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INSTRUMENTS FOR POWER INDUSTRY

Making energy visible

Three-phase Power Quality and Energy Analyzer
PQP-A Energotester



Synchronization



IEC 61000-4-30: 2008

Three-phase Power Quality and Energy analyzer PQP-A Energotester

Applicable standards:

- EN 50160: 2010 Power quality limits
- IEC 61000-4-30: 2008 Power quality measurement methods
- IEC 61000-4-7: 2008 Harmonics and interharmonics measurements
- IEC 61000-4-15: 2010 Flickermeter



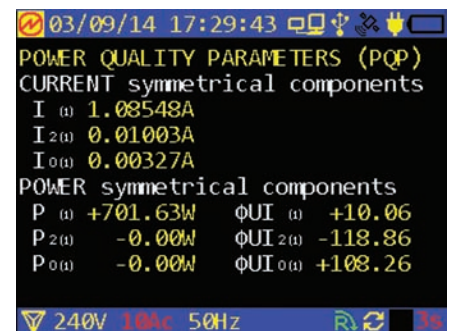
Sphere of application

Power quality measurements

- AC power certification (compliance with EN 50160: 2010 requirements)
- Arbitration tests
- Power quality monitoring
- Detecting sources of distortion and working out protection techniques

Characteristics

IEC 61000-4-30:2008, class A or S
0.1...480 V, $\pm 0.1\%$
42.5...75 Hz, ± 0.01 Hz
Flicker and accidental events

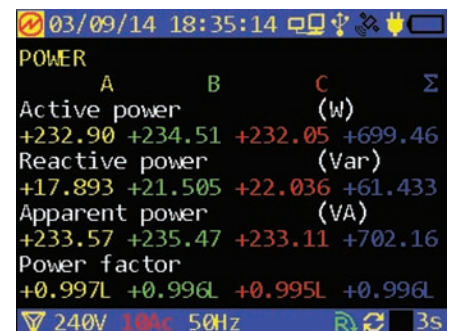


Power and energy measurements

- P, Q, S, W,
- Energy losses ΔW in power transmission lines
- Load profiles
- Energy efficiency classification

Characteristics

10 mA...3500 A, $\pm 0.2\%$...2.0 %
Averaging interval: 3 s, 10 min, 2 h
Logging capacity: up to 24 months

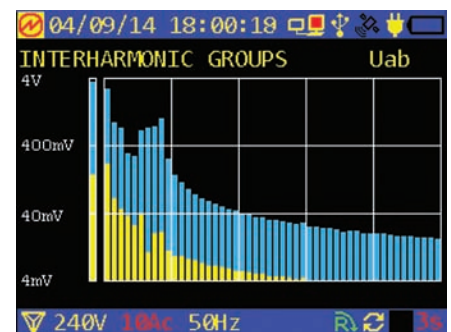
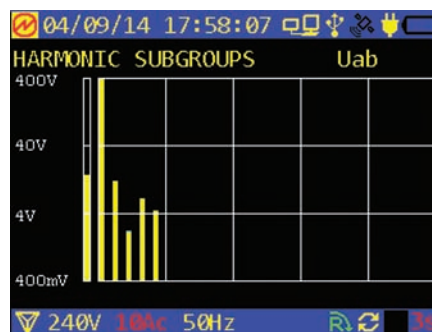


Analysis of waveforms and harmonics

- Analysis of distorting components
- Electromagnetic compatibility

Characteristics

IEC 61000-4-7:2008, class I
50 harmonics and interharmonics
Harmonic powers

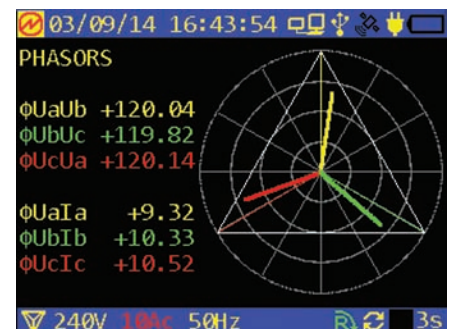
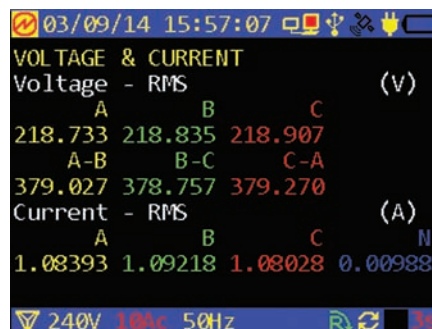


Inspection of energy meter reading systems

- Vector diagrams
- Checking connection of meters and transformers; performance testing
- Load capacity of CTs and VTs
- Voltage drop ΔU across a VT-Energy meter circuit

