

POWER QUALITY ANALYSIS AND HARMONIC STUDY SERVICES

Utilities, Facilities, Industries, Commercial Establishments FMCG,
Textile, Process and Plants



SACHU TECHNOLOGIES

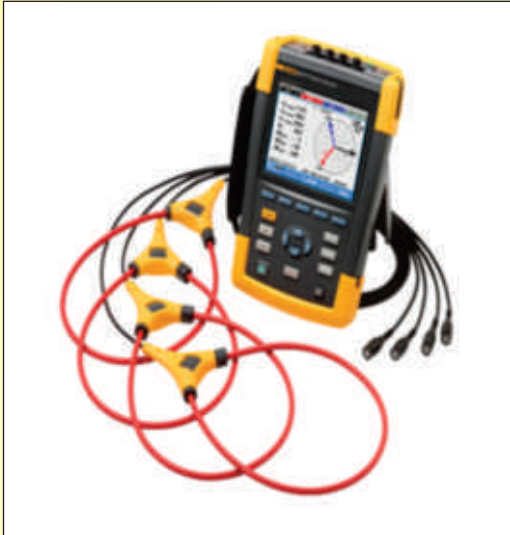
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SACHU TECHNOLOGIES offering Power Quality Analysis and Harmonic study get to the root of the problem, identifying grounding errors, harmonic distortions and other issues that may be reducing the quality and reliability of your power system to avoid Dips, spikes, surges and momentary outages can damage computers and other critical equipment and systems



Harmonic analysis involves the use of computer programs to identify and predict potential harmonic problems and mitigation techniques. The study will also look at different operating points as well as system. Changes that might occur in the future.

Transient Analysis & Surges

The study will be conducted to record the transients & surges of 1KV – 6KV magnitude.

Voltage Dips Swells Analysis

The study will be conducted to record the short term dips & swells along with magnitude & duration.

Reactive Power Analysis

The study will be conducted to calculate the desired reactive

power at distribution & load end. This will give precise reactive power & maintain unity power factor at PCC & reduce losses & resonance in network.

Captive Power Analysis

The study will be conducted to calculate the desired captive power.

Synchronise the captive power to cater to peak demands & reduce utility surcharge & fuel consumption.

Flicker Analysis

Flicker refers to variations in brightness due to small voltage fluctuations. These fluctuations are caused by the operation of various types of equipment connected to the network, such as arc furnaces, welding machines, motors, etc.

Load Flow Analysis

A load flow analysis is conducted to predict power flow magnitudes, power factor, voltage levels, and losses in branches of the system based on the specified operating conditions. The job for the Electrical system Power Quality study and analysis shall be carried out as indicated below:-

Power Quality

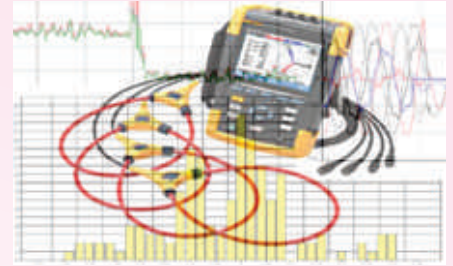
Power quality is often defined as the electrical network's or the grid's ability to supply a clean and stable power supply. In other words, power quality ideally creates a perfect power supply that is always available, has a pure noise-free sinusoidal wave shape, and is always within voltage and frequency tolerances

Why Measure Power Quality?

Power Quality (PQ) refers to the reliable delivery of electrical energy in a form that enables electrical equipment to operate properly. When dips and swells, spikes, surges, momentary outages, sags or other disturbances occur – computers and other electrically powered equipment may malfunction, fail prematurely or shut down unexpectedly. Many facilities simply cannot accept these consequences. Consider hospitals, banks, data communications centers, manufacturing and other facilities that rely on smooth, reliable power for operations. The consequences of an unplanned outage can cost thousands of dollars each minute or result in unsafe conditions or other serious problems unsafe conditions or other serious problems.

