

UT513A

Operating Manual



Insulation Resistance Tester

Introduction

Uni-Trend Model UT513A Insulation Resistance Tester (hereafter, "the Meter") is a handheld instrument designed primarily to make resistance/ insulation resistance measurement.

Unpacking the Meter

The Meter includes the following items:

Table 1. Unpacking Inspection

Item	Description	Qty
1	English Operating Manual	1 pc
2	One plug test lead to one alligator clip (Black)	1 pc
3	One-plug test lead to one alligator clip (Green)	1 pc
4	Two-plug test lead to one alligator clip (Red)	1 pc
5	1.5V Battery (LR14)	8 pcs
6	Tool Box	1 pc
7	USB Interface Cable	1 pc
8	Software	1 pc
9	Power adaptor (input voltage 230V, 50/60Hz, 150mA, output DC15V, 1100mA) (optional, available at extra cost)	1 pc

It is recommended to select the specific 8pcs chargeable batteries (LR14) and a charger. In the event you find any missing or damaged part, please contact your dealer immediately.

Safety Information

This Meter complies with EN 61010-1:2010, IEC 6155 7-1, IEC 61557-2.safety measurement requirement: Pollution Degree 2, measurement category CAT III 600V and Double Insulation.

CAT II (measurement category): Test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.

CAT III (measurement category): Test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.

Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be impaired.

⚠ **Danger** identifies conditions and actions that pose hazard(s) to the user.

⚠ **Warning** alerts the user to avoid electric shock.

⚠ **Caution** identifies conditions and actions that may damage the Meter and affect accurate measurement.

⚠ **Operating Caution** identifies conditions that user needs to take extra care during operating the Meter



Danger

Use of instrument in a manual not specified by the manufacturer may impair safety features/protection provided by the equipment. Read the following safety information carefully before using or servicing the instrument.

- Do not apply more than 600V.
- Do not use the Meter around explosive gas, vapor or dust.
- Do not use the Meter in a wet environment.
- When using the test leads, keep your figures away from the lead contacts. Keep your figures behind the finger guards on the leads.
- Do not use the Meter with any parts or cover removed.
- When carrying out insulation measurement, do not contact the circuit under test.



Warning

- Do not use the Meter if it is damaged or metal part is exposed. Look for cracks or missing plastic.
- Be careful when working above 33V rms, 46.7V ac rms or 70V DC. Such voltages pose a shock hazard.
- Discharge all loading of circuit under test after measuring high voltage.

- Do not change battery when the Meter is in wet environment.
- Place test leads in proper input terminals. Make sure all the test leads are firmly connected to the Meter's input terminals.
- Make sure the Meter is turned off when opening the battery compartment.



Caution

- When performing resistance tests, remove all power from the circuit to be measured and discharge all the power.
- When servicing the Meter, use only the test leads and power adaptor with the same model or identical electrical specifications.
- Do not use the Meter if the battery indicator () shows a battery empty condition. Take the battery out from the Meter if it is not used for a long time.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.
- Soft cloth and mild detergent should be used to clean the surface of the Meter when servicing. No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.
- Dry the Meter before storing if it is wet.

International Electrical Symbols

International symbols on the Meter and in this manual are explained in Table 2.

Table 2. International Electrical Symbols

⚡	Risk of electric shock
⊞	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION
⎓	Direct current
~	Alternating current
⏚	Grounding
⚠	Caution
🔋	Low Battery Indication
CE	Conforms to Standards of European Union

Battery Saver (Sleep Mode)

The Meter enters the Sleep Mode and blanks the display after 15 minutes' inactivity. This is done to conserve battery power. The Meter comes out of Sleep Mode when **ON/OFF** button is pressed and hold for 1 second.

Battery Indication

There is a battery indicator shown on the upper left corner of the display. Please refer to Table 3 for detailed explanation. When using battery test, the voltage maximum is 14.0V and minimum is 10.0V.

Table 3. Battery Indication

Battery indicator	Cell voltage (#2 Carbon battery)	Recommend test gear 如未提供EXCEL 对应R13A 英文表格
	< 9.9V	Can not use for testing,suggest replace battery
	10.0V~10.9V	use for 500V/1000V test
	11.0V~11.7V	use for 500V/1000V/2500V test
	> 11.8V	use for 500V/1000V/2500V/5000V test
	> 14.0V (For power adaptor only)	use for 500V/1000V/2500V/5000V test

When charging battery is applied, the charging battery work mode should be selected at the startup: Press and hold USB button prior to startup, then press down ON/OFF, LCD screen will display CHA or GEN, and select to display CHA by pressing the up/down key, after pressing USB key to confirm, the Meter successfully enters the charging battery work mode. GEN means the general alkaline battery work mode.

