

CAT III
1000 V

CAT IV
600 V

IP67

BLUETOOTH

Insulation resistance measurements: go premium

5 kV

maximum
measuring
voltage

15 TΩ

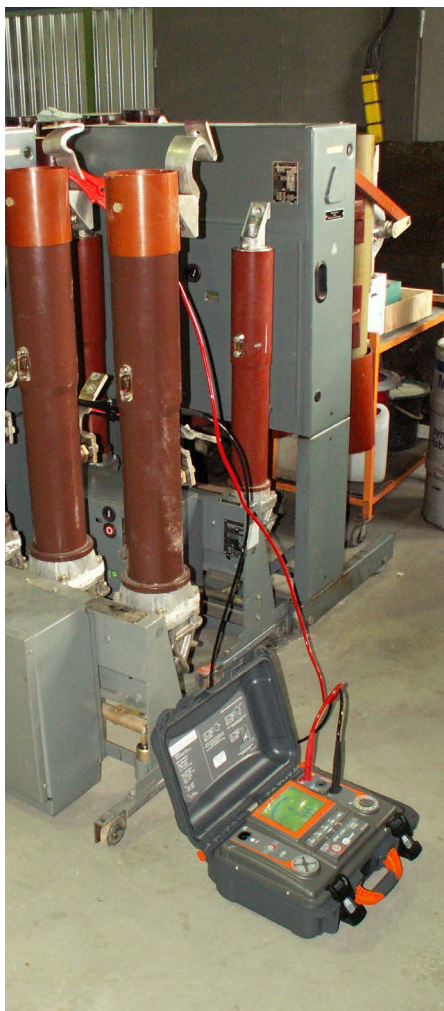
maximum
measurement
range



remote
control
by phone

Features

- Measuring voltage in the range of **50...5000 V**, 50...1000 V in steps of 10 V, 1...5 kV in steps of 25 V
- Continuous indication of measured insulation resistance and leakage current
- Automatic discharge of measured object capacitance voltage after the end of insulation resistance measurement
- Acoustic signalling of 5-second intervals to facilitate capturing time characteristics
- Adjustable measuring time - max. **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
- Measurement of coefficients: polarisation (PI), absorption Ab_1 , Ab_2 , dielectric absorption ratio (DAR)
- Indication of actual test voltage during measurement
- Test current: **1.2 mA** or **3 mA**
- Two- and three-lead method of insulation resistance measurement
- Measurements with test leads up to 20 m
- Protection against measuring live objects
- Measurement of capacitance during the measurement of R_{iso}
- Step voltage insulation resistance measurement (SV)
- Dielectric Discharge calculation (DD)
- Digital filters for measurements with strong interferences



Additional features

- Continuity measurement of protective connections and equipotential bonding in accordance with EN 61557-4 with current > 200 mA (**MIC-5010**)
- Adjustable limits for measured insulation resistance (**MIC-5010**)
- Adjustable limits for measured R_{CONT} resistance (**MIC-5010**)
- High resistance to interferences - digital filters (10 s, 30 s, 60 s)
- Measurement of capacitance during the measurement of R_{ISO}
- Measurement of leakage current during insulation resistance testing
- DC and AC voltage measurement in the range of 0...600 V
- 990 cells of memory (11880 records) with the capability of wireless data transmission to a PC (with Bluetooth) or via USB cable
- Power supply from mains or battery pack
- Backlit display
- Backlit keys (**MIC-5010**)
- The instruments meet the requirements of the EN 61557 standard

Comparison of meters

	MIC-5010	MIC-5005
maximum measuring voltage	5000 V	5000 V
maximum measuring range	15 TΩ	15 TΩ
resistance to external interference voltages	up to 500 V	up to 500 V
advanced, digital interference filtration	10 / 30 / 60 seconds	10 / 30 / 60 seconds
continuity measurement of protective conductors	✓	-
backlit keys	✓	-



Insulation resistance measurement

- Measuring range according to IEC 61557-2

$$R_{ISOmin} = U_{ISOnom} / I_{ISOmax} = 50 \text{ k}\Omega \dots 15.0 \text{ T}\Omega \quad (I_{ISOmax} = 1.2 \text{ mA or } 3 \text{ mA})$$

Display 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	±(3.5% m.v. + 10 digits)
10.0...99.9 GΩ	0.1 GΩ	
100...999 GΩ	1 GΩ	
1.00...9.99 TΩ	0.01 TΩ	±(7.5% m.v. + 10 digits)
10.0...15.0 TΩ	0.1 TΩ	±(10% m.v. + 10 digits)

Values of measured resistance depending on measuring voltage

U _{ISO} voltage	Measuring range
250 V	500 GΩ
500 V	1 TΩ
1000 V	2.00 TΩ
2500 V	5.00 TΩ
5000 V	15.0 TΩ