Measurement Functions

- ◆ The RMS values of AC voltages up to 1000 V between terminals. By using the ratios, the device can measure voltages up to hundreds of gigavolts.
- ◆ The RMS values of AC currents up to 10,000 amperes. By using the ratios, the device can measure currents up to hundreds of kiloamperes.
- ◆ The DC components of voltages and currents.
- ◆ Minimum and maximum half-cycle RMS voltage and current values
- ◆ Peak voltage and current values
- ◆ The frequency of 50 Hz and 60 Hz networks.
- ◆ Current and voltage peak factors (excluding neutral current).
- ◆ Calculation of the harmonic loss factor (FHL), application to transformers in the presence of harmonic currents.
- ◆ Calculation of the K factor (KF), application to transformers in the presence of harmonic currents.
- ◆ Measurement of total harmonic distortion with respect to the fundamental (THD in % f) of the current and of the voltages
- ◆ Measurement of the total harmonic distortion with respect to the RMS AC value (THD in % r) for the current and the voltages
- ◆ Active, reactive, non-active, distortion, and apparent power, by phase and cumulative.
- ◆ Power factor (PF) and displacement factor (DPF or $\cos \Phi$).
- ◆ Measurement of the RMS distortion value (d) for the current and the
- ◆ Short-term voltage flicker (PST).
- ◆ Active, reactive, non-active, distortion, and apparent energy.
- ◆ Current and voltage harmonics up to order 50: RMS value, percentage referred to the fundamental, (%f), or the total RMS value (%r) minimum and maximum and sequence harmonics
- ◆ Apparent harmonic power up to order 50: percentages referred to the fundamental apparent power (%f) or the total apparent power (%r), minimum and maximum of a rank
- ◆ Calculation of the RMS neutral current from the currents measured on the phases of a three-phase system.



Display Functions

- ➔ Display of waveforms (voltages and currents), Display of frequency bar chart (voltages and currents), Screen captures.
- ➔ Transients function, Detection and recording of transients (up to 51) between user-defined start and stop dates and times. Recording of complete cycles
- ➔ Trend recording (data logging) function. Enough memory with date-stamping and user-defined start and stop dates for recording, with recordings.
- ➔ Display, in bar chart or curve form, of the means of many parameters vs. time, with or without minima and maxima.
- ➔ Alarm function List of recorded alarms exceeding thresholds defined in the configuration
- ➔ Menu. User-defined alarm monitoring start and stop times – not more than two monitoring operations

Why Perform Power Factor Testing?

Most failures of electrical equipment are the result of a break down in the insulation system. Power factor testing is an effective way to detect defective electrical equipment insulation. Power factor is the ratio of the capacitive or 'charging' current (measured in voltamperes) to resistive or 'leakage' current (measured in watts).

What Types of Equipment are Tested with Power Quality and Harmonics Analyser?

The most frequent applications of power factor testing include medium and high voltage transformers and circuit breakers. Other equipment such as bushings, reclosers, switches, cables, capacitors, lightning arrestors, liquid insulation, potheads, rotating machinery, and voltage regulators may also be power factor tested. Power factor testing is used as a factory test and in the field for acceptance testing, preventive maintenance, and emergency diagnostic testing.

Benefits Of Power Quality Analysis

- ❖ Assist in preventative and predictive maintenance, Identify source and frequency of events
- ❖ Establish precise location and timing of events
- ❖ Develop maintenance schedules, Monitor and trend conditions
- ❖ Analyze harmonics, Flicker, Transients frequency variation ,voltage variations (sag/ swell)
- ❖ Ensure equipment performance, Assess sensitivity of process equipment to disturbances
- ❖ Evaluate performance against specifications
- ❖ Find out Inrush Characteristics in Motors

Solving Power Quality Problems

The first step is to identify the source and nature of the disturbance or condition that is causing the problem. This usually involves interviews with facility personnel and making a variety of measurements using power monitoring equipment. Based on the source and nature of the problem, alternative solutions are developed. Typical solutions may involve installation of an uninterruptible power supply (UPS), design and installation of filters, removing the external source of interference or the answer might be as simple as transferring the load to another circuit or reconnecting an improperly connected ground or neutral conductor. Here are some examples of PQ problems and solutions.

PQ Software Analysis and Reporting

Software allows configuration, transfers, processing and analysis.

PQA Scope of supply

- ➔ Program start-up & orientation (site), Onsite Assessment (site)
- ➔ Data collection from various location (Site), Final report preparation (Office)
- ➔ Submission & Presentation of report, (Site)

