

## List of Measurements

### Direct measurements for single-phase

- > Phase-neutral voltage L1-N
- > Phase-neutral voltage L2-N
- > Phase-neutral voltage L3-N
- > Phase-phase voltage L1-L2
- > Phase-phase voltage L2-L3
- > Phase-phase voltage L3-L1
- > Line current L1
- > Line current L2
- > Line current L3

### Single-phase derived measurements

- > Bi-directional active power L1 (positive=imported (Q1 and Q4), negative=exported (Q2 and Q3))
- > Bi-directional active power L2 (positive=imported, negative=exported)
- > Bi-directional active power L3 (positive=imported, negative=exported)
- > Bi-directional reactive power L1 (positive=imported (Q1 and Q4))
- > Bi-directional reactive power L2 (positive=imported)
- > Bi-directional reactive power L3 (positive=imported)
- > Distorting power L1 (indication of presence of current harmonics)
- > Distorting power L2 (indication of presence of current harmonics)
- > Distorting power L3 (indication of presence of current harmonics)
- > Apparent power L1
- > Apparent power L2
- > Apparent power L3
- > Power factor L1
- > Power factor L2
- > Power factor L3

### Harmonics and THD

- > Harmonics up to the 15<sup>th</sup>, both Voltage and Current
- > Voltage and Current THD

### Main measurements of three-phase system

- > Three-phase equivalent voltage phase-neutral
- > Three-phase equivalent voltage phase-phase
- > Three-phase equivalent current
- > Three-phase active power (positive=imported, negative=exported) Bidirectional
- > Three-phase reactive power (positive=imported) Bi-directional

### Secondary measurements of three-phase system

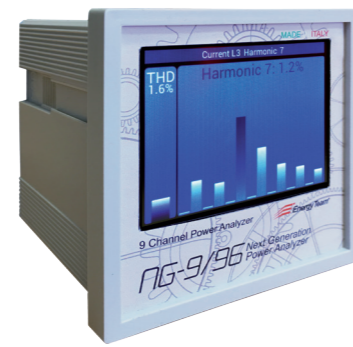
- > Three-phase equivalent distorting power
- > Three-phase equivalent apparent power
- > Three-phase equivalent power factor
- > Calculated neutral current
- > Ideal Neutral-center star Voltage, N-O
- > Frequency (measured on voltage input L)

### Integrated Energy values of three-phase system

- > Imported active Energy, Bench 1
- > Exported active Energy, Bench 1
- > Imported Inductive Energy (Q1), Bench 1
- > Exported Capacitive Energy (Q2), Bench 1
- > Exported Inductive Energy (Q3), Bench 1
- > Imported Capacitive Energy (Q4), Bench 1
- > Imported active Energy, Bench 2
- > Exported active Energy, Bench 2
- > Imported Inductive Energy (Q1), Bench 2
- > Exported Capacitive Energy (Q2), Bench 2
- > Exported Inductive Energy (Q3), Bench 2
- > Imported Capacitive Energy (Q4), Bench 2



Keypad



Harmonics



Monophase values

Inputs - Voltage	Basic Version
Voltage	Each voltage input can be matched with a current channel to allow any type of three or single phase measurement
Number of channels	3 current inputs with 5A RMS voltage output
Maximum working voltage	100-400 Vac
Inputs - Current	Plus Version
Number of channels	6 - each one is selectable individually
Accuracy	0,5 Class on the entire measuring chain
General	References
Consumption	5 VA
Protection degree	IP 20
Weight	300 gr
Maximum size LxHxW	96 x 96 x 75 mm
Size of panel inserting part LxHxW	91 x 91 x 65 mm
Display	LCD TFT 3.5" 320x240 pixel 262k colors
User interface	Icons with touchscreen
Working temperature	-10°C + 55°C
Relative humidity	95% without condensation
Power Supply	110-240 Vac / 24-120 Vdc
Frequency	50-60 Hz

