



1. ELECTRICAL SPECIFICATIONS – VERIFY TESTS

Accuracy is indicated as \pm (% readings + no. of digits) at 23°C \pm 5°C, con relative humidity <60%HR

Continuity test on protective and equalizing conductors

Range [Ω]	Resolution [Ω]	Accuracy
0.01 \div 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
10.0 \div 99.9	0.1	

Test current: > 200mA DC for $R \leq 5\Omega$ (included calibration) ; Resolution on current : 1mA
 Open-circuit voltage: $4V \leq V_0 \leq 24V$ DC

Insulation Resistance (DC voltage)

Test voltage [V]	Range [$M\Omega$]	Resolution [$M\Omega$]	Accuracy	
50	0.01 \div 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$	
	10.0 \div 49.9	0.1		
	50.0 \div 99.9		$\pm(5.0\%rdg + 2dgt)$	
100	0.01 \div 9.99		0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 \div 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$	
	100.0 \div 199.9			
250	0.01 \div 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$	
	10.0 \div 199.9	0.1		
	200 \div 249		1	$\pm(5.0\%rdg + 2dgt)$
	250 \div 499			
500	0.01 \div 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$	
	10.0 \div 199.9	0.1		
	200 \div 499		1	$\pm(5.0\%rdg + 2dgt)$
	500 \div 999			
1000	0.01 \div 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$	
	10.0 \div 199.9	0.1		
	200 \div 999		1	$\pm(5.0\%rdg + 2dgt)$
	1000 \div 1999			

Open-circuit voltage: <1.3 x nominal test voltage
 Short circuit current: <6.0mA at 500V test voltage
 Nominal test current: >2.2mA on 230k Ω load (500V); >1mA su 1k Ω per Vnom (others)
 Measurement limits fitted: 0.05, 0.10, 0.23, 0.25, 0.50, 1.00, 100M Ω

RCDs Tripping time (type A, AC, General and Selective)

Range [ms]		Resolution [ms]	Accuracy
$\frac{1}{2} I_{dn}$, I_{dn}	1 \div 999	1	$\pm(2.0\%rdg + 2dgt)$
2 I_{dn}	1 \div 200 general 1 \div 250 selective		
5 I_{dn}	1 \div 50 general 1 \div 160 selective		

Nominal trip-out currents: 10mA, 30mA, 100mA, 300mA, 500mA
 Phase-PE voltage: 100V \div 265V
 Frequency: 50Hz \pm 0.5Hz

RCDs Tripping current (type A, AC, General and Selective)

RCD type	I_{dn}	Range I_{dn} [mA]	Resolution [mA]	Accuracy I_{dn}
AC	$I_{dn} \leq 10mA$	(0.5 \div 1.4) I_{dn}	0.1 $I_{\Delta N}$	-0%, +(10% I_{dn})
A		(0.5 \div 2.4) I_{dn}		
AC	$I_{dn} > 10mA$	(0.5 \div 1.4) I_{dn}		
A		(0.5 \div 2.0) I_{dn}		

**Contact voltage**

Range [V]	Resolution [V]	Accuracy
0 ÷ 2U _{lim}	0.1	-0%, +(5.0% rdg + 3dgt)

U_{lim} (UI): 25V , 50V**Line Impedance (Phase-Phase)**

Range [Ω]	Resolution [Ω]	Accuracy (*)
0.01 ÷ 9.99	0.01	±(5.0% rdg + 3dgt)
10.0 ÷ 199.9	0.1	

(*) 0.1 mΩ on range 0.0 ÷ 199.9 mΩ (with IMP57 optional accessory)

Maximum peak current: 3.65A (at 127V); 6.64A (at 230V); 11.5A (at 400V)

Test voltage: 100÷265V (Phase-Neutral) / 100÷460V (Phase-Phase); 50Hz ± 0.5Hz

Fault Loop Impedance (Phase-Ground, Phase-Neutral)

Range [Ω]	Resolution [Ω]	Accuracy (*)
0.01 ÷ 19.99	0.01	±(5.0% rdg + 3dgt)
20.0 ÷ 199.9	0.1	
200 ÷ 1999	1	

(*) 0.1 mΩ on range 0.0 ÷ 199.9 mΩ (with IMP57 optional accessory)

Maximum peak current: 3.65A (at 127V); 6.64A (at 230V)

Test voltage: 100÷265V (Phase-Ground); 50Hz ± 0.5Hz

Fault Loop Resistance R_A without RCDs tripping

Range [Ω]	Resolution [Ω]	Accuracy
1 ÷ 1999	1	-0%, +(5.0% rdg + 3dgt)

Test current: 0.5 I_{ΔN} set on Ut test
15mA on Ra15mA test**Earth Resistance with rods**

Range [Ω]	Resolution [Ω]	Accuracy
0.01 ÷ 19.99	0.01	±(5.0%rdg + 3dgt)
20.0 ÷ 199.9	0.1	
200 ÷ 1999	1	

