Insulation Resistance Meter

MIC-5001

index: WMGBMIC5001

CAT IV
600 V
U_{ISO}≤2500 V

CAT III
1000 V
U_{ISO}≤2500 V

IP65

For measurement of wiring in houses

For measurement of wires and cables

For measurement of pole transformer substations

For measurement of street lighting power cables

For measurement of telephone wiring

For measurements of pre-insulated pipes

Measure insulation resistance up to 5 TΩ

Product features

- measurement voltage selected within the range of 50...500 V with steps of 50 V and from 500 to 5000 V with steps of 100 V
- continuous reading of measured insulation resistance or leakage current
- automatic discharge of the measured object's capacitance upon completion of insulation resistance measurement
- sound signalling of five-second time intervals, facilitating capture of time characteristics
- timing of measurement time T_1, T_2 and T_3 for measurement of dielectric absorption ratio (DAR) and polarization index (PI)
- reading of actual measurement voltage during measurement
- protection against measurement of live objects
- two- or three-lead method of insulation resistance measurement
- insulation resistance measurement according to the RampTest method and breakdown voltage measurement with ramping rate up to ~1 kV/s
- measurement of direct and alternating voltages within the range of 0...750 V
- 990-cell memory (11,880 entries), data transmission to PC via USB cable
- power supplied by accumulator
- instruments meet the requirements laid down by standard EN 61557
- the meter can be powered and charged from an external power adapter or from a car lighter socket

Application

Insulation resistance meter with adjustable testing voltage - up to 5 kV. It is a great tool for assessing the condition of electrical insulation in residential buildings, industry, railways and other facilities of general use. Due to its parameters - excellent performance, low power consumption from batteries, the option of charging them during measurements, convenience of use and a high ingress protection level - it is perfect for maintenance teams, testing motors, cables, street lighting or at the construction and maintenance of photovoltaic systems. The meter may be recommended to installers working on telecommunications and electric power systems that require the inspection of the insulation sleeve/sheath resistance ($U_N \leq 30$ kV) to the voltage of 5 kV applied for 5 minutes.

Features

The meter may be used to measure the insulation resistance using the adjustable test voltage up to 5000 V. When testing the cables, it automatically discharges their load at the moment of completing the measurement.
MIC-5001 allows the user to determine the insulation resistance by applying linearly increasing voltage with the slope of 1 kV/s, according to standard EEE Std 95TM-2002. This functionality is called RampTest.
In contrast the maximum test voltage, this slow and uniform method of applying test voltage protects the insulation against sudden “electrical stress”. This process may reveal defects that cannot be observed in classic R_{ISO} resistance measurement. If the tested insulation is weakened or defective, RampTest will enable the user to determine its maximum withstand voltage. In addition, this functionality is particularly useful in testing rotating machines or surge arresters.
The meter has a built-in voltmeter of AC and DC voltages in the range of up to 750 V. Extensive memory allows the device to record and send to a computer nearly 12,000 measurement results. Download Sonel Reader software from manufacturer’s website to analyse the measurement results and present them in graphic form, e.g. current or resistance values shown in a function of time.

Capabilities

An important advantage of the device is its ability to a sufficiently long operation after one recharging of batteries. Electricians performing tests on repetitive objects or at short intervals do not have to worry about batteries discharging before completing the task. In addition, during the measurement work, the user may recharge device from an external power source, e.g. a powerbank of 12 V/2 Ah.

Insulation resistance measurement

Measurement range acc. to IEC 61557-2 for $R_{ISOmin}=U_{ISOnom}/I_{ISOnom}$...5 TΩ

Range	Resolution	Accuracy
0.0...999.9 kΩ	0.1 kΩ	± (3% m.v. + 20 digits)
1.000...9.999 MΩ	0.001 MΩ	
10.00...99.99 MΩ	0.01 MΩ	
100.0...999.9 MΩ	0.1 MΩ	
1.000...9.999 GΩ	0.001 GΩ	
10.00...99.99 GΩ	0.01 GΩ	
100.0...999.9 GΩ	0.1 GΩ	
1.000...5.000 TΩ	0.001 TΩ	± (4% m.v. + 50 digits)

- max. short-circuit current I_{SC}: up to 1.5 mA

Values of measured resistance depending on measuring voltage

Voltage U_{ISO}	Measurement range
up to 100 V	50 GΩ
200 V...400 V	100 GΩ
500 V...900 V	250 GΩ
1000 V...2400 V	500 GΩ
2500 V	2500 GΩ
5000 V	5000 GΩ

RampTest insulation resistance measurement

Range	Resolution	Accuracy
0.0...999.9 kΩ	0.1 kΩ	±(5% m.v. + 40 digits)
1.000...9.999 MΩ	0.001 MΩ	
10.00...99.99 MΩ	0.01 MΩ	
100.0...999.9 MΩ	0.1 MΩ	
1.000...9.999 GΩ	0.001 GΩ	
10.00...99.99 GΩ	0.01 GΩ	
100.0...999.9 GΩ	0.1 GΩ	
1.000...4.999 TΩ	0.001 TΩ	

