



1. ELECTRICAL SPECIFICATIONS

Accuracy is calculated as [% rdg + (number of dgt) x resolution]. It is referred to 23°C ± 5°C, <80%RH

DC VOLTAGE

Range [V]	Resolution [V]	Accuracy	Input impedance	Overload protection
-1500.0 ÷ 1500.0	0.1	±(1.0%rdg + 3dgt)	1MΩ	1500VDC

Absolute voltage values <0.3V are zeroed

AC, AC+DC TRMS VOLTAGE

Range [V]	Resolution [V]	Accuracy	Input impedance	Overload protection
1.0 ÷ 999.9	0.1	±(1.0%rdg + 3dgt)	1MΩ	1000VDC/ACrms

Fundamental: 50/60Hz ± 15%, Bandwidth: 42.5Hz ÷ 1725Hz

Max. Crest Factor: 3 for voltage ≤470Vrms, 1.41 for voltage >470Vrms

Voltage RMS values <1V and values with frequency external range 42.5Hz ÷ 1725Hz are zeroed

DC VOLTAGE – MAX/MIN/CREST

Funzione	Range [V]	Resolution [V]	Accuracy	Response time
MAX/MIN	-1500.0 ÷ 1500.0	0.1	±(3.5%rdg + 5dgt)	200ms
CREST				1ms

Input impedance: 1MΩ ; Absolute voltage values <0.3V are zeroed

AC, AC+DC TRMS VOLTAGE – MAX/MIN/CREST

Funzione	Range [V]	Resolution [V]	Accuracy	Response time
MAX/MIN	1.0 ÷ 999.9	0.1	±(3.5%rdg + 5dgt)	200ms
CREST	-1500.0 ÷ 1500.0			1ms

Input impedance: 1MΩ; Fundamental: 50/60Hz ± 15%, Bandwidth: 42.5Hz ÷ 1725Hz

Max. Crest Factor: 3 for voltage ≤470Vrms, 1.41 for voltage >470Vrms

MAX/MIN values <1V, CREST values <1.4 and MAX/MIN/CREST values with frequency external range 42.5Hz ÷ 1725Hz are zeroed

DC CURRENT

Range [A]	Resolution [A]	Accuracy	Overload protection
0.1 ÷ 999.9	0.1	±(2.0%rdg + 5dgt)	1000ADC/ACrms

AC, AC+DC TRMS CURRENT

Range [A]	Resolution [A]	Accuracy	Overload protection
1.0 ÷ 999.9	0.1A	±(1.0%rdg + 5dgt)	1000ADC/ACrms

Fundamental: 50/60Hz ± 15%, Bandwidth: 42.5Hz ÷ 1725Hz ; Max. Crest Factor: 3 for current ≤515Arms, 1.41 for current >515A

Current RMS values <1A and values with frequency external range 42.5Hz ÷ 1725Hz are zeroed

DC/AC TRMS CURRENT – MAX/MIN

Range [A]	Resolution [A]	Accuracy	Response time	Overload protection
1.0 ÷ 999.9	0.1	±(3.5%rdg + 5dgt)	1s	1000VDC/ACrms

Fundamental: 50/60Hz ± 15%, Bandwidth: 42.5Hz ÷ 1725Hz ; Max. Crest Factor: 3 for current ≤515Arms, 1.41 for current >515A

MAX/MIN values <1A and MAX/MIN values with frequency external range 42.5Hz ÷ 1725Hz are zeroed

INRUSH CURRENT (DC, AC+DC TRMS) – DYNAMIC INRUSH

Range [A]	Resolution [A]	Accuracy (*)	Overload protection
1.0 ÷ 99.9	0.1	±(2.0%rdg + 5dgt)	1000ADC/ACrms
10 ÷ 999	1A		

(*) Accuracy declared for frequency: DC, (50±0.5)Hz, (60±0.5)Hz

Crest factor: 3, Sample frequency: 4kHz, Response time: Peak: 1ms, Max RMS : calculated on: 16.7, 20, 50, 100, 150, 200ms



RESISTANCE AND CONTINUITY TEST

Range [Ω]	Resolution [Ω]	Accuracy	Buzzer	Overload protection
0.0 ÷ 199.9	0.1	$\pm(1.0\%rdg + 5dgt)$	1 Ω ÷ 150 Ω	1000VDC/ACrms
200 ÷ 1999	1			
2.00k ÷ 19.99k	0.01k			
20.0k ÷ 29.9k	0.1k			

FREQUENCY WITH TEST LEADS AND JAWS

Range [Hz]	Resolution [Hz]	Accuracy	Overload protection
42.5 ÷ 69.0	0.1	$\pm(1.0\%rdg + 5dgt)$	1500VDC / 1000ADC/ACrms

Voltage range for frequency measure: 0.5 ÷ 1000V / Current range for frequency measure with jaws: 1 ÷ 1000A

PHASE SEQUENCE INDICATION AND PHASE CONFORMITY WITH 1-WIRE

Voltage range [V]	Frequency range [Hz]	Overload protection
100 ÷ 1000	45 ÷ 66	1000VDC/ACrms

Input impedance: 1.3M Ω

DC POWER

Range [kW]	Resolution [kW]	Accuracy (*)
0.00 ÷ 99.99	0.01	$\pm(3.0\%rdg + 3dgt)$
100.0 ÷ 999.9	0.1	

