

# SIRIUS87 - MACROTEST5035

## MULTIFUNCTION INSTRUMENTS FOR COMPLETE TESTS ON CIVIL AND INDUSTRIAL ELECTRIC SYSTEMS

SIRIUS87 and MACROTEST5035 are capable of carrying out complete tests on civil and industrial electric systems in compliance with standard IEC/EN61557-1. Thanks to their simple and intuitive use, these instruments allow saving all measurement results in their internal memory and transferring the saved data onto the PC by means of an optical interface in order to print useful measuring reports, to be attached to Declarations of Conformity, with the aid of the dedicated software supplied. SIRIUS87 and MACROTEST5035 also carry out loop/line impedance measurements and calculate the prospective short-circuit current with high-resolution (0.1mΩ) with the aid of the optional accessory IMP57. In this way, it is possible to obtain precise measurement results, also near HV/LV transformation cabs, where the inductive effect due to the presence of the transformer is significant, and therefore also allows correctly choosing the appropriate protections in industrial systems.

### FUNCTIONS

- Continuity of protective conductors with 200mA
- Insulation resistance with 50,100,250, 500,1000VDC
- Line/Loop impedance Phase-Phase, Phase-Neutral, Phase-PE also with high-resolution (0.1mΩ), with optional accessory IMP57
- Prospective short circuit current
- Contact voltage
- AC voltage and frequency
- Tripping time and current on RCDs type A, AC General and Selective with 10,30,100,300,500mA
- Global earth resistance without RCD tripping
- Earth resistance by 2-wire and 3-wire method
- Ground resistivity with 4-wire method
- Phase sequence indication
- Storage in memory up to 350 measurement results
- Optical/USB interface for communication to PC
- Power supply: 6x1.5V alkaline batteries type AA LR03
- Safety: IEC/EN61010-1, CAT III 265V (to ground), CAT III 460V (between inputs)
- Dimensions (LxWxH): 222x165x105mm
- Weight (batteries included): 1.2kg

### ACCESSORIES

#### Standard

	Code
3-terminal cable with SHUKO plug	C2033X
Set of 4 cables + 4 alligator clips + 2 test leads	KITGSC5
Set of 4 cables + 4 metal earth probes	KITERRNE
PC Windows software + optical / USB cable	TOPVIEW2006
Carrying bag	BORSA2051
ISO9000 calibration certificate	
User manual	

#### Optional

Accessory for Loop impedance with high resolution	IMP57
Set of straps for carrying belt	CN0050
Magnetic adapter for connection to screw heads	606-IECN
Safety flexible alligator clip	6007-IEC#

#### Optional accessories



IMP57- Accessory for measuring Loop Impedance with high resolution

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**SIRIUS87**  
HV000087-0201

**MACROTEST5035**  
HV005035-0201



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## 1. ELECTRICAL SPECIFICATIONS

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 ( $\Omega$ )	Resolution ( $\Omega$ )	Accuracy (*)
0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
10.0 $\div$ 99.9	0.1	

(\*) after cable calibration (which eliminates the cable resistance).

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

Resolution on current measurement: 1mA

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

### Insulation Resistance (DC voltage)

Test voltage(V)	Range (M $\Omega$ )	Resolution (M $\Omega$ )	Accuracy
50	0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 $\div$ 49.9	0.1	
	50.0 $\div$ 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$
100	0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 $\div$ 99.9	0.1	
	100.0 $\div$ 199.9	0.1	$\pm(5.0\%rdg + 2dgt)$
250	0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 $\div$ 199.9	0.1	
	200 $\div$ 249	1	$\pm(5.0\%rdg + 2dgt)$
	250 $\div$ 499	1	
500	0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 $\div$ 199.9	0.1	
	200 $\div$ 499	1	$\pm(5.0\%rdg + 2dgt)$
	500 $\div$ 999	1	
1000	0.01 $\div$ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 $\div$ 199.9	0.1	
	200 $\div$ 999	1	$\pm(5.0\%rdg + 2dgt)$
	1000 $\div$ 1999	1	

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

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

Nominal test current: <2.17mA on 230k $\Omega$  load (500V); >1mA su 1k $\Omega$  per Vnom (others)

Safety protection: error message at display for input voltage >30V

### RCDs Tripping time

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

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

RCDs type: AC, A, General and Selective

Phase-PE voltage: 100V  $\div$  265V

Frequency: 50Hz  $\pm$  0.5Hz



## Tripping current of RCDs

RCD type	I <sub>ΔN</sub>	Range I <sub>ΔN</sub> (mA)	Resolution (mA)	Accuracy I <sub>ΔN</sub>
AC	I <sub>ΔN</sub> ≤ 10mA	(0.5 ÷ 1.4) I <sub>ΔN</sub>	0.1 I <sub>ΔN</sub>	-0%, +(10.0% I <sub>ΔN</sub> )
A		(0.5 ÷ 2.4) I <sub>ΔN</sub>		
AC	I <sub>ΔN</sub> > 10mA	(0.5 ÷ 1.4) I <sub>ΔN</sub>	0.1 I <sub>ΔN</sub>	-0%, +(10.0% I <sub>ΔN</sub> )
A		(0.5 ÷ 2.0) I <sub>ΔN</sub>		

## Contact voltage U<sub>t</sub>

Range (V)	Resolution (V)	Accuracy
0 ÷ 2U <sub>tlim</sub>	0.1	-0%, +(5.0% rdg + 3dgt)

U<sub>tlim</sub> (UI): 25V, 50V

## Line Impedance (Phase-Phase, Phase-Neutral)

Range (Ω)	Resolution (Ω)	Accuracy (*)
0.01 ÷ 19.99	0.01	±(5.0% rdg + 3dgt)
20.0 ÷ 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<sub>A</sub> without RCDs tripping

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

Test current: 0.5 I<sub>ΔN</sub> set on U<sub>t</sub> 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: &lt;10mA – 77.5Hz

Open-circuit voltage: &lt; 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: &lt;10mA – 77.5Hz

Open-circuit voltage: &lt; 20V rms





# SIRIUS 87

Rel. 2.01 of 09/10/07

Instrument for safety test verify on electrical installations

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## 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)



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## 2. GENERAL SPECIFICATIONS

### DISPLAY AND MEMORY:

Features: LCD Custom 65x65mm  
Memory: 350 locations

### POWER SUPPLY:

Batteries: 6 batteries 1.5V type LR6-AA-AM3-MN 1500

### MECHANICAL FEATURES:

Dimensions: 225 (W)x165(L)x105(D) mm  
Weight (included batteries): about 1.2kg

### WORKING ENVIRONMENTAL CONDITIONS:

Reference temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$   
Working temperature:  $0^{\circ} \div 40^{\circ}\text{C}$   
Allowed relative humidity:  $< 80\% \text{ HR}$   
Storage temperature:  $-10 \div 60^{\circ}\text{C}$   
Storage humidity:  $< 80\% \text{ HR}$

### 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

### 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 III 460V~ (between inputs)  
CAT III 265V~ (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 2006/95/EEC (LVD) and EMC 2004/108/EEC**