

Earth testers

MI 3288 Earth Insulation Tester



MI 3288 Earth Insulation tester is a portable, battery powered test instrument with excellent IP protection (IP 54) and designed for high altitude (300 V CAT III at 4000 m), intended for measurement of earth resistance, specific earth resistance, earth potential, step and touch voltages, insulation resistance and continuity of protection conductors of various energetic and non-energetic objects. Tester enables 4-wire earth resistance measuring method in combination with one clamp, two clamps earth resistance measurement, 4-wire specific earth resistance measurement and TRMS current measurement.

With the option to measure earth potential, step and touch voltage as well as insulation resistance it becomes a very universal tester. Besides the breakdown voltage of overvoltage protection devices and resistance (continuity) measurements in micro- Ω range can be checked by the instrument. All the results can be saved on the instrument and then downloaded with the help of the PC software Metrel ES Manager to the computer for evaluation and report generation after testing.

MEASURING FUNCTIONS

- Earth Resistance 2/3/4 - pole;
- Selective Earth Resistance (1 x clamp);
- Specific Earth Resistance R_o **Wenner and Schlumberger method**;
- Earth Resistance with 2 iron clamps;
- Earth Potential;
- **Step and touch voltage measurement with external P/S probe**;
- **Insulation resistance with DC voltage from 50 V to 2500 V** and PI, DAR calculation, Dielectric discharge (DD) ratio;
- Capacitive measurements;
- Varistor test 2,5 kV;
- Withstand voltage test with DC voltage up to 2.5 kV;

- Current measurements with AC clamps;
- TRMS voltage and frequency measurements;
- Low Ohm measurements with 7 mA and 200 mA DC test current;
- **$\mu\Omega$ measurements with DC test current up to 2 A.**

KEY FEATURES

- Possibility of performing all main types of earth (R_e), specific earth (R_o), potential (U_s), insulation (R_{iso}), resistance ($\mu\Omega$), voltage / frequency and current measurements with a single instrument;
- Multi frequency test signal on output voltage (20/40 Vac) in earth measurement for best noise immunity (55 Hz also supported);
- Insulation resistance: wide range of insulation test voltages from 50 V to 2500 V, resistance measuring range up to 100 G Ω with Guard terminal, automatic discharge supported and additional filtering options (OFF, 5 s, 10 s, 30 s, 60 s);
- Low Ohm ($\mu\Omega$) resistance measuring range with $\mu\Omega$ resolution;
- Resistance measurement (Four wire Kelvin method);
- Resistance ($\mu\Omega$) with single, continuous and inductive mode of operation with selectable

- current: 10 mA, 100 mA, 1A and 2A (bidirectional);
- 4-wire / 2-wire 200 mA DC resistance measurement;
- 2-wire continuity (7 mA) measurement;
- Overvoltage category 600 V CAT II, 300 V CAT III; at 4000 m above sea level;
- 4.3" colour LCD display with touch screen;
- Programmable AUTO SEQUENCES;
- High degree of protection: IP 54;
- Support for single or automated measurements;
- Programable Hi/Lo limits;
- Built-in charger and rechargeable Li-Ion batteries as standard accessory;
- BT communication with PC, Android tablets and smart phones via built-in BT;
- PC SW Metrel ES Manager for measurement pre and post processing: preparation of the test structure, result download, tree-view, table view and graphical view, storing and printing.

