

**ROBIN**  **AMPROBE®**

**KMP7010**

**Ground Resistance Tester**

**Users Manual**





# **KMP7010**

## **Ground Resistance Tester**

### **Users Manual**

**English**

### **Limited Warranty and Limitation of Liability**

Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase, unless local laws require otherwise. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to an Amprobe dealer or distributor. See Repair Section for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STATUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

### **Repair**

All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe® Test Tools.

### **In-Warranty Repairs and Replacement – All Countries**

Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe® Test Tools distributor for an exchange for the same or like product. Please check the "Where to Buy" section on [www.amprobe.com](http://www.amprobe.com) for a list of distributors near you. Additionally, in the United States and Canada In-Warranty repair and replacement units can also be sent to a Amprobe® Test Tools Service Center (see address below).

### **Non-Warranty Repairs and Replacement – US and Canada**

Non-warranty repairs in the United States and Canada should be sent to a Amprobe® Test Tools Service Center. Call Amprobe® Test Tools or inquire at your point of purchase for current repair and replacement rates.

#### **In USA**

Amprobe Test Tools  
Everett, WA 98203  
Tel: 877-AMPROBE (267-7623)

#### **In Canada**

Amprobe Test Tools  
Mississauga, ON L4Z 1X9  
Tel: 905-890-7600

### **Non-Warranty Repairs and Replacement – Europe**

European non-warranty units can be replaced by your Amprobe® Test Tools distributor for a nominal charge. Please check the "Where to Buy" section on [www.amprobe.eu](http://www.amprobe.eu) for a list of distributors near you.

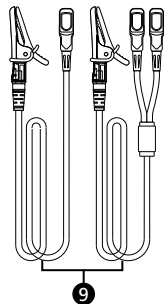
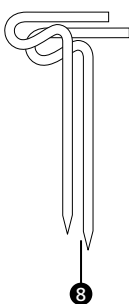
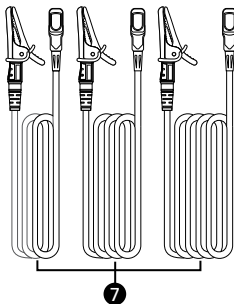
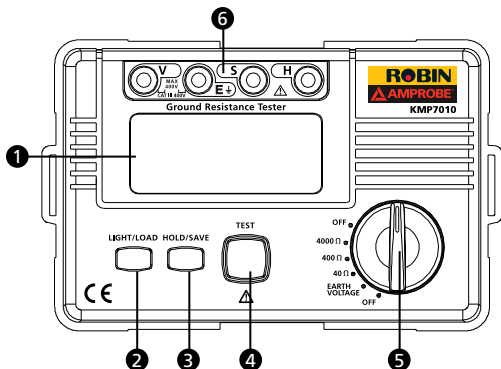
#### **European Correspondence Address\***

Amprobe® Test Tools Europe  
Beha-Amprobe GmbH  
In den Engematten 14  
79286 Glotttetal, Germany  
Tel.: +49 (0) 7684 8009 - 0  
[www.amprobe.eu](http://www.amprobe.eu)

Robin-Amprobe® Test Tools UK  
52 Hurricane Way  
Norwich, Norfolk, NR6 6JB  
United Kingdom  
Tel.: +44 (0) 1603 25 6662 Fax.: +44 (0) 1603 25 6664  
[www.robin-amprobe.co.uk](http://www.robin-amprobe.co.uk)

\*(Correspondence only – no repair or replacement available from this address. European customers please contact your distributor.)

# KMP7010 Ground Resistance Tester










- ① LCD Display
- ② LIGHT/LOAD button
- ③ HOLD/SAVE button
- ④ TEST button
- ⑤ ON/OFF function
- ⑥ Input terminals
- ⑦ Standard 3-Wires Test leads with alligator clip (Red, Yellow, Green)
- ⑧ Auxiliary earth stakes
- ⑨ 2 Wires test leads with alligator clip (Red, Green)

**CONTENTS**

<b>SYMBOLS</b> .....	2
<b>UNPACKING AND INSPECTION</b> .....	4
<b>FEATURES</b> .....	4
<b>OPERATION</b> .....	5
<b>SPECIFICATION</b> .....	9
<b>MAINTENANCE AND REPAIR</b> .....	10
Battery Replacement .....	10

## SYMBOLS

	Battery		Refer to the manual
	Double Insulated		Caution! Risk of electric shock
	Earth Ground		Complies with EU directives
	Do not dispose of this product as unsorted municipal waste		

### **⚠ WARNING!**

***Do not operate this instrument in the presence of gasoline, natural gas, propane, or in other combustible atmospheres.***

