

Q.2

Power quality analyzers



Power quality analyzers

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Analizadores de calidad de suministro

The transport of electrical energy is subject to many variations and factors that can cause the quality of the supply voltage to not always be as desired. Several factors, such as inclement weather, excessive distances in the distribution lines or the connection of loads with excessive distortion are some of the causes that may affect the proper quality of the electric supply.

Industries use increasingly more sophisticated processes with a greater number of control, automation and regulation elements, allowing companies to execute such processes automatically and be more competitive. In general, said loads are very sensitive to voltage variations, which can lead to faulty performance and critical problems in processes. Meanwhile, companies are increasingly investing in the measurement and control of the quality of the electric supply to avoid the costs generally associated with productive processes.

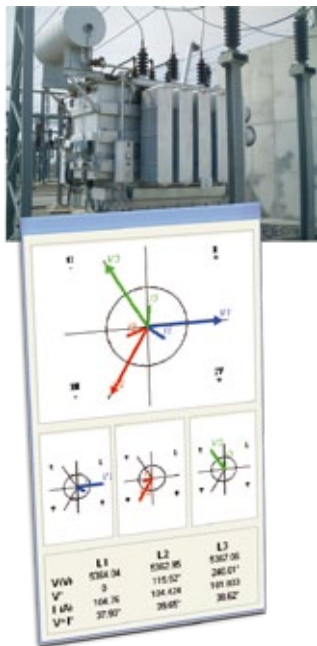
It has become essential to control not only the costs associated with the supply's lack of continuity, but also those associated with its lack of quality. It is of vital importance to supervise the smooth operation of the installation and the equipment connected to it, and to conduct proper energy management to avoid the unnecessary over-consumption.

The globalization of markets also gives the various actors involved in the electrical energy generation, transport and consumption processes the need to talk on equal terms in order to face the new challenges ahead that come along with the optimisation of both distribution lines and electrical installations. The future of **Smart Grids** is currently making a strong impact on the entire network of electrical distribution lines, allowing automation of substations and optimising of existing resources.

Measurement in various points on the distribution lines makes it necessary to have equipment that guarantees, on the one hand, the absolute validity of the measurement (in compliance with the **IEC-61000-4-30** standard), and on the other hand, proven robustness when implemented in complex environments. We are talking about equipment of reference for utilities throughout the world in very different environments and distribution lines. At the same time, companies are operating in increasingly global environments, forcing them to be more competitive and to optimise their processes. Therefore, the electrical disturbances affecting productive processes in companies must be analysed and studied with the purpose of improving and protecting installations against such disturbances.

Q.2





Definition

The **QNA** power quality analyzers comply with the strictest international standards. Currently, the **IEC-61000-4-30** standard specifies the way in which this type of equipment must take the measurements of a set of parameters. The standard has defined 3 classes: Firstly, class A is reserved for the most accurate equipment, which must comply with the strict measurement methodology and have a high degree of accuracy in all parameters measured. The equipment certified with class A accuracy in this standard will be used as pattern elements and can be used to resolve any type of dispute.

Secondly is class S, which follows the same measurement method as class A equipment but which does not require the same level of accuracy. This equipment is normally used at industry connection points with the distribution lines or in substations.

CIRCUTOR has electric power quality analyzers for both classes aimed at mee-

ting the needs of industries or for any customer that requires an exhaustive analysis of their electrical installation in order to improve productivity and avoid problems caused by electrical disturbances.

The log of historical values gives us an insight into the evolution and tendency of the supply voltage and the power consumed in the electrical installation, also letting us identify anomalies that may interfere with the optimum performance of the machines and systems connected to the network.

Any voltage event can be perceived to cause improper functioning in certain types of electronic equipment. Logging these incidents according to the network quality class A **IEC-61000-4-30** standard lets us accurately identify the causes of malfunctions and thus take the necessary corrective measures to minimize productivity costs.

The new **QNA500** series meets the most necessary

requirements to perform a correct analysis of the electrical power quality, providing the user with precise and detailed information on the evolution of all electrical variables, as well as any disturbances that could affect the smooth operation of the machines connected to the electrical network.

Also, using **CIRCUTOR's PowerVision + and PowerStudio** software, the user can automate many of the analyzer's functions, as well as customize alarms, **SCADA** screens and even run customized reports in accordance with **EN-50160** quality standards and other applicable regulations.

Applications

Big industry and large energy consumers

The network quality study in the network connection point is particularly important for the optimisation of the productive processes of companies. The detection of any network disturbances and assessment of the content of harmonic distortion in installations and the energy consumed are the parameters that must be assessed in any installation, with the purpose of improving its performance. **CIRCUTOR's** systems offer the solutions required to cater for these

needs. Notification via e-mail or SMS alarms can be sent when a programmed event takes place. This minimises the problem in many cases, since different actions can be implemented on the different burdens, thus avoiding greater problems associated to production processes.

Multi-point buildings

The **QNA500** lets you combine the measurements taken in different buildings of a single owner (ex. supermarkets, bank branches) in order to collectively evaluate the smooth operation and the

productivity levels that exist throughout the network of establishments. In this way, tracking and precautionary measures can be performed on electrical installations with preventive maintenance that can avoid future incidents.

Energy distributors

Currently, many utilities throughout the world use **QNA** power quality analyzers to analyze the behaviour of the quality of waves in distribution lines. The high reliability and robustness of these analyzers, as well as the **CIRCUTOR's** proven ex-

perience in measuring electrical parameters, lets us offer products customized to the needs of electrical energy transport and distribution companies.

