

Thermal imaging services in industries

Infrared radiation is emitted by all objects with a temperature above absolute zero degree temperature , as per black body radiation law. Amount of radiation emitted by an object increases with temperature. Normal cameras work in the visible range of light frequency spectrum.They can capture only visible pictures. Thermography cameras work in infrared range of frequency spectrum (Around 9000 to 14000 nanometers range) and produce image of the radiation called thermogram.These cameras use special lenses and sensors(microbolometer) to capture images in infrared frequency spectrum.



Image with infrared camera. See the colour pattern and temperature profile. (Courtesy: Wikipedia)



Same image with normal camera. (Courtesy: Wikipedia)

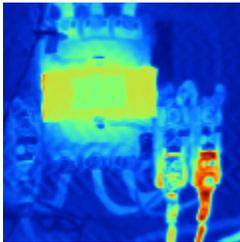
Infrared cameras are more expensive compared to ordinary cameras. Thermograms are actually display of infrared energy emitted,reflected by an object.Thermal imaging IR cameras interpret these data using suitable algorithms and build images.Thermal image shows the temperature of each point in the image by intensity of red colour in each point. In order to make

a temperature measurement , one must know the emissivity. Normally emissivity of various objects have been estimated and made available in public domain.

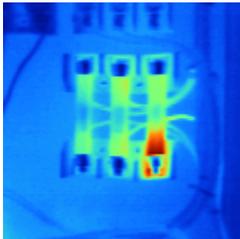
Infrared imaging in electrical installations:

Abnormal heating associated with high resistance(loose contact) or excessive current flow is the main cause of many problems in electrical installations.Infrared thermography allows us to see these invisible thermal signatures and help us to take corrective action to avoid expensive damages.

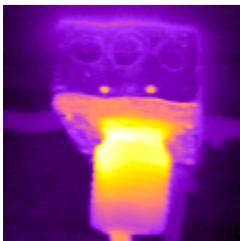
Examples:



1. Above is thermogram of motor controller for an elevator in a large hotel.Loose connection in one phase ,causing increased resistance producing excess heat. (courtesy: www.fluke.com)

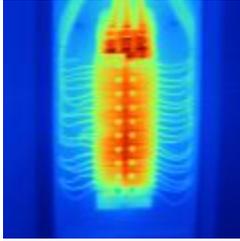


2. Thermogram of a fuse installation where one end is having poor contact.Thermogram shows increased temperature.

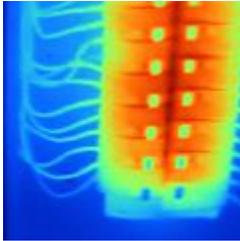


3. Thermogram of a two phase wall plug where the wire connections are loose causing the temperature to raise 50 deg. c above ambient.

4. Following thermograms show overheated components in circuit panel, control panel and current transformer .



Inside control panel thermogram



Inside circuit panel thermogram



Inside controller panel thermogram



Current transformer thermogram



Thermogram of overheated bus bar.

Similarly over heat in motors, pumps, compressors, bearings can be detected and damages can be prevented before they happen.

Several companies have state-of-art thermal imaging camera systems and experienced engineers to study the plant,capture thermograms and interpret the results. Industries can make use of their thermal imaging services to scan their entire electrical installations periodically and take suitable corrective actions to avoid expensive damages,