

**1. TECHNICAL SPECIFICATIONS**Accuracy is calculated as: $\pm[\% \text{reading} + (\text{no. of digits}) * \text{resolution}]$ at 23°C, <80%RH**AC TRMS VOLTAGE**

Range (V)	Resolution (V)	Accuracy
15 ÷ 460	1	$\pm(3.0\% \text{ rdg} + 2\text{dgt})$

FREQUENCY

Range (Hz)	Resolution (Hz)	Accuracy
47.50 ÷ 52.50 / 57.00 ÷ 63.00	1	$\pm(0.1\% \text{ rdg} + 1\text{dgt})$

CONTINUITY OF PROTECTION CONDUCTORS WITH 200mA

Range (Ω)	Resolution (Ω)	Accuracy
0.00 ÷ 9.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
10.0 ÷ 99.9	0.1	
100 ÷ 1999	1	

Test current: >200mA DC up to 5 Ω (test leads included)
 Test current generated: 1mA resolution, range 0 ÷ 250mA
 Open-circuit voltage: 4 < V₀ < 24VDC
 Safety protection: error message for input voltage >10V

INSULATION RESISTANCE

DC test voltage (V)	Range (M Ω)	Resolution (M Ω)	Accuracy
50	0.01 ÷ 9.99	0.01	$\pm(2.0\% \text{ rdg} + 2\text{dgt})$
	10.0 ÷ 49.9	0.1	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$
	50.0 ÷ 99.9		
100	0.01 ÷ 9.99	0.01	$\pm(2.0\% \text{ rdg} + 2\text{dgt})$
	10.0 ÷ 99.9	0.1	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$
	100 ÷ 199	1	
250	0.01 ÷ 9.99	0.01	$\pm(2.0\% \text{ rdg} + 2\text{dgt})$
	10.0 ÷ 99.9	0.1	
	100 ÷ 249	1	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$
	250 ÷ 499		
500	0.01 ÷ 9.99	0.01	$\pm(2.0\% \text{ rdg} + 2\text{dgt})$
	10.0 ÷ 199.9	0.1	
	200 ÷ 499	1	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$
	500 ÷ 999		
1000	0.01 ÷ 9.99	0.01	$\pm(2.0\% \text{ rdg} + 2\text{dgt})$
	10.0 ÷ 199.9	0.1	
	200 ÷ 999	1	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$
	1000 ÷ 1999		

Open-circuit voltage: rated test voltage -0% +10%
 Rated measuring current: >1mA with 1k Ω x V_{nom} (50V, 100V, 250V, 1000V), >2.2mA with 230k Ω @ 500V
 Short-circuit current: <6.0mA for each test voltage
 Safety protection: error message for input voltage >10V

LINE/LOOP IMPEDANCE P-P, P-N, P-PE – TT/TN SYSTEMS

Range (Ω)	Resolution (Ω) (*)	Accuracy
0.01 ÷ 19.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
20.0 ÷ 199.9	0.1	

(*) 0.1m Ω in range 0.1 ÷ 199.9 m Ω (by using the optional accessory IMP57)

Maximum test current: 3.31A (at 265V); 5.71A (at 457V)
 P-N/P-P Test voltage: (100V \pm 265V) / (100V \pm 460V); 50/60Hz \pm 5%
 Protection types: MCB (B, C, D, K), Fuse (aM, gG, BS882-2, BS88-3, BS3036, BS1362)

TEST ON RCD PROTECTION (MOLDED-CASE TYPE)

Differential protection type (RCD):	AC (⌚), A (⌚), General (G), Selective (S) and B (⌚)
Voltage range P-PE, P-N:	100V ÷ 265V RCD type A, A and B ($I_{\Delta N} \leq 100\text{mA}$), 190V ÷ 265V RCD type B ($I_{\Delta N} = 300\text{mA}$)
Voltage range N-PE:	<10V
Rated tripping currents ($I_{\Delta N}$):	6mA, 10mA, 30mA, 100mA, 300mA, 500mA, 650mA, 1000mA
Frequency:	50/60Hz ± 5%

RCD tripping current (for General RCDs only)

Type RCD	$I_{\Delta N}$	Range $I_{\Delta N}$ (mA)	Resolution (mA)	Accuracy
A, AC, B	6mA, 10mA	$(0.2 \div 1.1) I_{\Delta N}$	$0.1 I_{\Delta N}$	- 0%, +10% $I_{\Delta N}$
A, AC, B	$30\text{mA} \leq I_{\Delta N} \leq 300\text{mA}$			- 0%, +5% $I_{\Delta N}$
AC, A	$500\text{mA} \leq I_{\Delta N} \leq 650\text{mA}$			

Measurement RCD tripping time – TT/TN systems

	x 1/2		x 1		x 5		AUTO		AUTO+		
	\	G	S	G	S	G	S	G	S	G	S
6mA	AC	999	999	999	999	50	150	✓	✓	310	✓
	A	999	999	999	999	50	150	✓	✓	310	✓
	B	999	999	999	999					310	
10mA	AC	999	999	999	999	50	150	✓	✓	310	✓
	A	999	999	999	999	50	150	✓	✓	310	✓
	B	999	999	999	999					310	
30mA	AC	999	999	999	999	50	150	✓	✓	310	✓
	A	999	999	999	999	50	150	✓	✓	310	✓
	B	999	999	999	999					310	
100mA	AC	999	999	999	999	50	150	✓	✓	310	
	A	999	999	999	999	50	150	✓	✓	310	
	B	999	999	999	999					310	
300mA	AC	999	999	999	999	50	150	✓	✓	310	
	A	999	999	999	999	50	150	✓	✓	310	
	B	999	999	999	999					310	
500mA 650mA	AC	999	999	999	999	50	150	✓	✓	310	
	A	999	999	999	999					310	
	B										
1000mA	AC	999	999	999							
	A	999	999								
	B										

