



1. ELECTRICAL SPECIFICATIONS

Accuracy is indicated as \pm (% readings + no. of digits*resolution) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, <80%HR

Voltage (RCD, LOOP, Phase sequence)

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

Frequency

| Range [Hz] | Resolution [Hz] | Accuracy |
|-------------|-----------------|--|
| 47.0 ÷ 63.6 | 0.1 | $\pm(0.1\% \text{ rdg} + 1\text{dgt})$ |

Continuity test on protective and equalizing conductors

| Range [Ω] | Resolution [Ω] | Accuracy (*) |
|--------------------|-------------------------|--|
| 0.01 ÷ 19.99 | 0.01 | $\pm(5.0\% \text{ rdg} + 3\text{dgt})$ |
| 20.0 ÷ 99.9 | 0.1 | |

(*) calibrate the cables to null their resistance

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

Open-circuit voltage: $4\text{V} \leq V_0 \leq 12\text{V}$

Insulation resistance (DC voltage)

| Test voltage[V] | Range [$M\Omega$] | Resolution [$M\Omega$] | Accuracy |
|-----------------|---------------------|--------------------------|--|
| 50 | 0.01 ÷ 9.99 | 0.01 | $\pm(2.0\% \text{ rdg} + 2\text{dgt})$ |
| | 10.0 ÷ 49.9 | 0.1 | |
| | 50.0 ÷ 99.9 | 0.1 | $\pm(5.0\% \text{ rdg} + 2\text{dgt})$ |
| 100 | 0.01 ÷ 9.99 | 0.01 | $\pm(2.0\% \text{ rdg} + 2\text{dgt})$ |
| | 10.0 ÷ 99.9 | 0.1 | |
| | 100.0 ÷ 199.9 | 0.1 | $\pm(5.0\% \text{ rdg} + 2\text{dgt})$ |
| 250 | 0.01 ÷ 9.99 | 0.01 | $\pm(2.0\% \text{ rdg} + 2\text{dgt})$ |
| | 10.0 ÷ 99.9 | 0.1 | |
| | 100 ÷ 499 | 1 | $\pm(5.0\% \text{ rdg} + 2\text{dgt})$ |
| 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 | 1 | |
| 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 | 1 | |

Open-circuit voltage: nominal test voltage $-0\% +10\%$

Short circuit current: <6.0mA at 500V test voltage

Nominal test current: >1mA if load= $1\text{k}\Omega \cdot V_{\text{nom}}$ ($V_{\text{nom}}=50\text{V}, 100\text{V}, 250\text{V}, 500\text{V}, 1000\text{V}$)

Safety protection: the display shows an error message for input voltage >10V

Z Line (Line-Line, Line-Neutral, Line-PE)

| Range [Ω] | Resolution [Ω] | Accuracy |
|----------------------------|-------------------------|--|
| 0.00 ÷ 199.9 $m\Omega$ (*) | 0.1 $m\Omega$ (*) | $\pm(5.0\% \text{ rdg} + 1\text{m}\Omega)$ (*) |
| 200 ÷ 1999 $m\Omega$ (*) | 1 $m\Omega$ (*) | |
| 0.01 ÷ 9.99 Ω | 0.01 Ω | $\pm(5.0\% \text{ rdg} + 3\text{dgt})$ |
| 10.0 ÷ 199.9 Ω | 0.1 Ω | |

(*) By means of IMP57 optional accessory

Maximum test current: 5.81A (at 265V); 10.10A (at 457V)

Test voltage ranges: 100÷265V (Line-Neutral) / 100÷460V (Line-Line); 50/60Hz $\pm 5\%$

Protection type: MCB (B, C, D, K), Fuse (gG, aM)

Insulation materials: PVC, Rubber butyl, EPR, XLPE





First fault current (IT systems)

| Range (mA) | Resolution (mA) | Accuracy |
|------------|-----------------|--|
| 0.1 ÷ 0.9 | 0.1 | $\pm(5.0\% \text{ rdg} + 1\text{dgt})$ |
| 1 ÷ 999 | 1 | $\pm(5.0\% \text{ rdg} + 3\text{dgt})$ |

Limit contact voltage (ULIM) :

