

# UT207/208

## Operating Manual



### Digital Clamp Multimeters

#### Overview

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" carefully before using the Meter.

Model UT207 and UT208 are 3 5/6 digit AC&DC digital clamp multimeters (hereafter referred to as "the Meter") characterized with stable performance, high reliability and novel structure. They are designed with large-scale integrated circuits and dual integral A/D converter as its core and offer full-range overload protection. The Meter can measure AC/DC Voltage, AC/DC Current, Frequency, Duty Cycle, Resistance, Diodes, Continuity, Surge Current and etc.

UT208 has an extra temperature feature.

#### Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully for any missing or damaged part:

Item	Description	Qty
1	English Operating Manual	1 pc
2	Test Lead	1 pair
3	Point Contact Temperature Probe (Only UT208) (This included point contact temperature probe can only be used up to 230°C. For any measurement is higher than that, the rod type temperature probe must be used)	1 pair
4	Tool box	1 pc
5	9V Battery (NEDA1604A or 6LF22)	1 pc

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

#### Safety Information

This Meter complies with IEC61010-1, IEC61010-2-032, Pollution Degree 2, Overvoltage Category(CAT. II 600V, CAT. III 300V) and Double Insulation standards. CAT. II: Local level, appliance, PORTABLE EQUIPMENT etc., with smaller transient overvoltages than CAT. III. CAT. III: Distribution level, fixed installation, with smaller transient overvoltages than CAT. IV.

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

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 attention to.

#### ⚠ 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 leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads with identical model number or electrical specifications before using the Meter.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding. If the value to be measured is unknown, use the maximum measurement position and reduce the range step by step until a satisfactory reading is obtained.
- When measurement has been completed, disconnect the connection between the test leads and the circuit under test, remove the testing leads away from the input terminals of the Meter and turn the Meter power off.
- The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement to prevent damage of the Meter.

- Do not carry out the measurement when the Meter's back case and battery compartment are not closed to avoid electric shock. Do not input higher than 600V between the two Meter's input terminal to avoid electric shock and damage to the Meter.
- When the Meter is working at an effective voltage over 70V in DC or 33V rms in AC, special care should be taken for there is danger of electric shock.
- 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.
- When using the test leads, keep your fingers behind the finger guards.
- To avoid electric shock, do not touch the bare wires, connectors, unused input terminals or the tested circuit during measurement.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity and diode.
- Replace the battery as soon as the battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- When servicing the Meter, use only the replacement parts with the same model or identical electrical specifications.
- The internal circuit of the Meter shall not be altered at will to avoid damage to 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 accident.
- The Meter is suitable for indoor use.
- Turn the Meter off when it is not in use and take out the battery when not using for a long time.
- 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

	AC (Alternating Current)
	DC (Direct Current)
	AC or DC
	Grounding
	Double Insulated
	Warning. Refer to the Operating Manual
	Low Battery Indication
	Continuity Test
	Diode
	Danger of High Voltage
	Conforms to Standards of European Union

#### The Meter Structure (See Figure 1)

- Hand Guards: to protect user's hand from touching the dangerous area.
- Trigger: press the lever to open the transformer jaws. When the pressure on the lever is released, the jaws will close.
- Functional Buttons
- Input Terminals
- LCD Display
- Rotary Switch
- Transformer Jaw: designed to pick up the AC and DC current flowing through the conductor. It could transfer current to voltage. The tested conductor must vertically go through the Jaw center.

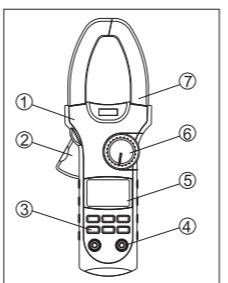


Figure 1

#### Functional Buttons

Below table indicated for information about the functional button operations.

