

Product Datasheet - Technical Specifications



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**Bedienungsanleitung /
Operation manual**

**Digitaler Erdungsmesser /
Digital Earth Resistance Tester**




Safety Precautions

This product complies with the requirements of the following European Community Directives: 2004/108/EC (Electromagnetic Compatibility) and 2006/95/EC (Low voltage) (CE-Marking).

To ensure safe operation of the equipment and eliminate the danger of serious injury due to short-circuits (arcing), the following safety precautions must be observed.

Damages resulting from failure to observe these safety precautions are exempt from any legal claims whatever.

- * Do not exceed the maximum permissible input ratings. (danger of serious injury and/or destruction of the equipment).
- * Check test leads and probes for faulty insulation or bare wires before connection to the equipment).
- * Replace a defective fuse only with a fuse of the original rating. Never short-circuit fuse or fuse housing.
- * Never touch the tips of the test leads or probe.
- * Comply with the warning labels and other info on the equipment.
- * Conduct measuring works only in dry clothing and in rubber shoes i. e. on insulating mats.
- * Do not connect voltage sources across the input terminals of the equipment.
- * Always start with the highest measuring range when measuring unknown values.
- * Disconnect test leads or probe from the measuring circuit before switching modes or functions.
- * Do not subject the equipment to direct sunlight or extreme temperatures

- * Do not subject the equipment to extreme humidity or dampness
- * Do not subject the equipment near strong magnetic fields (motors, transformers etc.)
- * Keep hot soldering iron or guns away from the equipment.
- * allow the equipment to stabilize at room temperature before taking up measurement (important for exact measurements).
- * do not modify the equipment in any way.
- * do not place the equipment face-down on any table or work bench to prevent damaging the controls at the front.
- * opening the equipment and service- and repair work must only be performed by qualified service personnel.
- * **Measuring instruments don't belong to children hands**
- * Rated environmental conditions:
 - indoor use
 - installation category III
 - pollution degree 2
 - altitude up to 2000 Meter
 - relative humidity 80 % max.
 - ambient temperature 0...40° C
- * Observe the international electric symbols listed below:
 -  Meter is protected throughout by double insulation or reinforced insulation
 -  Warning! Risk of electrical shock
 -  Caution! Refer to this manual before using the meter


Cleaning the cabinet

Clean only with a damp, soft cloth and a commercially available mild household cleanser. Ensure that no water gets inside the equipment to prevent possible shorts and damage to the equipment.

1. Features

- Capable of measuring earth voltage
- 2 mA measuring current permits earth resistance tests without tripping earth leakage current breakers in the circuit under test
- Battery operated
- Battery life indicator
- Data-Hold-Function

2. Specifications

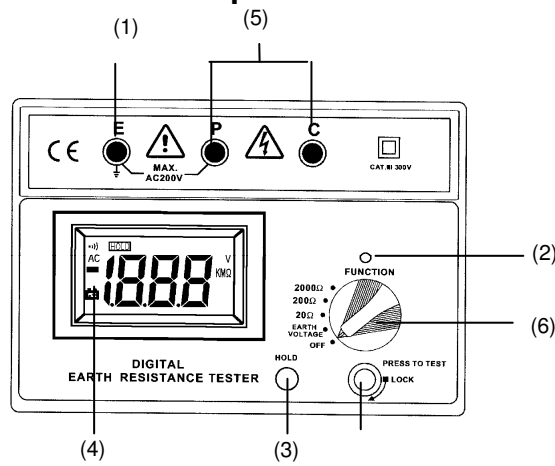
Measuring ranges	Earth resistance: 0~19,99 Ω (0,01 Ω) 0~199,9 Ω (0,1 Ω) 0~1999 Ω (1 Ω) Earth voltage: 0 - 200 V AC, 50/60 Hz
Accuracy:	Earth resistance: $\pm 2\% + 3$ dgt. at 200/2000 Ω $\pm 2\% + 0,3$ Ω at 20 Ω Earth voltage: within $\pm 3\%$ rdg. + 2 dgts.
Measurement System:	Earth resistance by constant current inverter. 820 Hz approx. 2 mA
Safety Standard	meet EN-61010-1, Safety requirements installation CAT III/300 V
Low battery indication	 symbol appears on the display
Data Hold indication	"DH" symbol appears on the display
Over range indication	"1"
Display	3 ½ digit LCD display (2000 counts)

Power Source: 1.5 V (UM-3) x 8 pcs. Type AA (High power batteries leak-proof)

Dimensions: 250 (L) x 190 (W) x 110 (D) mm

Accessories: Test leads (red, 15 m; yellow, 10 m; green, 5 m), auxiliary earth bars, carrying case, instruction manual

