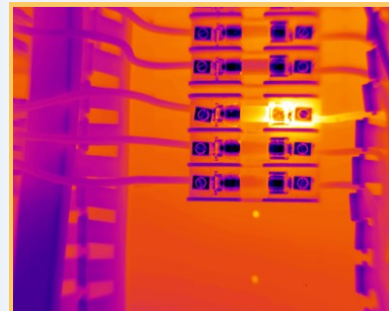
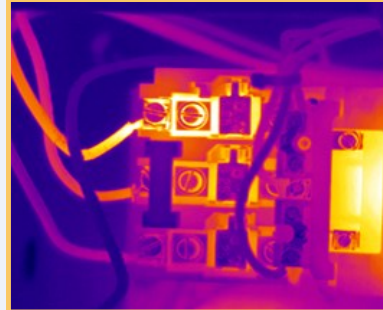
It's easy to sign up for our inspection plan. Email us at energyservices@mrenergy.com, or call us at 1-800-678-4042.

Providing solutions

THE MRES Digital Infrared Report includes:

- HD, full-color images
 - Visual identification photo
 - Colorized infrared image
- Temperature analysis
- Precise image descriptions
- Time- and date-stamped photos
 - Delta T of problem area
- Severity classification
 - Based on NETA and ASNT standards
- Comments on problem areas
- CD-ROM
 - Allows for additional copies
 - Downloadable image viewer allows for annual comparison

Custom reports and/or formats are available at an additional charge.



Using the latest in high-definition imaging equipment, our certified thermographer measures and records precise temperature variations inside electrical and mechanical equipment. The digital images identify “hot spots” that are early indicators of problems.

Contact us

The MRES Maintenance Program is offered through your local municipal utility and MRES.

To request a service quote or to schedule an inspection, call 800.678.4042, or email us at energyservices@mrenergy.com.

Ultrasonic inspection

Leaks in compressed air or vacuum systems, bearing vibrations, steam trap failures, and electrical arcing all create noise that cannot be heard by the human ear. These vibrations can be pinpointed and measured by MRES technicians using ultrasonic equipment.

Why is an ultrasonic inspection important?

- Saves you energy dollars
- Allows for more efficient operation
- Reduces the wear and tear on machinery
- Allows for replacement of equipment before failure
- Identifies potential inefficient equipment
- Identifies workplace hazards

Our inspections can identify...

- Leaks in compressed air systems
- Inefficient vacuum systems
- Correct lubrication levels in motor bearings
- Malfunctioning steam traps
- Arcing and corona in electrical systems

Providing solutions

The MRES Ultrasonic Inspection Report includes:

- Potential energy savings
- Calculated production losses
- Visual identification photos
- Comments on problem area(s) and equipment
- CD-ROM
 - Allows for copy reproduction
 - Downloadable image viewer allows for annual comparison

How do I sign up?

It's easy to sign up for our inspection plan. Email us at energyservices@mrenergy.com, or call us at 1-800-678-4042.

Did you know?

Your ultrasonic inspection service can potentially qualify for an energy-saving rebate from your local municipal utility and Missouri River Energy Services as part of the Bright Energy Solutions® program.

Motor testing

In today's business environment, motor management and maintenance efforts are key to reducing manufacturing costs, increasing return on investments, and improving reliability.

How can motor testing help my company?

The MRES Motor Testing Program uses motor current analysis to test the windings in electrical motors. Our equipment injects a low-voltage signal into the windings and evaluates the response to determine motor conditions. This response is evaluated and potential problems can be identified before failure occurs.

What motors should be tested?

All motors vital to the company's operation, including:

- Motors difficult to replace
- Specialty motors
- Overloaded motors
- Operationally cycled motors
- Motors subject to extreme conditions
- Inventoried motors (back-up motors)

How often should I test?

Motors should be tested annually (at a minimum) — more often for those considered critical to the operation, or motors that show obvious or potential concerns.

What tests are performed on the motors?

- | | |
|-----------------------|-------------------|
| • Loose connections | • Rotor faults |
| • Shorted windings | • Air-gap faults |
| • Ground faults | • Phase imbalance |
| • Insulation failures | • Resistive loss |

Providing solutions

The MRES Motor Testing Report includes:

- Resistance, impedance, inductance, and phase-angle levels and calculations
- Insulation test on windings (pass/fail)
- Precise motor description and visual image
- Estimated time to failure
- Spreadsheet database of in-use and inventoried motors



Take your maintenance program
to the **next level.**

**HD Digital Infrared.
Ultrasonic Leak Detection Services.
Motor Testing.**

Offered to you by your local municipal electric utility
and Missouri River Energy Services.