25V, 50V







RCD test (Molded case type)

RCD type: AC () , A () , B () – General (G), Selective (S) and Delayed ()
 Rated tripping currents (I Δ N):: 10mA, 30mA, 100mA, 300mA, 500mA, 650mA, 1000mA
 Line-PE, Line-N voltage: 100V \pm 265V RCD type AC and A, 190V \pm 265V RCD type B
 Frequency: 50/60Hz \pm 5%

RCD tripping current (Molded case type – RCD General)







| RCD type | I Δ N | Range I Δ N [mA] | Resolution [mA] | Accuracy I Δ N |
|----------|---------------------------------------|-------------------------------|-------------------------|------------------------|
| AC, A | I Δ N = 10mA | (0.3 \div 1.1) I Δ N | \leq 0.1 I Δ N | - 0%, +10%I Δ N |
| | 10mA <I Δ N \leq 650mA | | | - 0%, +5%I Δ N |
| B | 30mA \leq I Δ N \leq 100mA | | | |

RCD Molded type tripping time range [ms] (TT/TN system)

| | \ | x 1/2 | | | x 1 | | | x 2 | | x 5 | | AUTO | | |  | | |
|----------------|----|-------|-----|---|-----|-----|---|-----|-----|---|-----|------|---|---|---|---|--|
| | | G | S |  | G | S |  | G | S |  | G | S |  | G | S |  | |
| 10mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | B | | | | | | | | | | | | | | | | |
| 30mA 100mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | B | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | 310 | | |
| 300mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | B | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | 310 | | |
| 500mA 650mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | | | | | | 310 | | |
| | B | | | | | | | | | | | | | | | | |
| 1000mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | | | | | | | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |

 Resolution: 1ms, Accuracy: \pm (2.0%rdg + 2dgt)

RCD Molded type tripping time range [ms] (IT system)

| | \ | x 1/2 | | | x 1 | | | x 2 | | x 5 | | AUTO | | |  | | |
|------------------------|----|-------|-----|---|-----|-----|---|-----|-----|---|-----|------|---|---|---|---|--|
| | | G | S |  | G | S |  | G | S |  | G | S |  | G | S |  | |
| 10mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| 30mA 100mA 300mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| 500mA 650mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | 310 | | |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| 1000mA | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | | | | | | | | |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |

 Resolution: 1ms, Accuracy: \pm (2.0%rdg + 2dgt)

Test on earth leakage delay tester RCDs (with RCDX10 optional accessory)

| | |
|--|---|
| RCD type: | AC (⌚), A (⌚), B (⌚) – General (G), Selective (S) and Delayed (⌚) |
| Rated tripping currents (I _{ΔN}):: | 0.3A ÷ 10A |
| Line-PE, Line-N voltage: | 100V ÷ 265V RCD type AC and A, 190V ÷ 265V RCD type B |
| Frequency: | 50/60Hz ± 5% |

Earth leakage delay tester RCDs tripping current (RCD General)

| RCD type | I _{ΔN} | Range I _{ΔN} [mA] | Resolution [mA] | Accuracy I _{ΔN} |
|----------|-------------------------------|-----------------------------|-----------------------|---------------------------|
| AC, A, B | 300mA ≤ I _{ΔN} ≤ 10A | (0.3 ÷ 1.1) I _{ΔN} | ≤ 0.1 I _{ΔN} | - 0%, +5% I _{ΔN} |

Earth leakage delay tester RCDs trip out time range [ms] (TT/TN system)

| | \ | x 1/2 | | | x 1 | | | x 2 | | x 5 | | AUTO | | | 📈 | | |
|--------------------|----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---|---|---|---|-----|
| | | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | |
| 0.3A ÷ 1.0A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | B | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | | | 310 |
| 1.1A ÷ 3.0A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | B | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | | | |
| 3.1A ÷ 6.5A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | B | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | | | |
| 6.6A ÷ 10.0A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | | | | | | | | |
| | A | 999 | 999 | 999 | 999 | 999 | 999 | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |

Resolution: 1ms, Accuracy: ±(2.0%rdg + 2dgt)