Button	Operation Performed
<b>SELECT</b>	Press <b>SELECT</b> button to select the alternate functions including <b>V~</b> , <b>•Ω</b> , <b>%Hz</b> , <b>A~</b> and <b>°C/F</b> (UT208 only).
<b>MAX/MIN</b>	Starts recording of maximum and minimum values. Press to step the display through high (MAX) and low (MIN) readings at any mode.
	Press and hold for one second to exit MAX/MIN mode. Press to turn on the backlight, repress to turn it off, otherwise it will automatically off after 1 minute.
<b>HOLD</b>	Press <b>HOLD</b> to enter the Hold mode in any mode, the Meter beeps. Press <b>HOLD</b> again to exit the Hold mode to return to measurement mode, the Meter beeps. Turning the rotary switch or pressing <b>SELECT</b> button can also exit Hold mode. Press <b>HOLD</b> button for 2 seconds when turning on the Meter to display full icon.
<b>Hz</b>	When the Meter is at <b>%Hz</b> , <b>V~</b> and <b>A~</b> , press <b>Hz</b> to measure frequency and duty cycle.
<b>ZERO</b>	Press <b>ZERO</b> to zeroing the display before measuring DC current.

#### The Effectiveness of Functional Buttons

Not every functional buttons can be used on every rotary switch positions. Below table describe on which rotary switch position the functions of buttons are available.

Rotary Switch Positions	Functional Buttons					
	SELECT	MAX/MIN	*	HOLD	Hz	ZERO
<b>V~</b>	•	•	•	•	•	N/A
<b>•Ω</b>	•	•	•	•	N/A	N/A
<b>%Hz</b>	N/A	•	•	•	•	N/A
<b>66A:::</b>	N/A	•	•	•	N/A	•
<b>1000A:::</b>	N/A	•	•	•	N/A	•
<b>66A~</b>	•	•	•	•	•	N/A
<b>1000A~</b>	•	•	•	•	•	N/A
<b>°C/F</b>	•	•	•	•	N/A	N/A

#### Display Symbols (See Figure 2)

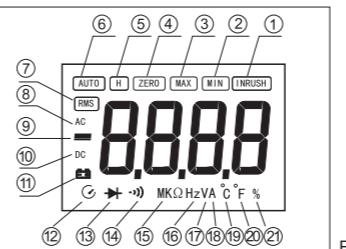


Figure 2

#### B. Measuring Resistance (See Figure 4)

##### ⚠ Warning

To avoid damage 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:

66Ω, 6.6kΩ, 66kΩ, 660kΩ, 6.6MΩ and 66MΩ

To measure resistance, connect the Meter as follows:

- Insert the red test lead into the **VΩHz** terminal and black test lead into the **COM** terminal.
- Set the rotary switch to **•Ω**. Resistance measurement is a default or press **SELECT** to switch to **Ω** measurement mode.

- Connect the test leads across with the object being measured.

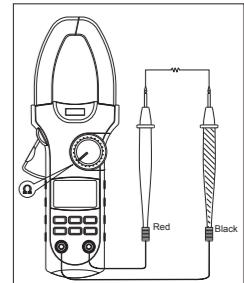


Figure 4

##### Note

- To obtain a more precise reading, you could remove the objects being tested from the circuit during measurement.
- When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals.

#### C. Testing Diodes (See Figure 5)

##### ⚠ Warning

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

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, then measure the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test the diode out of a circuit, connect the Meter as follows:

- Insert the red test lead into the **VΩHz** terminal and black test lead into the **COM** terminal.
- Set the rotary switch to **•Ω**. Press **SELECT** to switch to **→** measurement mode.
- For forward voltage drop readings on any semiconductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode.

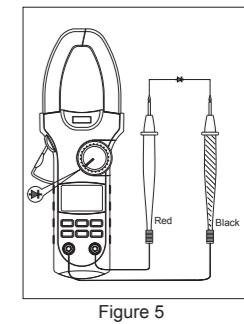


Figure 5

##### Note

- To obtain a more precise reading, you could remove the objects being tested from the circuit during measurement.
- When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals.

#### D. Testing for Continuity (See Figure 6)

##### ⚠ Warning

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

To test for continuity, connect the Meter as follows:

- Insert the red test lead into the **VΩHz** terminal and the black test lead into the **COM** terminal.
- Set the rotary switch to **•Ω** and press **SELECT** to select **•Ω** measurement mode.
- The buzzer sounds if the resistance of a circuit under test is less than 30Ω.