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# NG-9/96

## Multifunction meter

Three Multifunction Meters in only 1 device

Measure 3 three-phase lines with a single instrument

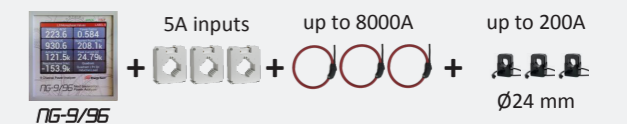


### Some possible configurations

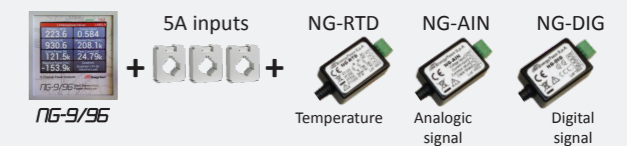
#### 3x THREE PHASE SYSTEMS



#### 3x THREE PHASE SYSTEMS



#### 1x THREE PHASE SYSTEM + OTHER CHANNELS



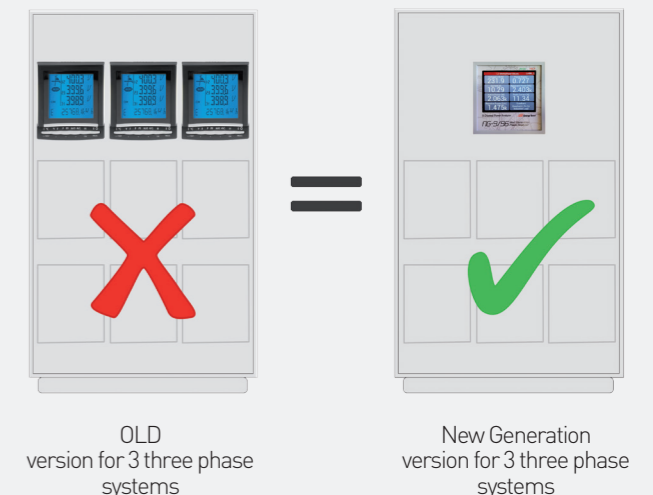
96x96mm Multifunction meter with **Colour LCD resistive touchscreen**, **three 5A current inputs** and **6 channels** to acquire energy data and other sources\* (Temperature, digital and analogic signals).

- > Bi-directional meter (Imported/delivered energy)
- > 50 true value Measurements (RMS) on 4 quadrants
- > The 96x96mm, 65mm deep case can be inserted in standard panels.
- > Graphic display: 3.5" LCD TFT, 320x240pixel, 262k colors, with resistive touchscreen, for a clear and readable displaying of measurements.
- > 84 Power Totalizers on 4 quadrants that can be set to zero.
- > Temperature probe within the instrument.
- > Clock and calendar.
- > Current measurement modules available:
  - Rogowski flexy probe from Ø 100 mm
  - Split Current Transformers
  - Ø6 mm - max 10A
  - Ø16 mm - max 100A
  - Ø24mm - max 200A
- > New Generation sensors
  - Temperature measurement sensor NG-RTD
  - Analogic voltage or current Inputs sensor NG-AIN
  - Digital signal acquisition sensor NG-DIG
- > Serial port: RS485
- > Protocol: Modbus

### Applied Standards

- > EN 55011(Class A)
- > EN 61000-4-2 -EN 61000-4-5
- > EN 61000-4-6
- > EN 61000-4-11
- > EN 61000-4-3
- > EN 61000-4-4
- > EN 60204-1