Their installation in HV or MV-distribution cells and remote measuring lets us obtain all the necessary information in a short time and even lets us integrate these analyzers in improvements to sub-stations themselves within the evolution of *Smart Grids*.

Product selection table

	Equipment	Communications	Voltage	Flicker	Harmonics and THD	Unbalance	Events	Current	Power (act / react)	FP	Power (act / react)	Digital inputs	6 voltage channels	Assembly	Page
QNA 500 8IO		RS-232 / RS-485, Ethernet, Web Server, Mail Server	•	•	50	•	•	•	•	•	•	•	•	DIN Rail	7
QNA -413		RS-232 / RS-485	•	•	50	•	•							Panel	7
		GPRS / GSM / RS-232	•	•	50	•	•							Panel	
QNA -412		RS-232 / RS-485	•	•	50	•	•	•	•	•	•	•		Panel	13
		GPRS / GSM / RS-232	•	•	50	•	•	•	•	•	•	•		Panel	
		ETHERNET	•	•	50	•	•	•	•	•	•	•		Panel	
QNA-PT		ETHERNET	•		50	•	•	•	•	•	•			Panel	16
QNA-P		RS-232	•	•	50	•	•	•	•	•	•	•		Portable	19
		GSM / RS-232	•	•	50	•	•	•	•	•	•	•		Portable	
CAVA		RS-232	•	•	20			(*)	(*)		(*)			Portable	21

(*) According to type.

QNA500

Modular power quality analyzer



Description

QNA500 is a modular power quality analyzer designed to measure and log the main electrical parameters and the transient disturbances. The measurement is taken as an RMS value by 5 AC voltage inputs and 4 AC current inputs. (through current transformers /5 A.

Application

QNA500 is designed to supervise the electrical installation and the problems related to the electrical power quality, with the objective of controlling the productive processes and managing incidents. Its easy integration into **SCADA** applications and its interaction with market **PLC** software lets it form part of more comprehensive data acquisition systems and report the information required by users at all times.

Its modularity and the addition of **8IO** modules also let the user control energy consumption, the statuses of switches or loads, the sending of alarms and even the connection/disconnection of loads based on configurable conditions.

Along with the **CIRCUTOR PowerVision+** software, the user can configure customized reports to evaluate the smooth operation of the electrical installation, and can apply standards like the **EN-50160**, CBEMA and UNIPED event tables, and others. By automating this information, the user can display the most important information with just one click, in order to carry out the corresponding analysis.

Features

Auxiliary Power Supply (BASE)	
Power supply voltage	90 - 300 V _{a.c.} - 130 - 380 V _{d.c.}
Frequency	50 ... 60 Hz
Consumption	7 W / 11 VA (BASE) 4 W / 5 VA (QNA500) 6 W / 10 VA (8IO)
Auxiliary battery power supply (BASE)	
Type	Removable battery
Battery life	15 minutes of continuous operation (QNA500) 1 minute of continuous operation (8IO)
Voltage measurement (QNA500)	
Measurement circuit	3 or 4 wires
Measurement range	0 ... 500 V _{p-n} / 0 ... 866 V _{p-p}
Other voltages	Through the measuring transformers
Maximum voltage of the permanent measurement	1500 V _{ac(p-p)}
Maximum voltage of the instantaneous measurement	1.2/50 μS (8/20 μS) 6 kV
Frequency	42.5 ... 69 Hz
Sampling frequency	512 samples/cycle
Current measurement (QNA500)	
Measurement range	1 ... 120 % I _n ... I _n = 5 A
Maximum current	120% of I _n (for I _n = 5A, I _{max} = 6A) permanent, 100A t<1 s
Sampling frequency	512 samples/cycle
Leakage current measurement (ID) (QNA500)	
Measurement range	0 ... 3 A
Maximum current	3 A
Sampling frequency	64 samples/cycle
Accuracy	
Voltage	0.1 %
Current	0.1 %
Power and Energy	0.2 %, depending on the model (IEC-62053-22)
Imbalance	± 0.15 %
Flicker	in compliance with IEC -61000-4-15
Harmonics	in compliance with IEC -61000-4-7
Memory	
	2Gb (MicroSD card)
Processor	
Sampling frequency	512 samples/cycle
DSP converter	24 bits
Connection	
Maximum cross-section of the cable	2.5mm ² (power supply) 2.5mm ² (voltage measurement) 4mm ² (current measurement) 2.5mm ² (earth leakage current measurement) 1mm ² (inputs / outputs)
Electrical safety	
CAT III - 1000 V AC or CAT IV-600V.	
EN-61010 Double-insulated electric shock protection class II	
Standards	
IEC 664, VDE 0110, UL 94, IEC 801, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1, EN 61000-4-11, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 55011, CE	