### **Safety Information**

- This operation manual includes the user guidance and safety instruction when using the tester, please read it before using.
- Before using the Tester, please read and understand the operating manual including the content.
- Must be followed all the related safety instructions, otherwise it may cause accidents or damage the Tester.
- Using the Tester only as specified in this manual or the protection provided by the meter might be impaired.
- Don not use the Tester or test leads if they appear damaged, or if the Tester is not operating properly. If in doubt, have the meter serviced.
- Always use the proper terminals, switch positions, and range for measurements
- Verify the Tester's operation by measuring a known source.
- Do not use the meter around explosive gas or vapor.
- Replace the battery as soon as the low battery indicator appears.
- Remove test leads from the Tester before opening the battery door.

Safety sign "⚠" has 3 meanings in this manual, user has to pay attention to this sign "⚠" for operation.

**⚠ DANGER!** *identifies conditions and actions that most likely pose hazard(s) or death.*

**⚠ WARNING!** *identifies conditions and actions that will pose hazard(s) or death.*

**⚠ CAUTION:** *identifies conditions and actions that will pose hazard(s) or damage the Tester.*

**⚠ DANGER!**

- *Do not use the Tester around explosive environment, which may cause fire and explosion.*
- *Do not use the Tester in wet environment or do not make any connection when your fingers are wet.*
- *Do not apply the load more than the Tester capacity or range.*
- *Do not open battery compartment while testing.*

**⚠ WARNING**

- *Do not use the Tester if it is damaged or metal part is exposed.*
- *Do not disassemble the tester. If it needs repair, please refer to our warranty statement.*
- *Do not change battery or open battery compartment when the Tester is wet. Soft cloth should be used to dry it first.*
- *Make sure the Tester is turned off when changing battery or opening the battery compartment.*

**⚠ CAUTION**

- *Ensure test leads are properly inserted into the corresponding port before measurement.*
- *Remove the batteries from the Tester if the tester will not be used for a long time.*
- *Do not expose the Tester in extreme temperature and wet environment.*
- *Soft cloth and mild detergent should be used to clean the surface of the Tester when servicing. No abrasive and solvent should be used.*



## UNPACKING AND INSPECTION

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Your shipping carton should include:

- 1 KMP7010 Ground Resistance Tester
- 1 Test Lead (Green) with alligator clip
- 1 Test Lead (Yellow) with alligator clip
- 1 Test Lead (Red) with alligator clip
- 2 Auxiliary ground rods
- 2 Test leads (Red, Green) with alligator clip
- 6 1.5V Alkaline Batteries (AA)
- 1 Strap
- 1 User's Manual
- 1 Carrying Case

If any of the items are damaged or missing, return the complete package to the place of purchase for an exchange.

## FEATURES

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A properly functioning grounding system is a critical safety feature of the electrical systems. It is used to mitigate the risk when exposed metal parts come in contact with dangerous voltages in the event when insulation fails. The building structures are protected by grounding systems to divert energy of lightning strikes straight to ground. Connections to ground limit the build-up of static electricity when handling flammable products or when repairing electronic devices.

ROBIN-AMPROBE Ground Testers are designed to measure resistance of the grounding systems to verify that the system has low enough resistance to provide protection for people, equipment and structures.

- Measures Earth ground resistance - 3 point (fall of potential) or 2 point tests
- Voltage measurement prevents false measurements
- Test leads, auxiliary electrodes are included for complete instrument
- Data Hold
- Large, backlit display

- Built-in memory to store 20 measurement
- Low Battery Indication
- Supplied with: Three Test Leads (Green, Yellow and Red) with alligator clip, Auxiliary ground stakes, two test leads with alligator clips
- Safety CAT III 400V

Range of application: This product is intended to be used to measure installation in process plants, industrial installations, and residential applications.






## OPERATION

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### Preparation before measurement

Checking the unit on a known source before taking measurements.

Battery Voltage check: Select function from OFF to EARTH VOLTAGE or EARTH RESISTANCE, LCD Display will show battery indicator : "□□□". Make sure the battery is at least at level 7.4~7.8V before making any measurement.

Battery sign	Battery Voltage
	$\geq 8.2V$
	7.8V~8.2V
	7.4V~7.8V
	7.0V~7.4V
	$\leq 7V$

### Test leads connection

Make sure all the test leads are firmly connected to the Tester input terminals; If the test leads are not connected properly, the accuracy of the measurement may be influenced.

### Making Measurement

This product is intended to be used to measure installations in process plants, industrial installations, and residential applications.