Capacitance measurement

Display range	Resolution	Accuracy
0...999 nF	1 nF	±(5% m.v. + 5 digits)
1.00...49.99 μF	0.01 μF	

- Capacitance measurement result is displayed after the R_{ISO} measurement
- For measurement voltages below 100 V the measurement error is not specified

Continuity test with current >200 mA (MIC-5010 only)

- Measuring range according to IEC 61557-2: 0.12...999 Ω

Display 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)

- Current flowing bidirectionally, average resistance is displayed on the screen
- Compensation of test leads resistance, autozeroing

Technical specification

type of insulation acc. to EN 61010-1 and IEC 61557	double
measurement category acc. to EN 61010-1	IV 600 V (III 1000 V)
ingress protection acc. to EN 60529	IP67 (IP40 for open case)
power supply	Li-Ion 14.8 V rechargeable battery from network 90 V ÷ 260 V, 50 Hz/60 Hz
dimensions	390 x 308 x 172 mm
weight	approx. 5.6 kg
storage temperature	-25°C...+70°C
operating temperature	-20°C...+50°C
humidity	20%...90%
operating altitude	≤3000 m
reference temperature	+23°C ± 2°C
reference humidity	40%...60%
display	segment LCD
number of R _{ISO} measurements with battery power supply	min. 1000 acc. to EN 61557-2
data transmission	USB and Bluetooth
quality standard	ISO 9001, ISO 14001, PN-N-18001 compliant
device meets the requirements of standards	EN 61010-1 and IEC 61557
the product meets EMC requirements (immunity for industrial environment)	with accordance to standards EN 61326-1 and EN 61326-2-2



Please see available applications with "Virtual Instruments Applications". They allow to check the functions of the meter and its interface before the purchase. Application user may set changes in device settings and perform all possible measurements as in reality.