QNA500

Modular power quality analyzer

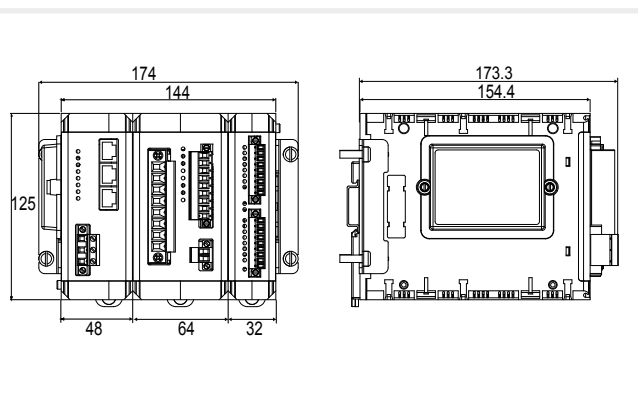
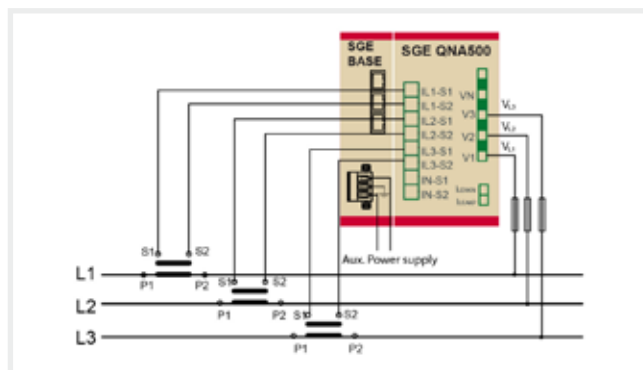
**Variables**

Registry variables	Unit	L 1	L 2	L 3	III
Phase-phase and phase-neutral voltage (RMS, maximum, minimum)	V	•	•	•	•
Current (RMS, maximum, minimum)	A	•	•	•	•
Neutral current (RMS, maximum, minimum)	A				•
Neutral ground voltage (RMS, maximum, minimum)	V				•
Frequency (RMS, maximum, minimum)	Hz	•	•	•	
Active power (RMS, maximum, minimum)	kW	•	•	•	•
Inductive reactive power (RMS, maximum, minimum)	kVar	•	•	•	•
Capacitive reactive power (RMS, maximum, minimum)	kVar	•	•	•	•
Apparent power (RMS, maximum, minimum)	KVA	•	•	•	•
Maximum demand	kW	•	•	•	
Power factor (RMS, maximum, minimum)		•	•	•	•
Crest factor (voltage and current)	V or A	•	•	•	
K Factor		•	•	•	
Active energy	kWh	•	•	•	•
Inductive reactive energy	kVarh	•	•	•	•
Capacitive active energy	kVarh	•	•	•	•
Voltage THD or TDD (RMS, maximum, minimum)	%	•	•	•	
Current THD or TDD (RMS, maximum, minimum)	%	•	•	•	
Voltage harmonics (up to 50th order)	V Harm	•	•	•	
Current harmonics (up to 50th order)	A Harm	•	•	•	
Voltage interharmonics (up to 50th order)	V Harm	•	•	•	
Current interharmonics (up to 50th order)	A Harm	•	•	•	
Flicker (PST)		•	•	•	
Gaps	%	•	•	•	
Interruptions	%	•	•	•	
Overvoltage	%	•	•	•	
Voltage transients		•	•	•	
Current transients		•	•	•	
Voltage Unbalance		•	•	•	
Current Unbalance		•	•	•	

References

Type	Code	Energy accuracy	Harmonic	Events	Transients log	Inputs / Outputs	Impulse control panel	Demand control	Server WEB	Mail Server
QNA500	Q20911	0.2	50	•	•	-			•	•
QNA500 8IO	Q20912	0.2	50	•	•	8 / 8 digital	•		•	•
QNA500 8IOR	Q20913	0.2	50	•	•	8 / 8 digital	•	•	•	•

Each unit is made up of a BASE module (power supply) + Measurement module + relay module (in accordance with the type)

Dimensions**Connections**

For other connections consult the manual.

8IO

Device module with 8 inputs and 8 digital outputs



Description

Features

8IO is a device with 8 programmable inputs and 8 digital programmable outputs (transistor or relay). The device has an integrated Web server enabling it to perform all the required configuration. The digital inputs enable it to count the pulses sent by other devices (ex. energy, water or gas meters) as well as log the status changes of external relays (ex. MCB or PLC). The digital outputs enable it to configure alarms, energy pulses and even remote control functions.

Being another **SGE** system module lets several 8IO modules connect to each other (up to 4) or with other **SGE** modules (ex. **QNA500**) to extend the product's functionality.

Application

8IO permits interaction with other **SGE** modules, enabling comprehensive control of the electrical installation by centralizing of the energy pulses of meters, controlling the alarms that may be produced at the head-end of the electrical installation and even sending these alarms to other **SCADA** or PLC systems.

Auxiliary Power Supply (BASE)	
Power supply voltage	90 - 300 V _{a.c.} - 130 - 380 V _{d.c.}
Frequency	50 ... 60 Hz
Consumption	7 W / 11 VA (BASE) 4 W / 5 VA (QNA500) 6 W / 10 VA (8IO)
Auxiliary battery power supply (BASE)	
Type	Removable battery
Battery life	1 minute of continuous operation (8IO)
Digital inputs (8IO)	
Working voltage	12 - 18 V _{dc}
Minimum signal width	Configurable
Electrical consumption (per input)	2.5 mW
Digital outputs (8IO)	
Type	Optocoupled
Working voltage	250 V
Working current	130 mA
Pulse weight	Configurable
Digital outputs per Relay (8IOR)	
Type	Relay
Nominal voltage	250 V _{ac} / 30 A _{dc}
Nominal current	6 A
Memory	2Gb (MicroSD card)
Processor	
Sampling frequency	512 samples/cycle
Converter	24 bits
Connection	
Maximum cross-section of the cable	2.5mm ² (power supply) 1mm ² (inputs / outputs)

QM-500

HMI monitoring module for QNA500



Description

QM-500 is an HMI monitor that lets you display all the variables for the **QNA500** power quality analyzer. The monitor communicates using a RS-232 port with an analyzer and displays all the electrical installation's parameters, including voltage, current, power, energy, THD and events.