### Three Multifunction Meters in only 1 device

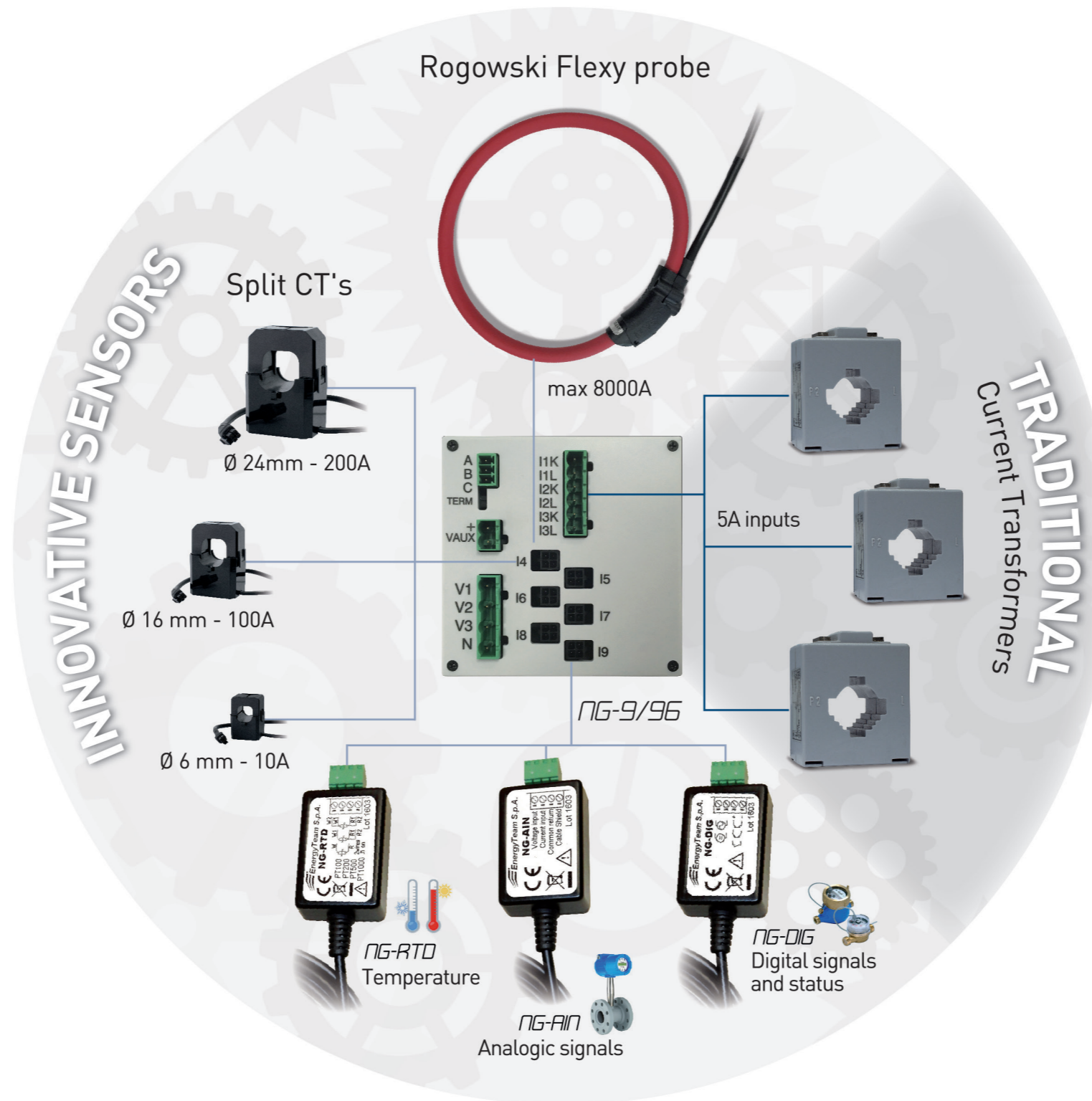


Sensor type 1 - Rogowski Coil RG-2k	
Diameter	100 mm
Selectable ranges by Joystick	2000 - 1000 - 400 - 200 - 100 A
Cable length	5m
Sensor type 1a - Rogowski Coil RG-4k	
Diameter	200 mm
Selectable ranges	4000 - 2000 - 800 - 400 - 200 A
Cable length	5m
Sensor type 1b - Rogowski Coil RG-8k	
Diameter	200 mm
Selectable ranges	8000 - 4000 - 1600 - 800 - 400 A
Cable length	5m

Up to 850 mm diameter available upon request.

Sensor type 2 - Standard size current clamp	
Cable window	24 mm
Dimensions [LxHxW]	44,5 x 65 x 33,5 mm
Selectable ranges by Joystick	200 - 80 - 40 - 20 A
Cable length	2m
Sensor type 3 - Miniature size current clamp	
Cable window	16 mm
Dimensions [LxHxW]	30 x 43,5 x 30 mm
Selectable ranges by Joystick	100 - 40 - 20 - 10 A
Cable length	2m
Sensor type 4 - Mini-transformer (TA) with output voltage	
Cable window	6mm
Dimensions [LxHxW]	16 x 32 x 26,4 mm
Selectable ranges by Joystick	1 - 2 - 5 - 10 A
Cable length	2m

Sensors extension	
Compatible with all sensors	
Cable length	4m



NG-RTD	
This sensor provides the NG-9 system with an ISOLATED Input for Temperature measurement with RTD sensors (i.e. PT100). NG-9 PLUS is compatible with PT100 (standard), PT200, PT 500 and PT1000.	
Measure isolation	dielectric strength of 1kV between Input and instrument to simplify use and improve protection against disturbance and the system's overall security
Accuracy	on the entire measuring chain is $\pm 0,2\%$ for readings between $-100^{\circ}\text{C}$ and $+200^{\circ}\text{C}$ , with a typical accuracy of $\pm 0,1\%$ for readings between $-20^{\circ}\text{C}$ and $+100^{\circ}\text{C}$ .

NG-AIN	
This sensor provides the NG-9 system with an analogic ISOLATED voltage or current Input.	
Flow range	$\pm 10\text{V}$ , $0-10\text{V}$ , $\pm 20\text{mA}$ , $0-20\text{mA}$ and $4-20\text{mA}$ selectable straight from the instrument
Measure isolation	dielectric strength of 1kV between Input and instrument to simplify use and improve protection against disturbance and the system's overall security
Accuracy	on the entire measuring chain is $0,2\%$ of the reading plus $0,05\%$ of the flow
Measurement field	between 0 and 120% of the flow. Maximum permanent overload capacity 400% of the flow for current measurements and 100V (1000%) for voltage measurements

NG-DIG	
This sensor provides the NG-9 system with an ISOLATED Input for digital signal acquisition from passive Outputs (PNP, NPN, OPTOMOS or electromechanical contacts) as well as active AC or DC Outputs from 12 to 110 Vdc or Vac.	
Acquisitions	the system can acquire, ON-OFF static signals as well as pulses coming from meters up to 10Hz frequency with a minimum pulse's duration of 5 milliseconds (10 milliseconds for AC Input).
Measure isolation	dielectric strength of 1kV between Input and instrument to simplify use and improve protection against disturbance and the system's overall security