Test current: <10mA – 77.5Hz
Open-circuit voltage: < 20V rms**Earth resistivity**

Range ρ [Ωm] (*)	Resolution [Ωm]	Accuracy (*)
0.06 ÷ 19.99	0.01	±(5.0%rdg + 3dgt)
20.0 ÷ 199.9	0.1	
200 ÷ 1999	1	
2.00 ÷ 99.99k	0.01k	
100.0 ÷ 125.5k	0.1k	

(*) with distance d=10m

Distance range d: 1 ÷ 10m

Test current: <10mA – 77.5Hz

Open-circuit voltage: < 20Vrms

Voltage (RCD, LOOP, Phase Sequence)

Range [V]	Resolution [V]	Accuracy
15 ÷ 460	1	±(3.0%rdg + 2dgt)

Frequency

Range [Hz]	Resolution [Hz]	Accuracy
47.0 ÷ 63.6	0.1	±(0.1% rdg + 1dgt)

2. ELECTRICAL SPECIFICATIONS – ANALYZER AND AUX

Accuracy is indicated as \pm (% readings + no. of digits) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, con relative humidity $<60\%$ UR.

Voltage – Single phase / Three phase systems (Autorange)

Range [V]	Resolution [V]	Accuracy	Input Impedance
15 ÷ 310	0.2	$\pm(0.5\% \text{rdg} + 2\text{dgt})$	300 k Ω (P-N, P-P)
310 ÷ 600	0.4		

Voltage Anomalies – Single / Three phase systems (Manual range)

Range [V]	Resolution Voltage [V]	Resolution Time	Accuracy Voltage	Accuracy Time (ref. 50Hz)
15 ÷ 310	0.2	10ms	$\pm(1.0\% \text{rdg} + 2\text{dgt})$	$\pm 10\text{ms}$
30 ÷ 600	0.4			

Input Impedance: 300 k Ω (Phase-Neutral and Phase-Phase)

Current by external clamp transducer – STD

Range (*)	Resolution (mV)	Accuracy	Input Impedance	Overload protection
0.005 ÷ 0.26V	0.1	$\pm(0.5\% \text{rdg} + 2\text{dgt})$	200k Ω	5V
0.26 ÷ 1V	0.4			

(*) Example: by using a clamp whose range is 1000A/1V, the instrument measures currents higher than 5A

Current by external clamp transducer – FlexINT (1000A AC range)

Range [A]	Voltage input	Resolution	Accuracy
10.0 ÷ 19.9	950.0 μV ÷ 1.691mV	8.5 μV	$\pm(4.0\% \text{rdg} + 8.5\mu\text{V})$
20.0 ÷ 99.9	1.7mV ÷ 8.491mV		$\pm(1.0\% \text{rdg} + 8.5\mu\text{V})$
100.0 ÷ 999.9	8.5mV ÷ 84.99mV		$\pm(1.0\% \text{rdg} + 85\mu\text{V})$

1A = 85 μV ; Rinput = 400k Ω

Current by external clamp transducer – FlexINT (3000A AC range)

Range [A]	Voltage input	Resolution	Accuracy
30.0 ÷ 999.9	2.55mV ÷ 84.99mV	8.5 μV	$\pm(1.0\% \text{rdg} + 17\mu\text{V})$
1000 ÷ 3000	85.0mV ÷ 255mV	85 μV	$\pm(0.5\% \text{rdg} + 85\mu\text{V})$

1A = 85 μV ; Rinput = 400k Ω

Power factor - Single / Three phase systems

Range	Resolution	Accuracy (°)
0.20 ÷ 0.50	0.01	1.0
0.50 ÷ 0.80		0.7
0.80 ÷ 1.00		0.6

Leakage current (by optional clamp transducer)

Range [mA]*	Resolution [mA]	Accuracy	Input Impedance	Overload protection
0.5 ÷ 999.9	0.1	$\pm(5.0\% \text{rdg} + 2\text{dgt})$	200k Ω	5V

(*) While recording the instrument stores only current values $> 5\text{mA}$ with 1mA resolution
Maximum stored value is the peak value calculated with response time of 1ms