In addition, with the **QNA500-8IO** analyzer you can monitor the status of the digital inputs and outputs in real time.

Features

Power Supply

Power supply voltage	24 V _{dc}
Consumption	5 W

Environmental conditions

Operating temperature	0 °C to 50 °C
Relative humidity	10 - 85 % (without condensation)

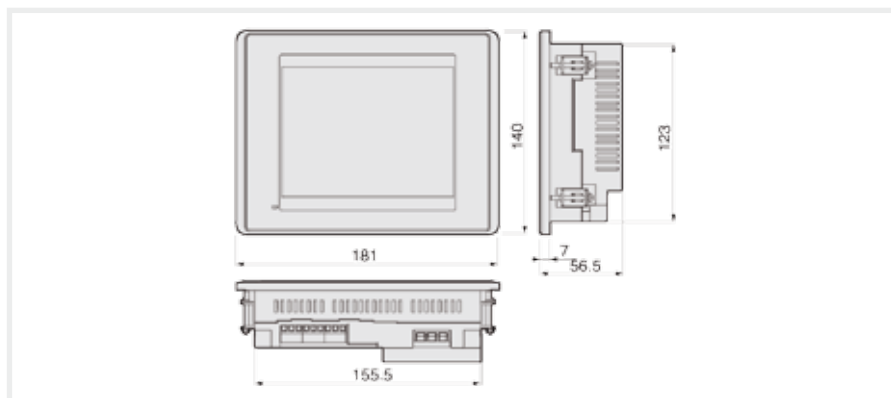
Build features

Display type	LCD monochrome
Display size	5.7"
Resolution	320 x 240 pixels
Backlight	LED
Processor	ARM920T (32 bit RISC) 200 MHz
Memory	16 Mb (Flash), 32 Mb (RAM)
Communication port	USB, RS-232, RS-485
Degree of protection	IP 65F
Dimensions	181 x 140 x 56.5 mm
Panel dimensions	156 x 123.5 mm
Weight	0.62 Kg.

Application

QM-500 lets you monitor the main instantaneous values of the **QNA500** electric power quality analyzer, in order to find out the status of the installation when the user is in the transformer substation or in the substation.

Dimensions



QNA 413

Power quality analyzer



Description

QNA 413 is a state-of-the-art power quality analyzer certified as a class A device, in compliance with the **IEC-61000-4-30 Standard**. It takes measurements in compliance with the international standard and has a high degree of accuracy. It can be used to analyze the quality of supply (voltage, flicker, harmonics, events, etc.) in any installation. The most common cases are sub-stations or transformation centres and points where companies are connected to the network.

Application

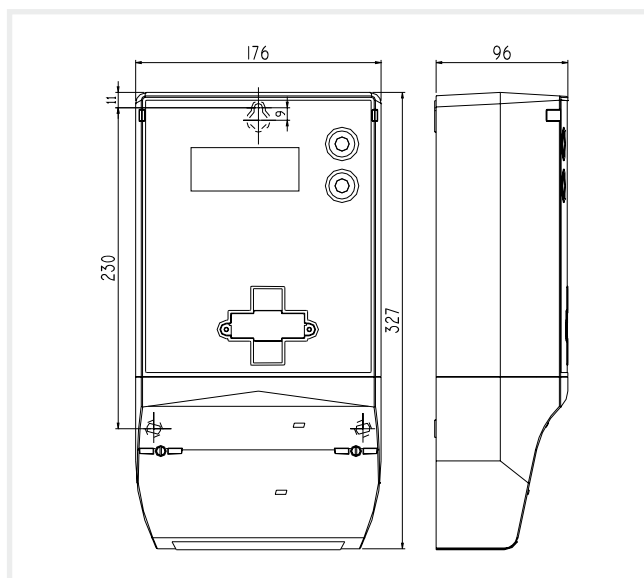
- Real-time supervision and continuous recording of the power supply quality in any measurement point.
- Detection and instantaneous recording of all events (in compliance with the **IEC Standards**) detected in the measurement point. It can be used to detect the origin of events to implement the necessary actions and carry out the preventive maintenance actions, in order to optimize the performance of the installation, thus increasing the company's productivity.
- It is certified as class A in compliance with the **IEC-61000-4-30** international standard, allowing it to define the quality of supply, regardless of the country and area of distribution.

