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# INSULATION RESISTANCE METER
# MIC-10k1 / MIC-5050

INSULATION RESISTANCE MEASUREMENT UP TO 40 TΩ IN ACCORDANCE WITH IEC 61557-2 MIC-10k1

CAT III 1000V

CAT IV 600V

EN 61557-2

Bluetooth
WIRELESS DATA TRANSMISION

NEW!

**Insulation resistance measurement:**
- up to 40 TΩ for MIC-10k,
- up to 20 TΩ for MIC-5050,

- measurement voltage any in the range of:
  - 50...5000 V for MIC-5050 (50...1000 V at 10 V and 1...5 kV at 25 V),
  - 50…10000 V for MIC-10k1 (50...1000 V at 10 V and 1...10 kV at 25 V),
- continuous indication of measured insulation resistance or leakage current,
- automatic discharge of measured object capacitance voltage after the end of insulation resistance measurement,
- acoustic signaling of 5 seconds intervals to facilitate capturing time characteristics,
- adjustable measuring time to 99'59'',
- metered $T_1$, $T_2$ and $T_3$ test times for measuring one or two absorption coefficients from the range of 1…600 s,
- polarization index (PI), absorption coefficients Ab1, Ab2 and dielectric absorption ratio (DAR) measurement,
- indication of actual test voltage during measurement,
- 1.2 mA, 3 mA and 5 mA test current,
- insulation resistance measurement using two- or three-wire method,
- measurements with test leads up to 20 m...
- protection against measuring live objects,
- automatic measurement of multiple core cables with the additional AutoISO-5000 adapter (for MIC-10k1 max. voltage 5 kV)
- measurement of capacitance during the measurement of $R_{ISO}$.
- measurement of temperature (with additional probe - WASONT1),
- step voltage insulation resistance measurement (SV),
- Dielectric Discharge calculation (DD),
- location of damage (burnout),

**- digital filters function for measurements in high noise environment,**
**- continuity measurement of protective connections and equipotential bonding in accordance with EN 61557-4 with current ≥ 200 mA,**
**- adjustable limits for measured resistance $R_{ISO}$ and $R_{CONT}$,**
**- measurement of leakage current during insulation resistance testing,**
**- DC and AC voltage measurement in the range of 0…750 V,**
**- drawing graphs on the display during measurement,**
**- innovative memory with possibility of description of: measurement points, facilities, names of customers.**
**- operating with mini Bluetooth keyboard (option),**
**- graphic LCD 5,6'' backlit,**
**- keyboard backlit,**
**- power supply from main power line or battery packs,**
**- built-in fast charger,**
**- the instruments meet the requirements of the EN 61557 standard.**

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# MIC-10k1 / MIC-5050

### Insulation resistance measurement

Measurement range acc. to IEC 61557-2 for MIC-5050 $U_N$ = 5000V: 5,00MΩ…20,0TΩ, for MIC-10k1 $U_N$ = 10000V: 10,0MΩ…40,0TΩ

| Range | Resolution | Accuracy |
|---|---|---|
| 0...999 kΩ | 1 kΩ | ±(3% m.v. + 10 digits) |
| 1,00..9,99 MΩ | 0,01 MΩ | |
| 10,0...99,9 MΩ | 0,1 MΩ | |
| 100..999 MΩ | 1 MΩ | |
| 1,00...9,99 GΩ | 0,01 GΩ | |
| 10,.0...99,9 GΩ | 0,1 GΩ | |
| 100...999 GΩ | 1 GΩ | ±(3.5% m.v. + 10 digits) |
| 1,00...9,99 TΩ | 0,01 TΩ | ±(7.5% m.v. + 10 digits) |
| 10,0...20,0 TΩ | 0,1 TΩ | ±(12.5% m.v. + 10 digits) |
| 10,0...40,0 TΩ* | | |

* - only for MIC-10k1, $U_N$= 10 kV

Values of measured resistance depending on measurement voltage

| Voltage $U_{iso}$ | Measurement range | AutoISO-5000 measurement range |
|---|---|---|
| 50 V | 200 GΩ | 20,0 GΩ |
| 100 V | 400 GΩ | 40,0 GΩ |
| 250 V | 1,00 TΩ | 100 GΩ |
| 500 V | 2,00 TΩ | 200 GΩ |
| 1000 V | 4,00 TΩ | 400 GΩ |
| 2500 V | 10,00 TΩ | 400 GΩ |
| 5000 V | 20,0 TΩ | 400 GΩ |
| 10 000 V* | 40,0 TΩ* | - |

