



# INSULATION RESISTANCE METER MIC-5000



MIC-5000 tester is designed to measure insulation resistance of power cables, transformers, motors and other electrically powered devices. Additionally the device allows for measurement of AC and DC voltages. Input circuits of the measuring devices are electronically protected from overloading, e.g. due to incorrect connection to the circuit being tested or incorrect use of input terminals.

## Standard accessories of the meter MIC-5000:

- Ni-MH battery package 7,2V 3Ah
- test lead with banana plug; 1,8m; 5kV; red
- shielded test lead with banana plug; 1,8m; 5kV; black
- test lead with banana plug; 1,8m; 5kV; blue
- „crocodile” clip K04; 5kV; black
- „crocodile” clip K05; 5kV; red
- „crocodile” clip K05; 5kV; blue
- pin probe with banana connector - black

**WAAKU05**  
**WAPRZ1X8REBB**  
**WAPRZ1X8BLBB**  
**WAPRZ1X8BUBB**  
**WAKROBL20K04**  
**WAKRORE20K05**  
**WAKROBU20K05**  
**WASONBLOGB2**

- pin probe with banana connector - red
- carrying case L1
- hanging stramps
- cable for battery charger
- RS-232 serial transmission cable
- operating manual
- calibration certificate issued by calibration laboratory

**WASONREOGB2**  
**WAFUTL1**  
**WAPOZSZE1**  
**WAPRZLAD230**  
**WAPRZRS232**

## Optional accessories of the meter MIC-5000:

- software for creation of documentation from electrical measurements „SONEL PE4”
- software for creation drawings and diagrams „SONEL Schematic” + „SONEL PE4”

**WAPROPE4EN**  
**WAPROPE4SEN**

- AGT-16P (triple phase socket adapter)
- AGT-32P (triple phase socket adapter)
- AGT-63P (triple phase socket adapter)
- USB1.1/RS232 adaptor
- USB key for software

**WAADAAGT16P**  
**WAADAAGT32P**  
**WAADAAGT63P**  
**WAADAUSBR232**  
**WAADAKEY1**

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# MIC-5000

## The most important features of MIC-5000 are:

### • Insulation resistance measurement:

- test voltage selection between 250...5000V in 50V intervals, or predefined 250, 500, 1000, 2500, 5000V,
- on-line insulation resistance measurement or leakage current,
- automatic discharge of tested object's capacitance after measurement of insulation resistance,
- direct measurement of one or two absorption coefficients,
- acoustic determination of 5 seconds time intervals that facilitates to take time characteristics during insulation resistance measurement,
- saving measured value of test voltages and selected times  $T_1$ ,  $T_2$  and  $T_3$  ranging from 1... 600 seconds,
- indicator of the actual test voltage value during a measurement,
- protection against live objects.

### • AC/DC voltage measurement in range 0...600V.

### • Memory of 999 measurement results with an ability to transfer the data to a PC.

### • Automatic selection of measurement ranges.

### • Powered by rechargeable battery pack:

- included with the device an external power supply for automatic battery charging to ensure prolonged battery life and optimal working conditions,
- battery status indicator.

### • AUTO-OFF function.

### • Meter meets the requirements of the standard EN 61557.

#### Electric security:

- type of insulation double, according to EN 61010-1 and IEC 61557
- measurement category CAT III 600V acc. to EN 61010-1
- measurement category for terminals and circuit 5kV: interpolated III 5000V
- protection class acc. to EN 60529 IP54

#### Rated operational conditions:

- operating temperature -10...+50°C
- test voltage accuracy ( $R_{\text{test}}[\Omega] \geq 1000 \cdot U_i[V]$ ) -0...+10% of the set value
- voltage fluctuation due to temperature changes better than 0,2%/°C
- converter output current min. 1,0mA for rated test voltage  
1,0...3,0mA for 2500V  
1,0...1,4mA for 5000V

- measurement rate approx. 1 measure/second
- quality standard ISO 9001

#### Other technical data:

- power supply Ni-MH battery pack
- power supply adaptor 100...240V
- minimum measurement time 5kV/1mA according to EN 61557 (5s/25s) 5h or 600 measurements
- time to auto-off:  
- mode  $R_{\text{iso}}/I_L$  depends on  $T_2$  or  $T_3$  ( $T_2/T_3 + 300$  seconds) settings  
- other modes 300 seconds

## Insulation resistance measurement

- test voltage can be set in the range between 250V and 5000V with 50V intervals
- test voltage accuracy ( $R_{\text{test}}[\Omega] \geq 1000 \cdot U_i[V]$ ): 0 +10% of the set value
- voltage fluctuation due to temperature changes - better than 0,2% / °C
- measurement times  $T_1$ ,  $T_2$  and  $T_3$  for absorption coefficient measurement selected from the range between 1sec and 600sec with accuracy  $\pm 1$  sec

measurement range according to EN 61557-2:  $R_{\text{ISOmin}} \dots 5,0T\Omega$ ;  $R_{\text{ISOmin}} = U_{\text{ISOtest}}/1\text{mA}$

Range	Resolution	Accuracy
0,0...999,9kΩ	0,1kΩ	±(3% m.v. + 20 digits)
1,000...9,999MΩ	0,001MΩ	
10,00...99,99MΩ	0,01MΩ	
100,0...999,9MΩ	0,1MΩ	
1,000...9,999GΩ	0,001GΩ	
10,00...99,99GΩ	0,01GΩ	
100,0...999,9GΩ	0,1GΩ	
1,000...5,000TΩ	0,001TΩ	

- for measurements of limited converter current, the accuracy is not specified.

## Minimum insulation resistance measured without limited converter current

Test voltage	Range
250V	250kΩ
500V	500kΩ
1000V	1,0MΩ
2500V	2,5MΩ
5000V	5,0MΩ

## DC voltage measurement

Range	Resolution	Accuracy
0...600V	1V	±(3% m.v. + 2 digits)

## AC voltage measurement

50Hz (sinusoidal shape with harmonic contents < 2%)

Range	Resolution	Accuracy
0...600V	1V	±(3% m.v. + 2 digits)

„m.v.“ - measured value.

## Leakage current reading

Range	Resolution	Accuracy
0... $I_{\text{pmax}}$	depending on range	$-\Delta I_1, +\Delta I_1$

$I_{\text{pmax}}$  - maximum converter current  $1,2 \pm 0,2$  mA,

$\Delta I_1, +\Delta I_1$  - current reading accuracy calculated using the following formula:

$$\Delta I_- = U_{\text{ISO}} \cdot \left( \frac{1}{R} - \frac{1}{R + |\Delta R|} \right)$$

$$\Delta I_+ = U_{\text{ISO}} \cdot \left( \frac{1}{R - |\Delta R|} - \frac{1}{R} \right)$$

$U_{\text{ISO}}$  - test voltage

R - displayed insulation resistance value

$\Delta R$  - resistance measurement defined for a particular measurement