Measuring Range, Tolerance & Environment. (Temperature:  $20\pm 5^{\circ}C$ ; Humidity: 45%~75% RH; Altitude  $\leq 2000$  meter)

## Earth Resistance Measurement

Display Range	Accuracy
0.00 – 40.00 $\Omega$	$\pm(2\% \text{ Rdg} + 20 \text{ LSD})$
0.0 – 400.0 $\Omega$	$\pm(2\% \text{ Rdg} + 3 \text{ LSD})$
0 – 4000 $\Omega$	$\pm(2\% \text{ Rdg} + 3 \text{ LSD})$

### Test Condition

**Relative Humidity:**  $\leq 75\% \text{RH}$

**Auxiliary Earth Resistance:** 500 $\Omega$  (Accuracy  $\pm 5\%$ )

**Earth Voltage:**  $\leq 10 \text{V}_{\text{ac}}$

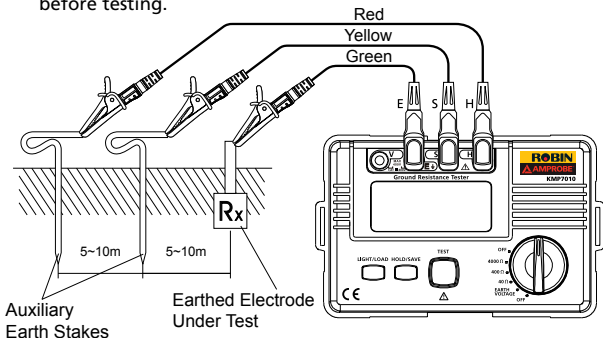
**EN 61557-5 Measurement Range:** 10 $\Omega$  – 4000 $\Omega$   $\pm(2\% + 3\text{LSD})$ ,  $f=840\text{Hz}$   
Interference voltages (3V) with system frequencies of 400Hz, 60Hz, 50Hz, 16 2/3Hz or with d.c. voltage across the terminals E and S or to the earth resistance loop would have additional operating uncertainty. The overall operating uncertainty B% is within  $\pm 30\%$

**Measurement times:** approx. 1400 times or more (with fresh batteries)

### Precision Measurement (using standard test leads for measurement):

1. place 2 ground stakes in earth/soil. Minimum distance between earth electrode(E), probe(S) and auxiliary earth (H) should be 5-10 M (16- 33 FT) apart, shown in Fig.2

**Note:** Make sure that the earth stakes are inserted in a moisturized soil. If the soil is too dry, add water to make it moist. Inserting the earth stakes into rock or sand area also needs to moisturize the test area before testing.



**H:** auxiliary electrode

**S:** potential electrode

**E:** earth electrode

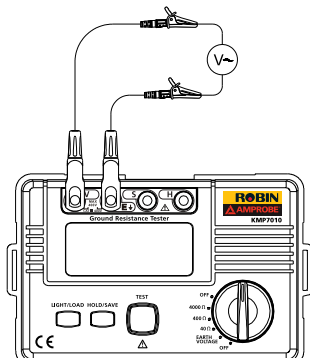
**Fig.2**

2. **Earth Voltage Testing:** Turn the rotary switch to select EARTH VOLTAGE. Connect the test leads to terminal V and E, and then connect to the testing points. LCD display will display earth voltage value.

### Voltage Measurement

Range	Accuracy
0 -400V AC, 50/60 Hz	$\pm(1\% \text{ Rdg} + 6 \text{ LSD})$

**Note:** Do not press the TEST button when measuring the earth voltage. If the measuring value  $>10\text{V}$ , switch-off all related voltage equipments. Wait until the earth voltage decrease, and then do it again. Otherwise, it may influence the accuracy of earth resistance.



### **⚠ WARNING!**

**Ground voltage testing only work in terminal V and E, H and S connecting cable must be separated. Otherwise, it will cause danger and damage the Tester.**

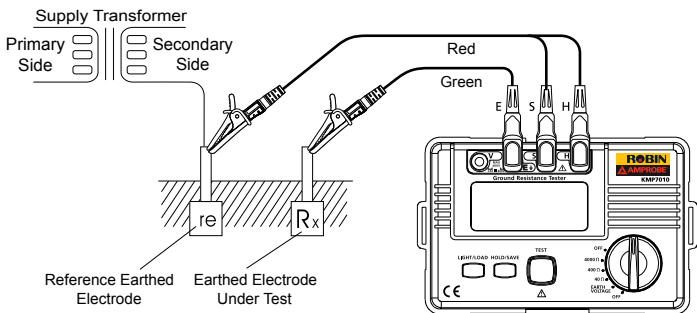
3. **Ground Resistance Testing:** Turn the rotary switch to  $40\Omega$  or  $400\Omega$  or  $4000\Omega$  range, press "TEST" button, LCD display will show earth resistance value. Choose the appropriate range depending on the earth resistance value for better accuracy.

