

lodern Inductance

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the Warnings and Notes strictly.

## **Warning**

To avoid electric shock or personal injury, read the "Safety Information" and "Rules for Safety Operation" carefully before using the Meter.

Digital Inductance Capacitance Meter Model UT602/UT603 (hereafter referred to as "the Meter") is a 3 1/2 digits with steady operations, fashionable design and highly reliable hand-held measuring instrument.

The UT602 can measure inductance, while UT603 can measure capacitance and inductance. They both can measure resistance, transistor, diode and continuity buzzer UT602 has an extra Data Hold feature.

## Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully to see any missing or damaged

Item	Description	Qty
1	English Operating Manual	1 piece
2	Test Clip	1 pair
3	9V Alkaline Battery (NEDA1604, 6F22	1 piece
	or 006P) (installed)	

In the event you find any missing or damage, please contact your dealer immediately.

## Safety Information

This Meter complies with the standards EMC EN61326. Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be

In this manual, a Warning identifies conditions and actions that pose hazards to the user, or may damage the Meter or the equipment under test. A **Note** identifies the information that user should pay

nternational electrical symbols used on the Meter and in this Operating Manual are explained on page 7.

## Rules For Safe Operation

## **⚠** Warning

To avoid possible electric shock or personal injury. and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic Pay attention to the insulation around the connectors
- Inspect the test clips for damaged insulation or exposed metal. Check the test clips for continuity. Replace damaged test clips with identical model number or electrical specifications before using the
- Do not apply voltage to the Meter.
- The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement is conducted to prevent amage of the Meter • Do not apply more than 30Vrms between the
- terminals and the grounding to avoid electric shock and damage to the Meter. Use the proper terminals, function, and range for
- your measurements.
- 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.
- Disconnect circuit power and discharge all highvoltage capacitors before testing resistance, continuity, capacitance or diodes. Replace the battery as soon as the battery indicate
- appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Remove test clips from the Meter and turn the Meter power off before opening the Meter case.
- When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.
- The internal circuit of the Meter shall not be altered at will to avoid damage of the Meter and any accident 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
- take out the battery when not using for a long time. Please constantly check the battery as it may leak when it has been using for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.

## International Electrical Symbols

÷	Grounding			
	Double Insulated			
C2	Deficiency of Built-In Battery.			
•1))	Continuity Test.			
<b>→</b> +	Diode.			
- (-	Capacitance Test			
Lx	Inductance Test			
8	Fuse.			
Δ	Warning. Refer to the Operating Manual.			
C€	Conforms to Standards of European Union.			

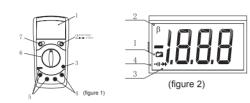
# The Meter Structure (see figure 1)

- 2. Data Hold (UT602) or L-C switch (UT603)
- 3. Transistor Jack Resistance. Diode and Continuity Input Terminal
- 5. Capacitance Input Terminal (UT602) or Capacitance and Inductance Input Terminal (UT603)
- Rotary Switch

## **Functional Buttons** Below table indicated for information about the functional button operations

## Description Power Press the Power down to turn the Meter on. Press the **Power** again to turn the Meter power off. Hold Press HOLD once to enter the hold feature, the LCD (UT602 display II . only) Press HOLD again to exit hold feature, the

disappear. L-C Press L-C down to enter the Capacitance (UT603 measurement mode. only) Press L-C up to enter the Inductance measure



## Display Symbols (see figure 2)

		7	<b>Display Symbols</b> (ess ligals
	No.	Symbol	Meaning
	1	ä	The battery is low.
<b>)</b>			⚠ Warning: To avoid false readings,
			which could lead to possible electric sho
			or personal injury, replace the battery a
			soon as the battery indicator appears.
	2	β	Transistor Test
	3	<del>&gt;</del> +	Test of diode.
	4	-1)}	The continuity buzzer is on.

• Make sure the Low Battery Display is not on,

Pav extra attention to the ∧ symbol, before carrying

To avoid damages to the Meter or to the devices under

test, disconnect circuit power and discharge all the

high-voltage capacitors before measuring resistance.

