

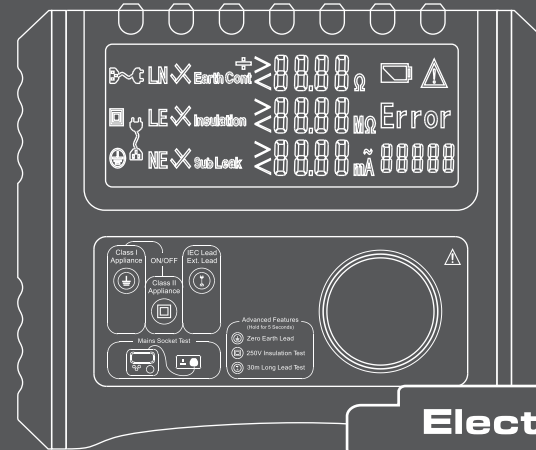
# UNI-T®

## UT528/528AU



Certificate No. 956661

### Operating Manual



Electrical Testers

REV.3  
DATE:2015/07/15  
P/N:110401105431X

# UT528/528AU PAT Tester Manual

## Overview - UT528/528AU

The UT528/528AU is a handheld, battery powered Portable Appliance Tester suitable for carrying out electrical safety tests on:

- Class I Appliances
- Class II Appliances
- Testing IEC and Extension Leads (Including Surge Protected) and long leads
- Mains Socket Earth Continuity, Insulation Resistance and Polarity Test

## Unpacking the Unit

Open the case and take out the PAT tester. Check the following items carefully to see if any parts are missing or damaged. If you find any missing or damaged parts please contact the supplier you bought the UT528/528AU from.


* UT528/528AU Main Unit	1 x
* Operating Manual	1 x
* Earth Bond Lead	1 x
* Alligator Earth Bond Clip	1 x

* Earth Nulling Block	1 x
* Neck strap	1 x
* IEC Lead	1 x
* Batteries C Type R14 1.5V UM2	6 x

## Safety Information



Warnings - Please be aware of the following warnings.

- Before using the unit and test leads inspect both items. Do not use the unit and test leads if they are damaged or the case is broken or damaged as this could result in electrical shock.
- Replace the battery as soon as the battery indicator “” appears. Low battery levels may produce inaccurate readings.
- Do not use or store the unit in high temperature, humid, flammable or electromagnetic environments as damage and incorrect readings may result.
- If the tester requires repair or replacement please contact your local service center.

## Declaration of Conformity

Uni-T manufactures this product and declares that this product conforms to the

following standards:

**BS EN 61326: 1998**

Electrical equipment for measurement, control and laboratory use

**BS EN 61010-1:2001**

Safety Requirements for electrical equipment for measurement, control, and laboratory use – Part 1

4mm banana test lead (CAT III 600V)

Alligator clip (CAT III 600V or CAT IV300V)

**Product Layout – UT528/528AU**

1.Connection Symbol

2.Mains Socket Polarity 1. Live Neutral (LN) 2. Live Earth (LE) 3. Neutral Earth (NE)

