

# NEPTUNE

Rel 1.02 of 17/10/18

Multifunction professional safety multimeter

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## 1. ELECTRICAL SPECIFICATIONS

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

### DC VOLTAGE (Autorange)

Range [V]	Resolution [V]	Accuracy	Input impedance	Overload protection
0.0 ÷ 999.9	0.1	±(0.5%lettura + 2cifre)	5MΩ	1000VDC/ACrms

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

Range [V]	Resolution [V]	Frequency range	Accuracy	Overload protection
0.5 ÷ 999.9	0.1	32Hz ÷ 1kHz	±(0.5%lettura + 2cifre)	1000VDC/ACrms

Input impedance VAC function: 5MΩ, Input impedance LoZ function: 3.5kΩ

Auto detection DC mode, Max crest factor: 1.5

### VOLTAGE/CURRENT FREQUENCY (Autorange)

Range [Hz]	Resolution [Hz]	Accuracy
32.00 ÷ 99.99	0.01	±(0.1%rdg+1dgt)
100.0 ÷ 999.9	0.1	

Voltage range: 0.5V ÷ 999V, Current range: 0.5A ÷ 3000A (Flex clamp F3000U), 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 + FLEX CLAMP FS=1V)

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%	$\pm(5.0\%rdg+20dgt)$
1 ÷ 25			$\pm(5.0\%rdg+10dgt)$
THD%		0.1%	$\pm(10.0\%rdg+10dgt)$

Accuracy of harmonics amplitudes expressed in % is evaluated considering the accuracy of parameters ratio

(\*) Harmonic voltages are zeroed in the following 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 following conditions:

- 1° harmonic: value <1%FS[A]
- DC, 2° to 25° harmonics: harmonic value <0.5% fundamental value or value <1%FS[A]

**INSULATION RESISTANCE (MΩ)**

Test voltage [V]	Range [MΩ]	Resolution [MΩ]	Accuracy
50	0.01 ÷ 9.99	0.01	$\pm(5.0\%rdg + 2dgt)$
	10.0 ÷ 99.9	0.1	
100	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$
	100.0 ÷ 199.9		
250	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$
	100 ÷ 499	1	
500	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 499	1	$\pm(5.0\%rdg + 2dgt)$
	500 ÷ 999		
1000	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 999	1	$\pm(5.0\%rdg + 2dgt)$
	1000 ÷ 1999		

Open voltage:

nominal test voltage-0% +10%

Nominal test current

>1mA at 1kΩ x Vnom (50V, 100V, 250V, 1000V), >2,2mA at 230kΩ @ 500V

Short circuit current:

<6.0mA for each test voltage

Safety protection:

error message for input voltage > 10V

**CONTINUITY OF EARTH CONDUCTORS (LoΩ)**

Range [Ω]	Resolution [Ω]	Accuracy
0.00 ÷ 9.99	0.01	$\pm(2.0\%rdg+2dgt)$
10.0 ÷ 199.9	0.1	

Test current:

>200mA DC for R≤5Ω; DC Current resolution :1mA, Accuracy:  $\pm(5.0\%rdg+5dgt)$

Open voltage:

4V ≤ V<sub>0</sub> ≤ 12V

Safety protection:

error message for input voltage > 10V

**PHASE SEQUENCE ROTATION WITH 1-WIRE METHOD (\*)**

Voltage range [V]	Frequency range
100.0 ÷ 999.9	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,  $\Omega$ ,  → approx 132h (backlight OFF)  
V, A,  $\Omega$ ,  → approx 68h (backlight ON)  
M $\Omega$  (@500V) → approx 400 test (backlight OFF)  
Lo $\Omega$  → approx 2000 test (backlight OFF)

### 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  $\pm$  5°C
- Working temperature: 5°C  $\div$  40°C
- Working humidity: <80%RH
- Storage temperature: -20°C  $\div$  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
- EMC: IEC/EN61326-1
- Test M $\Omega$ : IEC/EN61557-2
- Test Lo $\Omega$ : IEC/EN61557-4
- Phase sequence rotation: IEC/EN 61557-7
- Insulation: double insulation
- Pollution degree: 2
- Category of measure: CAT IV 600V, CAT III 1000V 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)**