Table with duration of tripping time measurement [ms] - Resolution: 1ms, Accuracy: ±(2.0%reading + 2digits)

Measurement RCD tripping time – IT systems

	x 1/2		x 1		x 5		AUTO		AUTO+		
	\	G	S	G	S	G	S	G	S	G	S
6mA	AC	999	999	999	999	50	150	✓	✓	310	✓
10mA	A	999	999	999	999	50	150	✓	✓	310	✓
30mA	B	999	999	999	999					310	
100mA	AC	999	999	999	999	50	150	✓	✓	310	
300mA	A	999	999	999	999	50	150	✓	✓	310	
	B	999	999	999	999					310	
500mA	AC	999	999	999	999	50	150	✓		310	
650mA	A	999	999	999	999			✓		310	
	B										
1000mA	AC	999	999	999	999						
	A	999	999								
	B										

Table with duration of tripping time measurement [ms] - Resolution: 1ms, Accuracy: ±(2.0%reading + 2digits)

**FIRST FAULT CURRENT – IT SYSTEMS**

Range (mA)	Resolution (mA)	Accuracy
0.1 ÷ 0.9	0.1	±(5.0% rdg + 1dgt)
1 ÷ 999	1	±(5.0% rdg + 3dgt)

Limit contact voltage (ULIM) : 25V, 50V

OVERALL EARTH RESISTANCE WITHOUT RCD TRIPPING

Voltage range P-PE, P-N:	100V ÷ 265V
Voltage range N-PE:	<10V
Frequency:	50/60Hz ± 5%

Overall earth resistance in systems with Neutral (3-wire) – (30mA or higher RCD)

Range (Ω)	Resolution (Ω)	Accuracy
0.05 ÷ 9.99	0.01	± (5.0% rdg + 8dgt)
10.0 ÷ 199.9	0.1	

Overall earth resistance in systems with Neutral (3-wire) – (6mA and 10mA RCD)

Range (Ω)	Resolution (Ω)	Accuracy
0.05 ÷ 9.99	0.01	± (5.0% rdg + 30dgt)
10.0 ÷ 199.9	0.1	

Overall earth resistance in systems without Neutral (2-wire) – (30mA or higher RCD)

Range (Ω)	Resolution (Ω)	Accuracy
0.05 ÷ 9.99	0.01	± (5.0% rdg + 8dgt)
10.0 ÷ 99.9	0.1	
100 ÷ 1999	1	

Overall earth resistance in systems without Neutral (2-wire) – (6mA and 10mA RCD)

Range (Ω)	Resolution (Ω)	Accuracy
0.05 ÷ 9.99	0.01	± (5.0% rdg + 30dgt)
10.0 ÷ 99.9	0.1	
100 ÷ 1999	1	

Contact voltage

Range [V]	Resolution [V]	Accuracy
0 ÷ Ut LIM	0.1	-0%, +(5.0%rdg + 3V)

PHASE ROTATION WITH 1 TEST LEAD

Voltage range P-N, P-PE[V]	Frequency range
100 ÷ 265	50Hz/60Hz ± 5%

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



2. GENERAL SPECIFICATIONS

MECHANICAL CHARACTERISTICS

Dimensions (L x W x H):	225 x 165 x 75mm (9 x 6 x 3in)
Weight (batteries included):	1.2kg (42 ounces)
Mechanical protection:	IP40

MEMORY AND PC CONNECTIONS

Memory:	999 locations, 3 mark levels
PC connection:	optical/USB port

DISPLAY

Characteristics:	COG Black/white graphic LCD, 320x240pxl
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POWER SUPPLY

Battery type:	6x1.5V alkaline batteries type AA IEC LR06 or 6 x1.2V rechargeable NiMH type AA
Battery life:	> 500 tests for each function
Auto Power OFF:	after 5 minutes' idling (if activated)

ENVIRONMENTAL CONDITIONS FOR USE

Reference temperature:	23°C ± 5°C (73°F ± 41°F)
Operating temperature:	0°C ÷ 40°C (32°F ÷ 104°F)
Allowable relative humidity:	<80%RH
Storage temperature:	-10°C ÷ 60°C (14°F ÷ 140°F)
Storage humidity:	<80%RH
Max. operating altitude:	2000m (6562ft)

REFERENCE GUIDELINES

Safety:	IEC/EN61010-1, IEC/EN61010-2-030, IEC/EN61010-2-033 IEC/EN61010-2-034, IEC/EN61557-1
EMC :	IEC/EN61326-1
Technical documentation:	IEC/EN61187
Safety of accessories:	IEC/EN61010-031
Insulation:	double insulation
Pollution level:	2
Measurement category:	CAT IV 300V to earth, maximum 415V between inputs
RPE:	IEC/EN61557-4, BS7671 17th ed., AS/NZS3000/3017
MΩ:	IEC/EN61557-2, BS7671 17th ed., AS/NZS3000/3017
RCD:	IEC/EN61557-6 (only on Phase-Neutral-Earth systems)
LOOP P-P, P-N, P-PE:	IEC/EN61557-3, BS7671 17th ed., AS/NZS3000/3017
Multifunction:	IEC/EN61557-10, BS7671 17th ed., AS/NZS3000/3017
Short-circuit current:	EN60909-0

This instrument satisfies the requirements of Low Voltage Directive 2014/35/EU (LVD) and of EMC Directive 2014/35/EU

This instrument satisfies the requirements of European Directive 2011/65/EU (RoHS) and 2012/19/EU (WEEE)