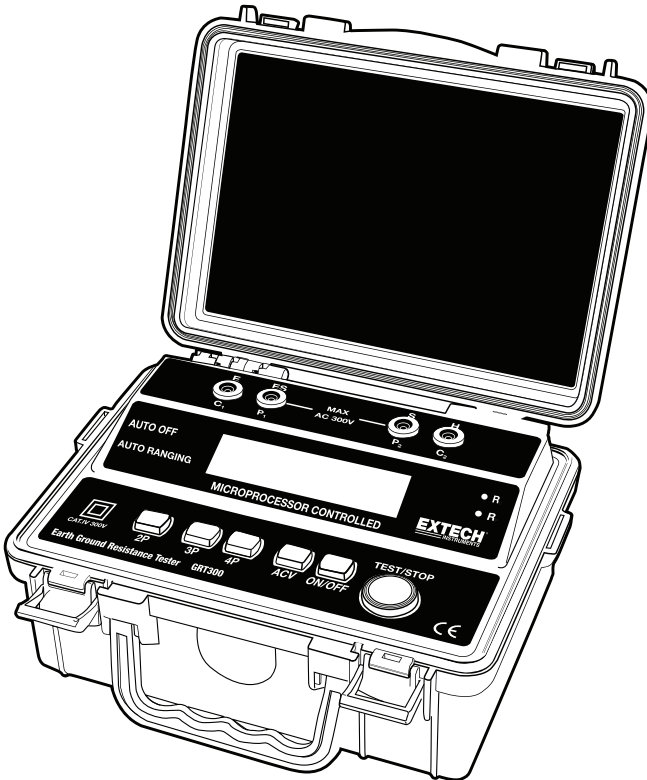


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HHM-GRT300 **4 Wire Earth Resistance Tester**



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The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, human applications.

Introduction

Congratulations on your purchase of Extech's 4 Wire Earth Resistance Tester. The Model GRT300 has been designed and tested according to the IEC Publication 348, safety requirements for Electronic Measuring Apparatus, EN 61010-1, EN 61326-1, EN 61557-1, EN 61557-5 and other safety standards. Proper use and care of this meter will provide many years of reliable service.

Safety Notes

- Read the all safety information carefully before attempting to operate or service the meter.
- Use the meter only as specified in this manual. Otherwise, the protection provided by the meter may be impaired.
- Rated environmental conditions :
 - Indoor & outdoor use.
 - Installation Category IV 300V.
 - Pollution Degree 2.
 - Altitude up to 2000m.
 - Relative Humidity 80% max.
 - Ambient temperature 0-40°C.

Observe the International Electrical Symbols listed below :



Detector is protected throughout by double insulation or reinforced insulation.



Warning ! Risk of electric shock.



Caution ! Refer to this manual before using the detector.



Earth(ground) terminal.



Equipment complies with current EU directives.

WARNING

To avoid electrical shock, do not touch the terminals during tests

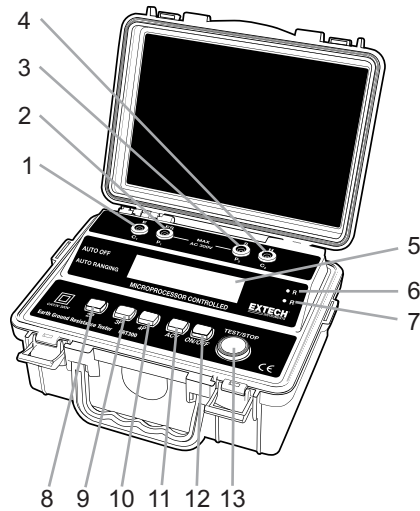
Never apply Voltage higher than 300V across P1 and P2 terminals.

Features

- Microprocessor controlled with advanced safety features
- Two line LCD display
- Auto-Ranging
- Earth resistance testing with four ranges: 0-2 Ω /0-20 Ω /0-200 Ω /0-2k Ω
- Earth voltage measuring range of 0-300Vac
- Automatic C spike check.
- Automatic P spike check.
- 2-wire test
- 3-wire test
- 4-wire test
- Auto power off
- Data hold
- Safety standard: EN 61010-1 CATIV 300V, EN 61326-1

Meter Description

1. C1 terminal
(Black test lead connection)
2. P1 terminal
(Green test lead connection)
3. P2 terminal
(Yellow test lead connection)
4. C2 terminal
(Red test lead connection)
5. Display
6. Rc LED
7. Rp LED
8. 2 Wire button
9. 3 Wire button
10. 4 Wire button
11. ACV button
12. Power button
13. TEST/STOP button



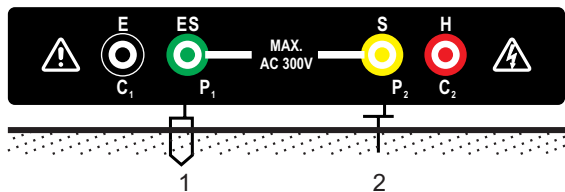
Operation

Battery Voltage check

1. Press the "ON/OFF" button, if "Battery Low" appears on the display, replace the batteries.

Earth Voltage measurement

1. Connect the test leads as shown below.



- (1) Earth electrode (rod) under test (2) Test spike

2. Press the "ON/OFF" button and wait for "Select Function" to appear on the display.
3. Press the "ACV" button and then the "TEST/STOP" button.
4. The earth voltage will be displayed on the display.

