

# GEOHM | 5

## Earth Tester

3-349-417-03  
7/11.20

Battery operated earth tester per DIN VDE 0413, part 5, for measuring earth resistance. This instrument can also be used to ascertain or measure soil resistivity and ohmic resistance in accordance with the current-voltage measuring method.

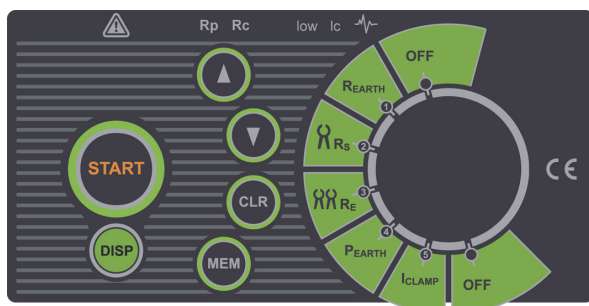
- Measurement of:
  - Earth resistance
  - Selective earth resistance
  - Soil resistivity
  - Current (TRMS) via current clamp transformer (optional)
- Three or four-pole measuring method
- No balancing required
- Continuous monitoring of interference voltage and auxiliary earth electrode resistance with indication if allowable limit values are violated
- Data storage for 250 measurements (1000 measured values)
- Data interface for transmission of measured values to a PC
- Software (optional accessory) for measured value storage and report generation at a PC (in preparation)



### Application

This instrument offers three different ways of measuring earth resistance, as well as measurement of soil resistivity and current. The current clamp transformers which are required for certain measurements are available as optional accessories.

| Measurable Quantities  | Switch Position                                 | Required Accessory   |
|--|---|--|
| Earth resistance RE (traditional 4-wire method according to Wenner)                                  | R <sub>EARTH</sub>                              | 4 earth spikes and 4 measurement cables (included)                           |
| Selective earth resistance RS (traditional 4-wire method with additional current clamp transformers) | R <sub>S</sub> (clip)                           | 4 earth spikes, 4 measurement cables, 1 current clamp transformer (optional) |
| Earth resistance RE (two current clamp transformers) – actually, loop resistance is measured!        | R <sub>E</sub> (two current clamp transformers) | 2 current clamp transformers (optional)                                      |
| Soil resistivity   | ρ <sub>EARTH</sub>                              | 4 earth spikes and 4 measurement cables (included)                           |
| Current (TRMS)   | I <sub>CLAMP</sub>                              | 1 current clamp transformer (optional)                                       |



### Applicable Regulations and Standards

|   |  |
|---|--|
| <b>IEC 61010-1/EN 61010-1/<br/>VDE 0411-1</b> | Safety requirements for electrical equipment for measurement, control and laboratory use – General requirements              |
| <b>IEC 61557/ EN 61557/<br/>VDE 0413</b>      | Devices for testing, measuring or monitoring protective measures<br>Part 1: General requirements<br>Part 5: Earth resistance |
| <b>EN 60529<br/>VDE 0470, part 1</b>          | Test instruments and test procedures<br>Degrees of protection provided by enclosures (IP code)                               |
| <b>DIN EN 61326<br/>VDE 0843, part 20</b>     | Electrical equipment for control technology and laboratory use – EMC requirements  |

### Regulations and Standards for Use of the Test Instrument

|  |  |
|--|--|
| <b>DIN VDE 0413, part 5</b>                    | Devices for testing, measuring or monitoring protective measures; earth resistance   |
| <b>DIN VDE 0100</b>                            | Stipulations for the setup of electric power installations with nominal voltages of up to 1000 V                           |
| <b>DIN VDE 0141</b>                            | Grounding in AC systems with nominal voltages of greater than 1 kV   |
| <b>DIN VDE 0800</b>                            | Setup and operation of telecommunications systems including data processing equipment; equipotential bonding and grounding |
| <b>DIN VDE 0185</b>                            | Lightning protection systems – general setup   |
| <b>International regulations and standards</b> |  |
| BS 7430 + BS 7671, NFC 15-100, IEC 60364       |  |