Characteristics

Power circuit	
Power supply range	100 - 400 Vac ($\pm 30\%$) / 90 - 730 Vdc
Consumption	16 V·A / 8 W
Frequency	50 - 60 Hz
Auxiliary power circuit	
Battery	Ni MH
Autonomy	Configurable, up to 9999 s of continuous operation
Voltage measurement circuit	
Nominal voltage	3 x 500 / 866 Vac (for 4-wire connections) 3 x 500 Vac (for 3-wire connections)
Other voltages	Through the measurement transformers
Frequency	42.5 ... 69 Hz
Sampling frequency	14.130 kHz
Consumption of the voltage per phase circuit	0.3 V·A
Accuracy	
Voltage	0.1 % U_n (IEC-61000-4-30 class A)
Unbalance	$\pm 0.15\%$ (IEC-61000-4-30 class A)
Flicker	5 % (IEC-61000-4-15 , IEC-61000-4-30 class A)
Harmonics	IEC-61000-4-7 class I, IEC-61000-4-30 class A
Communications	
RS-232 / RS-485, GPRS / GSM / RS-232	
Data memory	
Size	2 MB
Setup	Rotary (FIFO)
Ambient conditions	
Usage temperature	0 °C ... +50 °C
Storage temperature	-20 °C ... +70 °C
Build features	
Enclosure	In compliance with DIN 43859
Differential	IP 51
Dimensions	327 x 176 x 96 mm
Weight	2.3 kg
Safety	
EN-61010-1 category III 600 V	

QNA 413

Power quality analyzer

**Dimensions****Standards**

EN 60664, EN 61036, VDE 110, UL 94

Electromagnetic emission

EN 61000-3-2	Harmonics
EN 61000-3-3	Voltage fluctuations
EN 55022 class B	Driven
EN 55022 class A	Radiated
EN 50081-2	Industrial emission
-	-
-	-
-	-

Electromagnetic immunity

EN 50082-2	Industrial immunity
EN 61000-4-2	Electrostatic discharge
ENV 50140	EM Radiated field of RF
EN 61000-4-4	Quick temporary bursts
ENV 50141	RF in common mode
EN 61000-4-5	Shockwave
EN 61000-4-8	50 Hz Magnetic field
EN 61000-4-11	Power supply interruptions

References

Voltage	Current	Power rating	Energy	Flicker	Harmonics and THD	Unbalance	Events	Certificate	Communications	Type	Code
•				•	50	•	•	Class A	RS-232 / RS-485	QNA-413 RS232/RS485	Q20411
•				•	50	•	•	Class A	GPRS / GSM / RS-232	QNA-413 GSM-Free	Q20413

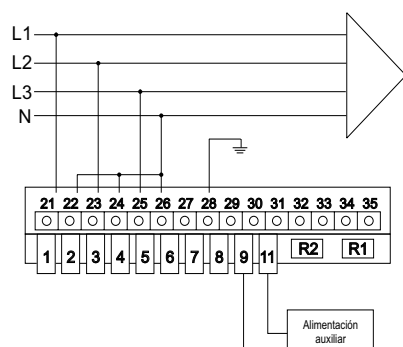
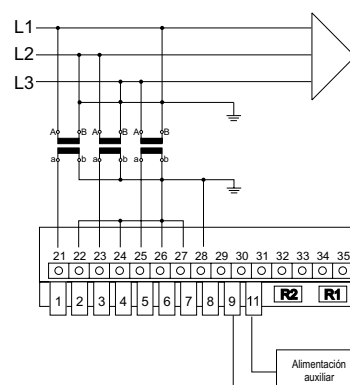
Distribution of memory

Type of file	Default storage capacity	Data stored
*.STD	33 days	Voltage, flicker, harmonics and unbalance
*.EVQ	minimum of 342 events	Measurement events (overvoltages, voltage gaps and interruptions)
*.EVE	4655 records	Events related to the analyzer (change of setup, change of hour, etc.)
*.H24	32 days	Data for the statistical study of the evolution of harmonics every 24 hours
*.STP	16 weeks	Weekly statistical voltage values, THD (U), flicker, frequency and unbalance

La distribución de la memoria es flexible y configurable por el usuario.

QNA 413

Power quality analyzer

**Connections****LV 4 wires****MV 3 wires**

QNA 412

Power quality analyzer that measures voltages and currents



Description

QNA 412 is a state-of-the-art power quality analyzer certified as a class A device, in compliance with the **IEC-61000-4-30 Standard**. It takes measurements in compliance with the international standard. In addition to the analysis of the variables related to the quality of supply (voltage, flicker, harmonics, events, etc.), it also acts as a network analyzer and redundant counter, since it can be used to analyse the current signals, power consumed (active and reactive), the power factor and active and reactive energy consumed or generated with an accuracy of 0.2S, as in the case of the high-precision energy meters.

Application

- Supervise the optimum operation of electric installations and transformers. The LV connection enables the supervision of the saturation of the power transformer and the reactive energy consumed in each installation.
- Detection and instantaneous recording of all events (in compliance with the **IEC Standard**) detected in the measurement point. It can be used to detect the origin of events to implement the necessary actions and carry out the preventive maintenance actions, in order to optimize the performance of the installation, thus increasing the company's productivity.
- It can work as a redundant counter to check the energy charged by the company. The unit is fully sealable, so that it can not be tampered with.