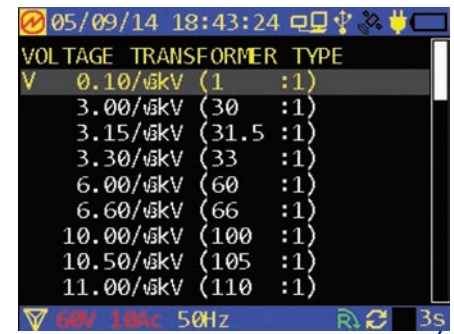
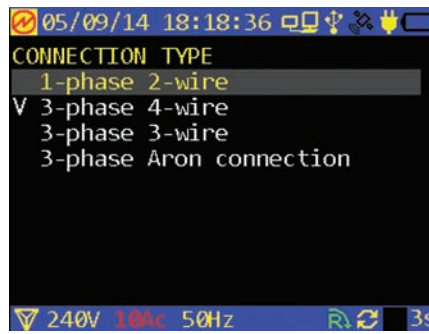
Characteristics

Certified ΔU measurement method provides standard type A measurement uncertainty 0.005 %, or less



Configuration flexibility

- 1-phase or 3-phase connections:
 - Connection to phase current circuits A, B, C
 - Connection to phase current circuits A and C (Aron connection)
- Selectable ranges of external instrument transformers (U and I) to be considered in calculations

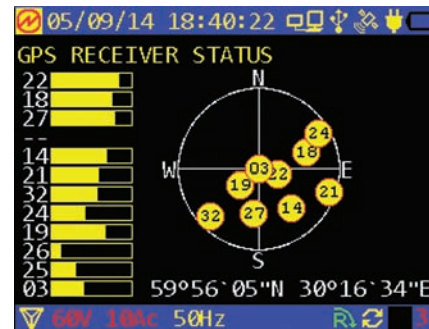


Diagnostics

- Displaying status of built-in GPS receiver

Displaying real-time waveforms

- Phase voltages, phase currents, line voltages and neutral current can be simultaneously displayed in any combination








Scope of supply

Basic set (voltage and power quality measurements)

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Energotester | GPS-antenna | Bag | Voltage leads | Power Supply Unit ($U_{out} = 12\text{ V}$, $I_{out} = 0.8\text{ A}$) | EmWorkNet software» |

Accessories 2015


| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| 1Ph/3Ph Power Adapter (powering from the measurement circuit) | USB/Wi-Fi Adapter | Transportation case (plastic) 480 × 385 × 190 mm | Transportation box (cardboard) 350 × 180 × 350 mm | Protection cover (rubber) |


Typical sets (Basic set + current clamp kit)

«10 A + 100 A»

10 mA...150 A
±0.2 %
window 6 mm

±0.2 %
window 20 mm



Clamp-on CTs 10 A
(accuracy cl. 0.2)


Clamp-on CTs 100 A
(accuracy cl. 0.2)

«10 A + 1000 A»

10 mA...15 A
±0.2 %


10...1500 A
±0.5 %
window 50 mm


Clamp-on CTs 1000 A
(accuracy cl. 0.5)

«10 A + 3000 A»

10 mA...15 A, ±0.2 %
Flexible Rogowski coils
«ME FLEX 3003»

3...3500 A, ±2 %
30/300/3000 A,
window 160 mm



Traceability of measurements

**National Standard
of AC power
PCS-ME 1.0**
(Active power measurement
error $\pm 0.004\%$)



Traceability of
measurement
units



Energometer 3.1KM
(active power measurement error
 $\pm 0.015\%$)

Automatic calibration



PQP-A Energotester

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Specifications

Operating temperature range:
from minus 20 to plus 55 °C
**Time of continuous battery-powered
operation:** at least 2 h
Protection provided by the enclosure: IP 51
Internal memory capacity: 512 MB
Sampling rate of 24-bit ADC: 40 kHz
UTC synchronization error: ± 5 ms
Dimensions (L×W×H): 250×120×80 mm
Weight: 1 kg, or less
Power supply: 80 to 240 V
(50...450 V for 1Ph/3Ph Power Adapter)

Basic accuracy characteristics (50/60 Hz)

| Parameter | Range | Measurement |
|------------------|----------------------------------|---------------|
| Voltage, V | 0.1...480 V | Relative: |
| | | $\pm 0.1\%$ |
| • AC voltage | 10 mA...3500A | $\pm 0.2\%$ |
| • DC voltage | | Relative: |
| AC current, A | 42.5...75 | $\pm 0.1\%$ |
| AC frequency, Hz | | Absolute: |
| Active power, W | 0.01 P_{nom} ...2.25 P_{nom} | ± 0.01 Hz |
| | | Relative |
| | | $\pm 0.1\%$ |