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1. ELECTRICAL SPECIFICATIONS

Accuracy calculated as [%reading + (num. dgt* resolution)] at 23°C ±5°, <80%HR

DC VOLTAGE (Autorange)

Range [V]	Resolution [V]	Accuracy	Imput impedance	Overload protection
0.0 ÷ 690.0	0.1	±(0.5%rdg + 2dgt)	1MΩ	690VDC/ACrms

AC, AC+DC, LoZ TRMS VOLTAGE (Autorange)

Range [V]	Resolution [V]	Frequency range	Accuracy	Overload protection
0.5 ÷ 690.0	0.1	32Hz ÷ 1kHz	±(0.5%rdg + 2dgt)	690VDC/ACrms

Input impedance VAC function: 1MΩ, Input impedance LoZ function: 3.5kΩ
Auto detection DC mode, Max crest factor: 1.5

VOLTAGE/CURRENT FREQUENCY (Autorange)

Range [Hz]	Resolution [Hz]	Accuracy
33.00 ÷ 99.99	0.01	±(0.1%rdg+1dgt)
100.0 ÷ 999.9	0.1	

Voltage range: 0.5V ÷ 690V, Current range: 0.5A ÷ 3000A (Flex clamp F300U), 1mV ÷ 1000mV (STD Clamp)

DC, AC, AC+DC CURRENT (STANDARD RIGID CLAMP + + FLEX CLAMP FS=1V) – (Autorange)

Range [mV]	Resolution [mV]	Accuracy (*)
1 ÷ 1000	1	±(0.5%rdg + 2dgt)

(*) For frequency >100Hz the accuracy is: ±(1.5%rdg + 5dgt)
Max crest factor: 3, Frequency bandwidth: 1kHz
Current zeroed for value <1%FS [A] (1V Flex clamp), Current zeroed for value <1%FS [A] (STD clamp)

AC TRMS CURRENT (FLEXIBLE CLAMP F3000U) – (Autorange)

Range [mV]	Resolution [mV]	Accuracy (*)
1 ÷ 3000	1	±(0.5%rdg + 2dgt)

(*) For frequency >100Hz the accuracy is: ±(1.5%rdg + 5dgt)
Max crest factor: 3, Frequency bandwidth: 1kHz
Current zeroed for value <1%FS [A]

INRUSH CURRENT – DC, AC, AC+DC TRMS (STANDARD RIGID CLAMP)

Range [mV]	Resolution [mV]	Accuracy (*)
1 ÷ 1000	1	±(2%rdg + 2dgt)

(*) Accuracy declared for frequency: DC, 42.5 ÷ 69Hz
Max crest factor: 3 ; Sample frequency: 4kHz ; Detection threshold: 1%FS [A] fixed
Response time: 1ms (Peak), 16.7ms, 20ms, 50ms, 100ms, 150ms, 175ms, 200ms (max RMS)

INRUSH CURRENT – AC TRMS (FLEXIBLE CLAMP F3000U)

Range [mV]	Resolution [mV]	Accuracy (*)
1 ÷ 3000	1	±(2%rdg + 2dgt)

(*) Accuracy declared for frequency: DC, 42.5 ÷ 69Hz
Max crest factor: 3 ; Sample frequency: 4kHz ; Detection threshold: 1%FS [A] fixed
Response time: 1ms (Peak), 16.7ms, 20ms, 50ms, 100ms, 150ms, 175ms, 200ms (max RMS)

RESISTANCE AND CONTINUITY TEST (Autorange)

Range [Ω]	Resolution [Ω]	Accuracy	Buzzer
0.0 ÷ 199.9	0.1	±(1.0%rdg + 5dgt)	<30Ω
200 ÷ 1999	1		

HARMONIC VOLTAGE AND CURRENT – (Autorange)

Harmonic order	Fundamental frequency	Resolution	Accuracy (*) (not zeroed values)
DC	42.5Hz ÷ 69Hz	0.1V / 0.1A /0.1%	±(5.0%rdg+20dgt)
1 ÷ 25			±(5.0%rdg+10dgt)
THD%		0.1%	±(10.0%rdg+10dgt)

Accuracy of harmonics amplitudes expressed in % is evaluated considering the accuracy of parameters ratio
(*) Harmonic voltages are zeroed in the followed conditions:
- 1° harmonic: value <0.5V
- DC, 2° to 25° harmonics: harmonic value <0.5% fundamental value or value <0.5V

(*) Harmonic currents are zeroed in the followed conditions:
- 1° harmonic: value <1%FS[A]
- DC, 2° to 25° harmonics: harmonic value <0.5% fundamental value or value <1%FS[A]