The resistance ranges are  $20\Omega$ ,  $200\Omega$ ,  $2k\Omega$ ,  $20k\Omega$ ,  $200k\Omega$ ,

To measure resistance, please connect the Meter as

1. Insert the red test clip into the  $\Omega \rightarrow 0$  terminal and

3. Connect the test clips across with the object being

The measured value shows on the display.

the black test clip into **COM** terminal.

2. Set the rotary switch to  $\Omega$  range.

A. Measuring Resistance (see figure 3)

otherwise false readings may be provided.

measurement, which is located besides the input

## **Measurement Operation**

terminals of the Meter.

2MO 20MO and 2000MO

⚠ Warning

test clips.

of resistance.

- Turn the Meter power off when it is not in use and

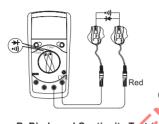
÷	Grounding		
	Double Insulated		
C2	Deficiency of Built-In Battery.		
•1))	Continuity Test.		
<b>→</b> +	Diode.		
- ←	Capacitance Test		
Lx	Inductance Test		
8	Fuse.		
$\triangle$	Warning. Refer to the Operating Manual.		
CE	Conforms to Standards of European Union.		

• When measuring at  $20\Omega$  and  $200\Omega$  range, the test clips can add 0.1 to  $0.3\Omega$  error to resistance. To obtain precise readings in these low-resistance measurement, that is the range  $20\Omega$  and  $200\Omega$ , short circuit the input terminals beforehand and record the reading obtained (called this reading as X). (X) is the additional resistance from the

Then use the equation measured resistance value (Y) - (X) = precision readings

- The Meter displays "1" when there is no input, for example, open circuit situation.
- For high resistance measurement (>1M $\Omega$ ), it is normal taking several seconds to obtain a stable reading.
- When resistance measurement has been completed. disconnect the connection between the testing clips and the circuit under test and remove the testing clips away from the input terminals of the Meter.





B. Diode and Continuity Test (see figure 4)

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring diodes and

Do not input more than DC 60V or AC 30V voltages to avoid electric shock and damage to the Meter

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 500mV and 800mV To test a diode out of a circuit, connect the Meter as follows:

the black test clip into the COM terminal.

## 2. Set the rotary switch to → •1).

3. For forward voltage drop readings on any semiconductor component, place the red test clip on the componentis anode and place the black test clip on the components

1. Insert the red test clip into the  $\Omega + \cdots$  terminal and

The display shows the diode forward voltage drop's nearest value

 In a circuit, a good diode should still produce a forward voltage drop reading of 500mV to 800mV; however, the reverse voltage drop reading can vary depending on the resistance of other nathways between the probe tips

- Connect the test clips to the proper terminals as said above to avoid error display. The LCD will display "1" ndicating open-circuit for wrong connection. The unit of diode is Volt (V), displaying the positive-connection oltage-drop value.
- When diode test has been completed, disconnect the connection between the testing clips and the circuit under test and remove the testing clips away from the input terminals of the Meter.

## Testing for Continuity

- To test for continuity, connect the Meter as below:
- 1. Insert the red test clip into the  $\Omega \rightarrow \cdots$  terminal and the black test clip into the COM terminal.
- 2. Set the rotary switch to ++ •1).
- 3. Connect the test clips across with the object being
- 4. The beeper comes on continuously when the resistance value of the tested circuit ≤10Ω. The beeper may may not come on when the resistance value of the test
- 5. The Meter displays the value of the test resistance

# • The LCD displays "1" indicating the circuit being tested

 When continuity test has been completed, disconnect the connection between the testing clips and the circuit under test and remove the testing clips away from the input terminals of the Meter.

