



1. ELECTRICAL SPECIFICATIONS – VERIFY TESTS

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

Continuity test on protective and equalizing conductors

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

(*) after the calibration of the cables which eliminates their resistance

Test current: >200mA DC for $R \leq 5\Omega$ (calibration included), resolution: 1mA

Open-circuit voltage: $4V \leq V_0 \leq 24V$

Insulation Resistance (DC voltage)

Test voltage(V)	Range (M Ω)	Resolution (M Ω)	Accuracy
50	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 49.9	0.1	
	50.0 ÷ 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$
100	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 99.9	0.1	
	100.0 ÷ 199.9	0.1	$\pm(5.0\%rdg + 2dgt)$
250	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 249	1	$\pm(5.0\%rdg + 2dgt)$
	250 ÷ 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	1	
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	1	

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 on 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

Range (ms)		Resolution (ms)	Accuracy
0.5Idn, Idn	1÷999	1	$\pm(2.0\%rdg + 2dgt)$
2Idn	1÷200 general		
	1÷250 selective		
5Idn	1÷ 50 general		
	1÷160 selective		

Nominal trip-out currents: 10mA, 30mA, 100mA, 300mA, 500mA

RCDs type: AC, A, general and selective

P-PE voltage: 100V ÷ 265V

Frequency: 50Hz \pm 0.5Hz

Contact voltage Ut

Range (V)	Resolution (V)	Accuracy
0 ÷ 2Utlim	0.1	-0%, +(10.0% rdg + 3dgt)

Utlim (UI): 25V , 50V



Tripping current of RCDs

RCD type	I _{ΔN}	Range I _{ΔN} (mA)	Resolution (mA)	Accuracy I _{ΔN}
AC	I _{dn} ≤ 10mA	(0.5 ÷ 1.4) I _{dn}	0.1 I _{dn}	-0%, +10%I _{dn}
A		(0.5 ÷ 2.4) I _{dn}		
AC	I _{dn} > 10mA	(0.5 ÷ 1.4) I _{dn}		
A		(0.5 ÷ 2.0) I _{dn}		

Line Impedance (Phase-Phase, Phase-Neutral)

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

(*) Resolution: 0.1 mΩ, 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)

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

(*) Resolution: 0.1 mΩ, 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 (d=10m)	Resolution	Accuracy (d=10m)
0.06 ÷ 19.99 Ωm	0.01 Ωm	±(5.0% rdg + 3dgt)
20.0 ÷ 199.9 Ωm	0.1 Ωm	
200 ÷ 1999 Ωm	1 Ωm	
2.00 ÷ 99.99 kΩm	0.01 kΩm	
100.0 ÷ 125.5 kΩm	0.1 kΩm	

Distance range d: 1 ÷ 10m

Test current: <10mA – 77.5Hz

Open-circuit voltage: < 20V rms

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°C \pm 5°C, con relative humidity <60%UR.

Voltage – Single phase system (Autorange)

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

Voltage Anomalies – Single system (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	$\pm(0.5\% \text{ rdg} + 2\text{dgt})$	400k 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 μ V ÷ 1.691mV	8.5 μ V	$\pm(4.0\% \text{ rdg} + 8.5\mu\text{V})$
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 μ V ; 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 μ V	$\pm(1.0\% \text{ rdg} + 17\mu\text{V})$
1000 ÷ 3000	85.0mV ÷ 255mV	85 μ V	$\pm(0.5\% \text{ rdg} + 85\mu\text{V})$

1A = 85 μ V ; Rinput = 400k Ω

Power factor (Cos ϕ) - Single phase system

Range (cos ϕ)	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	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$	400k Ω	5V

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



Power – Single phase system

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 phase system

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)

Parameter	Range	Resolution	Accuracy
Temperature [°C]	-20°C ÷ 80°C	0.1 °C	±(2.0%rdg+2dgt)
Temperature [°F]	-4°F ÷ 176°F	0.1 °F	
Relative humidity [%HR]	0 ÷ 100%HR	0.1% UR	
DC output voltage	0.1mV ÷ 1.0V	0.1mV	
Illuminance [Lux]	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 accessory according to Class AA



3. GENERAL SPECIFICATIONS

SINGLE PHASE RECORDING:

STORED PARAMETERS:

- Phase and delta voltage, Phase current, neutral current, Active, Reactive, Apparent power, Active energy (Class 2 EN61036), Reactive energy (Class 3 IEC1268), Power factor $\cos\phi$, Voltage, current harmonics (DC,1,2,...49), Voltage anomalies (sags, swells), Predefined settings (EN50160, Voltage anomalies, Harmonics, Start up, Power & Energy)
- Max selectable parameters: 63 or 1 AUX (environmental and/or leakage)
- Integration period: 5 ÷ 3600 sec.
- Recording: > 30 days with 15 minutes integration period
- Memory size: 2Mbyte

DISPLAY AND MEMORY:

Features:	Dot matrix with backlight
Resolution:	128x128 dots
Memory:	999 measures

POWER SUPPLY:

Batteries:	6 batteries 1.5V type LR6-AA-AM3-MN 1500
External power supply adapter:	A0050 or A0053 (AUX e ANALYZER functions only)

MECHANICAL FEATURES:

Sizes:	225 (W)x165(L)x105(D) mm
Weight (batteries included):	about 2.0 kg

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

TEST VERIFIES REFERENCE STANDARDS:

Continuity test with 200mA:	IEC 61557-4
Insulation resistance:	IEC 61557-2
Earth resistance:	IEC 61557-5
Fault Loop Impedance:	IEC 61557-3
RCDs test:	IEC 61557-6
Phase sequence:	IEC 61557-7

POWER/ENERGY MEASUREMENTS REFERENCE STANDARDS:

Active energy static counters for AC current	EN61036 (Class 2)
Reactive energy static counters for AC current	IEC1268 (Class 3)

GENERAL REFERENCE STANDARDS:

Safety of measuring instruments:	EN61010-1 + A2(1997)
Product type standard:	IEC61557-1, 2, 3, 4, 5, 6
Insulation:	class 2 (double insulation)
Pollution degree:	2
Overvoltage category:	CAT II 600V~ / 350V~ (to ground) CAT III 600V~ / 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