



Three-Phase Power Quality Analyzer

System Parameters

- **Nominal Voltage (U):** 400 V
- **System Highest Voltage (Um):** 400 V
- **System Frequency:** 50 Hz
- **Number of Phases:** Three Phase
- **Method of Earthing:** Effectively Earthed
- **System Fault Level:** 25 kA

Service Conditions

- **Annual Average Ambient Temperature:** 30°C
- **Maximum Ambient Temperature:** 40°C
- **Minimum Ambient Temperature:** 6°C
- **Maximum Relative Humidity:** 90%
- **Environmental Conditions:** Humid tropical climate
- **Operational Altitude:** 116 meters below sea level up to 4620 meters above sea level

Applicable Standards

The equipment and components supplied can conform to the latest edition of the standards specified below and amendments thereof:

- **IEC 61000-4-30:2015:** Electromagnetic compatibility (EMC) - Testing and measurement techniques - Power quality measurement methods
- **IEC 61000-4-7:2009:** Electromagnetic compatibility (EMC) - Testing and measurement techniques - General guide on harmonics and inter-harmonics measurements and instrumentation, for power supply systems and equipment connected thereto

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- **IEC 61000-4-15:2010:** Electromagnetic compatibility (EMC) - Testing and measurement techniques - Flicker meter - Functional and design specifications
- **IEC 61010-1:2010:** Safety requirements for electrical equipment for measurement, control, and laboratory use - General requirements
- **IEC 61326-1:2012:** Electrical equipment for measurement, control and laboratory use - EMC requirements - General requirements

Basic Features Measuring Parameters: The Power Quality Analyzer can comply with one of the standards to monitor power quality characteristics in real-time, with the capability to store and retrieve data for analysis using built-in facilities or for downloading to a computer. The analyzer should be compact, lightweight, and designed for outdoor use (drip and dustproof), suitable under the specified service conditions.

The Power Quality Analyzer can analyze the following parameters:

- Simultaneous measurement of U, I, ϕU , ϕI , f, and P
- Instantaneous values of U, I, and P
- Voltage & current waveforms (AC and DC)
- Power Factor (c), Power, & Energy
- Harmonics
- System unbalance
- Transients
- Voltage Sags, Swells
- Flicker
- Frequency
- Energy losses due to unbalance & harmonic issues
- Time derivative, integral over time, FFT analysis, mean value, histogram, and modeling
- Display of up to 24 measured values on one display
- Display of all values for each channel
- Display of all values in tabular form
- Display of measured values in a diagram
- Display of a vector diagram

Storage Capacity: The analyzer can include built-in circuitry for data storage from the electricity distribution system over a period of at least 30 days, with the facility for downloading data into a computer for analysis. The internal memory can be non-volatile with a capacity of not less than 32 GB. Removable memory storage capabilities (e.g., an SD card slot) can be accessible.

Battery: The analyzer can be equipped with a rechargeable battery (preferably Li-ion) to cover power outages for at least 3 hours. The battery should be readily available in the local market.

Computer Software: The analyzer supplied with software to configure, download, and analyze data. The software must be compatible with Microsoft Windows platforms and support the latest versions, including Windows 7, 8.1, and 10 or above.

Input and Output Characteristics

Voltage Inputs:

- **System:** Three-phase four-wire system (WYE)
- **Number of Inputs:** 4 (3 phase + neutral) — DC coupled
- **Maximum Input Voltage:** 1000 V

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- **Nominal Voltage Range:** 0 V to 1000 V

Current Inputs:

- **Number of Inputs:** 4 (3 phase + neutral) — DC coupled
- **Type:** Flexible probes current measuring clamps for AC and DC
- **Range:** 0.5 A to 2000 A DC and 6 A to 6000 A AC

Sampling System:

- **Resolution:** Minimum 16-bit analog-to-digital converter on 8 channels
- **Minimum Sampling Speed (Steady State):** 25 kHz on each channel simultaneously
- **Minimum Sampling Speed (Transients):** 200 kHz on each channel simultaneously
- **Nominal Frequency:** 50 Hz
- **Synchronization:** PLI synchronization required

Display Modes

- **Waveform Display:** 4 cycles of 4 waveforms on screen
- **Phasor Diagram:** To be displayed with waveform display
- **Meter Readings:** Provides a tabulated view of all available readings
- **Trend Graph:** Shows trends over time
- **Bar Graph:** For comparative analysis
- **Event List:** Records and lists events

Communication with PC

- The analyzer is equipped with a USB port with necessary accessories to connect to a PC.
- Communication capability with a GPRS modem and associated software and accessories can be provided if specified in the Price Schedule.

Accuracy and Range

Parameter	Range	Accuracy
Voltage	0 V - 1000 V	±0.1% or less
Current	0.5 A - 2000 A DC, 6 A - 6000 A AC	±0.5% or less
Frequency	46 Hz - 53 Hz	±0.01 Hz or less
Power Factor	0 - 1	±0.1% or less
Phase Angle	-360° to +0°	±0.1% or less

Analysis and Results

Configurable Parameters: The averaging time for steady-state parameters can be configurable between 0.25 s to 2 hrs in data logging mode. In addition to the default parameter sets, customer-selected parameter sets should be configurable, including threshold values for various parameters.

Data Analysis: The following information/data can be obtained from the analyzer for data analysis:

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- **Voltage/Current/Frequency:** Average RMS values, maximum and minimum values, capability to measure fundamental components of current and voltage
- **Sags and Swells:** As specified in one of the chosen standards
- **Harmonics:** Harmonic voltages, currents, and power—All measurable
- **Power and Energy:** Active, reactive, apparent power, and power factor
- **Unbalance:** Negative, zero, and fundamental values, including phase angles
- **Power Loss:** Due to unbalance and harmonics
- **Transients:** Trigger on sags, swells, interruptions, and current levels as specified by one of the chosen standards

Quality Assurance

The manufacturer can possess ISO 9001:2023 or the latest Quality Assurance Certification, valid throughout the delivery period, for the manufacture of Power Quality Analyzers.

Accessories to be Supplied with the Instrument

- Hard carrying case for instrument transportation
- Soft carrying case
- Operator manual
- User guide for computer software
- Power adapter / Battery charger
- Standard batteries (3 hours or more)
- Complete set of test leads and alligator clip set
- Complete set of flexible current measuring clamps for AC and DC
- 8 GB SD card
- USB cable/cables
- International plug adaptor set

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