(*) Accuracy referred for Voltage > 10V, Current \geq 2A

AC, AC+DC ACTIVE, APPARENT POWER

Range [kW, kVA]	Resolution [kW, kVA]	Accuracy (*)
0.001 ÷ 9.999 (**)	0.001	$\pm(3.0\%rdg + 10dgt)$
10.00 ÷ 99.99	0.01	
100.0 ÷ 999.9	0.1	

(*) Accuracy referred for sinusoidal waveform, 42.5..69Hz, Voltage > 10V, Current \geq 10A, Pf \geq 0.5(**) For Current <10A add \pm 7%rdg to the accuracy

AC REACTIVE POWER

Range [kVAR]	Resolution [kVAR]	Accuracy (*)
0.001 ÷ 9.999 (**)	0.001	$\pm(3.0\%rdg + 10dgt)$
10.00 ÷ 99.99	0.01	
100.0 ÷ 999.9	0.1	

(*) Accuracy referred for sinusoidal waveform, 42.5..69Hz, Voltage > 10V, Current \geq 10A, Pf \leq 0.9(**) For Current <10A add \pm 4%rdg to the accuracy

AC, AC+DC TRMS AC ACTIVE ENERGY

Range [kWh]	Resolution [kWh]	Accuracy (*)
0.001 ÷ 9.999(**)	0.001	$\pm(3.0\%rdg + 10dgt)$
10.00 ÷ 99.99	0.01	
100.0 ÷ 999.9	0.1	

(*) Accuracy referred for sinusoidal waveform, 42.5..69Hz, Voltage > 10V, Current \geq 10A, Pf \geq 0.5(**) For Current <10A add \pm 7%rdg to the accuracy

AC, AC+DC TRMS AC REACTIVE ENERGY

Range [kVARh]	Resolution [kVARh]	Accuracy (*)
0.001 ÷ 9.999 (**)	0.001	$\pm(3.0\%rdg + 10dgt)$
10.00 ÷ 99.99	0.01	
100.0 ÷ 999.9	0.1	

(*) Accuracy referred for sinusoidal waveform, 42.5..69Hz, Voltage > 10V, Current \geq 10A, Pf \leq 0.9(**) For Current <10A add \pm 4%rdg to the accuracy



POWER FACTOR/ $\text{COS}\phi$

Range	Resolution	Accuracy (*)
0.20i ÷ 1.00 ÷ 0.20c	0.01	$\pm(2.0\%rdg+2dgt)$

(*) Input impedance: 1M Ω , Accuracy referred for sinusoidal waveform, 42.5..69Hz, Voltage > 10V, Current \geq 2A

VOLTAGE / CURRENT HARMONICS

Harmonic order	Fund. frequency [Hz]	Resolution [V], [A]	Accuracy (* no zeroed values)
0 (DC)	42.5 ÷ 69.0	0.1V /0.1A	$\pm(10.0\%rdg+5dgt)$
1 ÷ 25			$\pm(5.0\%rdg+5dgt)$
THD%		0.1%	$\pm(10.0\%rdg+5dgt)$

(*) Voltage harmonics are zeroed in the below conditions:

- 1st harmonic: if value < 1.0V ; DC, 2nd to 25th harmonics: if harmonic value <0.5% of fundamental value or if value <1.0V

(*) Current harmonics are zeroed in the below conditions:

- 1st harmonic: if value <1.0A; DC, 2nd to 25th harmonics: if harmonic value <0.5% of fundamental value or if value <1.0A



2. GENERAL SPECIFICATIONS

General specifications

Aggregation time (IP):	1, 5, 10, 30, 60, 120, 300, 600 or 900s programmable
Inrush current acquiring threshold:	programmable between 2A ÷ 90A and 5A ÷ 900A in steps of 1A
Inrush current detection modes:	Fixed
Inrush current response times:	1ms (peak), 16.7, 20, 50, 100, 150, 200ms (max RMS value)
Memory capacity:	2Mbytes
Interface to PC/mobile devices:	WiFi

Recordings/Autonomy

Inrush current snapshots saving:	max 20 (each with max 10 events)
Log + Snapshot saving:	max 99 files
Sampling rate:	128 sample/period (basic sample)
Max Rec autonomy (hours)	ca 2.1 x IP. e.g: IP=60s → ca 126hours → ca 5days

Mechanical characteristics

Dimensions /L x W x H):	252 x 88 x 44mm
Weight (including battery):	420g
Max conductor size:	45mm
Mechanical protection:	IP20

Power supply

Battery type:	2 batteries 1.5V type AAA IEC LR03
Battery life:	approx. 40h (continue use in "W" position)
Auto Power Off:	approx. 5 minutes of idleness (disable)

Display

Characteristics:	graphic dot matrix, 128x128pxl with backlight
Sample rate:	128 samples/period (@ 50Hz)
Display update rate:	1 time/sec
Conversion mode:	TRMS

Climatic conditions

Reference temperature:	23°C ± 5°C
Operating temperature:	0°C ÷ 40 °C
Operating humidity:	<80%RH
Storage temperature:	-10°C ÷ 60°C
Storage humidity:	<70%RH
Max height of use:	2000m

Reference guidelines

Safety:	IEC/EN 61010-1, IEC/EN61010-2-032
EMC:	IEC/EN61326-1, EN301489-17V3.1.1, EN301328V2.1.1
Safety of test leads:	IEC/EN61010-031
Insulation:	double insulation
Pollution level :	2
Measurement category:	CAT IV 600V, CAT III 1000V to ground

This instrument satisfies the requirements of Low Voltage Directive 2014/35/EU (LVD) and of EMC Directive 2014/30/EU

This instrument satisfies the requirements of 2011/65/EU (RoHS) directive and 2012/19/EU (WEEE) directive