Characteristics

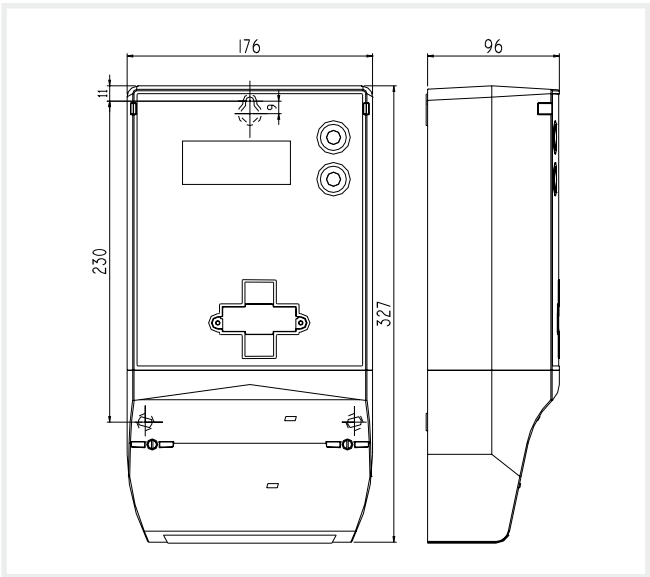
Power circuit	
Power supply range	100 - 400 Vac ($\pm 30\%$) / 90 - 730 Vdc
Consumption	16 V-A / 8 W
Frequency	50 - 60 Hz (QNA 412-T type, only 50 Hz)
Auxiliary power circuit	
Battery	Ni MH
Autonomy	Configurable, up to 9999 s of continuous operation
Voltage measurement circuit	
Nominal voltage	3 x 500 / 866 Vac (for 4-wire connections) 3 x 500 Vac (for 3-wire connections)
Other voltages	Through the measurement transformers
Frequency	42.5 ... 69 Hz
Sampling frequency	14.130 kHz
Consumption of the voltage per phase circuit	0.3 V-A
Current measurement circuit	
Measurement margin	.../5 (6) A (input with galvanic insulation) .../1 (1.2) A (input with galvanic insulation).../2 V.../ITF-EXTERIOR
Consumption of the circuit, current per phase	0.01 V-A
Maximum sampling frequency	14.130 kHz
Energy meter, maximum value	1 999 999 kW·h (rotates)
Accuracy	
Voltage	0.1 % U_n (IEC-61000-4-30 class A)
Current	0.1 % I_n (IEC-61000-4-30 class A)
Energy	Class 0.2S in accordance with EN-62053-22
Unbalance	$\pm 0.15\%$ (IEC-61000-4-30 class A)
Flicker	5 % (IEC-61000-4-15 , IEC-61000-4-30 class A)
Harmonics	IEC-61000-4-7 class I, IEC-61000-4-30 class A
Communications	RS-232 / RS-485, GPRS / GSM / RS-232, Ethernet
Data memory	
Size	4 MB
Setup	Rotary (FIFO)
Ambient conditions	
Usage temperature	0 °C ... +50 °C
Storage temperature	-20 °C ... + 70 °C
Build features	
Enclosure	In compliance with DIN 43859
Differential	IP 51
Dimensions	327 x 176 x 96 mm
Weight	2.3 kg
Safety	EN-61010-1 category III 600 V

QNA 412

Power quality analyzer that measures voltages and currents



Dimensions



Standards

EN 60664, EN 61036, VDE 110, UL 94			
Electromagnetic emission		Electromagnetic immunity	
EN 61000-3-2	Harmonics	EN 50082-2	Industrial immunity
EN 61000-3-3	Voltage fluctuations	EN 61000-4-2	Electrostatic discharge
EN 55022 class B	Driven	ENV 50140	EM Radiated field of RF
EN 55022 class A	Radiated	EN 61000-4-4	Quick temporary bursts
EN 50081-2	Industrial emission	ENV 50141	RF in common mode
-	-	EN 61000-4-5	Shockwave
-	-	EN 61000-4-8	50 Hz Magnetic field
-	-	EN 61000-4-11	Power supply interruptions

References

Voltage	Current	Power rating	Energy	Flicker	Harmonics and THD	Unbalance	Events	Certificate	... / 5 A	... / 1 A	.../2 V	.../ITF-EXTERIOR	RMS Gráph	Forma onda evento	Communications	Type		Code
●	●	●	●	●	●	●	●	A	●						RS-232 / RS-485	QNA-412 RS232/RS485	.../5 A	Q20510
●	●	●	●	●	●	●	●	A		●					RS-232 / RS-485		.../1 A	Q20510 001
●	●	●	●	●	●	●	●	A			●				RS-232 / RS-485		.../2 V	Q20510 002
●	●	●	●	●	●	●	●	A				●			RS-232 / RS-485		.../ITF-EXTERIOR	Q20510 003
●	●	●	●	●	●	●	●	A	●						GPRS / GSM / RS-232	QNA-412 GPRS/RS232	.../5 A	Q20530
●	●	●	●	●	●	●	●	A		●					GPRS / GSM / RS-232		.../1 A	Q20530 001
●	●	●	●	●	●	●	●	A			●				GPRS / GSM / RS-232		.../2 V	Q20530 002
●	●	●	●	●	●	●	●	A				●			GPRS / GSM / RS-232		.../ITF-EXTERIOR	Q20530 003
●	●	●	●	●	●	●	●	A	●						Ethernet	QNA-412 Ethernet	.../5 A	Q20542
●	●	●	●	●	●	●	●	A		●					Ethernet		.../1 A	Q20542 001
●	●	●	●	●	●	●	●	A			●				Ethernet		.../2 V	Q20542 002
●	●	●	●	●	●	●	●	A				●			Ethernet		.../ITF-EXTERIOR	Q20542 003