3.Pass / Fail Symbols

4.Resistance of Earth / Protective Conductor

5.Resistance of the Insulation

6.Units

7.Low Battery Symbol

8.Warning Symbol

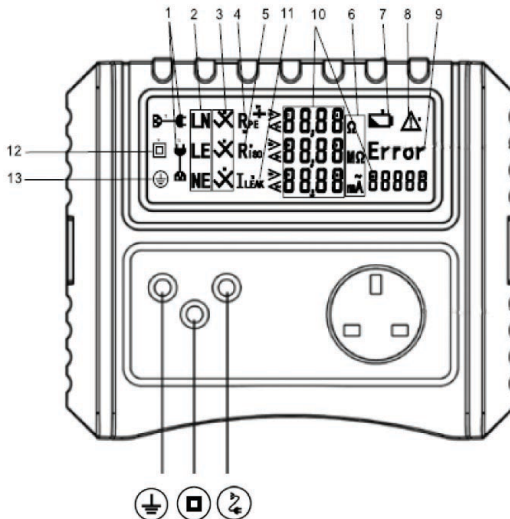
9.Unit Error

10.Readings and Cable Results

11.Leakage Current

12.Double Insulated / Class II Test

13.Class I Test





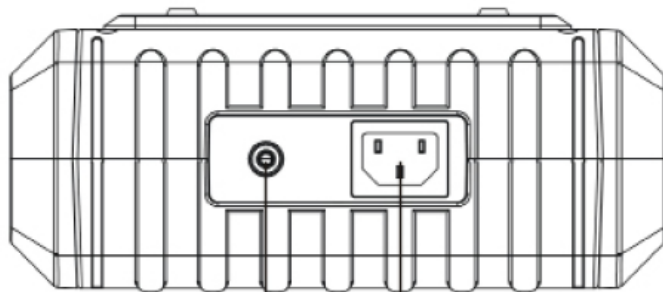
Class I Test Button + Zero/Null Selection



Class II Test Button + 250V Insulation Selection








IEC / Cable Test Button +30m Long Lead Selection





Earth Probe

Mains / IEC testing

## Front Panel Operation

- 1: Press  +  button to Power on / Power Off.
- 2: Press  button when testing a CLASS I Appliance.
- 3: Press  button when testing a CLASS II Appliance.
- 4: Press  button when performing Cord / Extension Lead testing.

## Advance Features

- 5: Press and hold the  button this will set the tester into Long Lead Mode.
6. Press and hold the  button to activate 250v insulation test.

You can exit the above advanced features by turning the unit off and back on.

## **Before Testing - Zero the Earth Bond Test Lead!**

Plug the earth probe into the rear of the unit and connect it to the earth nulling adapter. Plug the earth nulling adapter into the front panel earth socket to complete the circuit.



Press and hold the button for 5 seconds to zero the earth bond reading using the earth bond lead and the nulling adapter together in the front test socket.

This will null the earth reading of the test lead and “GOOD” will be displayed once complete. It is good practice to do this once prior to carrying out testing.

## **Auto Switch Off**

The unit will automatically switch off after approximately 2 minutes if no buttons are pressed.

## **Testing a Class 1 Appliance**

Plug the appliance into the UT528/528AU panel main socket. Plug the earth test lead into the socket on the UT528/528AU end panel. Connect the earth crocodile clip to an



exposed metal part on the appliance as shown in Diagram 3.

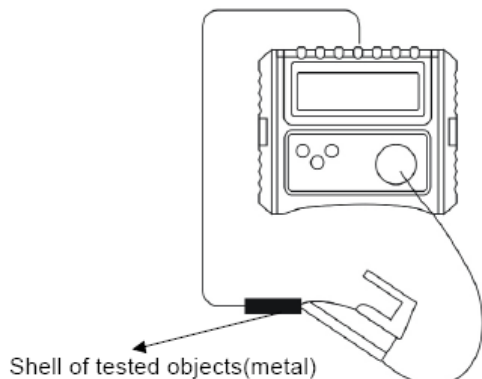



Diagram 3

### 1. Earth / Protective Conductor Test


Press the Class 1 test button  to start the test. The earth resistance test will begin.

If the earth resistance measured is greater than  $0.2\Omega$ , the meter will display “x Rpe”, which is a FAIL. If this occurs, re- check the connections between the pin of the plug to the bodywork of the appliance and that the crocodile clip is attached to clean earthed metalwork on the appliance (try attaching the clip to an alternative piece of metalwork). If all connections are ok the appliance earth connection may be faulty.

The PASS mark for the earth bond test is  $0.2 \Omega$  for a Class 1 appliance.

If the reading is less than  $0.2 \Omega$ , the meter will display “√ Rpe”, which is a PASS.

The unit will then automatically attempt to proceed to the insulation test. If it detects that the appliance’s power switch is in the ON position it will carry out the insulation test automatically.

If this is not detected the unit will display a flashing  symbol and also “LO LOAD”. Press the button to proceed to the insulation test.

## 2. **Insulation Resistance Test**

Before the unit carries out the insulation test it will attempt to check that the connected appliance's power switch is in the on position.

If it detects that the appliance switch is in the on position it will automatically carry out the insulation test.

Please note: most electronic appliances will have electronic 'on/off' switches and even though they are switched on the "Check Connections" message will still appear.