The buzzer may or may not sound if the resistance of a circuit under test is between 30Ω to 100Ω.

The buzzer does not sound if the resistance of a circuit under test is higher than 100Ω.

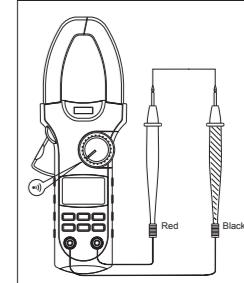


Figure 6

##### Note

- When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals.

#### E. Measuring Frequency (See Figure 7)

##### ⚠ Warning

To avoid damage to the Meter or to the Meter from electric shock, do not attempt to measure voltages higher than 600V AC/DC, although readings may be obtained.

The frequency ranges are:

660Hz, 6.6kHz, 66kHz, 660kHz, 6.6MHz and 66MHz.

To measure frequency, connect the Meter as follows:

- Insert the red test lead into the **VΩHz** terminal and black test lead into the **COM** terminal.
- Set the rotary switch to **V~**. DC measurement mode and auto ranging is a default. Press **SELECT** to switch to AC measurement mode.
- Press **Hz** button to measure frequency or duty cycle, but the frequency or duty cycle readings obtained from this range is only for reference.
- Connect the test leads across with the object being measured.

The measured value shows on the display.

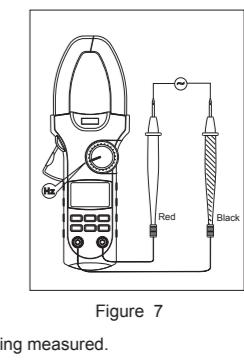


Figure 7

##### Note

- When DC/AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input terminals of the Meter.
- When frequency measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

**F. Measuring Duty Cycle (See Figure 8)**

**⚠ Warning**

To avoid harm to you or damage to the Meter from electric shock, do not attempt to measure voltages higher than 600V AC/DC, although readings may be obtained.

The duty cycle range is: 0.1%~99.9%.

To measure duty cycle, connect the Meter as follows:

1. Insert the red test lead into the **VΩHz** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **%Hz**. Press **SELECT** to switch to % measurement mode.
3. Connect the test leads across with the object being measured.

The measured value shows on the display.

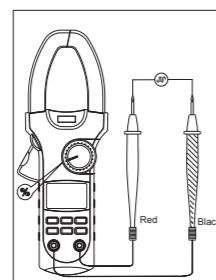


Figure 8

**Note**

- When the Meter is at °C range, it beeps to remind user to insert temperature probe.
- The Meter automatically displays the room temperature when the temperature probe is inserted but without any input.
- The included point contact temperature probe can only be used up to 230°C. For any measurement is higher than that, the rod type temperature probe must be used.
- When the temperature measurement has been completed, disconnect the connection between the temperature probe and the object under test, and remove the temperature probe away from the input terminals of the Meter.

**Sleep Mode**

To preserve battery life, the Meter automatically turns off if you do not turn the rotary switch or press any button for around 15 minutes.

The Meter beeps 3 times in one minute before entering Sleep Mode and long beep one time just before entering Sleep Mode.

The Meter can be activated by turning the rotary switch or pressing the button based on "The Effectiveness of Functional Buttons" section.

If the Meter is activated by pressing button, the Meter will keep the measurement value before entering Sleep Mode.

Pressing **MAX/MIN**, **LIGHT** or **Hz** to turn on the Meter can disable the Sleep Mode feature.

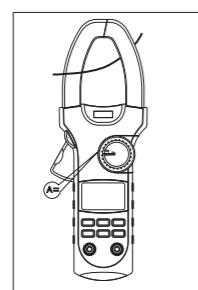


Figure 9

**Note**

- When duty cycle measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

**G. Measuring DC Current (See Figure 9)**

The DC current ranges are: 66A **mA** and 1000A **mA**.