The Meter Structure

Below Figure 1 and Table 4 shows the Meter front structure and description

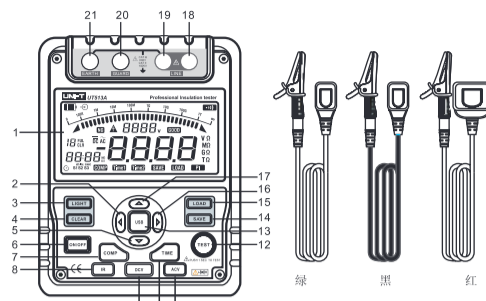


Figure 1. The Meter Front Structure

Table 4. Meter Front Description

1	LCD
2	◀ Arrow Button
3	Emergency Stop
4	Data Clear the Display Backlight Button
5	▼ Arrow Button
6	On/Off Button
7	Compare Button
8	Insulation Resistance Button
9	DC Voltages measurement Button
10	Timer Button.
11	AC Voltages measurement Button
12	Test Button
13	USB Button
14	Data Store Button.
15	Data Recall Button
16	▶ Arrow Button
17	▲ Arrow Button
18	LINE: High voltage input terminal (Connected to two-plug red test lead)
19	High voltage line shielding input terminal (Connected to two-plug red test lead)
20	GUARD: Grounding protection input terminal (Connected to one-plug black test lead)
21	EARTH: High resistance measurement input terminal (Connected to one-plug test lead)
22	Testing leads: Two-plug red test lead to one alligator clip. One-plug black test lead to one alligator clip. One-plug green test lead to one alligator clip.

Below Figure 2 and Table 5 shows the Meter side structure and description

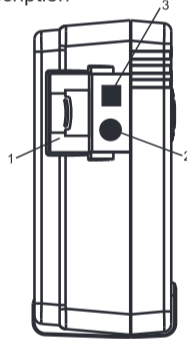


Figure 2. The Meter Side Structure

Table 5. Meter Side Description

1	Safety Shutter
2	Power adaptor Input Terminal
3	USB Port

Display

Table 6 and Figure 3 describe the display.

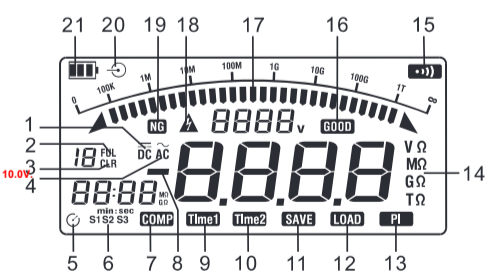


Figure 3. Display

Table 6. Display Description

Number	Meaning
1	Indicator for DC voltage
2	Indicator for data store full
3	Indicator for clearing
4	Indicator for AC voltage
5	Indicator for timer
6	Step symbol
7	Indicates selected pass/fail compare value
8	Indicates for negative reading
9	Timer 1 symbol
10	Timer 2 symbol
11	Data store is on
12	Data recall is on

13	Indicator for polarization index
14	Unit symbols
15	The continuity buzzer is on
16	Compare feature pass
17	Analogue bar graph
18	Risk of electric shock
19	Compare feature fail
20	Indicator for power adaptor
21	Battery life indicator

Key Functions

Table 7. Key Description

ON/OFF	Turn on or off the Meter. Press and hold the button for 1 second to turn the Meter on. Press again to turn off the Meter. The Meter defaults at 500V range and under continuous measurement of insulation resistance when turned on.
LIGHT	Press to turn on/off the backlight.
CLEAR	Press to clear the saved data.
SAVE	Press to store the current measurement value. The Meter can save up to 18 sets. When the stored readings memory is full, the Meter shows FULL and stop storing. Press and hold CLEAR to clear the stored value in order to store the next measurement value.
LOAD	<ul style="list-style-type: none">Press once to recall the first stored value.Press again to exit Load feature.Load feature can only be used when there is no high voltage output.
▲	<ul style="list-style-type: none">When the insulation resistance measurement has no testing voltage output, press to select previous voltage range.Under load mode: press to recall the previous stored value.
▼	<ul style="list-style-type: none">When the insulation resistance measurement has no testing voltage output, press to select next voltage range.Under load mode: press to recall the next stored value.
◀	<ul style="list-style-type: none">When setting the timer for the measurement of insulation resistance or polarization index, press to decrement the time. The maximum length of time is 15 minutes and 30 seconds, the Meter will automatically carry out measurement.When compare function is enabled for insulation resistance measurement, press to decrement a resistance comparing value.After polarization index measurement, press to display polarization index, TIME 2 and TIME 1 insulation resistance values in sequence.
▶	<ul style="list-style-type: none">When setting the timer for the measurement of insulation resistance or polarization index, press to increment the time. The maximum length of time is 30 minutes and 30 seconds, the Meter will automatically carry out measurement.When compare function is enabled for insulation resistance measurement, press to increment a resistance comparing value.After polarization index measurement, press to display polarization index, TIME 2 and TIME 1 insulation resistance values in sequence.
USB	<ul style="list-style-type: none">Press once to start the data transferring to the computer via USB, USB symbol shows on the display.Press again to stop the data transferring to the computer via USB, USB symbol disappears.
COMP	Set a pass / fail limit for insulation tests. The default value is 10MΩ
TIME	Press to step through continuous, timed and polarization index measurements in sequence.
TEST	Press to stop or start an insulation resistance test
IR	Press to initiate insulation resistance measurement
DCV	Press to initiate DC voltage measurement
ACV	Pres to initiate AC voltage measurement

Measurement Operation

This section explains how to make measurements.

Press and hold **ON/OFF** to turn on the Meter, press again to turn off the Meter. The Meter defaults at 500V range and under continuous measurement of insulation resistance when turned on.

A. Measuring Voltage