LOOP IMPEDANCE L-N, L-L, RA⏚, RA⏚RCD (NO RCD TRIPPING)

L-PE, L-N, L-L Voltage range: 100V ÷ 690V, 42.5 ÷ 69Hz
Test current : (see below table)

Test	Test current	Range [Ω]	Resolution [Ω]	Accuracy
Ra⏚ RCD	15mA	1 ÷ 1999	1	-0%, +(5.0% rdg + 3Ω)
L-N, L-L, Ra⏚	100mA	0.1 ÷ 199.9	0.1	-0%, +(5.0% rdg + 0.3Ω)

RCD TESTS (INSTANTANEOUS MOLDED CASE TYPE)

RCDs type: AC (∿), A (⏦),General (G)
L-PE, L-N Voltage range: 100V ÷ 690V, 42.5 ÷ 69Hz
Rated tripping current (I∆N): 30mA, 100mA, 300mA (see below table)
Tripping time: resolution: 1ms, accuracy: ±(2.0%rdg + 2dgt)

Tripping times for Molded case RCD
(n.a. = not available function)

		x 1/2 G	x 1 G	x 5 G	⟋ G	AUTO G		
30mA	AC	300	310	40	310	x1	x5	x½
	A	300	310	40	310	x1	x5	x½
100mA	AC	300	310	n.a	n.a.	x1	x½	
	A	300	310	n.a	n.a.	x1	x½	
300mA	AC	300	310	n.a.	n.a.	x1	x½	
	A	300	310	n.a.	n.a.	x1	x½	

Possible combinations and tripping time duration [ms]

TRIPPING CURRENT (Ramp ⟋)

Type	I∆N	Ramp [LCD]	Current value [mA RMS @20ms]	Accuracy
AC	30mA	6.0, 6.5, 7.0 .. 32.5, 33.3	6.0, 6.5, 7.0 .. 32.5, 33.0	- 0%, +5%IΔ_N
A	30mA	6.0, 6.5, 7.0 .. 32.5, 33.3	8.5, 9.2, 9.9 .. 46, 46.7	- 0%, +5%IΔ_N

PHASE SEQUENCE ROTATION WITH 1-WIRE METHOD (*)

Voltage range [V]	Frequency range
130 ÷ 690	42.5 ÷ 69Hz

(*) Measurement is only carried out by direct contact with metal live parts (not on insulation sheath).

2. GENERAL SPECIFICATIONS

Display:
- 4 LCD, (max 9999 counts), sign, decimal point and bargraph
- Automatic polarity indication
- Backlight
- Refresh frequency: 2/s
- Conversion: TRMS

Features:
- Data HOLD
- MAX/MIN
- PEAK (Voltage and Current), response time = 1ms
- Autorange
- Automatic detection of AC/DC signals
- Auto Power OFF after 15 minutes of idleness

Power supply:
- 4x1.5V alkaline batteries type AAA IEC LR03
- Battery life:
  V, A, Ω, → approx 132h (backlight OFF)
  V, A, Ω, → approx 68h (backlight ON)
  Ra (15mA) → approx 5400 test (backlight ON)
  Ra (100mA) → approx 13k test (backlight ON)
  RCD → approx 8600 test (backlight ON)
  RCD T → approx 160k test (backlight ON)

Mechanical specifications:
- Dimensions (L x W x H): 175 x 85 x 55mm
- Weight (included batteries): 420g
- Mechanical protection: IP40

Environmental conditions:
- Reference temperature: 23°C ± 5°C
- Working temperature: 5°C ÷ 40°C
- Working humidity: <80%RH
- Storage temperature:-20°C ÷ 60°C
- Storage humidity: <80%RH
- Max height of use: 2000m

Reference guidelines:
- Safety: IEC/EN61010-1, IEC/EN61010-2-030, IEC/EN61010-2-033
- RCD test: IEC/EN61557-6
- LOOP P-P, P-N, P-PE, Ra test: IEC/EN61557-3
- Phase sequence rotation: IEC/EN 61557-7
- EMC: IEC/EN61326-1
- Insulation: double insulation
- Pollution degree: 2
- Category of measure: CAT IV 600V, CAT III 690V to ground and between inputs

This product conforms to the prescriptions of the European directive on low voltage 2014/35/EU and to EMC directive 2014/30/EU
This product conforms to the prescriptions of the European directive 2011/65/EU (RoHS) and the European directive 2012/19/EU (WEEE)