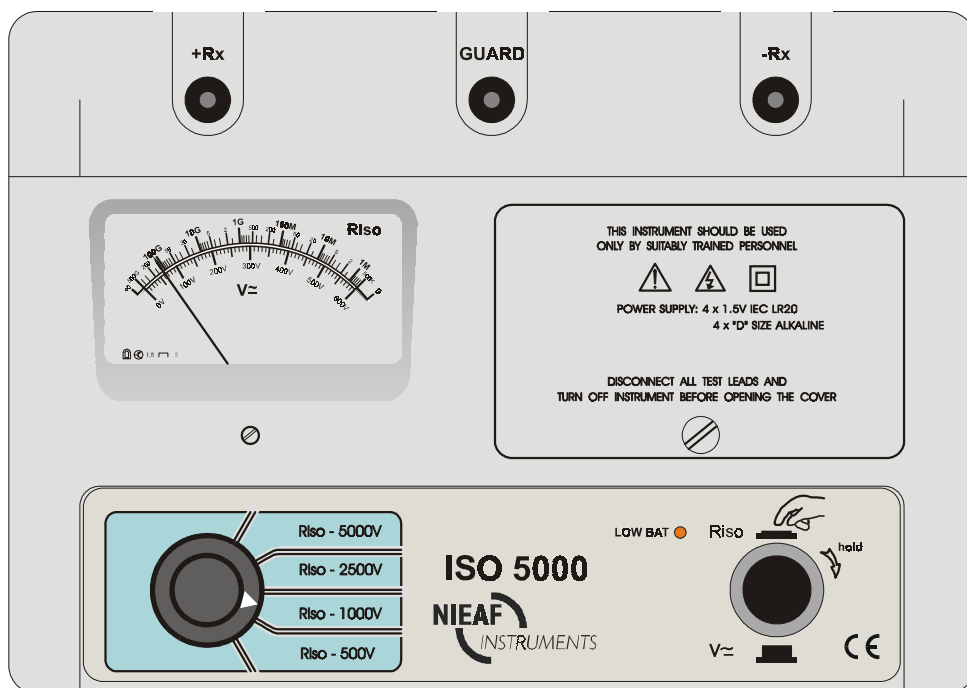


# User manual

## ISO 5000

### Insulationtester







## Preface

This manual describes the Insulation ISO 5000 Tester. The information in this manual is important for proper and safe functioning of the machine. In case you are not familiar with the operation, the preventive maintenance, etc. of the ISO 5000 Tester, then you need to read this user manual from the beginning to the end thoroughly.

If you are familiar with these matters, you can use this manual for reference. You can find the required information rapidly using the table of contents.

In this user manual, the following four marking conventions are used to focus attention on certain subjects of actions.

	<p style="text-align: center;"><b>TIP:</b> <i>gives you suggestions and advice to perform certain tasks easier or faster.</i></p>
	<p style="text-align: center;"><b>ATTENTION:</b> <i>a remark with additional information; draws your attention to possible problems.</i></p>
	<p style="text-align: center;"><b>CAUTION:</b> <i>the machine may be damaged, if you do not carefully execute the procedures.</i></p>
	<p style="text-align: center;"><b>WARNING FOR DANGER:</b> <i>you can (seriously) hurt yourself or seriously damage the product, if you do not carefully execute the procedures.</i></p>

- this document is described with the words “manual” or “user manual”;
- the test equipment is described with the words “tester”, “instrument” or “test device”;
- values or displayed data is placed between inverted commas for example “230 V”;

## **Warranty**

Nieaf-Smitt bv guarantees the tester for a period of 6 months.

The period of warranty will be effective at the day of delivery. The warranty clauses and the stipulations regarding liability in terms of delivery (FME and HE).

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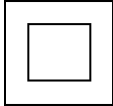

All rights reserved. Nothing from this edition may be multiplied, or made public in any form or manner, either electronically, mechanically, by photocopying, recording, or in any manner, without prior written approval from Nieaf-Smitt bv.

Nieaf-Smitt bv reserves the right to change parts at any given moment, without prior or direct notification to the client. The contents of this user manual may also be changed without prior warning.

This user manual is compiled with all possible care, but Nieaf-Smitt bv can not accept any responsibility for possible errors in this user manual or any consequences resulting from that.

## Warning pictograms on the tester


There are a number of pictograms on the tester, meant to warn the user of remaining risks that may be present in spite of the safe design.


