Power Quality Analyzer

PQM-700

index: WMGBPQM700

CLASS S
IEC 61000-4-30

CAT IV
300 V

IP65

55°C
HEAVY DUTY
-20°C

EVENTS

Recording and diagnostics in all conditions

Features

- **4 current inputs**, physical measurement of current in the neutral conductor.
- **Registration of up to 1100 parameters**, including average, maximum, minimum and instantaneous values.
- **Built-in heater**, stable operation at low temperatures down to -20ºC.
- **Internal rechargeable battery**, autonomy of the meter (min. 6 hours).
- **IP65 ingress protection**, possibility of work in rain, snow and high humidity.

Measured parameters

- **Voltages L1, L2, L3, N (four measurement inputs)** – average, minimum, maximum and instant values within the range up to 760 V, interoperability with voltage transducers.
- **Currents L1, L2, L3, N (four measurement inputs)** – average, minimum, maximum and instant values, current measurement within the range up to 6 kA (depending on applied current clamp), interoperability with current transducers.
- Crest factors for current (CFI) and voltage (CFU).
- Frequency within the range of 40 Hz – 70 Hz.
- Active power (P), reactive power (Q), distortion power (D), apparent power (S) with identification of the nature of reactive power (capacitive, inductive).
- Calculation of reactive power using the Budeanu method and IEEE 1459 method.
- Active energy (E_P), reactive energy (E_Q), apparent energy (E_S).
- Power factor (PF), cosφ, tanφ.
- Harmonics up to the 40th in voltage and current.
- Total harmonic distortion THD for current and voltage.
- Short-term (P_{ST}) and long-term (P_{LT}) light flicker index.
- Unbalance of voltages (in compliance with IEC 61000-4-30 class S) and currents.
- Event logging for current and voltage along with oscillograms and half-period RMS charts.
- **All parameters are registered in compliance with class S according to standard EN 61000-4-30.**

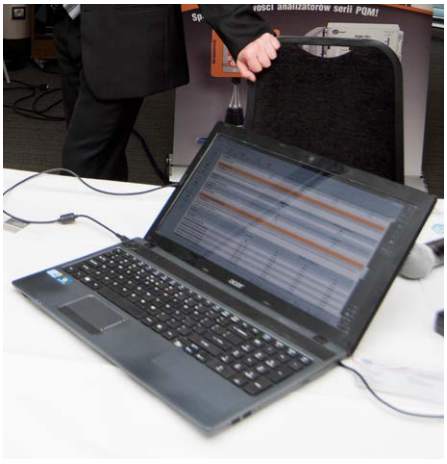
Wide range of mains to analyze

- **With rated frequency** 50/60 Hz
- **With rated voltages:** 64/110 V;110/190 V; 115/200 V; 120/208 V 127/220 V; 133/230 V; 220/380 V; 230/400 V; 240/415 V; 254/440 V; 265/460 V; 277/480 V, 290/500 V, 400/690 V
- **Direct current**
- Systems:
  - » single-phase
  - » split-phase with common N
  - » three-phase – WYE with and without N conductor
  - » three-phase – Delta
  - » three-phase – WYE and Delta Aron
  - » with current and voltage transducers

Capabilities

The analyzer provides comprehensive measurements of power quality parameters in **class S**, in accordance with IEC 61000-4-30, which guarantees high accuracy of results. Even when the temperature reaches -20ºC, the measurements are reliable and the device operation is stable - all thanks to the built-in heater.

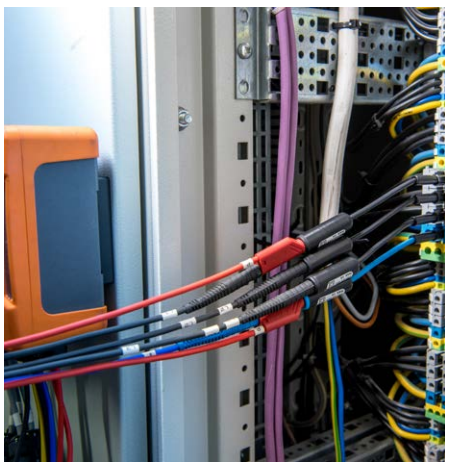
Thanks to the internal battery, the analyzer does not turn off after a power failure, but maintains recording - **up to 6 hours**. Data is recorded on a removable 2 GB memory card. Logs can be downloaded using a USB connection or using an external reader. Then they can be analyzed in free Sonel Analysis software.



Displaying data

All recorded parameters - including indicated events - can be easily read using the dedicated **Sonel Analysis** software. The advanced features of the application allow you to view the collected results and save them on your computer's hard drive - in the form of raw data or reports.