To measure current, do the following:

1. Set the rotary switch to 66A **mA** or 1000A **mA**.
2. Press the lever to open the transformer jaw, hold it tight and don't release. The built-in components are very sensitive not only to the magnet but also to heat and mechanical force. Any shock will cause change to the reading in the short time.
3. Center the conductor within the transformer jaw, then release the Meter slowly until the transformer jaw is completely closed. Make sure the conductor to be tested is placed at the center of the transformer jaw, otherwise it will cause deviation. The Meter can only measure one conductor at a time, to measure more than one conductor at a time will cause deviation.

**Note**

- If the Meter does not display 00.00 when it is at 66A **mA** range, press **ZERO** to zeroing. After zeroing, it allows 10 digits bouncing reading.
- When the Meter is at 1000A **mA**, it displays 0 and it is not allowed to press **ZERO** to zeroing.
- When current measurement has been completed, remove the conductor away from the transformer jaw of the Meter.

**H. Measuring AC Current (See Figure 10)**

**⚠ Warning**

The AC current ranges are: 66.00A **~** and 1000A **~**.

To measure AC current, do the following:

1. Set the rotary switch to 66A **~** or 1000A **~**.
2. Press the lever to open the transformer jaw, hold it tight and don't release. The built-in components are very sensitive not only to the magnet but also to heat and mechanical force. Any shock will cause change to the reading in the short time.
3. Center the conductor within the transformer jaw, then release the Meter slowly until the transformer jaw is completely closed. Make sure the conductor to be tested is placed at the center of the transformer jaw, otherwise it will cause deviation. The Meter can only measure one conductor at a time, to measure more than one conductor at a time will cause deviation.
4. When the measuring current >1A, press **Hz** button to step through AC current, frequency and duty cycle measurement mode. But the frequency or duty cycle readings obtained from this range is only for reference.
5. Press **SELECT** to carry out surge current measurement.

To measure surge current measurement, do the following:

1. Set the rotary switch to 1000A **~**.
2. Press **SELECT** when the Meter displays the minimum readings. The Meter then displays "----" means it is ready to carry out surge current measurement.
3. Turn on the electrical equipments at that time to measure the moment start up current.
4. Press and hold **SELECT** for one second to exit surge current measurement mode.
5. When the Meter is at surge current measurement, it is locked to the highest measurement range.

**Note**

- When current measurement has been completed, remove the conductor away from the transformer jaw of the Meter.

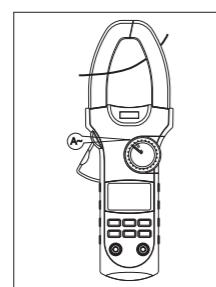


Figure 10

**I. Measuring Temperature (UT208 Only, See Figure 11)**

The temperature measurement range: -40°C~100°C and -40°F~183°F.

To measure temperature measurement, connect the Meter as follows:

1. Insert the red temperature probe into the **VΩHz** terminal and the black temperature probe into the **COM** terminal.
2. Set the rotary switch to °C/F. Press **SELECT** to switch between °C and °F measurement mode.
3. Place the temperature probe to the object being measured.

The measured value shows on the display.

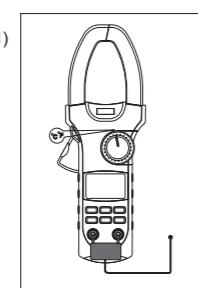


Figure 11

**Note**

- When the Meter is at °C range, it beeps to remind user to insert temperature probe.
- The Meter automatically displays the room temperature when the temperature probe is inserted but without any input.
- The included point contact temperature probe can only be used up to 230°C. For any measurement is higher than that, the rod type temperature probe must be used.
- When the temperature measurement has been completed, disconnect the connection between the temperature probe and the object under test, and remove the temperature probe away from the input terminals of the Meter.

**Sleep Mode**

To preserve battery life, the Meter automatically turns off if you do not turn the rotary switch or press any button for around 15 minutes.

The Meter beeps 3 times in one minute before entering Sleep Mode and long beep one time just before entering Sleep Mode.

The Meter can be activated by turning the rotary switch or pressing the button based on "The Effectiveness of Functional Buttons" section.

If the Meter is activated by pressing button, the Meter will keep the measurement value before entering Sleep Mode.