Pictogram	Description	Location on the tester
	Warning: General sign for danger. Read the instructions carefully before use.	At the front side of the tester on the instruction label.
	Warning: Danger for direct contact with live parts.	At the front side of the tester on the instruction label and under the battery cover.
	Mark: Insulation class II (double insulation).	At the front side of the tester.
	CE-mark: Declares the conformity with the European Directives.	The CE-mark is placed on the front side of the tester.


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# 1. GENERAL SAFETY REGULATIONS


	<p><i>Read, before you perform any action in connection with the tester, this user manual carefully.</i></p> <p><i>Nieaf-Smitt bv is not liable for injuries, (financial) damage and/or excessive wear resulting from incorrectly performed maintenance, incorrect use of or modifications to the instrument.</i></p>
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	<p><i>It is not allowed to remove, to skirt or to tide over (by handy constructions) the enclosure or safeties of the tester during normal use.</i></p> <p><i>Method of measurement and range are indicated on the back side of the instrument.</i></p>
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	<p><i>It's forbidden to place and/or to use the instrument in a room where is a risk of explosion.</i></p>
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	<p><i>If the tester is used by a third party, you being the owner are responsible, unless otherwise specified.</i></p>
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	<p><i>Repair can only be done by Nieaf-Smitt bv.</i></p>
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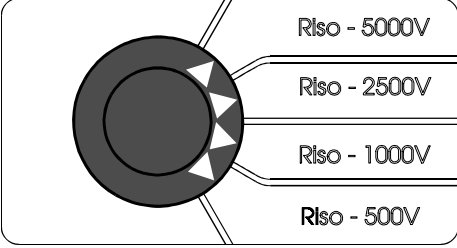

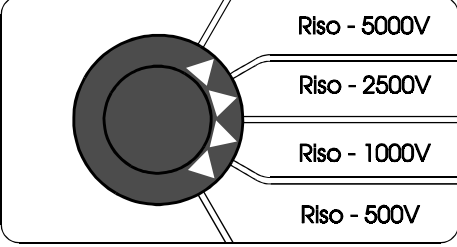

	<p><i>Provide a clean and save workplace which has sufficient lightning.</i></p>
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## 2. INTRODUCTION

The ISO 5000 Meter is a professional instrument intended for the measurement of insulation resistance from 500k $\Omega$  up to 500 G $\Omega$  using dc test voltages of 500, 1000, 2500 and 5000V and also for the measurement of dc and 50Hz ac voltages up to 600V.

The instrument is incorporated into a robust portable plastic casing which ensures its insensibility to mechanical strains as well as its safe operation. It is battery powered (4 x 1.5V dc IEC LR20) for autonomous operation. Its logarithmic scale provides an easy and accurate reading of the measurement results.

### 3. LIST OF MEASUREMENTS THE INSTRUMENT CAN DO

Rotary switch and START key position		Function
		Insulation resistance measurement using measuring voltage of 500, 1000, 2500 or 5000 Vdc
		AC/DC voltage measurement



## 4. TECHNICAL SPECIFICATIONS

### Insulation resistance

Measuring range:	500 k $\Omega$ ÷ 500 G $\Omega$
Measuring voltage:	500, 1000,2500, 5000 Vdc
Short circuit measuring current:	approx. 1,3 mA
Scale:	logarithmic, l=90 mm
Accuracy:	$\pm$ 2 mm
START HOLD system:	Included
Discharging of line:	automatic, when START key is not pressed
Max. overvoltage:	1,3 x U <sub>N</sub>