Sonel Analysis is constantly updated and developed. This means that the user will keep up with the latest requirements of norms and standards.



Application

PQM-700 fulfills its role in industry - in hands of electricians, maintenance services etc. - as a cheap, multi-functional load parameter recorder. It is also used by consumers and producers of renewable energy (wind farms, solar farms), where a 4-quadrant power analysis is required.

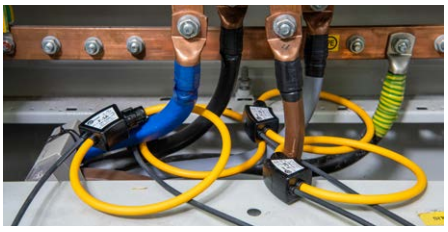
Parameters

Parameter	Measuring range	Max. resolution	Accuracy
Alternating voltage (TRMS)	0.0…760.0 V	4 significant digits	±0.5% U_{nom}
Crest Factor			
Voltage	1.00…10.00 (≤1.65 for 690 V voltage)	0.01	±5%
Current	1.00…10.00 (≤3.6 for I_{nom})	0.01	±5%
Alternating current (TRMS)	depending on clamp*	4 significant digits	±0.2% I_{nom} (error does not account for clamp error)
Frequency	40.00...70.00 Hz	0.01 Hz	±0.05 Hz
Active, reactive, apparent and distortion power	depending on configuration (transducers, clamps)	4 significant digits	depending on configuration (transducers, clamps)
Active, reactive and apparent energy	depending on configuration (transducers, clamps)	4 significant digits	as power error
cosφ and power factor (PF)	0.00...1.00	0.01	±0.03
tanφ	0.00...10.00	0.01	depends on error of active and reactive power
Harmonics			
Voltage	DC, 1...40	as for alternating voltage True RMS	±0.15% U_{nom} for m.v. < 3% U_{nom} ±5% m.v. for m.v. ≥ 3% U_{nom}
Current	DC, 1...40	as for alternating current True RMS	±0.5% I_{nom} for m.v. < 10% I_{nom} ±5% m.v. for m.v. ≥ 10% I_{nom}
THD			
Voltage	0.0..100.0% (relative to RMS value)	0.1%	±5%
Current			±5%
Flicker index	0.40...10.00	0.01	±10%
Unbalance factor			
Voltage and current	0.0...10.,0%	0.1%	±0.3% (absolute error)

m.v. – measured value

* **F-1A1**, **F-2A1**, **F-3A1** clamp: 0...1500 A AC (5000 A_{p-p}) • **F-1A**, **F-2A**, **F-3A** clamp: 0...3000 A AC (10 000 A_{p-p}) • **F-1A6**, **F-2A6**, **F-3A6** clamp: 0...6000 A AC (20 000 A_{p-p})
C-4A clamp: 0...1000 A AC (3600 A_{p-p}) • **C-5A** clamp: 0...1000 A AC/DC (3600 A_{p-p}) • **C-6A** clamp: 0..10 A AC (36 A_{p-p}) • **C-7A** clamp: 0...100 A AC (360 A_{p-p})

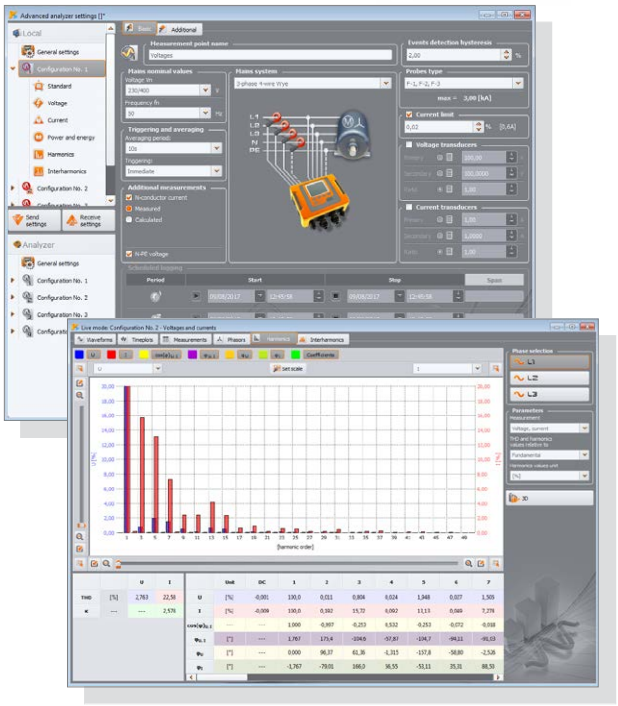
							
	C-4A	**C-5A**	**C-6A**	**C-7A**	**F-1A1 / F-1A / F-1A6**	**F-2A1 / F-2A / F-2A6**	**F-3A1 / F-3A / F-3A6**
	WACEGC4AOKR	WACEGC5AOKR	WACEGC6AOKR	WACEGC7AOKR	WACEGF1A1OKR WACEGF1AOKR WACEGF1A6OKR	WACEGF2A1OKR WACEGF2AOKR WACEGF2A6OKR	WACEGF3A1OKR WACEGF3AOKR WACEGF3A6OKR
Rated current	1000 A AC	1000 A AC 1400 A DC	10 A AC	100 A AC	1500 / 3000 / 6000 A AC		
Frequency	30 Hz…10 kHz	DC…5 kHz	40 Hz…10 kHz	40 Hz…1 kHz	40 Hz…10 kHz		
Output signal level	1 mV / 1 A	1 mV / 1 A	100 mV / 1 A	5 mV / 1 A	77.6 µV / 38.8 µV / 19.4 µV 1 A		
Max. diameter of measured conductor	52 mm	39 mm	20 mm	24 mm	360 mm	235 mm	120 mm
Minimum accuracy	≤0.5%	≤1.5%	≤1%	0.5%	1%		
Battery power	–	√	–	–	–		
Lead length	2.2 m	2.2 m	2.2 m	3 m	2.2 m		
Measurement category	IV 300 V	IV 300 V	IV 300 V	III 300 V	IV 600 V		
Ingress protection	IP40				IP67		



SONEL ANALYSIS

Sonel Analysis software – application delivered as standard accessory, indispensable for working with PQM-series analyzers. It enables:

- analyzer configuration,
- data reading from logger,
- preview of network parameters in real time (with capability of reading via GSM modem),
- deletion of data in the analyzer,
- data presentation in tables,
- data presentation in charts,
- data analysis and generating reports in compliance with standard EN 50160 (reports) and other user defined reference conditions - also for PV micro-installations up to 50 kW, a breakdown for active power states P>0, P<0 and P=0 and taking into account the graphs $Q_1=f(U_1/U_n)$ and $\cos\varphi=f(P/P_n)$,
- independent support of multiple analyzers,
- analyzer firmware updates.



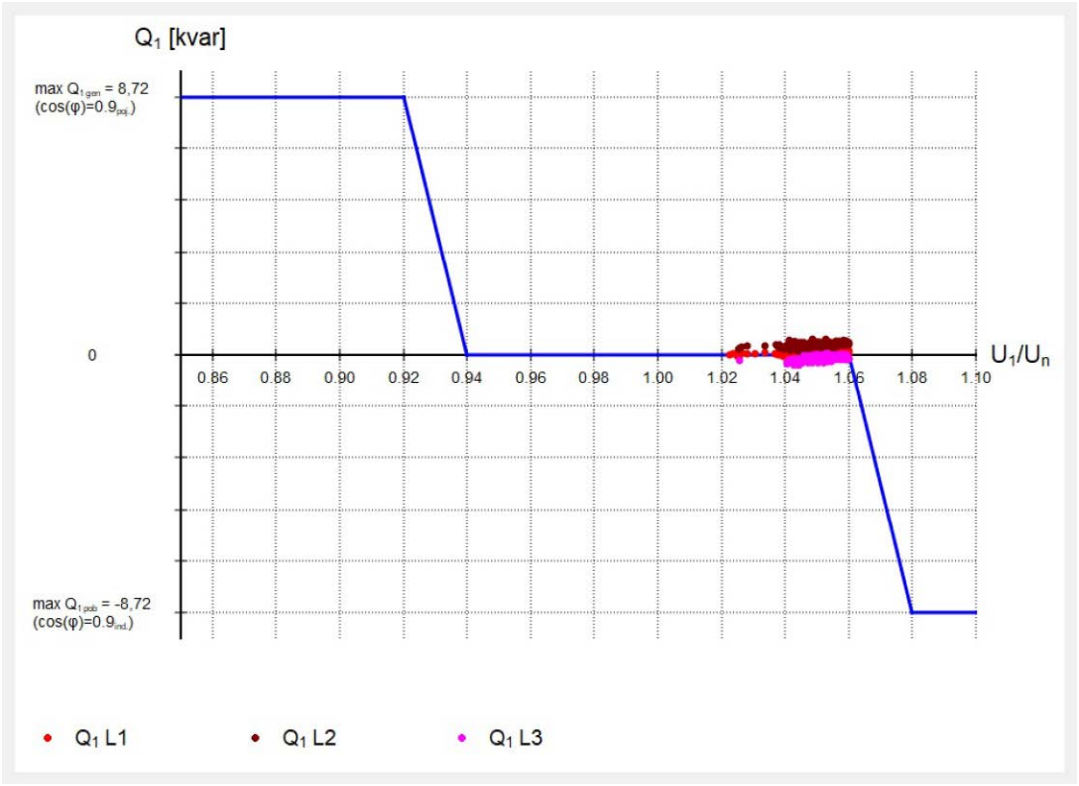
The software enables readout of selected parameters and their visualization in real time. These parameters are measured independently from the registration saved on the memory card. The user can view:

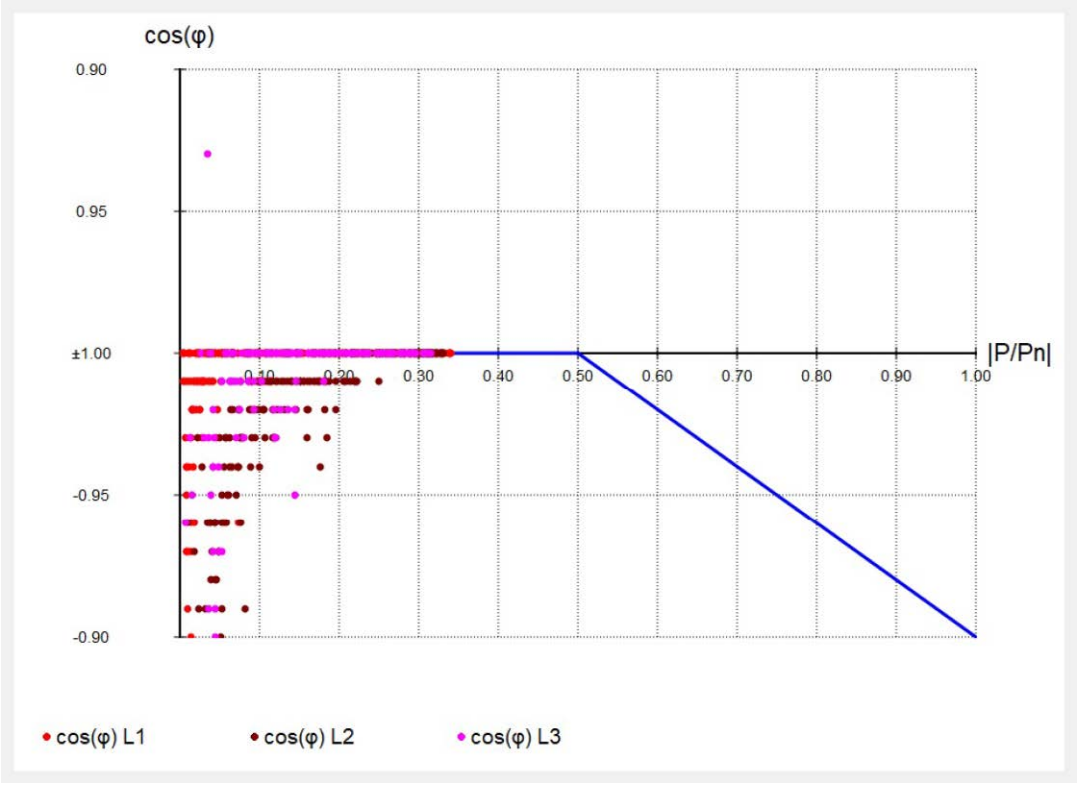
- charts of voltage and current progression (oscilloscope),
- charts of voltage and current over time,
- phasor diagram,
- measurements of multiple parameters,
- harmonics and harmonic powers (estimating the direction of harmonics),
- interharmonics.

REPORT: Micro-installations up to 50 kW (P > 0, power consumption)