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## C. Canacitance Measurement (UT603 only see figure 5)

the test clip first, then carrying out the measurement. The actual correct reading is the measured reading minus the short circuit reading.

the small value iack.

capacitor is discharged. The Meter's capacitance ranges are: 2nF, 20nF, 200nF, 2μF, 20μF, 200μF and 600μF

To measure capacitance, connect the Meter as follows 1. Set the rotary switch to F measurement mode. If the value of capacitor to be measured is unknown, use the maximum measurement position 600uF and decrease

To avoid damage to the Meter or to the equipmen

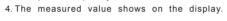
under test, disconnect circuit power and discharge all

high-voltage capacitors before measuring capacitance.

Use the DC Voltage function to confirm that the

the range step by step until a satisfactory reading is obtained and the overloading icon "1" is disappeared. 2. Insert the red test clip into the CAP + terminal and black test clip into the CAP - terminal. For small value

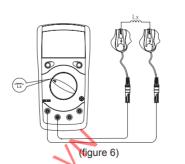
- capacitor measurement, insert the capacitor into the small value jack. 3. Use the red test clip to clip the capacitor's positive and the black test clip to clip the capacitor's negative when
- the capacitor has polarity.





- To minimize the effect of capacitance stored in the test clips, the test clips should be as short as possible and use the small value jack when measuring small value of
- The Meter cannot check the quality of the canacitor • For large capacitor, please make sure the contact is
- stable and reliable. • When the tested capacitor is leaking or damaged and the tested value is not stable, the capacitor may have problems. You need to use other tools or equipment to

check and confirm. When capacitance measurement has been completed disconnect the connection between the testing clips and the circuit under test and remove the testing clips away from the input terminals of the Meter.



To test the inductance, please follow the following procedure: Set the rotary switch to Lx measurement mode 2 If the tested inductance value is unknown, use the maximum measurement position and decrease the range step by step until a satisfactory reading is obtained 3. Insert the test clips into the corresponding Lx input

- 4. Use the test clips to clip the inductance to carry out the
- 5. The measured value shows on the display.

Overload protection: 250V DC or AC rms at all ranges

At 20MΩ range, short circuit test lead, LCD displayir

12 digits from the obtained reading.

Function Range Resolution

 $\leq 10\Omega$ , beeper comes on continuously

C. Capacitance Test (UT603 only)

2.000nF 0.001nF

0.0nF 0.1nF

.000μF | 0.001μF

200.0μF 0.1μF

Overload Protection

capacitance.

D. Inductance Test

Range Resolution

2mH 0.001mH

20mH 0.01mH

2H 0.001H

Overload Protection:

E. Transistor

200H 0.1H Reference only

200mH 0.1mH

• Measure of Capacitance:

Remarks:

Range Resolution Accuracy

20.00nF 0.01nF ±(1%+5)

20.00μF 0.01μF ±(4%+5)

0.315A, 250V, fast type fuse, \$5x20 mm

 $1F=10^{3}mF = 10^{6}\mu F = 10^{9}nF = 10^{12}pF$ 

>  $10\Omega$ , beeper may or may not comes on.

the correct tested value.

B. Continuity & Diodes

Continuity •1))

Continuity

12 digits is normal. During measurement minus these

When measuring  $20\Omega$  and  $200\Omega$  range, short circuit test

clips to display the resistance value of the test lead.

Subtract this value from the measurement value to obtain

Open Circuit Voltage around 5.8V, forward current around

600µF | 0.001mF | Reference only | 100Hz/1.5mV

Discharge all high-voltage capacitors before testing

 $\pm (5\% + 5)$ 

20H 0.01H ±(5%+15) 100Hz/15μA

■ Measure of Inductance: 1H=10³mH = 106µH.

0:315A, 250V, fast type fuse, \$5x20 mm

Accuracy Tested Frequ-

UT602 UT603 ency / Current

Protection

250V rms

- When carrying out measurement at 2mH, short circuit
- When testing a small value inductance, it is better to use
- The Meter cannot check the quality of the inductance. When inductance measurement has been completed disconnect the connection between the testing clips and the circuit under test and remove the testing clips away from the input terminals of the Meter.