QNA 412

Power quality analyzer that measures voltages and currents

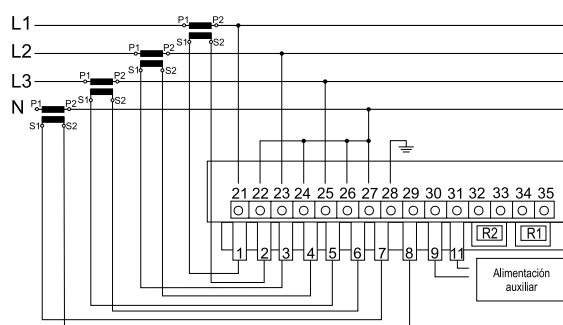


Distribution of memory

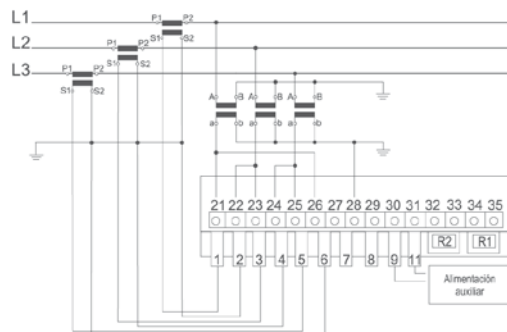
Type of file	Default storage capacity	Data stored
*.STD	74 days	Voltage, flicker, harmonics and unbalance
*.EVQ	minimum of 342 events	Measurement events (overvoltages, voltage gaps and interruptions)
*.EVE	4655 records	Events related to the analyzer (change of setup, change of hour, etc.)
*.WAT	32 days	Active, reactive <i>L</i> and reactive <i>C</i>
*.H24	32 days	Data for the statistical study of the evolution of harmonics every 24 hours
*.STP	16 weeks	Weekly statistical voltage values, THD (<i>U</i>), flicker, frequency and unbalance

Connections

LV 4 wires



MV 3 wires



QNA-P

Portable power quality analyzer



Description

Portable electric power quality analyzer that measures and records the data in compliance with the class A **IEC-61000-4-30 Standard**. Specially designed for outdoor measurements or in situations that require a highly accurate and very robust unit.

The **QNA-P** enclosure has an IP 67 degree of protection, which guarantees its robustness to strong impacts. The **QNA-P** analyzer has been tailor-made with clips and it has a wide range of flexible (LV measurements) and rigid clips (LV and MV Measurements). The internal switches can be adapted to any type of network (3/4 wires), with the use of its rigid (**CP** type) and flexible (**C-FLEX** type) clips.

Application

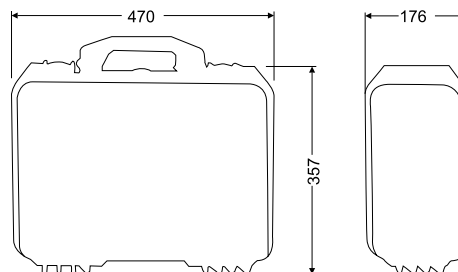
- The **QNA-P** portable analyzer is highly versatile and can combine rigid and flexible nucleus clips. Its robustness makes it ideal for the intake of measurements in places subject to severe weather conditions.
- The unit has been specially designed for the execution of audits and revisions, since it has been certified as Class A, in compliance with the **IEC-61000-4-30 Standard**, so that the measurements taken can be used for any type of verification; a pattern element is used during the intake process.
- The internal GSM type can also be used to download the information remotely and draft a report with the data, even before removing the analyzer, which avoids the need of travelling to the installations.

Characteristics

Power circuit	
Power supply range	100 - 240 Vac
Consumption	16 V·A / 8 W
Frequency	50 - 60 Hz
Auxiliary power circuit	
Battery	Ni MH
Autonomy	Configurable, up to 9999 s of continuous operation
Voltage measurement circuit	
Nominal voltage	3 x 500 / 866 Vac (for 4-wire connections) 3 x 500 Vac (for 3-wire connections)
Other voltages	Through the measurement transformers
Frequency	42.5 ... 69 Hz
Sampling frequency	14.130 kHz
Consumption of the voltage per phase circuit	0.3 V·A
Current measurement circuit	
Measurement margin	Depending on the clip
Maximum current	1.2 I_n
Maximum sampling frequency	14.130 kHz
Energy meter, maximum value	1 999 999 kW·h (rotates)
Accuracy	
Voltage	0.1 % U_n (IEC-61000-4-30 class A)
Current	0.1 % I_n (IEC-61000-4-30 class A)
Energy	Class 0.2S in accordance with EN-62053-22
Unbalance	± 0.15 % (IEC-61000-4-30 class A)
Flicker	5 % (IEC-61000-4-15 , IEC-61000-4-30 class A)
Harmonics	IEC-61000-4-7 class I, IEC-61000-4-30 class A
Communications	
	RS-232 / RS-485, GPRS / GSM / RS-232
Data memory	
Size	4 MB
Setup	Rotary (FIFO)
Ambient conditions	
Usage temperature	-20 °C ... +65 °C
Build features	
Enclosure	Sealed enclosure
Differential	IP 67
Dimensions	470 x 357 x 176 mm
Weight	6.7 kg
Safety	
	EN-61010-1 category III 600 V

QNA-P

Portable power quality analyzer

**Dimensions****Standards**

EN 60664, EN 61036, VDE 110, UL 94

IEC-61000-4-30 class A	Quality
IEC-61000-4-7 class I	Harmonics
IEC-61000-4-15	Flicker

Electromagnetic emission

EN 61000-3-2	Harmonics
EN 61000-3-3	Voltage fluctuations
EN 55022 class B	Driven
EN 55022 class A	Radiated
EN 50081-2	Industrial emission
-	-
-	-
-	-