Note: When the earth voltage is more than 10V, errors in earth resistance measurements may occur. Make sure that the indicated value is less than 10V.

Earth Resistance measurement

Note: The measured results may be influenced by inductive or capacitive coupling if the test leads are twisted or adjacent to each other. When connecting the Probes, keep the leads separated.

Setup

Insert the Potential spike and the Current spike (if required) as deep as possible into the soil. The distance between spikes must be 5 to 10 meters (16 to 32 feet).

Four-terminal earth resistance measurements



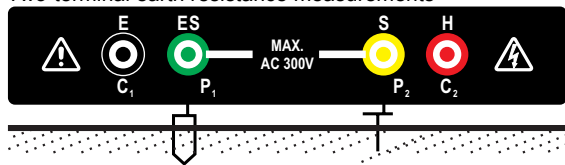
- 1 2 3
(1) Earth electrode (rod) under test (2) Potential spike (3) Current spike

Three-terminal earth resistance measurements



- 1 2 3
(1) Earth electrode (rod) under test (2) Potential spike (3) Current spike

Two-terminal earth resistance measurements



- 1 2
(1) Earth electrode (rod) under test (2) Potential spike

Testing

1. Connect the test leads for 2, 3 or 4 terminal testing.
2. Press the ON/OFF button and wait for the "Select Function" screen to appear.
3. Press the "2P", "3P" or "4P" button that agrees with the setup.
4. Press "TEST/STOP" button to begin the test.
5. The meter will beep while the test is in progress (approximately 10 seconds) and then the reading will appear on the lower line of the display.

Notes:

"Rc" & "Rp" LED indications:

Rc: No test current output. Check connections.

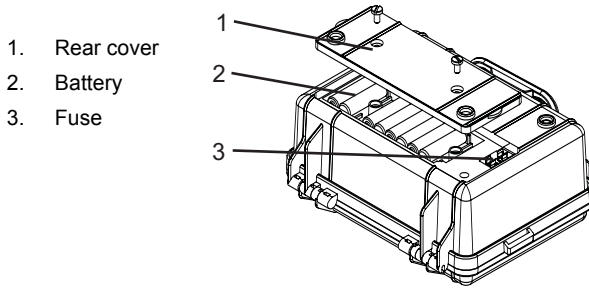
Rp: If Rp is on and the display indicates "> 2 k Ω ", the earth resistance is greater than 2000 Ω .

If, in "4P" mode, the display shows "Vp Error", short circuit C1(black) and P1(green).

Measurement Considerations

2 terminal testing of earth resistance is appropriate for most general purpose testing in normally conductive soil. But, 2 terminal measurements include test lead and contact resistance in the measurement and the result will be a reading slightly higher than the true earth resistance. When measured results are higher than desired or if measurement directives require multi-terminal techniques, switch to the 3 or 4 terminal techniques as needed.

Maintenance



Fuse Replacement

1. Disconnect the test leads from the instrument.
2. Remove the rear cover by removing two screws.
3. Remove and replace the fuse with the new one of the same value and size 0.1A/250V, 5 x 20mm.
4. Replace and secure the rear cover.

Battery replacement

When "Battery Low" appears on the display, replace the batteries.

1. Disconnect the test leads from the instrument and remove the rear cover and the batteries.
2. The tester's battery is situated under the tester.
3. Replace with eight 1.5V AA light batteries, taking care to observe correct polarity.
4. Reinstall battery holder and the battery cover.

Cleaning And Storage

WARNING: To avoid electrical shock or damage to the meter, do not get water inside the case.

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

Specifications

Measuring Ranges	Earth Resistance: 0-2 Ω , 0-20 Ω , 0-200 Ω , 0-2k Ω Earth Voltage: 0-300V AC (40 to 500Hz)
Accuracy	Earth Resistance: $\pm(2\%rdg+3dgt)$ Earth Voltage: $\pm(2\%rdg+3dgt)$
Earth Resistance Resolution	0-2 Ω : 0.01 Ω 0-20 Ω : 0.1 Ω 0-200 Ω : 1 Ω 0-2k Ω : 0.01k Ω
Test Frequency	820Hz
Test Current	2mA
Temperature & Humidity	Operating : 0 to 50°C (32 to 122°F) \leq 80%R.H. Storage : -10 to 60°C (14 to 140°F) \leq 80%R.H.
Power Source	1.5V(AA) x 8
Dimensions	250(L) x 190(W) x 110(D)mm (9.84x7.5x4.33")
Weight	Approx. 1430g(battery included)
Fuse(0.1A/250V 5 x 20mm

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WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. **BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS).** The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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