<https://www.sonel.pl/en/virtual-instrument-applications>

Standard accessories



**Test lead 1.8 m
11 kV (banana
plugs) blue**

WAPRZ1X8BUBB10K



**Test lead 1.8 m 11
kV (banana plugs,
shielded) black**

WAPRZ1X8BLBBE10K



**Test lead 1.8 m
11 kV (banana
plugs) red**

WAPRZ1X8REBB10K



**Crocodile clip,
blue, 11 kV, 32 A**

WAKROBU32K09



**Crocodile clip,
black, 11 kV, 32 A**

WAKROBL32K09



**Crocodile clip,
red, 11 kV, 32 A**

WAKRORE32K09



**Mains power
cable Uni-Schuko
/ IEC C13 plug**

WAPRZ1X8BLIEC



**Pin probe 11 kV (ba-
nana socket) black**

WASONBLOGB11



**Pin probe 11 kV
(banana socket) red**

WASONREOGB11



USB cable

WAPRZUSB



W1 hanging straps

WAPOZSZE5



L4 carrying case

WAFUTL4



Calibration certificate

Optional accessories



**Test lead 11 kV
(banana plugs)
blue
3 / 5 / 10 / 20 m**

WAPRZ003BUBB10K
WAPRZ005BUBB10K
WAPRZ010BUBB10K
WAPRZ020BUBB10K



**Test lead 11 kV
(banana plugs,
shielded) black
3 / 5 / 10 / 20 m**

WAPRZ003BLBBE10K
WAPRZ005BLBBE10K
WAPRZ010BLBBE10K
WAPRZ020BLBBE10K



**Test lead 11 kV
(banana plugs)
red
3 / 5 / 10 / 20 m**

WAPRZ003REBB10K
WAPRZ005REBB10K
WAPRZ010REBB10K
WAPRZ020REBB10K



**CS-5kV cali-
bration box**

WAADACS5KV



**PRS-1 resist-
ance test probe**

WASONPRS1GB



**PC software:
Sonel Reader**

WAPROREADER



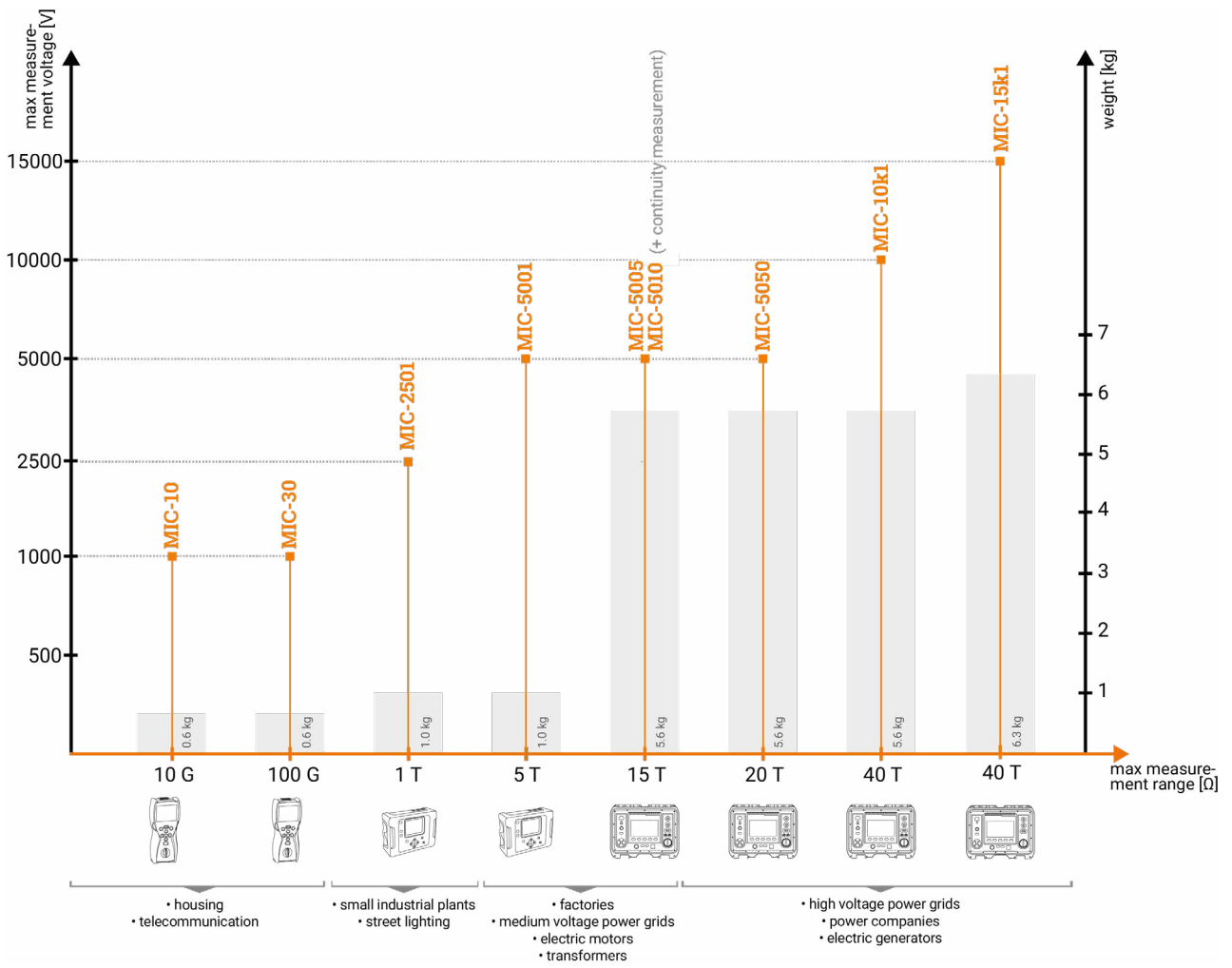
**Calibration certifi-
cate issued by an
accredited laboratory**

Times of charging and discharging the tested object at measuring voltage of 1.05 U_{ISO}

Meter	Measuring voltage			Capacitance [μF]	Charging the object		Discharging the object down to voltage of 50 V [s]
	5 kV	10 kV	15 kV		Current [mA]	Maximal time [s]	
MIC-5005 / MIC-5010	✓			1	1.2	4.3	0.4
					3	1.7	
MIC-5050	✓			1	1.2	4.3	0.4
					3	1.7	
					6	0.8	
MIC-10k1	✓			1	1.2	4.3	0.9
					3	1.7	
					6	0.8	
		✓		1	1.2	8.7	1.0
					3	3.5	
					6	1.7	
MIC-15k1	✓			1	1.2	4.3	1.1
					3	1.7	
					5	1.0	
					7	0.7	
		✓		1	1.2	8.7	1.3
					3	3.5	
					5	2.1	
					7	1.5	
			✓	1	1.2	13.1	1.4
					3	5.2	
5					3.1		
7					2.2		
					10	1.5	

Times of charging and discharging the tested object at measuring voltage of 1.025 U_{ISO}

Meter	Measuring voltage			Capacitance [μF]	Charging the object		Discharging the object down to voltage of 50 V [s]
	5 kV	10 kV	15 kV		Current [mA]	Maximal time [s]	
MIC-5005 / MIC-5010	✓			1	1.2	4.2	0.4
					3	1.7	
MIC-5050	✓			1	1.2	4.2	0.4
					3	1.7	
					6	0.8	
MIC-10k1	✓			1	1.2	4.2	0.9
					3	1.7	
					6	0.8	
		✓		1	1.2	8.5	1.0
					3	3.4	
					6	1.7	
MIC-15k1	✓			1	1.2	4.2	1.1
					3	1.7	
					5	1.0	
					7	0.7	
		✓		1	1.2	8.5	1.3
					3	3.4	
					5	2.0	
					7	1.4	
			✓	1	1.2	12.8	1.4
					3	5.1	
5					3.0		
7					2.1		
					10	1.5	



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