The measurement of breakdown voltage in RampTest mode

Range	Resolution	Chosen U_{ISO}	Accuracy
25.0 V...99.0 V	0.1 V	≤600 V	± (5% m.v. + 10 digits)
100 V...600 V	1 V	≤600 V	± (5% m.v. + 4 digits)
25 V...999 V	1 V	>600 V	± (5% m.v. + 5 digits)
1.00 kV...5.00 kV	10 V	>600 V	± (5% m.v. + 4 digits)

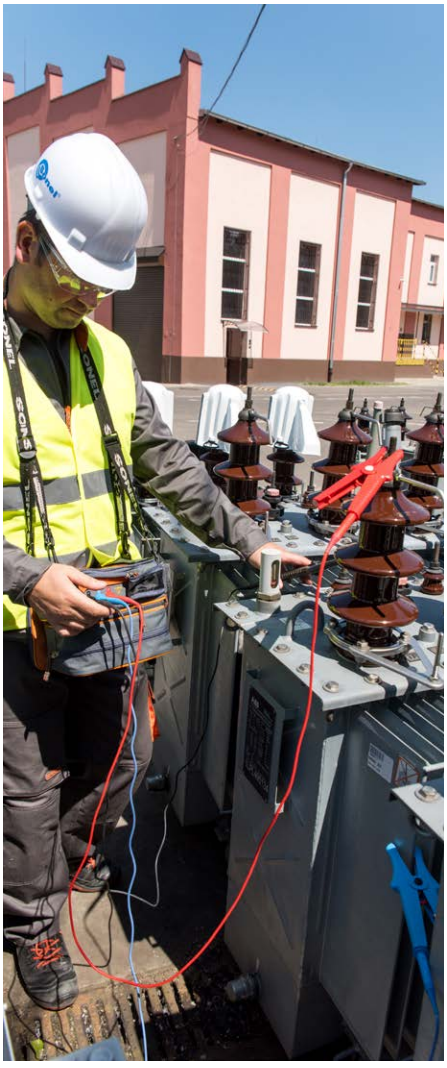
DC and AC voltage measurement

Range	Resolution	Accuracy
0...299.9 V	0.1 V	±(3% m.v. + 2 digits)
300...750 V	1 V	

- frequency range: 45...65 Hz

Technical specification

type of insulation acc. to EN 61010-1 and EN 61557	double
measurement category according to EN 61010-1	
for measuring voltage U_{ISO}≤2500 V	CAT III 1000 V (CAT IV 600 V)
for measuring voltage U_{ISO}>2500 V	CAT III 600 V (CAT IV 300 V)
degree of housing protection acc. to EN 60529	IP65
power supply of the meter	NiMH 9.6 V 2 Ah rechargeable battery
battery charging time	usually 4 h max. 10 h
parameters of the external power supply adapter	90 V...264 V 50 Hz...60 Hz
dimensions	200 x 150 x 75 mm 7.9” x 5.9” x 3.0”
meter weight	ca. 1.0 kg ca. 2.2 lbs
operating temperature	-15°C...+40°C 5°F...104°F
number of R_{ISO} measurements acc. to EN 61557-2	ca. 800
display	segment LCD
memory of measurement results	990 cells
data transmission	USB
quality standard for design, construction and manufacturing compliant with	ISO 9001 ISO 14001 PN-N-18001
the device meets the requirements of	EN 61557
the product meets EMC requirements (immunity for industrial environment) according to the following standards	EN 61326-1 EN 61326-2-2



Abbreviation „m.v.” used in the specification of measurement means a measured value.

Standard accessories

shielded test lead with banana plugs; 5 kV; 1.8 m; black

WAPRZ1X8BLBB

test lead with banana plugs; 5 kV; 1.8 m; red

WAPRZ1X8REBB

test lead with banana plugs; 5 kV; 1.8 m; blue

WAPRZ1X8BUBB

black “crocodile” clip 11 kV 32 A

WAKROBL32K09

red “crocodile” clip 11 kV 32 A

WAKRORE32K09

blue “crocodile” clip 11 kV 32 A

WAKROBU32K09

test probe with banana socket; 5 kV; black

WASONBLOGB2

test probe with banana socket; 5 kV; red

WASONREOGB2

USB cable

WAPRZUSB

meter power adapter (type Z7)

WAZASZ7

230 V power cord (IEC C7 plug)

WAPRZLAD230

M-8 carrying case

WAFUTM8

Factory calibration certificate

Optional accessories

test lead 5 m / 10 m, black, 5 kV (banana plugs, shielded)

WAPRZ005BLBBE5K
WAPRZ010BLBBE5K

test lead 5 m / 10 m, red, 5 kV (banana plugs, shielded)

WAPRZ005REBB5K
WAPRZ010REBB5K

test lead 5 m / 10 m, blue, 5 kV (banana plugs, shielded)

WAPRZ005BUBB5K
WAPRZ010BUBB5K

Cable for battery charging from car cigarette lighter socket (12 V)

WAPRZLAD12SAM

PRS-1 resistance test probe

WASONPRS1

CS-5kV calibration box

WAADACS5KV

Sonel Reader PC software

WAPROREADER

Calibration certificate with accreditation