## E. Transistor hFE Measurement (see figure 7)

1. Set the rotary switch to hFE measurement mode. 2. Check that the transistor is PNP or NPN type. 3. Insert the Insert the transistor to be measured to the corresponding Transistor Jack

measure transistor, set up the Meter as follows:

4. The Meter displays the tested transistor's nearest value

 When transistor measurement has been completed, disconnect the connection between the testing clips and he circuit under test and remove the testing clips away from the input terminals of the Meter.

## **General Specifications**

- Fused Protection for Inductance Input Terminal (UT602): 0.315A, 250V, fast type fuse, \$5x20 mm. Fuse Protection for Inductance and capacitance Input
  - Terminal (UT603): 0.315A, 250V, fast type fuse, \$5x20 mm.
  - Maximum Display: Display: 1999
  - Measurement Speed: Updates 2-3 times /second Polarity: Auto. (Display "4" when negative)
  - Overloading: Display "1"
  - Range: Manual Ranging Temperature: Operating: 0°C~40°C (32°F~104°F)
  - Storage: 10°C~50°C (14°F~122°F). Relative Humidity:
  - ≤75% @ 0°C 30°C ≤50% @ 31 - 40°C.
  - Operating: 2000 m
  - Storage: 10000 m. Battery Type:One piece of 9V Alkaline (NEDA1604 or
  - 0062 or 6F22 or 006P). Battery Deficiency: Display
  - Dimensions (HxWxL): 172 x 83 x 38 mm.
  - Weight: Approximate 310g (battery included) Safety/Compliances: EMC EN61326.

## ● Certification: **(€**

A. Resistance Test

20kΩ 10Ω

200kΩ 100Ω

2MΩ 1kΩ

20ΜΩ 10kΩ

 $2000M\Omega$   $1M\Omega$  Reference only

**Accuracy Specifications** Accuracy: ±(a% reading + b digits), guarantee for vea The display value is the Operating temperature: 23°C ±5°C. Vce ≈ 5.8V tested transistor's Relative humidity: < 75%. I bo ≈ 10μA (NPN, PNP) nearest Temperature coefficient: 0.1 x (specified accuracy) / 1°C

Accuracy UT602 Maintenance Range Resolution UT603 This section provides basic maintenance information including battery and fuse replacement instruction. 20Ω 0.01Ω ±(1%+5) 200Ω 0.1Ω

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

not get water inside the case.

# Model UT602/603: OPERATING MANUAL

- A. General Service Periodically wipe the case with a damp cloth and mild
- detergent. Do not use abrasives or solvents.

  To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time. Do not store the Meter in a place of humidity, high

## temperature and strong magnetic field. B. Replacing the Battery (see figure 8)



To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator " " appears. To replace the battery:

- 1. Turn the Meter power off and remove all connections
- from the terminals. 2. Remove the screw from the battery compartment, and
- separate the battery compartment from the case bottom.

  3. Remove the battery from the battery compartment. 4. Replace the battery with a new 9V alkaline battery
- (NEDA1604 or 0062 or 6F22 or 006P) 5. Rejoin the case bottom and battery compartment, and
- Replacing the Fuse (see figure 9)

reinstall the screw.

/ Warning



To avoid electrical shock or arc blast, or personal injury or damage to the Meter, use specified fuses ONLY in accordance with the following procedure.

- 1. Turn the Meter power off and remove all connections
- 2. Remove the screw from the battery compartment, and
- separate the battery compartment from the case bottom.

  3. Remove the screws from the case bottom, and separate
- take out the fuse from its bracket. 5. Install ONLY replacement fuses with the identical type and specification as follows and make sure the fuse is
- 6. Rejoin the battery compartment and the case top, and
- lacement of the fuses is seldom required. Burning of

No6. Gong Ye Bei 1st Road.

To avoid electrical shock or damage to the Meter, do

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replace the Meter's fuse: from the terminals. the case top from the case bottom. 4. Remove the fuse by gently prying one end loose, then

ixed firmly in the bracket. Fuse 1: 0.315A, 250V, fast type fuse, \$5x20 mm. reinstall the screw.

7. Rejoin the case bottom and case top, and reinstall the

a fuse always results from improper operation. This operating manual is subject to change without notice