Earth leakage delay tester RCDs trip out time range [ms] (IT system)

| | \ | x 1/2 | | | x 1 | | | x 2 | | x 5 | | AUTO | | | 📈 | | |
|--------------------|----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---|---|---|---|-----|
| | | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | G | S | ⌚ | |
| 0.3A ÷ 3.0A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| 3.1A ÷ 6.5A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | 50 | 150 | ✓ | ✓ | | | | 310 |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| 6.6A ÷ 10.0A | AC | 999 | 999 | 999 | 999 | 999 | 999 | 200 | 250 | | | | | | | | |
| | A | | | | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |

Resolution: 1ms, Accuracy: ±(2.0%rdg + 2dgt)

R_A – Non-trip earth loop impedance

Test voltage: 100÷265V (Line-PE), 50/60Hz ± 5%

R_A – Systems with Neutral wire

| Range [Ω] | Resolution [Ω] | Accuracy |
|--------------|----------------|-------------------------|
| 0.01 ÷ 9.99 | 0.01 | -0%, +(5.0% rdg + 0.1Ω) |
| 10.0 ÷ 199.9 | 0.1 | -0%, +(5.0% rdg + 1Ω) |
| 200 ÷ 1999 | 1 | -0%, +(5.0% rdg + 3Ω) |

Test current: ~10mA

R_A – Systems without Neutral wire

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

 Test current: < ½ I_{ΔN} set

**Contact voltage (RCD and Ra test)**

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

Phase sequence rotation with 1-wire method

| 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**)

Voltage drop on main power lines ($\Delta V\%$)

| Range (%) | Resolution (%) | Accuracy |
|-----------|----------------|---------------------|
| 0 ÷ 100 | 0.1 | ±(10.0% rdg + 4dgt) |

Leakage current (by HT96U optional clamp transducer)

| Range [mA] | Resolution [mA] | Accuracy |
|-------------|-----------------|--------------------|
| 0.5 ÷ 999.9 | 0.1 | ±(5.0% 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 lux probe is according to Class AA

Measurement of main parameters and harmonics (PQA)

AC TRMS Voltage

| Range [V] | Resolution [V] | Accuracy |
|--------------|----------------|-------------------|
| 15.0 ÷ 459.9 | 0.1V | ±(1.0%rdg + 1dgt) |

Allowed crest factor ≤ 1,5 ; Frequency: 42.5 ÷ 69.0 Hz

Frequency

| Range [Hz] | Resolution [Hz] | Accuracy |
|-------------|-----------------|-------------------|
| 42.5 ÷ 69.0 | 0.01 | ±(2.0%rdg + 2dgt) |

Allowed voltage: 15.0 ÷ 459.9V ; Allowed current: 5%FS clamp ÷ FS clamp

AC TRMS Current

| FS clamp | Range [A] | Resolution [A] | Accuracy |
|------------------|---------------|----------------|--|
| ≤ 10A | 5% FS ÷ 9.99 | 0.01 | 1Ph: ±(1.0%rdg + 3 dgt) 3Ph: ±(2.0%rdg + 5 dgt) |
| 10A ≤ FS ≤ 200 | 5% FS ÷ 199.9 | 0.1 | |
| 200A ≤ FS ≤ 3000 | 5% FS ÷ 2999 | 1 | |

Range: 5 ÷ 999.9 mV; Values under 5mV are zeroed

Allowed crest factor ≤ 3; Frequency: 42.5 ÷ 69.0 Hz

Active power (@ 230V in 1Ph systems, 400V in 3Ph systems, cosφ=1, f=50.0Hz)

| FS clamp | Range [kW] | Resolution [kW] | Accuracy |
|-------------------|---------------|-----------------|--|
| ≤ 10A | 0.000 ÷ 9.999 | 0.001 | 1Ph: ±(2.0%rdg + 5 dgt) 3Ph: ±(2.5%rdg + 8 dgt) |
| 10A ≤ FS ≤ 200 | 0.00 ÷ 999.99 | 0.01 | |
| 200A ≤ FS ≤ 1000 | 0.0 ÷ 999.9 | 0.1 | |
| 1000A ≤ FS ≤ 3000 | 0 ÷ 9999 | 1 | |

