MACROEVTEST
Professional
Installation
Safety Tester

HT Instruments MACROEVTEST Professional Installation Safety Tester Owner's Manual

Contents

HT Instruments MACROEVTEST Professional Installation Safety Tester

ELECTRICAL SPECIFICATIONS

- Accuracy is indicated as ± (% readings + no. of digits*resolution) at 23°C ± 5°C, <80%RH

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)

Continuity test on protective and equalizing conductors

Range [WΩ]	Resolution [Ω]	Accuracy (*)
0.01 ÷ 99.99	0.01	±(5.0%rdg + 3dgt)

(*) calibrate the cables to null their resistance

- Test current: > 200mA DC for R≤5Ω (calibration included) ; Resolution for DC current :1mA
- Open-circuit voltage: 4V ≤ V0 ≤ 12V

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 ÷ 99.9	0.1	
	100 ÷ 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: nominal test voltage –0% +10%
- Short circuit current: <6.0mA at 500V test voltage
- Nominal test current: >1mA if load= 1kΩ*Vnom (Vnom=50V, 100V, 250V, 500V, 1000V)
- 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**Ω** (*)	0.1 m**Ω** (*)	±(5.0% rdg + 1m**Ω**) (*)
200 ¸ 1999 m**Ω** (*)	1 m**Ω** (*)	
0.01 ¸ 9.99 **Ω**	0.01 **Ω**	±(5.0% rdg + 3dgt)
10.0 ¸ 199.9 **Ω**	0.1 **Ω**	

(*) By means of the 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 ± 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	±(5.0% rdg + 1dgt)
1 ¸ 999	1	±(5.0% rdg + 3dgt)

- 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 ($I\Delta N$):: 6mA, 10mA, 30mA, 100mA, 300mA, 500mA, 650mA, 1000mA
- Line-PE, Line-N voltage: 100V÷ 265V RCD type AC and A, 190V÷ 265V RCD type B
- Frequency: 50/60Hz ± 5%

RCD tripping current (Molded case type – RCD General)

RCD type	$I\Delta N$	Range $I\Delta N$ [mA]	Resolution [mA]	Accuracy $I\Delta N$
AC, A, B	6mA,10mA	(0.2 ÷1.1) $I\Delta N$	£ 0.1 $I\Delta N$	– 0%, +10%$I\Delta N$
AC, A, B	30mA ≤$I\Delta N$ ≤300mA			– 0%, +5%$I\Delta N$
AC, A	500mA ≤$I\Delta N$ ≤650mA			

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

		x 1/2				x 1			x 2			x 5		AUTO						AUTO+			
	\	G	S		G	S		G	S		G	S		G	S		G	S		G	S	
6mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	A	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	B	999	999	999	999	999	999										310					

10mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	A	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	B	999	999	999	999	999	999										310					
30mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	A	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	B	999	999	999	999	999	999										310					
100mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	A	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	B	999	999	999	999	999	999										310					
300mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	A	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	B	999	999	999	999	999	999										310					
500mA **650mA**	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	A	999	999	999	999	999	999	160	210								310					
	B																					
1000mA	AC	999	999	999	999	999	999	160	210													
	A	999	999	999	999	999	999															
	B																					

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

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

		x 1/2				x 1			x 2			x 5		AUTO					AUTO+			
	\	G	S		G	S		G	S		G	S		G	S		G	S		G	S	
6mA 10mA 30mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310			✓		
	A																					
	B																					
100mA 300mA 500mA 650mA	AC	999	999	999	999	999	999	160	210		50	150		✓	✓		310					
	A																					
	B																					
1000 mA	AC	999	999	999	999	999	999	160	210													
	A																					
	B																					

- **Resolution**: 1ms, Accuracy: ± (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 (IΔN):** 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	IDN	Range IDN [mA]	Resolution [mA]	Accuracy IDN
AC, A, B	300mA ≤IDN £1A	(0.3 ÷ 1.1) I_{DN}	≤ 0.1IΔ_N	– 0%, +5%IΔ_N
AC, A	1.1A ≤IDN £10A			

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

		x 1/2				x 1			x 2			x 5		AUTO					AUTO+
	\	G	S		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		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)

