1. ELECTRICAL SPECIFICATIONS – VERIFY TESTS

Accuracy is indicated as ± (% readings + no. of digits) at 23°C ± 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	±(2.0%rdg + 2dgt)
10.0 ÷ 99.9	0.1	

(*) after cable calibration (which eliminates the cable resistance).
Test current: > 200mA DC for R≤5Ω (included calibration)
Resolution on current measurement: 1mA
Open-circuit voltage: $4V \leq V_0 \leq 24V$

Insulation Resistance (DC voltage)

Test voltage(V)	Range (MΩ)	Resolution (MΩ)	Accuracy
50	0.01 ÷ 9.99	0.01	±(2.0%rdg + 2dgt)
	10.0 ÷ 49.9	0.1	
	50.0 ÷ 99.9	0.1	±(5.0%rdg + 2dgt)
100	0.01 ÷ 9.99	0.01	±(2.0%rdg + 2dgt)
	10.0 ÷ 99.9	0.1	
	100.0 ÷ 199.9	0.1	±(5.0%rdg + 2dgt)
250	0.01 ÷ 9.99	0.01	±(2.0%rdg + 2dgt)
	10.0 ÷ 199.9	0.1	
	200 ÷ 249	1	
	250 ÷ 499	1	±(5.0%rdg + 2dgt)
500	0.01 ÷ 9.99	0.01	±(2.0%rdg + 2dgt)
	10.0 ÷ 199.9	0.1	
	200 ÷ 499	1	
	500 ÷ 999	1	±(5.0%rdg + 2dgt)
1000	0.01 ÷ 9.99	0.01	±(2.0%rdg + 2dgt)
	10.0 ÷ 199.9	0.1	
	200 ÷ 999	1	
	1000 ÷ 1999	1	±(5.0%rdg + 2dgt)

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

RCDs Tripping time

Range (ms)		Resolution (ms)	Accuracy
½ $I_{\Delta N}$, $I_{\Delta N}$	1÷999	1	±(2.0%rdg + 2dgt)
2 $I_{\Delta N}$	1÷200 general		
	1÷250 selective		
5 $I_{\Delta N}$ RCD	1÷ 50 general		
	1÷160 selective		

Nominal trip-out currents: 10mA, 30mA, 100mA, 300mA, 500mA
RCDs type: AC, A, General and Selective
Phase-PE voltage: 100V ÷ 255V
Frequency: 50Hz ± 0.5Hz

Tripping current of RCDs

RCD type	IΔN	Range IΔN (mA)	Resolution (mA)	Accuracy IΔN
AC	IΔN ≤ 10mA	(0.5 ÷ 1.4) $I_{\Delta N}$	0.1 $I_{\Delta N}$	-0%, +(5.0% $I_{\Delta N}$)
A		(0.5 ÷ 2.4) $I_{\Delta N}$		
AC	IΔN > 10mA	(0.5 ÷ 1.4) $I_{\Delta N}$	0.1 $I_{\Delta N}$	-0%, +(5.0% $I_{\Delta N}$)
A		(0.5 ÷ 2.0) $I_{\Delta N}$		

Contact voltage Ut

Range (V)	Resolution (V)	Accuracy
0 ÷ 2Utlim	0.1	-0%, +(5.0% rdg + 3dgt)

Utlim (Ul): 25V , 50V

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	

(*) 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)

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 $I_{\Delta N}$ 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 (*)	Resolution	Accuracy (*)
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	

(*) with distance d=10m
Distance range d: 1 ÷ 10m
Test current: <10mA – 77.5Hz
Open-circuit voltage: < 20V rms

Continuity test with 10A according to EN60204-1

Range (Ω)	Resolution (Ω)	Accuracy
0.001 ÷ 0.999	0.001	±(1.0% rdg + 2dgt)

Test current: >10A AC for R≤0.45Ω
Resolution test current: 0.1A
Open-circuit voltage: between 6 and 12V AC
Power supply voltage: 230V- 50Hz

Continuity test with 10A according to EN60204-1

Range (Ω)	Resolution (Ω)	Accuracy
0.01 ÷ 9.99	0.01	±(1.0% rdg + 2dgt)

Test current: >10A AC for R≤0.45Ω
Resolution test current: 0.1A
Open-circuit voltage: <12V AC
Power supply voltage: 230V- 50Hz

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 ± (% readings + no. of digits) at 23°C ± 5°C, con relative humidity <60%UR.