# GE OHM | 5

## Earth Tester

### Technical Data

| Function (per EN 61557)  | GE OHM   5         |
|--|--------------------|
| Measuring voltage  | 40 V               |
| Measuring frequency  | 125/150 Hz         |
| Rs   | Max. 50 kΩ         |
| Rh   | Max. 50 kΩ         |
| <b>3-pole measurement</b>  |                    |
| Measuring range  | 0.11 Ω to 19.99 kΩ |
| Resolution   | 0.01 Ω to 10 Ω     |
| Measuring error  | ± (2% rdg. + 3d)   |
| <b>4-pole measurement</b>  |                    |
| Measuring range  | 0.11 Ω to 19.99 kΩ |
| Resolution   | 0.01 Ω to 10 Ω     |
| Measuring Error  | ± (2% rdg. + 3d)   |
| <b>3-pole selective measurement with current clamp transformer</b> |                    |
| Measuring range  | 0.11 Ω to 1.99 kΩ  |
| Resolution   | 0.01 Ω to 10 Ω     |
| Measuring error  | ± (2% rdg. + 3d)   |
| <b>4-pole selective measurement with current clamp transformer</b> |                    |
| Measuring range  | 0.00 Ω to 1.99 kΩ  |
| Resolution   | 0.01 Ω to 10 Ω     |
| Measuring error  | ± (2% rdg. + 3d)   |
| <b>2-clip measuring method</b>                                     |                    |
| Measuring range  | 0.0 Ω to 100 Ω     |
| Resolution   | 0.1 Ω to 1 Ω       |
| Measuring error  | ± (10% rdg. + 2d)  |

Key: d = digit(s), rdg. = reading (measured value)

### Earth Resistance, 3/4-Pole Method

Measuring range RE (0.11 to 19.99 kΩ)

| Display range (Ω)  | Resolution (Ω) | Measuring error      |
|--------------------|----------------|----------------------|
| 0.00 to 19.99      | 0.01           | (2% rdg. + 3 digits) |
| 20.0 to 199.9      | 0.1            |                      |
| 200 to 999         | 1              |                      |
| 1.000 k to 1.999 k | 1              | (5% rdg.)            |
| 2.00 k to 19.99 k  | 10             |                      |

|   |   |
|---|---|
| Additional error caused by the spike at Rc max. or Rp max.  | ±(3% rdg. + 10 digits)                                  |
| Rc max. <sup>1)</sup>                                       | The smaller value of (4 kΩ + 100·RE) or 50 kΩ           |
| Rp max. <sup>1)</sup>                                       | The smaller value of (4 kΩ + 100·RE) or 50 kΩ           |
| Additional error caused by 3 V interference voltage (50 Hz) | (5% rdg. + 10 digits)                                   |
| Test voltage at the test sockets                            | 40 V AC   |
| Type of test voltage  | Sine  |
| Test voltage frequency                                      | 125 (countries with 50 Hz) / 150 (countries with 60 Hz) |
| Short-circuit test current                                  | < 20 mA   |
| Automatic resistance test at current and potential spikes   | Yes   |
| Automatic interference voltage test                         | Yes   |

<sup>1)</sup> R<sub>C</sub> = R<sub>H</sub> (Hilfserder); R<sub>P</sub> = R<sub>S</sub> (Sonde)

### Earth Resistance with current clamp transformer and 4-Pole Test Method

The technical data are the same as for the 4-pole method except for display range and measuring range (see deviating values below).

Measuring Ranges RE (0.11 to 1.99 kΩ)

| Display Range (Ω) | Resolution (Ω) | Measuring Error      |
|-------------------|----------------|----------------------|
| 0.00 to 19.99     | 0.01           | (2% rdg. + 3 digits) |
| 20.0 to 199.9     | 0.1            |                      |
| 200 to 999        | 1              |                      |
| 1.00 k to 1.99 k  | 10             |                      |

### Additional Specifications

|  |                                    |
|--|------------------------------------|
| Additional error for interference voltage, indicated by displaying the interference voltage warning symbol (valid for maximum ratio R <sub>earth_total</sub> / RS = ½) | (10% rdg. + 10 digits)             |
| Symbol for current noise   | As of approx. 2.1 A                |
| Additional resistance ratio error  | RS / R <sub>earth_total</sub> · 1% |
| Display in case of too little current at the clip  | Less than 0.5 mA                   |
| Automatic interference voltage test  | Yes                                |
| Observe additional error caused by the clip.   |                                    |

### Earth Resistance with 2 current clamp transformer

| Display Range (Ω) | Resolution (Ω) | Measuring Error       |
|-------------------|----------------|-----------------------|
| 0.0 to 19.9       | 0.1            | (2% rdg. + 10 digits) |
| 20. to 100        | 1              | (20% rdg.)            |

\* Distance between current clamp transformer > 30 cm

|  |   |
|--|---|
| Additional error at most insignificant interference voltage with warning symbol                | (10% rdg. + 10 digits)                          |
| The symbol appears as of   | I <sub>Rausch</sub> / I <sub>Signal</sub> > 100 |
| Additional error caused by use of current clamp transformers must be taken into consideration. |   |

### Soil Resistivity

All of the technical data for the 4-pole method apply here too, except for display range (see deviations listed below).

| Display Range (Ωm)       | Resolution (Ωm) | Measuring Error                        |
|--------------------------|-----------------|--|
| 0.00 to 19.99            | 0.01            | See measuring error for RE measurement |
| 20.0 to 199.9            | 0.1             |  |
| 200 to 1999              | 1               |  |
| 2.00 K to 19.99 k        | 10              | ρ = 2π a·RE                            |
| 20.0 k to 199.9 k        | 0.1 k           |  |
| 200 k to 999 k (at 8 m)  | 1 k             |  |
| 200 k to 1999 k (at 8 m) |                 |  |

