

# Power Audit & Thermography Test

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## Power Quality

**Power Quality** is a concept of powering & grounding electronic equipment in a manner, which is suitable to its operation & compatible with premise wiring system & other connected equipments.

In today's fast changing scenario and push towards cost saving and Green IT concept, **Power Quality** has become a major concern for all types of industries, especially those operating critical machinery & IT equipment that need constant uninterrupted power supply to keep them running. Poor quality of power leads to major problems like breakdowns, production interruptions, excess energy consumptions, etc.

In order to prevent such occurrences nowadays the conventional electrical systems are being replaced by modern **Power Electronics** systems. As power quality becomes an important factor, focus on quality of equipment used to supply power that can make a big difference in performance is also growing.

## Power Audit Objectives

1. Protect client from dangers of power outages or power swings.
2. Protect client from any kind of loss or interruption in business.
3. Protect client from certain other specific power related problems

## Power Audit Process

Power Audit Process includes variety of analysis, assessment, and reporting, namely

- Walkthrough Assessment
- Safety Assessment
- Redundancy Assessment
- Threat/Risk Analysis
- Monitoring Power Parameters
- Harmonic Assessment
- Detailed Report

## The Process

### 1. Walkthrough Assessment

1. Detailing of electrical distribution.
2. Current running load capacity.
3. Maintenance feasibility.
4. Routing of cables.
5. Separation of power & communication/data cables.

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*Choice Solutions Ltd.  
provides services like Power  
Audit, Air Audit, Data Center  
Audit, Energy Audit,  
Harmonics Study &  
Thermography Test*

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### 2. Safety Assessment

1. Grounding of critical ITES.
2. Panel ground current test.
3. Grounding of metallic equipments.
4. Interlocking of electrical operations.

### 3. Redundancy Assessment

1. Studying backup plans in the event of source failure.
2. Studying transfer logic arrangement.
3. Transfer load to DG set.
4. UPS system source redundancy.
5. Equipments receiving power from single source.
6. Power redundancy check from source level for critical, cooling circuits.

### 4. Threat/Risk Analysis

1. Corrections based on collected data, breaker sizing, & cable sizing.
2. Identify whether the operations can be foolproof.
3. Potential area of sabotage will be studied.

### 5. Power Parameters

Measure various power characteristics & disturbances at main source, emergency source, UPS system input, output & its distribution:

1. Phase Voltage Imbalance
2. Voltage Regulation
3. Transients
4. Normal & Common Mode Noise
5. Load current nature, variation & imbalance
6. Frequency Regulation
7. Power factor
8. Active, Reactive & Apparent power
9. Static Charge & Magnetic Field Test

### 6. Harmonic Assessment

1. Measure VTHD & ITHD at main source & emergency source
2. Measure VTHD & ITHD at UPS system input & output

### 7. Detailed Report

1. Includes corrective actions as per international standards & guidelines
2. Includes steps for improve as per international standards & guidelines
3. Detailed analysis of power parameters

## Equipment

1. Fluke 434 Power Quality Analyzer
2. Fluke 43 B Power Quality Analyzer
3. Kyoritsu 4200 Earth Clamp Tester
4. Zeebeelectronics Static Charge Tester
5. Lutron EMF Tester



## Standards For Evaluation

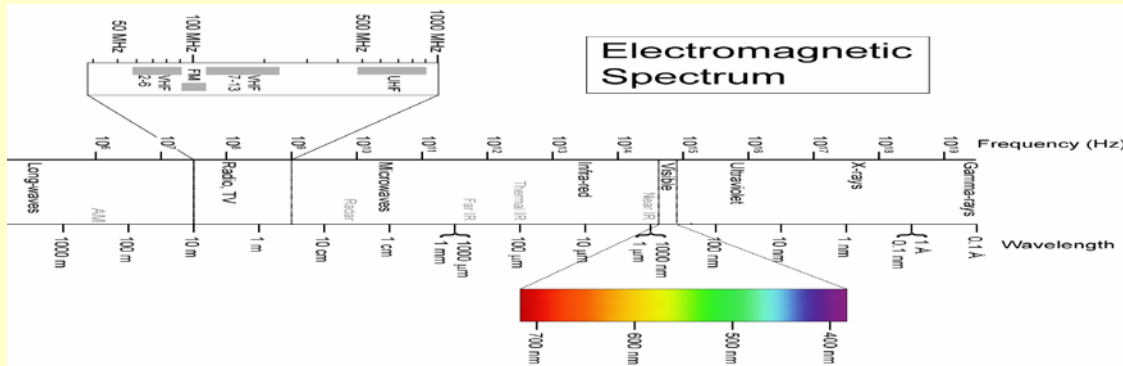
1. IEEE 1100 – 2005 IEEE Recommended Practice for Powering & Grounding Electronic Equipments
2. IEEE 142 – 1991 IEEE Recommended Practice for Grounding of Industrial & Commercial Power Systems
3. IEEE 519 – 1992 IEEE Recommended Practices & Requirements for Harmonic Control in Electrical Power Systems
4. IS 3043 – 1987 Indian Standard Code of Practice for Earthing

## Power Quality Solutions

1. Reduce the magnitude or frequency of power variations
2. Improve the susceptibility of load equipments
3. Add power conditioning to mitigate power quality problems
4. Savings in energy bills due to reduced losses
5. Improve safety
6. Improve system efficiency
7. Improve uptime

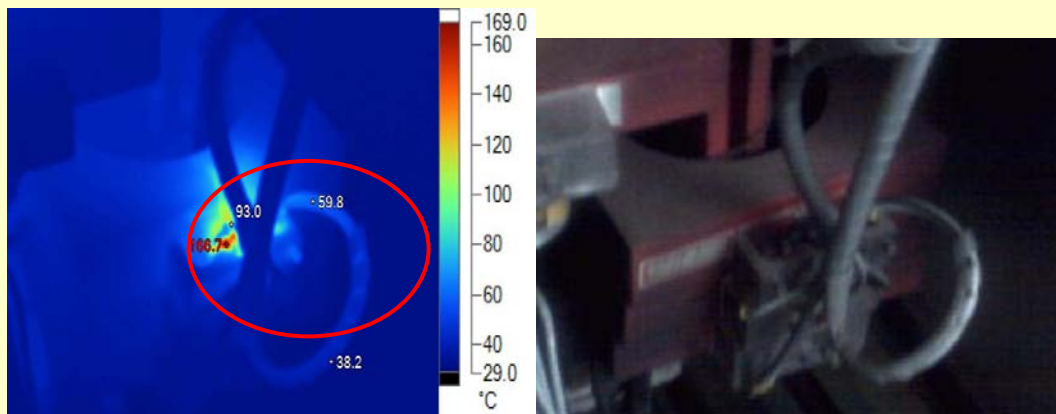
## Thermography

**Temperature** is the physical property that quantitatively expresses the common notations of hot & cold. Every object emits energy in electromagnetic spectrum. The wavelength of the energy differs depend on materials. As shown below; if the wavelength is in the range between 400 nm to 720 nm i.e. visible range, then the body would be visible. If the energy emitted is having wavelength beyond 720 nm, then it would be invisible. This infrared energy can be captured using **Thermal Imager**.



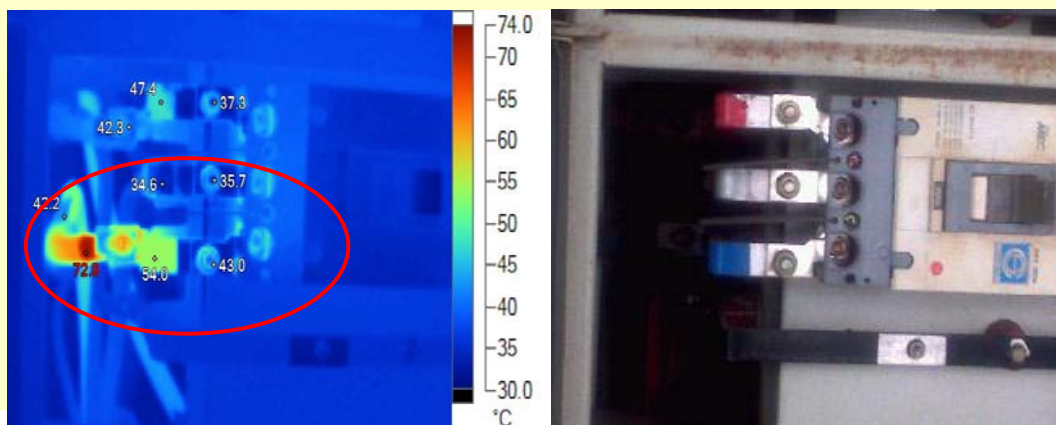
Thermography is the non-contact analysis & mapping of thermal patterns of an object. It's known that all objects emit infrared radiation based on their temperature. Thermal imagers detect this infrared radiation & according to the black body radiation law, thermography makes it possible to see one's environment with **OR** without visible illumination. As such Thermography is used to monitor & analyze the performance of electrical equipments & if done properly can help prevent fire hazards/failures.

## Difference between Normal & Thermal Images



Thermal Image

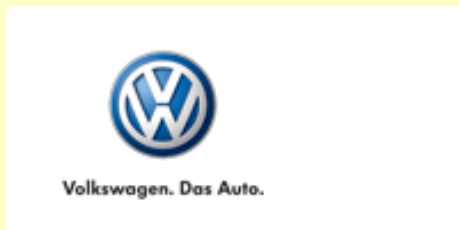
Normal Image



## Benefits

1. Prevent fire hazards
2. Reduce equipment down time
3. Maintenance economics reduction
4. Business interruption minimization

## Partial Client List



## About Choice Solutions

Established in 1991 Choice Solutions Ltd. is a leading IT and Facilities solutions provider. Choice Solutions Ltd. business comprises of Six different practices, namely

### IMS

- Desktop, Server, Network, Storage, Support, OS, Assets, Apps, Non IT
- Hardware - A-Add, M-Modify, I-Install, C-Change, R-Repair
- Assets, Security, Software Distribution, Upgrades

### Networking

- Packaged Services Monitoring & Management
- Products, Security, Design, Deploy, Maintain
- Auditing & Compliance, SOC

### Datacenter

- DC Audit, Monitor & Manage, Training
- Assess, Design, Built, Deploy, Disaster Recovery

### Consulting

- Business Consulting, CIO & Technology Services, Physical Security, Power Devices, IT Consulting
- DC Consulting, ERP, CRM & Custom Apps

### Cloud Computing

- Cold Site – Backup, Disaster Recovery
- Hot Site – HaaS, Software, Manage
- Public Cloud, Private Cloud, Hybrid Cloud
- CaaS, License Software, IaaS
- Disaster Recovery

### Power

- Power Audit, Equipment Management
- Physical Security, Power Devices
- Power Saving Devices
- Design & Audit
- Renewable Energy Products