TECHNICAL SPECIFICATION

FUNCTION	Measuring range	Resolution	Accuracy
Insulation resistance Riso Un = 2,5 kV	0 kΩ ... 999 kΩ	1 kΩ	±(3 % of reading + 3 digits)
	1.00 MΩ ... 9.99 MΩ	0.01 MΩ	
	10.0 MΩ ... 99.9 MΩ	0.1 MΩ	
	100 MΩ ... 999 MΩ	1 MΩ	±(5 % of reading + 3 digits) ±(15 % of reading + 1 digits)
	1.00 GΩ ... 9.99 GΩ	10 MΩ	
	10.0 GΩ ... 99.9 GΩ	100 MΩ	
Continuity 200 mA of PE conductor with polarity change	0.020 Ω ... 1.999 Ω	0.001 Ω	±(1 % of reading + 2 digits)
	2.00 Ω ... 19.99 Ω	0.01 Ω	
	20.0 Ω ... 999.9 Ω	0.1 Ω	
	1.000 kΩ ... 1.999 kΩ	1 Ω	
Low resistance continuity measurement, test current 7 mA (continuous measurement)	0.0 Ω ... 199.9 Ω	0.1 Ω	±(0,5 % of reading + 5 digits)
	200 Ω ... 1,999 kΩ	1 Ω	
	2.00 kΩ ... 19.99 kΩ	10 Ω	
	20.0 kΩ ... 199.9 kΩ	100 Ω	±(2 % of reading + 5 digits)
	200 kΩ ... 999 kΩ	1 kΩ	
μΩ - METER (2A) 1A, 2A 1A 100 mA 10 mA	0.000 mΩ ... 1.999 mΩ	1 μΩ	±(0.25 % of reading + 4 digits)
	2.00 mΩ ... 19.99 mΩ	10 μΩ	
	20.0 mΩ ... 199.9 mΩ	100 μΩ	
	200 mΩ ... 499 mΩ	1 mΩ	
	0.500 mΩ ... 1.99 mΩ	1 mΩ	
	0.00 mΩ ... 19.99 mΩ	10 μΩ	
	20.0 mΩ ... 199.9 mΩ	100 μΩ	
	200 mΩ ... 1.999 Ω	1 mΩ	
	2 Ω ... 19.99 Ω	10 mΩ	
	0.00 mΩ ... 199.9 mΩ	100 μΩ	
	200 mΩ ... 1.999 Ω	1 mΩ	
	2.00 Ω ... 19.99 Ω	10 mΩ	
	20.0 Ω ... 199.9 Ω	100 mΩ	
	0.010 Ω ... 1.999 Ω	0.001 Ω	
	2.00 Ω ... 19.99 Ω	0.01 Ω	
	20.0 Ω ... 199.9 Ω	0.1 Ω	
	200 Ω ... 999 Ω	1 Ω	
	1.000 kΩ ... 1.999 kΩ	0.001 kΩ	
	2.00 kΩ ... 19.99 kΩ	0.01 kΩ	
Earth resistance 2/3/4-wire method Test frequency 55 – 164 Hz	0.010 Ω ... 1.999 Ω	0.001 Ω	±(3 % of reading + 3 digits)
	2.00 Ω ... 19.99 Ω	0.01 Ω	
	20.0 Ω ... 199.9 Ω	0.1 Ω	
	200 Ω ... 999 Ω	1 Ω	
	1.000 kΩ ... 1.999 kΩ	0.001 kΩ	
	2.00 kΩ ... 19.99 kΩ	0.01 kΩ	
Earth resistance 4-wire method with one current clamp - Selective	0.010 Ω ... 1.999 Ω	0.001 Ω	±(8 % of reading + 3 digits)
	2.00 Ω ... 19.99 Ω	0.01 Ω	
	20.0 Ω ... 199.9 Ω	0.1 Ω	
	200 Ω ... 999 Ω	1 Ω	
	1.000 kΩ ... 1.999 kΩ	0.001 kΩ	
	2.00 kΩ ... 19.99 kΩ	0.01 kΩ	
2-clamp earth resistance measurement	0.000 Ω ... 1.999 Ω	0.001 Ω	±(5 % of reading + 5 digits)
	2.00 Ω ... 9.99 Ω	0.01 Ω	±(5 % of reading + 2 digits)
	10.0 Ω ... 49.9 Ω	0.1 Ω	±(10 % of reading + 2 digits)
	50 Ω ... 100 Ω	1 Ω	±(20 % of reading)
Specific earth resistance Ro Wenner and Schlumberger method	0.00 Ωm ... 19.99 Ωm	0.01 Ωm	calculated value (consider uncertainty of 4 – pole measurement)
	20.0 Ωm ... 199.9 Ωm	0.1 Ωm	
	200 Ωm ... 999 Ωm	1 Ωm	
	1.000 kΩm ... 1.999 kΩm	0.001 kΩm	
	2.00 kΩm ... 19.99 kΩm	0.01 kΩm	
	20.0 kΩm ... 199.9 kΩm	0.1 kΩm	
	200 kΩm ... 999 kΩm	1 kΩm	
	1.0 MΩm ... 1.99 MΩm	10 kΩm	
Earth Potential - voltage	0.00 mV ... 99.99 mV	0.01 mV	±(1 % of reading + 3 digits)
	100.0 mV ... 999.9 mV	0.1 mV	
	1.000 V ... 9.999 V	1 mV	
	10.00 V ... 49.99 V	10 mV	
Step and Touch	0.1 V ... 199.9 V 200 V ... 999 V	0.1 V 1 V	calculated value
Voltage TRMS	0.000 V ... 9.999 V	0.001 V	Range: 15 ... 99 Hz ±(0.5 % of reading + 3 digits)
	10.00 V ... 99.99 V	0.01 V	Range: 100 ... 399 Hz ±(1 % of reading + 3 digits)
	100.0 V ... 749.9 V	0.1 V	Range: 400 ... 1200 Hz ±(5 % of reading + 3 digits)
Voltage DC	0.000 V ... 9.999 V	0.001 V	±(0.5 % of reading + 3 digits)
	10.00 V ... 99.99 V	0.01 V	
	100.0 V ... 999.9 V	0.1 V	
Frequency	15.00 Hz ... 99.99 Hz	0.01 Hz	±(0.2 % of reading + 1 digits)
	100.0 Hz ... 999.9 Hz	0.1 Hz	
	1000 Hz ... 1200 Hz	1 Hz	
Current with Iron clamp A 1281	10 mA ... 749 mA	1 mA	±(2.5 % of reading + 3 digits)
	0.10 A ... 749 A	0.01 A	
	2.0 A ... 99.9 A	0.1 A	
	100 A ... 149 A	1 A	
	20 A ... 999 A	1 A	
Current with Flex clamps A 1227/ A 1609	0.6 A ... 59.9 A	0.1 A	±(3.5 % of reading + 3 digits)
	6 A ... 599 A	1 A	
	60 A ... 5.99 kA	10 A	