Distance between the spikes is 1 to 30 m or 3 to 90 feet

**Current (TRMS AC) by means of current clamp transformer 1000:1 (optional accessories)**

| Display Range I (A) | Resolution (A) | Measuring Error      |
|---------------------|----------------|----------------------|
| 0 mA to 99.9 mA     | 0.1 mA         | (5% rdg. + 3 digits) |
| 100 mA to 999 mA    | 1 mA           | (5% rdg.)            |
| 1.00 A to 9.99 A    | 0.01 A         |                      |
| 10.0 A to 19.9 A    | 0.1 A          |                      |

|   |            |
|---|------------|
| Input impedance   | 10 Ω       |
| Transformation ratio  | 1 A / 1 mA |
| Nominal frequency   | 50 / 60 Hz |
| Additional error caused by the current clamp transformers must be taken into consideration. |            |

### Reference Conditions

|                     |              |
|---------------------|--------------|
| Battery voltage     | 5.5 V ± 1%   |
| Ambient temperature | +23 °C ± 2 K |
| Relative humidity   | 40 to 60%    |

### Electromagnetic Compatibility (EMC)

|                                |                    |
|--------------------------------|--------------------|
| Interference emission/immunity | IEC 61326/EN 61326 |
|--------------------------------|--------------------|

### Ambient Conditions

|                       |  |
|-----------------------|--|
| Reference temp. range | 10 to +30 °C   |
| Operating temp. range | 0 to +40 °C  |
| Relative humidity     | Max. 80% (at 0 to +40 °C)<br>no condensation allowed |

### Power Supply

|   |  |
|---|--|
| Batteries   | 4 ea. 1.5 V baby cell (4 ea. C size)<br>(alkaline manganese per IEC LR14)                                |
| Rechargeable batteries  | 4.8 V (4 ea. 1.2 V NiCd, NiMH<br>rechargeable batteries per IEC LR14)                                    |
| Charger   | Upon request   |
| Charging voltage  | 6 V  |
| Due to lower charging capacity, fewer measurements are possible with rechargeable batteries than with normal batteries as a rule. |  |
| Battery saver circuit   | The test instrument is switched off automatically approximately 10 minutes after the last key operation. |

### Electrical Safety

|              |                  |
|--------------|------------------|
| Safety class | Double insulated |
|--------------|------------------|

### Mechanical Design

|         |   |
|---------|---|
| Display | Multiple display with LCD<br>(61 x 33 mm) |
|---------|---|



|            |                               |
|------------|-------------------------------|
| Dimensions | W x H x D: 15.5 x 9.5 x 19 cm |
| Weight     | Approx. 1.3 kg with batteries |
| Protection | Housing: IP 54 per EN 60529   |

Table Excerpt Regarding Significance of IP Codes

| IP XY<br>(1 <sup>st</sup> char. X) | Protection against penetration by solid particles | IP XY<br>(2 <sup>nd</sup> char. Y) | Protection against penetration by water |
|------------------------------------|---|------------------------------------|---|
| 5                                  | Dust protected                                    | 4                                  | Splashing water                         |

### Data Interface

|            |  |
|------------|--|
| Type       | RS 232C, serial, per DIN 19241                   |
| Format     | 9600 baud, no parity, 8 data bits,<br>1 stop bit |
| Connection | 9-pin subminiature socket connector              |

### Scope of Delivery

- 1 Earth tester
- 1 Case (rugged, lockable Aluminium case)
- 1 Neck strap
- 1 Set batteries
- 4 Earth spikes
- 4 Measurement cables:  
2 x 4 m, 1 x 15 m and 1 x 20 m
- 1 Set operating instructions
- 1 Proprietary calibration certificate



# GE OHM | 5

## Earth Tester

### Accessories

#### E-Clip 1 Current clamp transformer (Z591A)

Measuring range: 1 mA to 1200 A  
 Measuring category: 600 V CAT III  
 Max. cable diameter: 52 mm  
 Transformation ratio: 1000 A/1A  
 Frequency range: 40 Hz to 5 kHz  
 Output signal: 1  $\mu$ A to 1.2 A  
 Supplied with connector cable (1.5 m) and laboratory safety plug



#### E-Clip 2 Current clamp transformer (Z591B)

Measuring range: 0.2 A to 1200 A  
 Measuring category: 600 V CAT III  
 Max. cable diameter: 52 mm  
 Transformation ratio: 1000 A/1A  
 Frequency range: 40 Hz to 5 kHz  
 Output signal: 0.2 mA to 1.2 A  
 Equipped with 4 mm safety sockets  
 Supplied with 2 test leads (red, black), each with stackable 4 mm safety plugs at both ends, approx. 1,5 m long



#### Charger (Z591Z)

Input: 230 V AC, 50 Hz  
 Output: 4.8 V DC, 350 mA  
 Battery charging is indicated by means of a charging display.