Pressing **MAX/MIN**, **LIGHT** or **Hz** to turn on the Meter can disable the Sleep Mode feature.

**Technical Specifications**

**A. General Specifications:**

- Maximum Voltage between any terminals and grounding: Refer to different range input protection voltage.
- Display: 3.5/6 digits LCD display, Maximum display 6666.
- Polarity: Auto
- Overloading: Display **OL** or **-OL**.
- Battery Deficiency: Display **B**.
- Sampling: 3 times per second.
- Measurement Deviation: If the conductor being measured is not placed in the center of the jaw during AC/DC current measurement, it will cause extra ±1% deviation based on the stated accuracy.
- Drop Test: 1 meter drop test passed.
- Max. Jaw Opening: 55mm diameter.
- Max. Current conductor size: 45mm diameter.
- Electro-Magnetic: When carrying out measurement near the electro-magnetic, it may cause unstable or wrong reading.
- Power: 1 x 9V battery (6LF22 1604A)
- Battery Life: typically 150 hours (alkaline battery)
- Dimensions: 285.3mm x 105mm x 44.5mm
- Weight: Approximate 533g (battery included)

**B. Environmental Requirements**

- The Meter is suitable for indoor use.
- Altitude: Operating: 2000m Storage: 10000m
- Safety/ Compliances: IEC61010-1; IEC61010-2-032. CAT.II 600V, CAT.III 300V Double Insulation and Pollution Degree 2.
- Temperature and humidity:
  - Operating: 0°C~30°C (≤80%R.H)
  - 30°C~40°C (≤75%R.H)
  - 40°C~50°C (≤45%R.H)
- Storage: -20°C~+60°C (≤80%R.H)

**Accuracy Specifications**

Accuracy: ± (a% reading + b digits), guarantee for 1 year.

Operating temperature: 23°C ± 5°C

Relative humidity: ≤80%R.H

Temperature coefficient: 0.1x(specified accuracy)/1°C

**A. DC Voltage**

Range	Resolution	Accuracy	Overload protection
6.600V	1mV		
66.00V	10mV	± (0.8%+1)	600V DC/AC
600.0V	100mV		

Remark: Input Impedance: 10MΩ

**B. AC Voltage**

Range	Resolution	Accuracy	Overload protection
6.600V	1mV		
66.00V	10mV	± (1.2%+5)	600V DC/AC
600.0V	100mV		

Remarks:

- Input Impedance: 10MΩ
- Frequency Response: 40Hz~400Hz
- AC Conversion:
- It is AC-coupled and True RMS responded. Input sine wave to adjust. Non sine wave must follow the below data to adjust:
- Peak factor: 1.4~2.0, add 1.0% on the stated accuracy
- Peak factor: 2.0~2.5, add 2.5% on the stated accuracy
- Peak factor: 2.5~3.0, add 4.0% on the stated accuracy.

**C. Resistance**

Range	Resolution	Accuracy	Overload protection
66.00Ω	0.1Ω	± (1.2%+2)	
6.600kΩ	1Ω		
66.00kΩ	10Ω	± (1%+2)	
66.00kΩ	100Ω		
6.600MΩ	1kΩ	± (1.2%+2)	
66.00MΩ	10kΩ	± (1.5%+2)	

**D. Diode Test**

Range	Resolution	Accuracy	Overload protection
→	1mV	0.5V~0.8V (Open circuit voltage approx. 3.0V)	250VAC

**E. Continuity Test**

Range	Resolution	Accuracy	Overload protection
•	0.1Ω	Around <10Ω, the buzzer beeps. (Open circuit voltage approx. -0.47V)	250VAC

Remark:

- The buzzer may or may not beeps when the resistance of a circuit under test is between 10Ω~100Ω.
- The buzzer does not beep when the resistance of a circuit under test is > 100Ω

**F. Frequency**

Range	Resolution	Accuracy	Overload protection
66.00Hz	0.1Hz		
6.600kHz	0.001kHz		
66.00kHz	0.01kHz		
66.00kHz	0.1kHz		
6.600MHz	0.001MHz		
66.00MHz	0.01MHz		

Remarks: