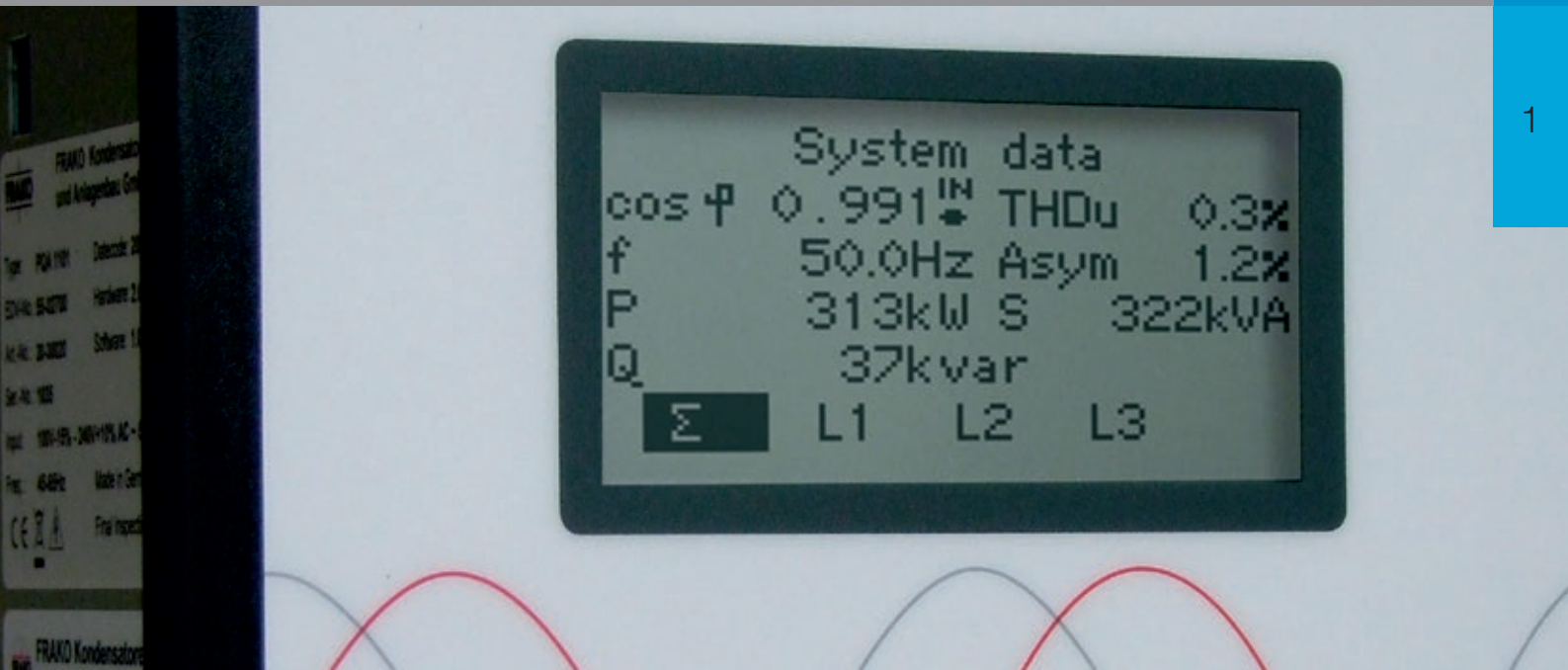


# Devices of the PQ Series

Power Quality Analyzer



## Mains Analysis Device

The power quality of electrical supply networks plays an increasingly important role for the operational safety of electrical infrastructure. Therefore it becomes more and more important to take appropriate measures to monitor the power quality.

Unlike in the past, it is no longer sufficient to measure once and not pay any further attention to power quality if the values are inconspicuous.

Due to complex manufacturing processes, fluctuating load conditions and also due to an increasing degree of automation of industrial plants it is more important than ever to continuously monitor the quality of the product "current".

Regardless of whether a single analyzer is used to monitor individual machines or consumption, or whether the entire electrical equipment is monitored and analyzed by means of an energy management system – FRAKO offers the optimal solution.

In order to facilitate the control of the "Power Quality" or its legal limit values, various alarm channels are available, such as warning lights, e-mail, SMS etc.



Depending on type and version this can be achieved already by a single device or – even better – in combination with the FRAKO Energy Management System.

Measurement of residual current, PE-monitoring, monitoring of transformers, measurements at low voltage distribution boards as well as monitoring of individual machines and consumers .... FRAKO has the solution for every application.

# Devices of the PQ Series

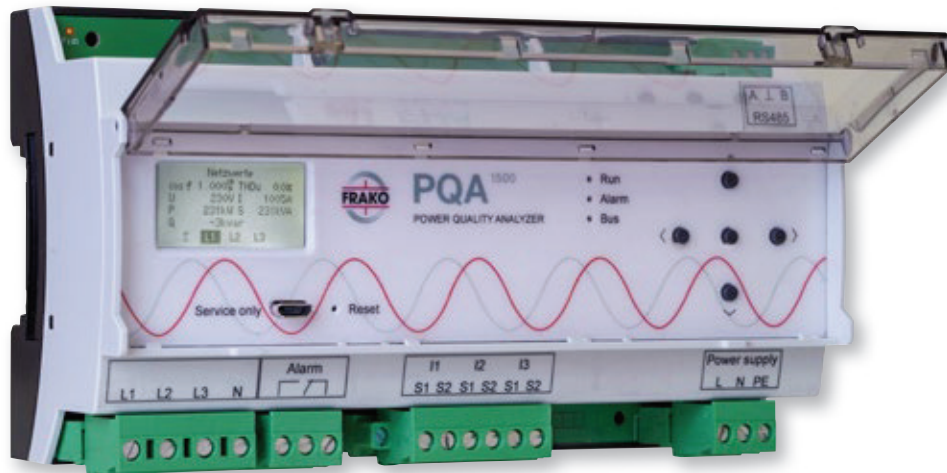
Power Quality Analyzer

1

	PQA 1500	PQA 1101
		
Voltage	85-267 V AC or 100-377 V DC	85-267 V AC or 100-377 V DC
Frequency	85-267 V AC or 100-377 V DC	45-65 Hz
Power consumption	Max. 7 VA	Max. 7 VA
Contact termination 3/4/5-wire	• / • / -	• / • / -
Current measurements	3 x X/5A (Transformer current > 15 mA), electrically isolated	3 x X/5A (Transformer current > 15 mA), electrically isolated
Voltage measurements	3 x 60-400 V AC (external/neutral conductor) 3 x 115-525 V AC (external/external conductor)	3 x 60-400 V AC (external/neutral conductor) 3 x 115-690 V AC (external/external conductor)
Harmonics V/A	1-19	1-19
Short term interruptions	•	•
Active energy class	1	1
Analogue In-/Outputs	-	2 temperature / -
Digital In-/Outputs	1 alarm signalling contact 250 V AC, max. 3 A	Tariff input for selection of 2 profiles / 1 alarm signalling contact 250 V AC, max. 3 A
Memory Min./Max. values	•	•
<b>Interfaces</b>		
Ethernet	•	•
FRAKO Energy Management System	• via FRAKO Starkstrombus	• via FRAKO Starkstrombus
RS-485	•	•
Webserver	•	•
Recommended applications	Machine disposals / transformer	Machine disposals / transformer
Article-No.	20-30030	PQA 1101 FRAKO Starkstrombus: 20-30020 PQA 1101 with Ethernet interface: 20-30022

# Devices of the PQ Series

Power Quality Analyzer for DIN rail mounting or door installation



## PQA 1500 Power Quality Analyzer

Meter for active and reactive power of transformers and machine outlets in low-voltage main distributions with FRAKO bus connection and network connection for integration into the FRAKO data acquisition system according to EN 50001. The expanded measurement functions of Power Quality assist in reliably monitoring the increasingly challenging network conditions and thereby enhancing the supply reliability of the electrical installation.

### Description

- Monitoring and evaluation of the mains quality; measurement of all relevant mains data in low and medium voltage mains
- Energy meter for active power (input and output) and reactive power
- Integrated alarm management with different output configurations: contact outputs, display, LED
- Connection to the FRAKO Energy Management System via FRAKO Starkstrombus (RS 485) and TCP/IP
- Top hat rail mounting

### Measurement functions:

- Voltages of the phase-to-phase / phase-to-neutral
- Currents of the 3 phases and in N / PEN
- Power factor ( $\cos\varphi$ ), active, reactive, and apparent power of the phases
- Frequency and asymmetry (unbalanced load)
- THD of voltage and current of the phases
- Portion of harmonic voltage/current  $U_2/I_2 \dots U_{19}/I_{19}$
- Manual recording of voltage and current up to the 50th harmonic

### Measurement value and Min. Max. memory:

Measurement data per phase

- Voltage
- Current
- Powers (Active, Reactive, and Apparent Power)
- Mains frequency
- Voltage harmonics
- Current harmonics
- Temperatures
- Measurement via three external current transformers
- Menu guidance in plain text and display of up to 8 measurement values simultaneously
- Menu-driven programming with user guidance
- Backlit display
- Backup of meter readings and limit values in the event of a power outage

# Devices of the PQ Series

Power Quality Analyzer for DIN rail mounting or door installation

## Technical Data

Measurement inputs	
Voltage path	0 V AC – maximum 580 V AC (phase – phase, absolute limits), suitable for 115 – 525 V AC systems, electrically interconnected via high resistances, measurement of medium voltages possible using an x/100 V transformer; In areas where UL / CSA standards apply in systems with nominal voltages 115 – 600 V AC; power failure detection after duration of a half-wave
Frequency	45-65 Hz
Power consumption	Max. 5 VA
Fuse protection	Max. 2 A external protection required
Current path	x/5 A AC or x/1 A AC (transformer secondary current > 15 mA), electrically isolated, power draw maximum 1 VA per transformer connection, continuous overload rating up to 6 A AC, transient overload maximum 10 A AC for 10 seconds
Power consumption	Max. 1 VA each transformer connection
Outputs	
Alarm contact	Potential-free changeover contact, AC-14 250 V AC, maximum 3 A, or DC-13 30 V DC, maximum 3 A. Note: Utilization category AC-14 / DC-13 according to IEC 60947-5-1.
Interfaces	
1 FRAKO Starkstrombus	For connection to FRAKO Energy Management System, according to EN 50170 (P-Net) standardised fieldbus, RS 485 Transfer rate: 76.8 kbit/s Type/ Protocol: RS-485 / P-Net
Display	internal
Ethernet interface	Modbus TCP, Webserver

Controls	5 buttons
Display	Illuminated LCD display with 128 x 64 pixels
Connections	Pluggable via connector strips (included in delivery)

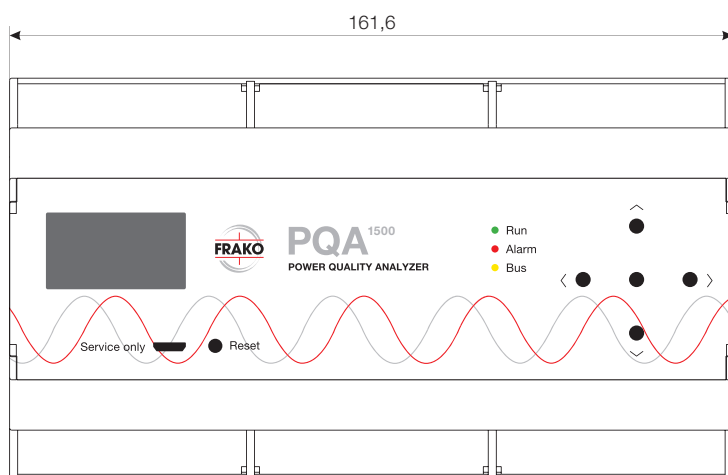
Mechanical construction	
Dimensions	161,6 x 89,7 x 60,5 mm (W x H x D)
Ingress protection	Housing/clamps: according to DIN EN 60529 IP 30 / IP 20
Version	Protection class 1 according to DIN EN 61140
Housing	Flame-retardant UL94-V0
Installation	On standard rail 35 mm according to DIN EN 50022
Mounting position	Optional
Weight	Approx. 0.5 kg

Operating conditions	
Ambient temperature	-20 °C...+60 °C

## Optional Accessories

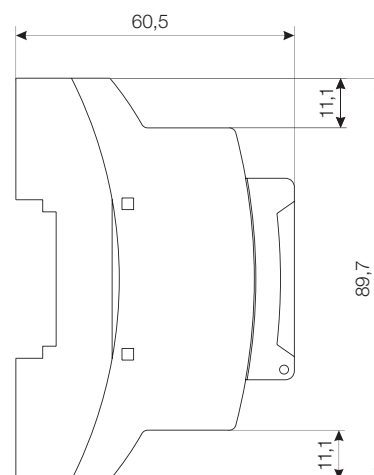
Article-No.	Type	Description
20-10317	EM-PQ-SW	Software for the configuration and online display of data from the EM-PQ 1500 Power Quality Monitor. Access via: data collector. <b>Note:</b> included with FRAKO-NET when supplied on CD-ROM

## Dimensions



Dimensional drawing PQA 1500

All dimensions in mm



# Devices of the PQ Series

Power Quality Analyzer



## PQA 1101 Power Quality Analyzer

A measuring and monitoring instrument for the acquisition, analysis and supervision of all key electrical data in low voltage 3-phase systems from 115 V to 690 V.

### Description

Measurement functions:

- Phase-phase and phase-neutral voltages
- Currents in the 3 phases and N / PEN conductors
- $\cos \varphi$ , active, reactive and apparent power for each phase
- Frequency and asymmetry (load unbalance)
- THD of voltage and current for each phase
- Proportion of voltage/current harmonics V2 – V19 / I2 – I19
- Manual acquisition of voltage and current up to the 50<sup>th</sup> harmonic

### Selectable options:

- 2x active and reactive energy via external tariff switching, or:
  - 1x active and reactive energy (imported)
  - 1x active energy (power feed-in / in-house generation)
- 2x temperature via external PT100 RTD probes

### Measurement data and Min/Max memory:

Measurement data per phase

- Voltage
- Storage
- Power (active, reactive and apparent power)
- Supply frequency
- Voltage harmonics
- Current harmonics
- Temperatures
- Measurement via three external current transformers
- Menu-driven user interface in plain language with display of up to 8 measurement readings simultaneously
- Menu-driven configuration with user dialogue
- Backlit display
- Meter readings and alarm limits saved on power failure

# Devices of the PQ Series

Power Quality Analyzer

## Technical Data

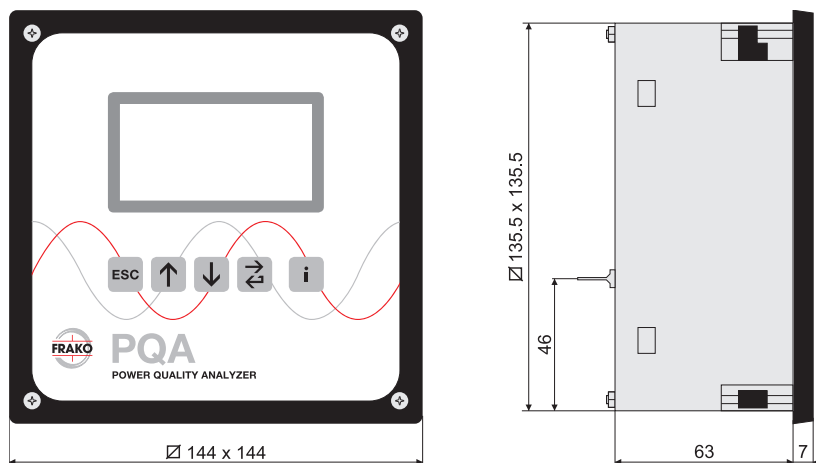
Power supply	
Mains voltage	85 V AC – 267 V AC (absolute limits), Frequency 45 – 65 Hz or 100 V DC – 377 V DC (absolute limits)
Power consumption	Max. 5 VA
Fuse protection	2 A external protection required
Measurement input	
Voltage path	80 V AC – maximum 760 V AC (phase – phase, absolute limits), suitable for 115 – 690 V AC systems, electrically interconnected via high resistances, measurement of medium voltages possible using an x/100 V transformer; In areas where UL / CSA standards apply in systems with nominal voltages 115 – 600 V AC; power failure detection after duration of a half-wave
Current path	x/5 A AC or x/1 A AC (transformer secondary current > 15 mA), electrically isolated, power draw maximum 1 VA per transformer connection, continuous overload rating up to 6 A AC, transient overload maximum 10 A AC for 10 seconds
Outputs	
1 Alarm signalling contact	Volt-free NO contact, AC-14 250 V AC, maximum 3 A or DC-13 – 30 V DC, maximum 3 A, Note: utilization category AC-/DC- as per IEC 60947-5-1
Inputs	
Tariff inputs	2 profiles selectable (e.g. HT/NT) Control via open collector output. Voltage withstand rating required: 10 V.

Interfaces (mode can be selected)	
Ethernet Interface	Modbus TCP, Webserver
FRAKO Starkstrombus	For connection to the FRAKO Energy Management System, standardized fieldbus, RS 485, Protocol P-Net
Operating elements	Membrane keyboard with 5 keys
Display elements	Backlit LC Display with 128 x 64 pixel
Connections	Plug-in connecting strips (included with delivery)
Mechanical construction	
Dimensions	Dimensions of front panel: 144 x 144 mm (DIN 43700), panel cut-out: 138 x 138 mm (DIN 43700), installation depth: 75 mm
Ingress protection	Front of instrument IP40 (with seal set IP54), rear of instrument IP20 all as per 60529, contamination level 2 as per EN 61010-1:2011-07
Version	Housing protection class 1 according to DIN EN 61140
Installation	From front panel with screwdriver
Weight	Approx. 0.77 kg
Operating conditions	
Ambient temperature	0 °C up to +55 °C

## Optional Accessories

Article-no.	Type	Description
20-10311 EMA-SW	EMA-SW	Software for configuration and online display for EMA 1101. Access through: Data collector. <b>Note:</b> Included in the scope of delivery for FRAKO-NET (with CD shipment).

## Dimensions



Dimensional Drawing PQA 1101

all dimensions in mm