**Note:** when H or S does not connect properly, or earth resistance is out of range, or testing terminal open circuit, LCD display will show " - - - ",

Check the wiring connections, if soil is too dry, or if auxiliary earth stakes are within the specified measurement distance. When the earth resistance is greater than the selected measuring range, LCD display will show "OL"(overload).

4. **Auto Power Off:** The tester will turn itself off after 10 minutes when in idle.
5. **Back Light:** Press LIGHT/LOAD to turn ON or turn OFF the backlight.
6. **Hold/Save Function:** While testing, press "Hold/Save" button, save data function will be on, the displayed testing value will be saved and LCD displays the corresponding sign. Press "Hold/Save" button again to exit this function.
7. **Storage function:**
  - a) **Storage data:** Press "Hold/Save" button for about 2 seconds. Storage function will be on and save the corresponding data. Press "Hold/Save" button again to save the 2nd data; press "Hold/Save" button again to save the 3rd data and so on..., Press "Hold/Save" button for about 2 seconds to exit this function.
  - b) **Read data:** Press "Light/Load" button for about 2 seconds to read the saved data in memory. it will show number 01 saved data. Press "Light/Load" button again to show number 02 saved data and so on (up to 20th saved data). To return to the previous saved data, press "Hold/Save". When "Hold/ Save" button and "Light/Load" button is working as Up and Down selection button, press "Light/Load" button for about 2 seconds to exit this function.
  - c) **Clear saved data:** Press "Hold/Save" button and "Light/Load" button simultaneously, then turn on the tester by rotating the ON/OFF dial to any position. LCD display will show "C L .", All data in the storage memory will be deleted.

**Simple measurement(Use simple 2-Wires test leads for measurement):** This method will be used when the auxiliary earth stakes cannot be used. Use the exposed earth resistance object from the ground as earth, like metal water bath, water pipe, ground wire, building earth, also can use 2-wires test leads method (E and S&H terminals).**Connection diagram is as below:**



## SPECIFICATION

At Temperature:  $20\pm 5^{\circ}\text{C}$ ; Humidity: 45%~75% RH; Altitude  $\leq 2000$  meter)

**Operating temperature:**  $5^{\circ}\text{C}\sim 40^{\circ}\text{C}$  ( $32^{\circ}\text{F}$  to  $104^{\circ}\text{F}$ )

**Relative Humidity:**  $\leq 80\%$  RH

**Altitude:**  $\leq 2000$  meter

**Storage Condition:**

A) **Temperature:**  $-20^{\circ}\text{C}\sim 60^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$  to  $152^{\circ}\text{F}$ )

B) **Relative Humidity:**  $\leq 90\%$

**Product Size:** 160mm x 101mm x 71mm (6.3 x 3.98 x 2.79in)

**Product Net Weight:** About 500g (1.1 lb)

**CE Regulation Compliance:**

EN 61010-1 CAT III 400V, EN 61010-2-31 for test leads

EN 61557-1, EN 61557-5

EN 61326-1 (EMC)


Pollution degree II, Class II equipment (double insulation)

IP40 as per EN 60529

## MAINTENANCE AND REPAIR

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If there appears to be a malfunction during the operation of the meter, the following steps should be performed in order to isolate the cause of the problem.

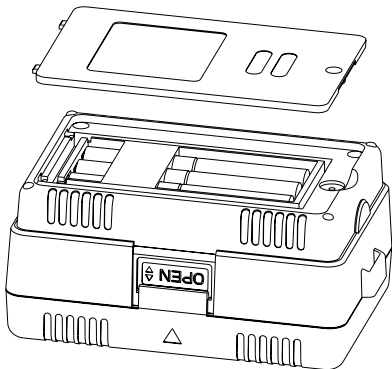
1. Check the battery. Replace the battery immediately when the symbol "" appears on the LCD.
2. Review the operating instructions for possible mistakes in operating procedure.

Except for the replacement of the battery, repair of the meter should be performed only by a Factory Authorized Service Center or by other qualified instrument service personnel. The front panel and case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow to dry completely before using. Do not use aromatic hydrocarbons, Gasoline or chlorinated solvents for cleaning.

### Battery Replacement

Replace the batteries immediately after the low battery indicator appears on the screen. Follow the steps below to replace the batteries:

1. Turn the rotary switch to OFF position
2. Remove the screws from the battery cover and open the battery cover
3. Remove the batteries and replace with 6 new 1.5V Alkaline Batteries (AA). Pay attention to the polarity signs in the battery compartment.
4. Put the battery cover back and re-fasten the screw.



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