If the measured resistance is greater than  $1\text{M}\Omega$ , the meter will display " $\checkmark$  Riso" as a PASS rating.

If the insulation of the appliance is less than  $1\text{M}\Omega$ , it will display " $\times$  Riso" as a FAIL rating.

### **Leakage Test**

3. After the unit has completed the insulation test it will automatically proceed to the leakage test.

If the measured leakage is less than 0.75mA, the meter will display “√ ILeak” as a PASS rating.

If the measured leakage is greater than 0.75mA, it will display “× ILeak” as a FAIL rating.

### **Final Result**

4. After the above tests are completed, the meter will indicate whether the appliance has Passed or Failed the tests.



Note: to interrupt a test press any other key whilst carrying out the tests.

### **Testing a Class 2 Appliance**

Plug the appliance into the UT528/528AU panel main socket. Plug the earth/insulation test lead into the socket on the UT528/528AU end panel. Connect the earth test probe to an exposed part on the appliance as in Diagram 4.

To start a test on a Class 2 appliance press the  button.

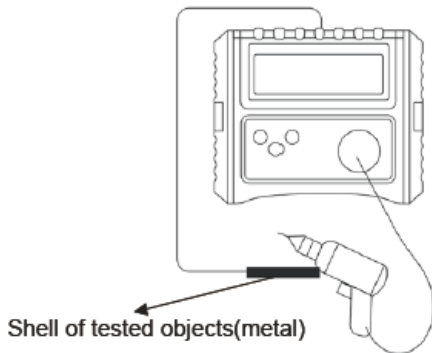



Diagram 4

### **Class 2 Pre-Check**

If the unit detects that the appliance appears to be Class 1 as it detects an earth connection (possibly as a result of a connected earth clip) it will display

a flashing  symbol and you will be prevented from carrying out the Class 2 test. Test the appliance instead using the Class 1 test.


### **Insulation Resistance Test – Class 2 Appliance**


Before the unit carries out the insulation test the unit will attempt to check to

see if the appliance is in the on position.

If it detects that the appliance switch is in the “OFF” position it will wait and

display a flashing  symbol.

If you are sure that the appliance is switched on press the  button again to start the test.

Please note: most electronic appliances will have electronic ‘on/off’ switches and even though they are switched on the flashing  will still appear.

If the measured resistance is greater than  $2M\Omega$ , the meter will display “√ Riso” as a PASS rating.

If the insulation of the appliance is less than  $2M\Omega$ , it will display “× Riso” as a FAIL rating.

## **Leakage Test**

5. After the unit has completed the insulation test it will automatically proceed to the leakage test.

If the measured leakage is less than 0.25mA, the meter will display “√ ILeak” as a PASS rating.

If the measured leakage is greater than 0.25mA, it will display “× ILeak” as a FAIL.

## **Final Result - Class 2**

After the above tests are completed, the meter will indicate whether the appliance has Passed or Failed the Class 2 test.

## **Testing an IEC Lead / Extension Lead / Cord Test**

Plug the mains lead under test into the socket and the front panel mains socket on the unit as shown in Diagram 5.

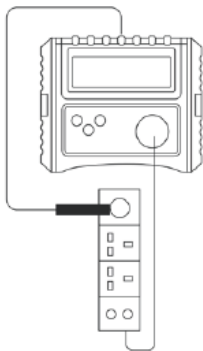


Diagram 5

## To Start the Cord Test Press



### 1. Earth Bond Test

The unit will carry out an earth bond test in the same manner as a Class 1 appliance. The Pass mark for this test is  $0.2 \Omega$

### 2. Insulation Test

The unit will then carry out an insulation test as previously discussed in the manual. The PASS Mark for this test is  $2 M\Omega$ .



Please note: when testing Surge Protected Extension Leads this test may fail. This is normal and a result of circuitry within the surge protection device.

### **3. Polarity Test**

The polarity test is the final test to be carried out and will check that the cord or extension is wired correctly. It will check for open circuit, short circuit or Line / Neutral reversal.