### Voltage

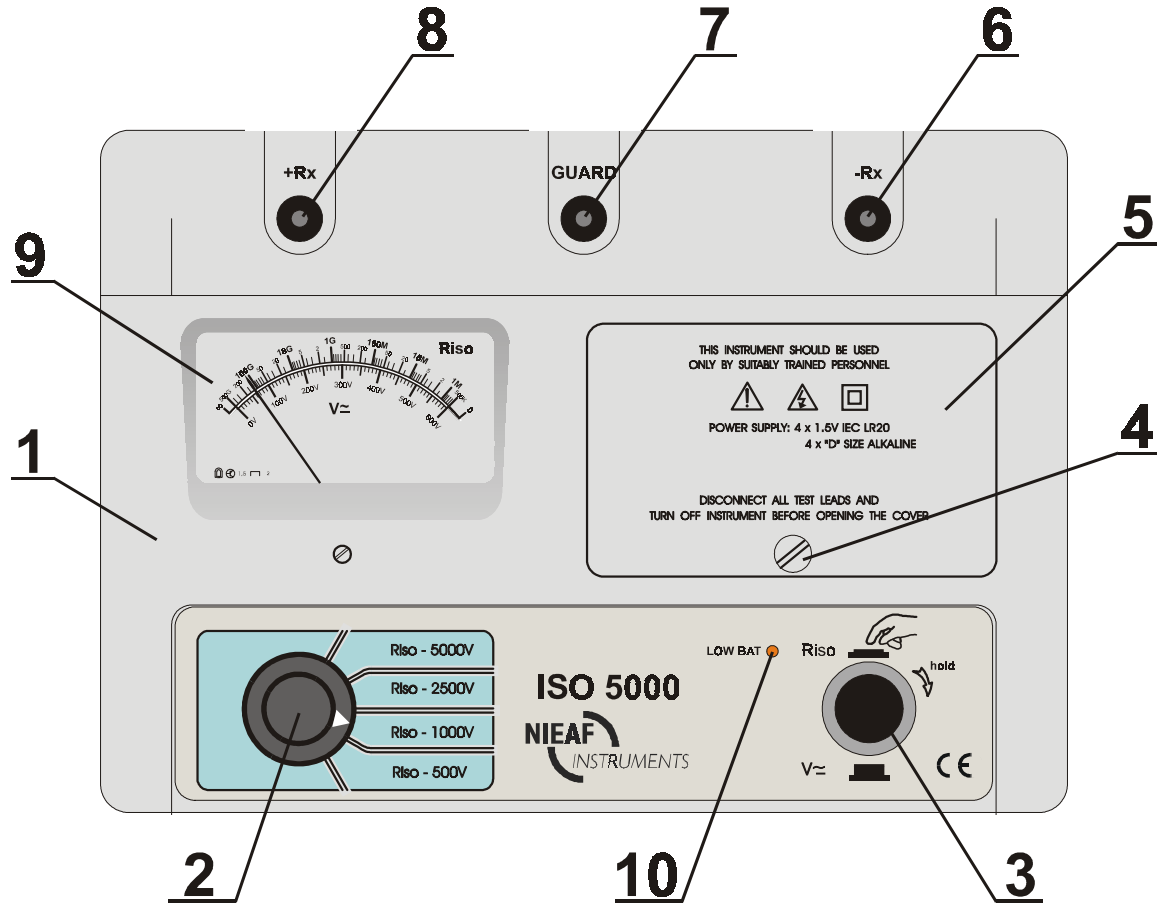
Measuring range:	0 - 600 Vac/dc
Input resistance	
DC voltage:	3 M $\Omega$
Input resistance	
AC voltage:	1,35 M $\Omega$
Scale:	linear, l=90 mm
Accuracy:	$\pm$ 2 % of full scale

### General

Power supply:	Batteries 4 x 1,5 Vdc IEC LR20
LOW BAT indicator:	red LED
Dimensions (WxHxL):	345 x 130 x 250 mm
Case:	robust, plastic
Working temp. range:	0 ÷ 40 °C
Nominal temp. range:	10 ÷ 30 °C
Storage temp. Range:	-10÷60 °C
Max. working humidity:	85% RH (0÷40 °C)
Max. storage humidity:	90% RH (-10÷40 °C) 80% RH (40÷60 °C)
Mass:	4,5 kg
Battery life time (open circuit, 5kV, 5s/25s measurement system):	500 h approx.
Overvoltage category:	III 600V
Protection classification:	double insulation
Pollution degree:	2

## 5. INSTRUMENT DESCRIPTION

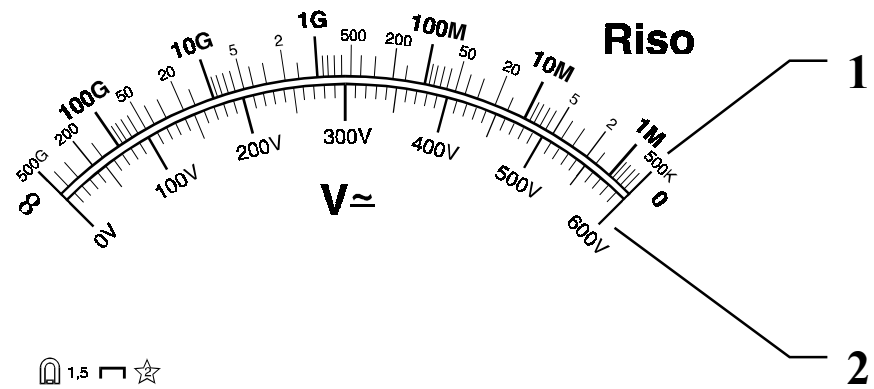
### 5.1. Front panel



Legend:

- 1 Front panel, plastic
- 2 Test voltage switch
- 3 START key
- 4 Battery cover fastening screw
- 5 Battery cover
- 6 - Rx terminal
- 7 GUARD terminal
- 8 + Rx terminal
- 9 Pointer instrument
- 10 LOW BAT indication LED


## 5.2. Scale of the Instrument




Legend:

1. Insulation resistance scale
2. dc. or ac. voltage scale


## 6. INSTALLATION; START-UP AND ADJUSTING

	<p><i>The tester can only be used if no damages or defects are noticed and all original components belonging to the tester are mounted</i></p>
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	<p><i>The transportation and the handling of the tester should be done carefully to prevent any damage.</i></p>
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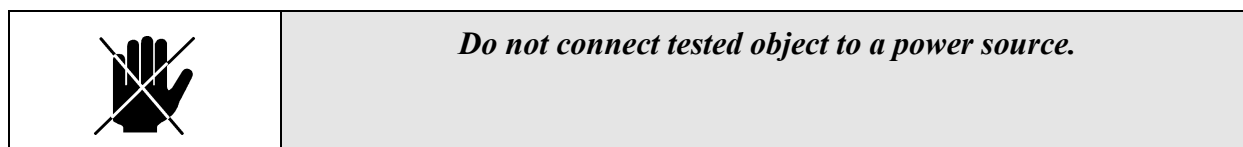
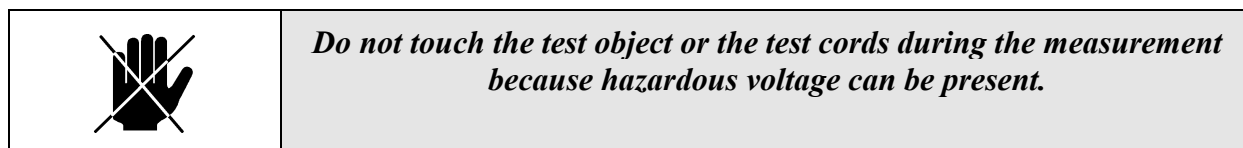
This paragraph describes the installation and the starting up procedure of the instrument. The installation, the starting up and the adjustment of the instrument may be done by competent persons.

1. Unpack the instrument. Remove the packing materials without causing damages to the environment. Check the tester on possible damages. If damages are noticed, contact Nieaf-Smitt bv..
2. Put the instrument in a horizontal position, at the workplace or in the test room. Keep enough clearance around the instrument to facilitate an easy operation, adjustment and reading of test results, without any problems or extra danger.
3. Insert the batteries in the instrument.
4. Connect the test object according to the circuit diagrams with the ISO 5000.
5. Carry out the selected test.

	<p><i>Find a place to put the manual such that it is within reach during the use of the instrument.</i></p>
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## 7. INSTRUCTION FOR USE

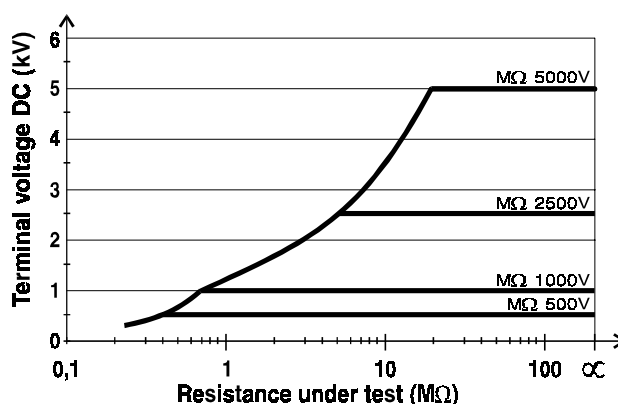
### 7.1. Measurement of Insulation Resistance



#### WARNINGS:

1. Before connecting the instrument to tested object, make sure **START** button of the instrument is released; the voltage at test terminals can be as high as 5kV.
2. Should a capacitive tested object be disconnected during the measurement, it remains charged and has to be discharged before touching it.
3. When performing a long-duration test (**START** key is locked), check every 5 minutes the tested object for insulation breakdown. If breakdown is detected, switch off the instrument to avoid any useless battery discharging.
4. Continuous maximal voltage at the test terminals (V-meter) is 1000V dc or 1000V ac peak value. As a general rule, disconnect test terminals of the instrument immediately if tested voltage exceeds 600V.
5. During the measurement of insulation resistance check the condition of batteries (the red LED should not light).
6. Use the instrument according to this Instruction manual only. Do not connect **GUARD** terminal to hazardous voltage.