NoTripTest – Non-trip earth loop impedance

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

NoTripTest – Systems with Neutral wire

Range [Ω]	**Resolution [Ω]**	**Accuracy (*)**
0.01 ÷ 9.99	0.01	±(5% reading + N/10)
10.0 ÷ 199.9	0.1	±(5% reading + N)
200 ÷ 1999	1	±(5% reading + 3N)

- If $I_{\Delta N}$ <30mA, test current = $I_{\Delta N}$/2 and N[Ω]=30/$I_{\Delta N}$ **Ω**; if $I_{\Delta N}$ ≥ 30mA, test current <15mA and N=1Ω

NoTripTest – Systems without Neutral wire

Range [Ω]	**Resolution [Ω]**	**Accuracy (*)**
1 ÷ 1999	1	-0%, +(5.0% lettura +N)

Contact voltage (RCD and NoTripTest)		
Range [V]	**Resolution [V]**	**Accuracy**
0 ÷ Utlim	0.1	-0%, +(5.0% rdg + 3V)

Contact voltage (EARTH test – TT system)		
Range [V]	**Resolution [V]**	**Accuracy**
0 ÷ 99.9	0.1	-0%, +(5.0% rdg + 3V)

Contact voltage (EARTH test – TN system)		
Range [V]	**Resolution [V]**	**Accuracy**
0 ÷ 99.9	0.1	-0%, +(5.0% rdg + 3V)
100 ÷ 999	1	

Ground resistance with 3-wire method		
Range [Ω]	**Resolution [Ω]**	**Accuracy (*)**
0.01 ÷ 9.99	0.01	±(5.0% rdg + 3dgt)
10.0 ÷ 99.9	0.1	
100 ÷ 999	1	
1.00k ÷ 49.99k	0.01k	

- Test current: <10mA – 77.5Hz, Open-circuit voltage: < 20Vrms
- (*) Add 5% to the accuracy if the probe resistances (Rs or Rh) > 100 x Rmeas

Soil resistivity with 4-wire Wenner method		
Range [Ωm]	**Resolution [Ωm]**	**Accuracy (*)**
0.06 ÷ 9.99	0.01	±(5.0% rdg + 3dgt)
10.0 ÷ 99.9	0.1	
100 ÷ 999	1	
1.00k ÷ 9.99k	0.01k	
10.0k ÷ 99.9k	0.1k	
100k ÷ 999k	1k	
1.00M ÷ 3.14M	0.01M	

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

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 (DV%)		
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, cosθ=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	

Reactive power (@ 230V in 1Ph systems, 400V in 3Ph systems, cosθ=0, f=50.0Hz)

FS clamp	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

cosθ (@ 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)

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°C ÷ 40°C
- Relative humidity: <80%RH
- Storage temperature: -10°C ÷ 60°C
- Storage humidity: <80%RH

TEST VERIFIES REFERENCE STANDARDS

- Continuity test with 200mA: IEC/EN61557-4
- Insulation resistance: IEC/EN61557-2
- Earth resistance: IEC/EN61557-5
- 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
- Test on EVSE devices: IEC/EN61851-1, IEC/EN60364-7-722 (with EV-TEST100)

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 IV 300V~ (to ground), max 415V between inputs
- **Max height of use**: 2000m

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)

- Rivium 2e straat 12 2909 LG Capelle a/d IJssel
- T: 010-2 888 OOO
- F: 010-2 888 010
- verkoop@euro-index.nl
- www.euro-index.nl

Frequently Asked Questions

Q: What should I do if the tester displays an error message for input voltage?
A: If the input voltage exceeds 10V, disconnect the tester immediately to prevent damage and ensure safety.

Q: How do I select the appropriate test voltage range for insulation resistance testing?
A: Refer to the insulation materials used and choose the corresponding test voltage range as per the specifications provided.

Q: What are the recommended safety protections for conducting electrical tests?
A: Use MCB (B, C, D, K) or Fuse (gG, aM) as safety protection measures during testing to prevent electrical hazards.

Documents / Resources

	HT Instruments MACROEVTEST Professional Installation Safety Tester [pdf] Owner's Manual Rel 1.00 of 23-10-20, MACROEVTEST Professional Installation Safety Tester, MACROEVTEST, Professional Installation Safety Tester, Installation Safety Tester, Safety Tester

References

- User Manual