If the Polarity is correct then the meter will display “√ Good”

If the Polarity test detects a fault, the meter will display “× Cross” or “× Open”

### **4. Overall Result**

After the above measurements are completed, the meter will indicate whether the measured appliance is compliant with the requirements of cord testing with “PASS” or “FAIL”

## **Testing a Surge Protected Extension Lead or Appliance**

When you press and hold the Class II appliance button for 5 seconds the tester


will go into 250v insulation test mode and the screen will display '250 test'.

The insulation test voltage reduces from 500V to 250V to allow for the testing of surge protected appliances and leads.

Please note: each insulation test carried out in this mode will be at 250V.

To exit this mode turn the tester off and back on.

### **Testing a Long Cable up to 30 metres**

To test a long extension lead or cable ensure the tester is in long lead mode by pressing and holding the  button for 5 seconds. To exit this mode turn off the tester.

### **Checking a Mains Power Supply**

The unit comes complete with a built in socket tester which will check to ensure

that the socket is wired correctly.

Connect an IEC lead to the mains socket and plug this into the back of the meter as shown in Diagram 6.

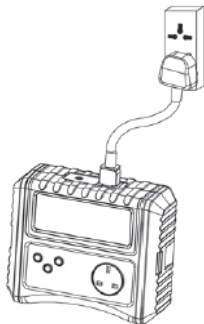


Diagram 6

- 1) If the Live and Neutral in the socket wiring are reversed or there is a fault with the protective earth connection this is indicated as “LN√, LE×, NE×”.
- 2) If there is a fault with the neutral connection this is indicated as “LN×, LE√, NE×”
- 3) If the mains socket wiring is correct the display will show “LN√, LE√, NE√”

## Earth Continuity

Pass Limit& Accuracy	$\pm(5\%+2)$
Test Current	200mA minimum
Test Voltage	5V nominal

## Insulation Resistance

Pass Limit & Accuracy	$\pm(5\%+2)$
Test Voltage	500V
Test Current	>1mA 500k
Test Current	<2mA 1k

## Leakage Current

Accuracy	$\pm(5\%+2)$
Test Voltage	40Vrms,50Hz AC
Test Current	<5mA 2k

## Factory Default PASS/Fail Limits

	Class I		Class II		Cord	
	UT528	UT528AU	UT528	UT528AU	UT528	UT528AU
Earth Continuity	0.2ohms		N/A		0.2 ohm	1 ohm
Insulation Resistance	1.0Mohms		2.0 Mohms	1.0 Mohms	2.0 Mohms	1.0 Mohms
Leakage	0.75mA	N/A	0.25mA		N/A	

### Remarks (UT528AU Only):

Earth Continuity: class I  $\leq 0.2\Omega$ , Cord  $\leq 1\Omega$  is PASS.

Insulation Resistance  $\geq 1.0M\Omega$  is PASS.


Leakage: class II  $\leq 0.25mA$  is PASS.

	Cord Size / Current Rating		
Length	0.5mm <sup>2</sup> /(3A)	1.0mm <sup>2</sup> /(10A)	1.25mm <sup>2</sup> /(13A)
5m	0.20	0.10	0.10
10m	0.40	0.20	0.20
25m	1.00	0.50	0.40

Table 1: Approximate resistance of protective earth conductors.

## Maintenance

### Battery Replacement

When the low battery symbol “” appears, replace the batteries by:

- 1) Disconnecting all test leads before battery replacement.

- 2) Power off the unit.
- 3) Unscrew the battery cover.
- 4) Use 6 C cell 1.5V R14 batteries or UM2 batteries.
- 5) Ensure the polarity of the batteries is correct.
- 6) Re-attach the battery cover.

### **Cleaning**

Clean only with a dry cloth; do not use solvents.

Before use, ensure unit is clean and dry; visually inspect all leads, connectors, and case. Any damage or wear must be rectified to preserve user safety.

### **Maintenance & Service**

This unit should be calibrated and repaired by an authorized service center.

To ensure the accuracy of the device it must be calibrated annually.

There are no user serviceable parts.

### **Environmental rating**

Operating temperature range 0°C to 40°C,

**Do not expose to moisture or condensation as incorrect or non-genuine readings may result.**

**Storage temperature range -25° C to 65°C.**

**Batteries should be removed prior to storage.**

Manufactured by Uni-T, an ISO9001 company.