3. Front Panel Description



- (1) Jack for "Earth" lead connection
- (2) Operation indicator
- (3) Hold-Button
- (4) LCD-Display
- (5) Jack for "Line" lead
- (6) Function Switch
- (7) Pushbutton operation

4. Measuring Methods

1. Before proceeding with measurement, if "⚡" symbol appears on the display, replace with new batteries.
2. Rotate the function switch to the "Earth voltage" position and press to test. Earth voltage will be displayed on the LCD. When the earth voltage is more than 10 V, it may result in errors in earth resistance measurement. Accurate earth resistance measurement may not be made.
3. Precision earth resistance measurement method:
 - (1) Connect green, yellow and red test leads to instrument terminals E, P and C with auxiliary earth spikes P1, C1 inserted into earth "IN A STRAIGHT LINE". (Fig. 1)
 - (2) Rotate the function switch to the proper range, then press the push-button to test and take the reading.

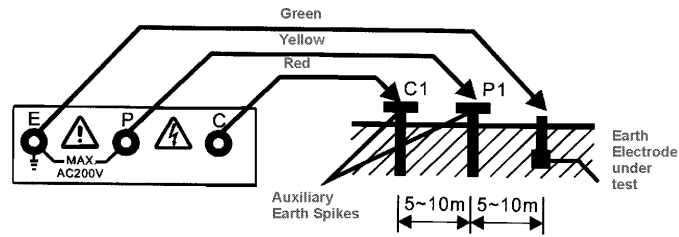


Fig. 1

4. Simplified earth resistance measurement method:
 - (1) This method is recommended where an earth resistance higher than 10Ω is measured or where it is not possible to drive auxiliary earth spikes. An approx. value of earth resistance can be obtained by the two-wire system as shown in Fig. 2
 - (2) Rotate the function switch to the "Earth Voltage" position and press to test. Make certain that earth voltage is less than 10 V.
 - (3) First rotate the function switch to "200 Ω " position and press to test. Read earth resistance. If the display shows "1" (MSD), switch to "2000 Ω " and read earth resistance.

(4) The reading obtained (R_x) is an approx. earth resistance value.

There is no need for external shorting since P and C terminals are shorted by using the test leads specified for the simplified measurement.

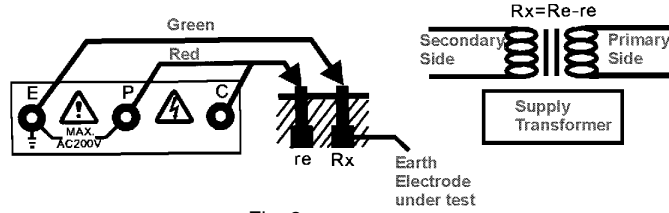


Fig. 2

(5) $R_x = R_e - r_e$

R_x = True earth resistance

R_e = Indicated value


r_e = Earth resistance or earth electrode

(6) Since the measuring current is as low as 2 mA, the earth leakage breaker (ELCB) does not trip even if the earth side of the commercial power supply with an ELCB is used.

* Follow the proper connection as shown in Fig. 1. The LED (red) indicator will be lit. This proves, that a correct current circulation is under its operation.

5. Maintenance

5.1 Battery replacement

When the symbol "" appears on the display, replace the batteries as follows:

1. Disconnect the test leads from the instrument and turn off the power.
2. Use a screwdriver to unscrew the screw on back cover then slide the cover, take out the batteries and replace with new batteries type UM-3.

3. Place back cover and secure by a screw.

If the meter is not to be used for a longer period, remove the batteries and store them separately.

Cleaning and storage:

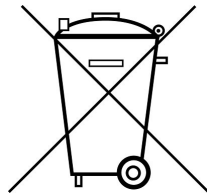
Periodically wipe the case with a damp cloth and detergent. Do not use abrasives or solvents.

If the meter is not to be used for periods of longer than 60 days, remove the batteries and store them separately.

Statutory Notification about the Battery Regulations

The delivery of many devices includes batteries, which for example serve to operate the remote control. There also could be batteries or accumulators built into the device itself. In connection with the sale of these batteries or accumulators, we are obliged under the Battery Regulations to notify our customers of the following:

Please dispose of old batteries at a council collection point or return them to a local shop at no cost. The disposal in domestic refuse is strictly forbidden according to the Battery Regulations. You can return used batteries obtained from us at no charge at the address on the last side in this manual or by posting with sufficient stamps.



Batteries, which contain harmful substances, are marked with the symbol of a crossed-out waste bin, similar to the illustration shown left. Under the waste bin symbol is the chemical symbol for the harmful substance, e.g. „Cd“ for cadmium, „Pb“ stands for lead and „Hg“ for mercury.

You can obtain further information about the Battery Regulations from the Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (*Federal Ministry of Environment, Nature Conservation and Reactor Safety*).

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