GENERAL INFORMATION

Analyzer:	Type: PQM-702 | Version: FW1.50HWc | Serial number: AZ0025			
Report generated using:	SONEL Analysis 4.6.0 BUILD 111			
Measurement time (UTC±00:00):	Start: 2021-12-03 16:00:00.000 Stop: 2021-12-10 16:00:00.000 Time: 1w 0d 0h 0m 0s			
Number of parameter's samples averaged for every 5 s:	120,960			
Number of parameter's samples averaged for every 10 min:	1,008			
Number of parameter's samples averaged for every 15 min:	672			
Number of parameter's samples averaged for every 2 h:	84			
Number of excluded samples:	0 (PLT: 0)			
	L1	L2	L3	L123-N
Number of parameter's samples averaged for every 5 s (P > 0, power consumption):	28,320	73,329	119,605	119,006
Number of parameter's samples averaged for every 10 min (P > 0, power consumption):	243	682	1,002	994
Number of parameter's samples averaged for every 15 min (P > 0, power consumption):	164	459	669	664
Number of excluded samples (P > 0, power consumption):	0	0	0	0
Nominal values:	Mains system: 3-phase 4-wire Wye Phase voltage: 230.00 V Phase-to-phase voltage: 400.00 V Frequency: 50.00 Hz Inverter power (3-p): 30.00 kW Insensitivity threshold: 300.00 W			
Events limits:	Swells %Un: 10.00 Dips %Un: -10.00 Interruptions %Un: -95.00			


Q1 [kvar]
max Q1 gen = 8,72
(cos(φ)=0.9ind.)
0
max Q1 pob = -8,72
(cos(φ)=0.9ind.)
0.86
0.88
0.90
0.92
0.94
0.96
0.98
1.00
1.02
1.04
1.06
1.08
1.10
U1/Un
Q1 L1
Q1 L2
Q1 L3


cos(φ)
0.90
0.95
±1.00
-0.95
-0.90
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
|P/Pn|
cos(φ) L1
cos(φ) L2
cos(φ) L3

Standard accessories

3 x crocodile clip, black, 1 kV, 20 A
WAKROBL20K01

2 x crocodile clip, red, 1 kV, 20 A
WAKRORE20K02

Crocodile clip, blue 1 kV 20 A

WAKROBU20K02

4 x magnetic voltage adapter - set

WAADAUMAGKPL

Straps for mounting on a pole - set - 1.2 m

WAPOZOPAKPL

DIN rail mounting bracket with positioning catches
WAPOZUCH3

2 x fasteners and bands for mounting the analyzer
WAPOZUCH4

AZ-1 power supply adapter (mains plug/banana inputs)

WAADAAZ1

L-5 carrying case

WAFUTL5

Data transfer and analysis

USB cable
WAPRZUSB

Sonel Analysis software
WAPROANALIZA4

Factory calibration certificate

Optional accessories

F-1A flexible clamp (Φ=360 mm)

1.5 kA: WACEGF1A1OKR
3 kA: WACEGF1AOKR
6 kA: WACEGF1A6OKR

F-2A flexible clamp (Φ=235 mm)

1.5 kA: WACEGF2A1OKR
3 kA: WACEGF2AOKR
6 kA: WACEGF2A6OKR

F-3A flexible clamp (Φ=120 mm)

1.5 kA: WACEGF3A1OKR
3 kA: WACEGF3AOKR
6 kA: WACEGF3A6OKR

C-4A clamp (Ø 52 mm) 1000 A AC

WACEGC4AOKR

C-5A clamp (Ø 39 mm) 1000 A AC/DC

WACEGC5AOKR

C-6A clamp (Ø 20 mm) 10 A AC

WACEGC6AOKR

C-7A clamp (Ø 24 mm) 100 A AC

WACEGC7AOKR

L2 carrying case for clamps

WAWALL2

AC-16 line splitter

WAADAAC16

Flat test clip (grip - banana socket) (5 pcs)

WASONKCB1KPL

Test clips with steel jaws – set (5 pcs)

WASONKGB1KPL

Adapter for control terminals (5 pcs)

WAADAPRZKPL1

Voltage adapter with M4/M6 thread - set 4 pcs

WAADAM4M64

Magnetic voltage adapter

black
WAADAUMAGKBL
blue
WAADAUMAGKBU

ASX-1 piercing adapter - set 4 pcs

WAADAPRZASX1KPL

AGT-16T industrial socket adapter 16 A / 32 A

WAADAAGT16T
WAADAAGT32T

AGT-16C three-phase socket adapter 16 A / 32 A (PEN)

WAADAAGT16C
WAADAAGT32C

AGT-16P three-phase socket adapter 16 A / 32 A

WAADAAGT16P
WAADAAGT32P

AGT-63P three-phase socket adapter 63 A

WAADAAGT63P

XL2 carrying case

WAWALXL2

PQM magnetic strap (2 pcs)

WAPOZUCH5

Calibration certificate with accreditation

PQM-711

PQM-710

PQM-707

PQM-700

Portable Class S analyzer for basic and long term analysis	Stand alone Class S mains network analyzer for fast diagnosis	Class A high accuracy mains network analyzer	Top class of mains network analyzers with transients capture

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