Voltage – Single phase / Three phase systems (Autorange)

Range (V)	Resolution (V)	Accuracy	Input Impedance
15 ÷ 310	0.2	±(0.5% rdg + 2dgt)	300 kΩ (Phase-Neutral) 300 kΩ (Phase-Phase)
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	±(1.0%rdg + 2dgt)	±10ms
30 ÷ 600	0.4			

Input Impedance: 300 kΩ (Phase-Neutral and Phase-Phase)

Current by external clamp transducer – FlexEXT / STD

Range (*)	Resolution (mV)	Accuracy	Input Impedance	Overload protection
0.005 ÷ 0.26V	0.1	±(0.5%rdg + 2dgt)	200kΩ	5V
0.26 ÷ 1V	0.4			

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

Power factor (Cosφ) - Single / Three phase systems

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

Leakage curreny (by optional clamp transducer)

Range (mA)*	Resolution (mA)	Accuracy	Input Impedance	Overload protection
0.5 ÷ 999.9	0.1	±(5.0% rdg + 2dgt)	200kΩ	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 / Three phase systems

Measures type	Range	Resolution	Accuracy
ACTIVE POWER	100.0 ÷ 999.9W 1.000 ÷ 9.999kW 10.00 ÷ 99.99kW 100.0 ÷ 999.9kW 1.000 ÷ 9.999MW 10.00 ÷ 99.99MW 100.0 ÷ 999.9MW	0.1W 0.001kW 0.01kW 0.1kW 0.001MW 0.01MW 0.1MW	±(1.0% rdg + 2dgt)
REACTIVE POWER	100.0 ÷ 999.9VAR 1.000 ÷ 9.999kVAR 10.00 ÷ 99.99kVAR 100.0 ÷ 999.9kVAR 1.000 ÷ 9.999MVAR 10.00 ÷ 99.99MVAR 100.0 ÷ 999.9MVAR	0.1VAR 0.001kVAR 0.01kVAR 0.1kVAR 0.001MVAR 0.01MVAR 0.1MVAR	
APPARENT POWER	100.0 ÷ 999.9VA 1.000 ÷ 9.999kVA 10.00 ÷ 99.99kVA 100.0 ÷ 999.9kVA 1.000 ÷ 9.999MVA 10.00 ÷ 99.99MVA 100.0 ÷ 999.9MVA	0.1VA 0.001kVA 0.01kVA 0.1kVA 0.001MVA 0.01MVA 0.1MVA	
ACTIVE ENERGY (Class 2 EN61036)	100.0 ÷ 999.9Wh 1.000 ÷ 9.999kWh 10.00 ÷ 99.99kWh 100.0 ÷ 999.9kWh 1.000 ÷ 9.999MWh 10.00 ÷ 99.99MWh 100.0 ÷ 999.9MWh	0.1Wh 0.001kWh 0.01kWh 0.1kWh 0.001MWh 0.01MWh 0.1MWh	
REACTIVE ENERGY (Class 3 IEC1268)	100.0 ÷ 999.9VARh 1.000 ÷ 9.999kVARh 10.00 ÷ 99.99kVARh 100.0 ÷ 999.9kVARh 1.000 ÷ 9.999MVARh 10.00 ÷ 99.99MVARh 100.0 ÷ 999.9MVARh	0.1VARh 0.001kVARh 0.01kVARh 0.1kVARh 0.001MVARh 0.01MVARh 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)
- Phase and total three phase Power factor Cosφ
- Voltages, currents harmonics (DC,1,2,…49)
- Voltage anomalies (sags, swells, breaks)
- Predefined recordings (EN50160, Voltage anomalies, Harmonics, Start up, Power & Energy)
- Max selectable parameters: 63 or 3 AUX (Environmental and/or leakage)
- Integrated period: 5 ÷ 3600 sec.
- 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:	6 batteries 1.5V type LR6-AA-AM3-MN 1500
External power supply adapter:	Code **A0050** (AUX e ANALYZER functions only)
Mains power supply:	230V- 50Hz (LOWΩ10A function only)

MECHANICAL FEATURES:

Dimensions:	225 (W)x165(L)x105(D) mm
Weight (included batteries):	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
Continuity test with 10A:	EN60439-1, EN60204-1

POWER/ENERGY MEASUREMENTS REFERENCE STANDARDS:

Features of voltage supplied by public utilities:	EN50160
Active energy static counters for AC current	EN61036 (Class 2)
Reactive energy static counters for AC current	IEC1268 (Class 3)

NOISE MEASUREMENTS REFERENCE STANDARDS:

Sound measurements (with **HT55** probe):	EN60651:1994/A1 type 1 EN60804:1994/A2 type 1

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)
Use:	internal use; max altitude: 2000m
EMC:	EN61326-1 (1998) + A1 (1999)

This instrument complies with the requirements of the European Low Voltage Directives 72/23/CEE (LVD) and EMC 89/336/CEE, amended with 93/68/CEE

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