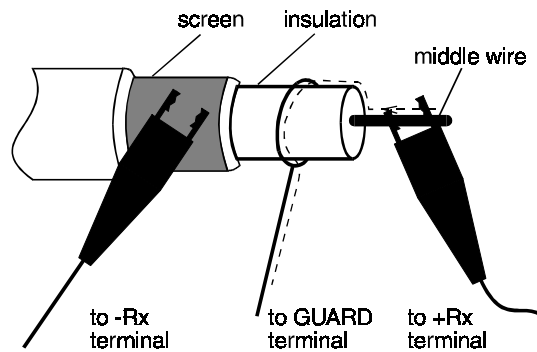
Test voltage:



Typical diagram of test voltages

The usage of GUARD terminal:


In general the measurements of insulation resistance are carried out without using the GUARD terminal. If e.g. a coaxial cable is being tested, the test result can be the consequence of both insulation's conductivity and of insulation's surface conductivity. If one wants to eliminate the influence of the surface conductivity (which appears either due to humidity in the atmosphere or due to dirt) the terminal GUARD should be used as shown in figure below:



## 7.2. Measurement of DC or AC Voltage

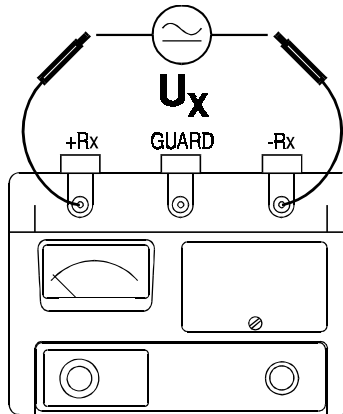
WARNINGS:

1. For voltage measurements it is not necessary to insert the batteries or to test the battery condition.

	<b><i>Max. allowed input voltage is 600 Volts.</i></b>
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2. Continuous maximal voltage at the test terminals (V-meter) is 1000V dc or 1000V ac peak value. As a general rule, disconnect test terminals of the instrument immediately if tested voltage exceeds 600V.
3. Before connecting the instrument to tested object, make sure START button of the instrument is released; the voltage of the terminals can be as high as 5kV.

Connect test leads to the tested voltage as shown in figure below:



The instrument indicates the value of dc voltage or rms ac voltage (50Hz) without depressing START key.

### 7.3. Replacement of Batteries

	<p><i>Exchange all four batteries.</i></p>
	<p><i>Disconnect all cables before removing the battery cover.</i></p> <p><i>Caution, possible live parts under the battery cover</i></p> <p><i>Throw, after using, the empty batteries in the special battery basket.</i></p>

If the red LED starts to light during the insulation resistance measurement, this indicates that the batteries are used up and should be replaced. The accuracy of the test results, when the red LED lights, can not be guaranteed. Red LED starts to light in case battery voltage is lower than 4,2V approx..

#### ATTENTION

- If one intends not to use the instrument for a longer time period, it is advisable to remove the batteries in order from it to avoid possible leak of acid.
- Use the batteries of IEC LR20 type (4 x 1.5V dc).
- Always replace all four batteries.

## 7.4. Cleaning



***Do not use liquids based on petrol!  
Do not spill cleaning liquid over the instrument.***

Use soft patch moistens by water or alcohol, and leaves the instrument to dry totally after the cleaning.

Do not use liquids based on petrol!

Do not spill cleaning liquid over the instrument!

## 7.5. Calibration

Technical specification is guaranteed only if the instrument is calibrated at least once per 2 years by a competent service-man. Contact your dealer for detailed information.

## 7.6. Service

In case of any instrument malfunction or if some damage is noticed on the instrument or test leads, the instrument must be serviced by a competent service-man. Contact your dealer for detailed information.

There are no user replaceable parts in the instrument!

## 8. STANDARD SET

Instrument ISO 5000.

Measuring lead banana / crocodile, 2 m: 3x.

Instruction manual.