* - only for MIC-10k1

### Step voltage insulation resistance measurement

| Voltage $U_{iso}$ | MIC-5050 | MIC-10k1 |
|---|---|---|
| 50...1000 V | 10 V | 10 V |
| 1000...5000 V | 25 V | 25 V |
| 5000...10000 V | - | 25 V |

### Continuity measurement of protective connections and equipotential bonding with 200 mA current

Measurement range acc. to EN 61557-4: 0,12...999 Ω

| Range | Resolution | Accuracy |
|---|---|---|
| 0,00...19,99 Ω | 0,01 Ω | ±(2% m.v. + 3 digits) |
| 20,0...199,9 Ω | 0,1 Ω | |
| 200...999 Ω | 1 Ω | ±(4% m.v. + 3 digits) |

- Voltage on open terminals: 4...24 V
- Output current at R < 15 Ω: min. 200 mA ($I_{SC}$: 200...250 mA)
- Compensation of test lead resistance
- Current flowing in both directions, mean value of resistance is displayed

### DC and AC voltage measurement

| Range | Resolution | Accuracy |
|---|---|---|
| 0,0...29,9 V | 0,1 V | ±(2% m.v. + 20 digits) |
| 30,0...299,9 V | 0,1 V | ±(2% m.v. + 6 digits) |
| 300...750 V | 1 V | ±(2% m.v. + 2 digits) |

- Frequency range 45...65Hz

### Measurement of capacitance

| Display range | Resolution | Accuracy |
|---|---|---|
| 0...999 nF | 1 nF | ±(5% m.v. + 5 digits) |
| 1,00...49,99 µF | 0,01 µF | |

- capacity measurement result is displayed after the $R_{ISO}$ measurement
- for measuring voltages under 100 V capacitance measurement accuracy not specified.

### Measurement of temperature

| Display range | Resolution | Accuracy |
|---|---|---|
| -40,0...99,9 °C | 1 °C | ±(3% m.v. + 8 digits) |
| -40,0...211,8 °F | 1 °F | ±(3% m.v. + 16 digits) |

## Standard accessories:

| | |
|---|---|
| - test lead banana plug; 3 m; 10kV; red | **WAPRZ003REBB10K** |
| - test lead „E" banana plug; 3 m; 10 kV; blue | **WAPRZ003BUBB10K** |
| - test lead banana plug; 1,8 m; 10 kV; black; shielded | **WAPRZ003BLBBE10K** |
| - USB cable | **WAPRZUSB** |
| - "crocodile" clip 5,5 kV; black | **WAKROBL32K07** |
| - "crocodile" clip 5,5 kV; red | **WAKRORE32K07** |
| - "crocodile" clip 5,5 kV; blue | **WAKROBU32K07** |
| - pin probe 5,5 kV with banana connector; red | **WASONREOGB5X5** |
| - pin probe 5,5 kV with banana connector; black | **WASONBLOGB5X5** |
| - carrying case L4 for accesories | **WAFUTL4** |
| - power cord | **WAPRZ1X8BLIEC** |
| - temperature probe ST-1 | |
| - battery pack (built-in) | **WASONT1** |
| - "SONEL Reader" software | |
| - calibration certificate | |

**Electrical safety:**

- type of insulation: double, EN 61010-1 and IEC 61557 compliant
- measurement category: IV 600 V (III 1000 V) according to EN 61010-1
- degree of housing protection acc. to EN 60529: IP40 (IP67 for closed enclosure)

**Other technical specifications:**

- power supply of the meter: 12 V gel battery; 90 V ÷ 260 V 50 Hz/60 Hz from the electric grid
- dimensions: 390 mm x 310 mm x 180 mm
- meter weight: approx. 7 kg
- storage temperature: -25°C...+70°C
- working temperature: -20°C...+50°C
- humidity: 20%...80%
- altitude (above sea level): ≤3000 m
- reference temperature: +23 °C ± 2 °C)
- reference humidity: 40%...60%
- display: LCD 5,6', segment-type
- transmission of measurement results: USB or *Bluetooth*
- number of $R_{ISO}$ measurements, acc. to EN 61557-2 with battery power supply: min. 1000
- quality standard: design, construction and manufacturing are ISO 9001, ISO 14001, PN-N-18001 compliant
- the device meets the requirements of the EN 61010-1 and IEC 61557 standards
- the product meets EMC requirements (immunity for industrial environment) according to

The acronym "m.v." stands for a "measured reference value".