Power – Single / Three phase systems

Measures type	Range	Resolution	Accuracy
ACTIVE POWER	100.0 ÷ 999.9W	0.1W	±(1.0% rdg + 2dgt)
	1.000 ÷ 9.999kW	0.001kW	
	10.00 ÷ 99.99kW	0.01kW	
	100.0 ÷ 999.9kW	0.1kW	
	1.000 ÷ 9.999MW	0.001MW	
	10.00 ÷ 99.99MW	0.01MW	
	100.0 ÷ 999.9MW	0.1MW	
REACTIVE POWER	100.0 ÷ 999.9VAR	0.1VAR	
	1.000 ÷ 9.999kVAR	0.001kVAR	
	10.00 ÷ 99.99kVAR	0.01kVAR	
	100.0 ÷ 999.9kVAR	0.1kVAR	
	1.000 ÷ 9.999MVAR	0.001MVAR	
	10.00 ÷ 99.99MVAR	0.01MVAR	
	100.0 ÷ 999.9MVAR	0.1MVAR	
APPARENT POWER	100.0 ÷ 999.9VA	0.1VA	
	1.000 ÷ 9.999kVA	0.001kVA	
	10.00 ÷ 99.99kVA	0.01kVA	
	100.0 ÷ 999.9kVA	0.1kVA	
	1.000 ÷ 9.999MVA	0.001MVA	
	10.00 ÷ 99.99MVA	0.01MVA	
	100.0 ÷ 999.9MVA	0.1MVA	
ACTIVE ENERGY (Class 2 EN61036)	100.0 ÷ 999.9Wh	0.1Wh	
	1.000 ÷ 9.999kWh	0.001kWh	
	10.00 ÷ 99.99kWh	0.01kWh	
	100.0 ÷ 999.9kWh	0.1kWh	
	1.000 ÷ 9.999MWh	0.001MWh	
	10.00 ÷ 99.99MWh	0.01MWh	
	100.0 ÷ 999.9MWh	0.1MWh	
REACTIVE ENERGY (Class 3 IEC1268)	100.0 ÷ 999.9VARh	0.1VARh	
	1.000 ÷ 9.999kVARh	0.001kVARh	
	10.00 ÷ 99.99kVARh	0.01kVARh	
	100.0 ÷ 999.9kVARh	0.1kVARh	
	1.000 ÷ 9.999MVARh	0.001MVARh	
	10.00 ÷ 99.99MVARh	0.01MVARh	
	100.0 ÷ 999.9MVARh	0.1MVARh	

Harmonics - Single / Three phase systems

Range	Maximum resolution	Base accuracy
DC ÷ 25 ^a	0.1V / 0.1 A	±(5.0% rdg + 2dgt)
26 ^a ÷ 33 ^a		±(10% rdg + 2dgt)
34 ^a ÷ 49 ^a		±(15% rdg + 2dgt)

Environmental parameters (AUX function)

Range	Resolution	Accuracy
-20°C ÷ 80°C	0.1 °C	±(2.0% rdg + 2 dgt)
0 ÷ 100% UR	0.1% UR	
0.001Lux ÷ 20.00 Lux (*)	0.001 ÷ 0.02 Lux	
0.1 Lux ÷ 2000 Lux (*)	0.1 ÷ 2 Lux	
1 Lux ÷ 20 kLux (*)	1 ÷ 20 Lux	

(*) Accuracy of HT53 luxmeter probe is according to Class AA



3. GENERAL SPECIFICATIONS

SINGLE/THREE PHASE RECORDING:

STORED PARAMETERS:

- Phase and delta voltages, Phase currents, neutral current, Phase and total three phase Active, Reactive, Apparent power, Active energy (Class 2 EN61036), Reactive energy (Class 3 IEC1268), Power factor, Voltages, currents harmonics (DC,1,2,...49), Voltage anomalies (sags, swells)
- Predefined recordings (EN50160, Voltage anomalies, Harmonics, Start up, Power & Energy)
- Max selectable parameters: 63 or 3 AUX (Environmental and/or leakage)
- Integrated period: 5s ÷ 60min
- Recording autonomy: > 30 days with integrated period of 15 minutes
- Memory capacity: 2Mbyte

DISPLAY AND MEMORY:

Features:	Dot matrix with backlight
Resolution:	128x128 dots
Visible area:	73x73 mm
Memory:	999 measures

POWER SUPPLY:

Batteries:	6x1.5V alkaline batteries type AA LR06
External power supply adapter:	230V/50Hz – 12VDC (AUX e ANALYZER functions only)

PC INTERFACE:

PC connection:	optical / USB optoinsulated (with cable C2006)
Connection with Bluetooth™:	about 10m distance range

MECHANICAL FEATURES:

Dimensions:	225 (W)x165(L)x105(H) mm
Weight (included batteries):	1.7kg

WORKING ENVIRONMENTAL CONDITIONS:

Reference temperature:	23°C ± 5°C
Working temperature:	0° ÷ 40°C
Allowed relative humidity:	< 80% HR
Storage temperature:	-10 ÷ 60°C
Storage humidity:	< 80% HR

REFERENCE STANDARDS:

Safety test on plants:	IEC/EN61557, VDE0100, IEC 60364
Insulation test on switchboards:	IEC/EN60439-1
Active energy static counters for AC current	EN61036 (Class 2)
Reactive energy static counters for AC current	IEC1268 (Class 3)

SAFETY:

Safety of measuring instruments:	IEC/EN61010-1 + A2(1997)
Insulation:	double insulation
Pollution degree:	2
Measurement category:	CAT III 600V (among inputs) CAT III 300V (to ground)
Max altitude of use:	2000m

This instrument complies with the requirements of the European Low Voltage Directives 2006/95/EEC (LVD) and EMC 2004/108/EEC