Electromagnetic immunity

EN 50082-2	Industrial immunity
EN 61000-4-2	Electrostatic discharge
ENV 50140	EM Radiated field of RF
EN 61000-4-4	Quick temporary bursts
ENV 50141	RF in common mode
EN 61000-4-5	Shockwave
EN 61000-4-8	50 Hz Magnetic field
EN 61000-4-11	Power supply interruptions

References

Analyzer	Clips	Type	Code
QNA-412 RS232/RS485	3 x C-FLEX 10k/1k/100 A - 55 mm	Kit 1 QNA-P RS	Q20711
QNA-412 GPRS/RS232	3 x C-FLEX 10k/1k/100 A - 55 mm	Kit 1 QNA-P GPRS	Q20731
QNA-412 RS232/RS485	3 x C-FLEX 10k/1k/100 A - 55 mm, kit 3 CP-5 A and 1 x CPR-500	Kit 2 QNA-P RS	Q20712
QNA-412 GPRS/RS232	3 x C-FLEX 10k/1k/100 A - 55 mm, kit 3 CP-5 A and 1 x CPR-500	Kit 2 QNA-P GPRS	Q20732

Distribution of memory

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CAVA

Single-phase power quality analyzers



Description

The **CAVA** series analyzers are measurement equipment that can analyze and record the main supply quality parameters of an electricity network. There are three types with different measurement capacities. The basic performance features are stated next:

- Analysis of 100% of the voltage and current cycles
- Optional measurement of currents between 2 A and 10 000 A with different current sensing clips
- Large storage capacity
- Easy installation and programming
- Programming and extraction of data with a PC
- PowerVision** software used to analyse measurements.

Application

The **CAVA** single-phase analyzer has been specially designed for the intake of LV measurements during long periods of time, with the purpose of determining the supply quality existing in the measurement point (voltage, flicker, harmonics, etc). It is the perfect product to analyze the difference in voltage between the start and end of distribution lines. Its easy installation and the user-oriented **PowerVision** software can be used to analyze any information and apply the quality standards (for ex., **EN-50160**) to the measurements taken to determine the degree of quality.

Characteristics

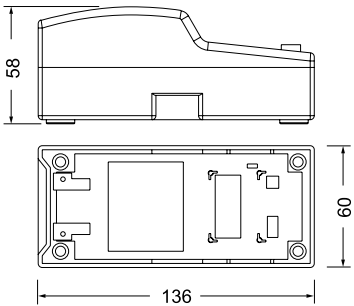
Power circuit	
Power supply (*) (**)	230 Vac
Voltage tolerance	- 15 % / + 15 %
Frequency	50 - 60 Hz
Consumption	3 V·A
(*) The power supply voltage is taken during the measurement	
(**) Other voltages, on demand	
Current measurement circuit	
With current sensing clip:	
CP-2000-200	20 ... 2 000 Aac (scale 2 000 A) 2 ... 200 Aac (scale 2 000 A)
CPR-1000	10 ... 1 000 Aac
CPR-500	5 ... 500 Aac
CP-200 (M1-U)	2 ... 200 Aac
CP-100 (M1-U)	1 ... 100 Aac
CP-5	50 mA ... 5 Aac
C-FLEX 2000/200-45	200 ... 2,000 Aac
C-FLEX 2000/200-80	200 ... 2,000 Aac
C-FLEX 10 k / 1 K - 120	1 000 ... 10 000 A c.a.
Measurement accuracy (+5 °C ... / +45 °C)	
Voltage	0.5 % of the reading
Current	0.5 % of the reading
Power ratings	1 % of the reading
Error in current sensing clips is not included	
Data memory	
Recording capacity	1 MB
Recording period	Programmable
Software: Program to configure the reading and presentation of data in an environment	PowerVision
Ambient conditions	
Limit temperature	0 °C ... +50 °C
Relative humidity	Maximum 85 % without condensation
Standards	
EN-61010 cat. III (Safety), IEC-60664 , VDE-0110 , UL-94 , EN-50081-1 , EN-50082 , EN-61000-4-15	

CAVA

Single-phase power quality analyzers



Dimensions













References

RMS voltage	RMS current	Active, reactive and apparent power	FP	Frequency	Weighted RMS Flicker: WA	Flicker: Pst	Harmonics: THD	Gaps (Number of cycles)	Micro-drops (Number of cycles)	Classification of intervals of U	% correct cycles	Communications	Type	Code
•				•	•	•	•	•	•	•	•	RS-232	CAVA-251	Q20112
•	•			•	•	•	•	•	•	•	•	RS-232	CAVA-252	Q20122
•	•	•	•	•	•	•	•	•	•	•	•	RS-232	CAVA-253	Q20132

Distribution of memory

Type of file	Default storage capacity	Data stored
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*.EVQ	minimum of 342 events	Measurement events (overvoltages, voltage gaps and interruptions)
*.EVE	4655 records	Events related to the analyzer (change of setup, change of hour, etc.)

Relation between products and accessories

		Converters	Transformers	Clips	Software
					
		Communications converters	Measurement transformers	Current sensing clips	Energy management software
		See M.5	See M.7	See M.8	See M.9
QNA500		•	•	--	•
QNA -413		•	•	--	•
QNA -412		•	•	--	•
QNA-P		--	--	•	•
QNA-PT		--	•	--	•
CAVA		--	--	•	•