Varistor Test	0.0 V 99.9 V 100 V 999 V 1.00 kV 2.50 kV	0.1 V 1 V 10 V
Measuring category	300 V CAT IV; derate to 600 V CAT II; 300 V CAT III at 4000 m ASL	
Protection class	Double insulation	
COM port	BT, USB	
Display	4.3" colour LCD display with backlight and touch screen	
Degree of protection	IP 54	
Power supply	7.2 V (4400 mAh Li-Ion battery pack)	

APPLICATION

- Initial and periodic testing of domestic and industrial installations;
- Testing on TT and IT systems;
- Lightning system testing.
- Industrial areas, smaller buildings, installation in mining
- Testing sub-station earthing;
- Motor & generator winding;
- Power transformer;
- Power inductors;
- Wire & cable resistance.
- Measurement of insulation resistance of transformers, motors, cables, machines, etc.;
- Testing on CAT IV installations (distribution side of installations, industrial plants, etc.);
- Observation of insulation trends;
- Testing of PE conductors continuity and main and supplementary PE connections.

STANDARDS

Safety

- EN 61010 - 1
- EN 61010 - 2 - 030 c
- EN 61010 - 2 - 032
- EN 61010 - 031

Functionality

- EN 61557 - 2
- EN 61557 - 4
- EN 61557 - 5

Electromagnetic compatibility

- EN 61326

Other reference standards

- IEC/EN/HD 60364
- AS/NZ 3018
- CEI 64.8
- HD 384
- BS 7671
- VDE 0413

OPTIONAL ACCESSORIES

Photo	Order No.	Acc. Description
	A 1568	8800 mAh battery pack
	A 1019	Current clamp
	A 1281	Current clamp
	A 1757	Large kelvin test clip 65 mm
	A 1609	1-phase flexible current clamp
	A 1227	1-phase flexible current clamp 3000/300/30 A / 1 V
	S 2040	Earth test set, 4-wire, 20 m

Photo	Order No.	Acc. Description
	S 2123	Earth test set, 4-wire, 50 m
	A 1719	Test lead, 4 x 2.5 m (grey)
	A 1721	Test lead, 4 x 1 m (grey)
	A 1437	Test lead with Kelvin probe
	S 1072	Continuity test lead, with crocodile clip, 2 x 2.5 m, 2 pcs
	A 1593	Large Kelvin test crocodile
	A 1595	Large test crocodile, black
	A 1596	Large test crocodile, red

ORDERING INFORMATION



Picture of MI 3288 - 50 m set

Standard set MI 3288

- MI 3288 Earth Insulation Tester
- Battery pack 7.2 V 4400 mAh
- Power supply adapter 12 V/3 A
- 2.5 kV test lead, 2 x 1.5 m
- Test lead, green, 1.5 m
- Test lead, 4 x 1 m
- Test probe, 2 pcs (red, black)
- Crocodile clip, 4 pcs (black, blue, green, red)
- Soft carrying bag
- Soft carrying neck belt
- USB cable
- PC SW Metrel ES Manager BASIC License
- Short instruction manual
- Instruction manual
- Calibration certificate

MI 3288 - 20 m

- MI 3288 ST
- Earth test set, 20 m (2 x test lead, 20 m; 2 x test lead, 4.5 m; 4 x earth test rod)

MI 3288 - 50 m

- MI 3288 ST
- Earth test set, 50 m (2 x test lead, 50 m; 2 x test lead, 4.5 m; 4 x earth test rod)

Photo	Order No.	Acc. Description
	S 2053	Step voltage plates
	A 1333 V2	Reference resistor 750 μΩ
	A 1597	Human body resistance probe
	P 1104	Metrel SDK Licence Key
	A 1006	Soft carrying bag

METREL d.o.o.

Merilna in regulacijska oprema
Ljubljanska 77, SI-1354 Horjul, Slovenija
T +386 (0)1 75 58 200
info@metrel.si
www.metrel.si