Potenza Reattiva (@ 230V in 1Ph systems, 400V in 3Ph systems, cosφ=0, f=50.0Hz)

| FS pinza | Range [kVAr] | Resolution [kVAr] | Accuracy |
|-------------------|---------------|-------------------|--|
| ≤ 10A | 0.000 ÷ 9.999 | 0.001 | 1Ph: ±(2.0%rdg + 7 dgt) 3Ph: ±(3.0%rdg + 8 dgt) |
| 10A ≤ FS ≤ 200 | 0.00 ÷ 999.99 | 0.01 | |
| 200A ≤ FS ≤ 1000 | 0.0 ÷ 999.9 | 0.1 | |
| 1000A ≤ FS ≤ 3000 | 0 ÷ 9999 | 1 | |

Power factor (@ 230V in 1Ph systems, 400V in 3Ph systems, f=50.0Hz)

| Range | Resolution | Accuracy |
|----------------------|------------|---|
| 0.70c ÷ 1.00 ÷ 0.70i | 0.01 | ±(4.0%rdg + 10dgt) if I ≤ 10%FS ±(2.0%rdg + 3dgt) if I > 10%FS |

cosφ (@ 230V in 1Ph systems, 400V in 3Ph systems, f=50.0Hz)

| Range | Resolution | Accuracy |
|----------------------|------------|---|
| 0.70c ÷ 1.00 ÷ 0.70i | 0.01 | ±(4.0%rdg + 10dgt) if I ≤ 10%FS ±(1.0%rdg + 7dgt) if I > 10%FS |

Voltage harmonics (@ 230V in 1Ph systems, 400V in 3Ph systems, f=50.0Hz)

| Range [%] | Resolution [%] | Order | Accuracy |
|-------------|----------------|---------|-------------------|
| 0.1 ÷ 100.0 | 0.1 | 01 ÷ 25 | ±(5.0%rdg + 5dgt) |

Frequency of fundamental: 42.5 ÷ 69.0 Hz, DC accuracy not declared

Current harmonics (f=50Hz)

| Range [%] | Resolution [%] | Order | Accuracy |
|-------------|----------------|---------|---------------------|
| 0.1 ÷ 100.0 | 0.1 | 01 ÷ 9 | ±(5.0%rdg + 5dgt) |
| | | 10 ÷ 17 | ±(10.0%rdg + 5dgt) |
| | | 18 ÷ 25 | ±(15.0%rdg + 10dgt) |



2. GENERAL SPECIFICATIONS

DISPLAY AND MEMORY:

| | |
|----------------|--|
| Features: | Touch screen, color graphic LCD, 320x240mm |
| Memory: | 999 locations, 3 marker levels |
| Communication: | Optical-USB and built-in WiFi |

POWER SUPPLY:

| | |
|-----------------|--|
| Batteries: | 6 x 1.2V(rechargeable) type AA or 6 x 1.5V type AA |
| Battery life: | > 500 test for each funtions |
| Auto Power OFF: | after 5 min of idleness (disabled) |

MECHANICAL FEATURES:

| | |
|------------------------------|------------------|
| Dimensions (L x W x H): | 225 x 165 x 75mm |
| Weight (included batteries): | 1.2kg |

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/EN61557-4 |
| Insulation resistance: | IEC/EN61557-2 |
| Fault loop impedance: | IEC/EN61557-3 |
| RCD test: | IEC/EN61557-6 |
| Phase sequence: | IEC/EN61557-7 |
| Multifunction: | IEC/EN61557-10 |
| Prospective short circuit current: | EN60909-0 |
| Earth resistance on TN systems: | EN61936-1 + EN50522 |

GENERAL REFERENCE STANDARDS:

| | |
|----------------------------------|--|
| Safety of measuring instruments: | IEC/EN61010-1, IEC/EN61010-031, IEC/EN61010-2-032 |
| Product type standard: | IEC/EN61557-1 |
| Technical documentation : | IEC/EN61187 |
| Insulation: | double insulation |
| Pollution degree: | 2 |
| Encapsulation : | IP40 |
| Overvoltage category: | CAT III 240V~ (to ground), max 415V between inputs |
| Max height of use: | 2000m |

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