#### Cable reel TR25II (Z503X)



25 m measurement cable coiled onto a plastic drum. Connection to the inside end of the cable is made possible with two sockets integrated into the drum. The other end is equipped with a banana plug.

#### Cable reel TR50II (Z503Y)



50 m measurement cable coiled onto a plastic drum. Connection to the inside end of the cable is made possible with two sockets integrated into the drum. The other end is equipped with a banana plug.

#### Earth Drill SP500 (Z503Z)



#### E-SET PROFESSIONAL (Z592A)



## Order Information

| Description   | Type               | Article Number |
|---|--------------------|----------------|
| Earth tester set, see page 3  | GEOHM5-SET         | M591B          |
| <b>Accessories</b>  |                    |                |
| Charger with 4 NiMH rechargeable batteries  | Z591C              | Z591C          |
| Current clamp transformer<br>Transformation ratio: 1000 A/1A<br>Current measuring range:<br>1 mA to 1200 A<br>Output signal: 1 µA to 1.2 A  | E-Clip 1           | Z591A          |
| Current clamp transformer<br>Transformation ratio: 1000 A/1A<br>Current meas. range: 0.2 A to 1200 A<br>Output signal: 0.2 mA to 1.2 A  | E-Clip 2           | Z591B          |
| Cable reel for low-resistance and earth-resistance measurement, 25 m  | TR25II             | Z503X          |
| Cable reel for low-resistance and earth-resistance measurement, 50 m  | TR50II             | Z503Y          |
| Earth Drill 500 mm  | SP500              | Z503Z          |
| Accessories for earthing measurement consisting of 1 x carrier bag, 4 earth spikes 500 mm, 1 x measuring lead 40 m blue on cable drum with hand strap, 1 x measuring lead 20 m red on cable drum with hand strap, 1 x measuring lead 5 m black, 1 x measuring lead 5 m green, 1 x test clamp with black 4 mm socket, 1 x test clamp with green 4 mm socket, 1 x hammer, 1 x roller tape measure, 1 x duster, 1 x writing pad with pen | E-SET PROFESSIONAL | Z592A          |
| <b>Earth testing set:</b><br>Carrying case accommodating GEOHM 5<br>1 drum with 25 m measurement cable<br>2 drums with 50 m measurement cable each, 4 measurement cables,<br>3 x 0.5 m long, 1 x 2 m long<br>1 test clamp<br>4 earth drills, each 350 mm long<br>1 dust cloth<br>2 pads of earth testing measurement data forms   | E-Set 5            | Z590B          |

For additional information regarding accessories please refer to

- The data sheet for the respective device or our Measuring Instruments and Testers catalogue.
- [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

# GE OHM | 5

## Earth Tester

---

---

© Gossen Metrawatt GmbH  
Edited in Germany • Subject to change without notice / errors excepted • A pdf version is available on the Internet

All trademarks, registered trademarks, logos, product names, and company names are the property of their respective owners.

 **GOSSEN METRAWATT**

Gossen Metrawatt GmbH  
Südwestpark 15  
90449 Nürnberg • Germany

Phone +49 911 8602-111  
Fax +49 911 8602-777  
E-Mail [info@gossenmetrawatt.com](mailto:info@gossenmetrawatt.com)  
[www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for* [Environmental Test Equipment](#) *category:*

*Click to view products by* [Gossen Metrawatt](#) *manufacturer:*

Other Similar products are found below :

[CW40](#) [F150C10E3DRT](#) [F150LTC20](#) [F150CD10E2](#) [F150L75](#) [F150LRS](#) [2837806](#) [4328074](#) [4366444](#) [S-11](#) [382153](#) [700PTP-1](#) [GEO-](#)  
[CABLE-REEL-50M](#) [H115](#) [H300](#) [F150-SLC50](#) [TM-192](#) [TM-192D](#) [TM-414](#) [HS115](#) [SHG-02](#) [SHS-05](#) [SHG-01](#) [RH520-220](#) [TESTO 175-H1](#)  
[0572 1754](#) [TESTO 830-T1](#) [0560 8311](#) [AX-5002](#) [AX-5003](#) [AX-B150](#) [AX-B180](#) [AX-B350](#) [AX-L230](#) [AX-PH02](#) [12227021](#) [12228657](#)  
[12229067](#) [12230090](#) [7358958](#) [12230111](#) [12230146](#) [12230171](#) [12229190](#) [12228801](#) [12228665](#) [12228819](#) [12229360](#) [12230502](#) [12229378](#)  
[12229394](#) [12229415](#)