UNI-T UT205E

UNI-T UT205E Digital Clamp Meter Instruction Manual

Model: UT205E
Brand: UNI-T

1. Introduction

The UNI-T UT205E is a 2nd generation 1000A True RMS Digital Clamp Meter designed for accurate and reliable electrical measurements. This device is suitable for a wide range of applications in industrial, commercial, and residential settings. It features a large LCD for high-definition display, auto backlight for easy reading in dark environments, and industrial-grade rubber buttons for durability. The UT205E is certified with CE, UKCA, and cETLus standards, ensuring compliance with safety and quality regulations.

2. Safety Information

Always read and understand all safety warnings and operating instructions before using this instrument. Failure to observe safety precautions may result in electric shock, fire, or damage to the meter.

- Ensure the meter is in good working condition and free from damage before each use.
- Do not apply voltage or current that exceeds the maximum specified limits for the meter.
- Always use the correct function and range for measurements.
- Be cautious when working with voltages above 30V AC RMS, 42V peak, or 60V DC, as these pose a shock hazard.
- The UT205E conforms to CAT III 1000V and CAT IV 600V safety standards. Adhere to these category ratings for safe operation.
- Wear appropriate personal protective equipment (PPE), such as insulated gloves and safety glasses, when performing electrical measurements.
- Do not operate the meter in explosive gas, vapor, or dusty environments.
- Overload protection is provided up to 1000V AC across all ranges to prevent damage to the

meter from accidental wrong gear selection.

3. Product Overview

The UNI-T UT205E Digital Clamp Meter is designed for ease of use and durability. Below is an overview of its main components and features.

3.1. Components

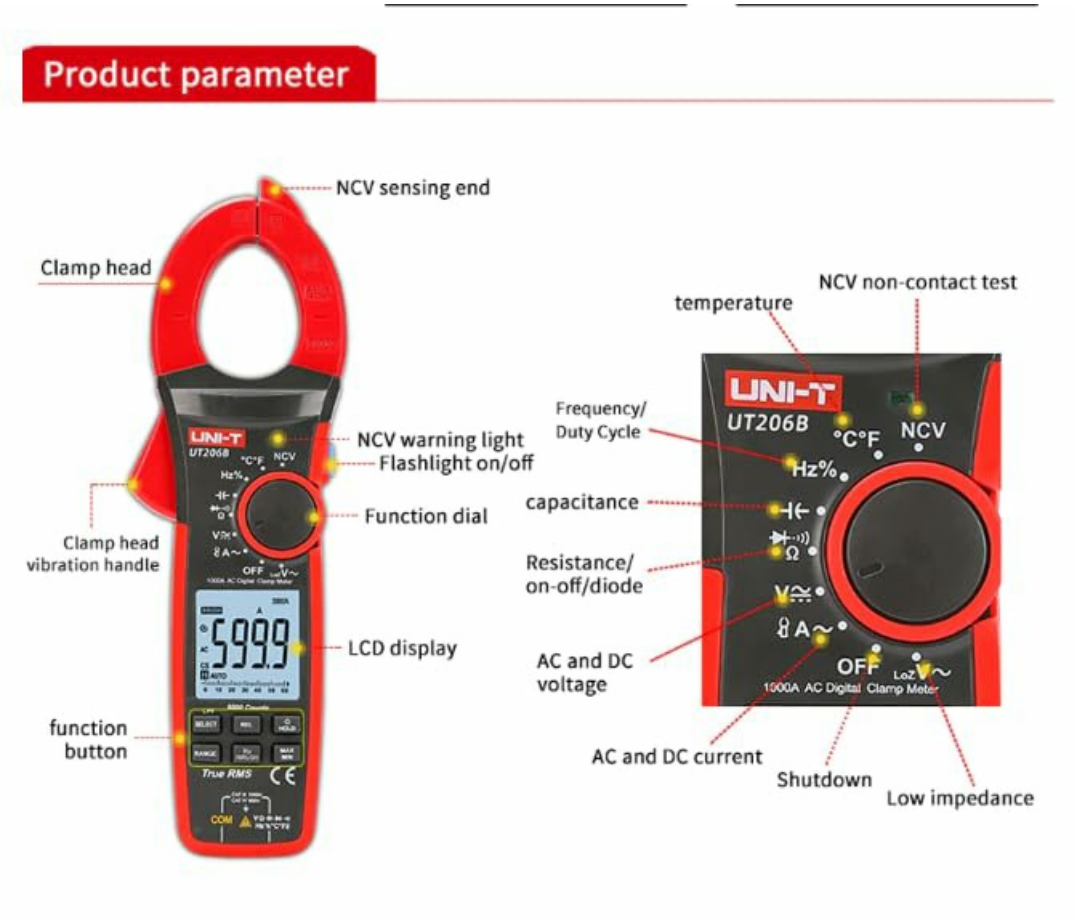

Figure 1: Key Components of the UT205E Digital Clamp Meter. This diagram highlights the clamp head, NCV sensing end, flashlight, function dial, LCD display, and function buttons.

- **Clamp Jaw:** Used for non-contact AC/DC current measurement. Opens up to 42 mm to accommodate multiple conductors.
- **Trigger:** Opens and closes the clamp jaw.
- **Rotary Switch:** Selects the desired measurement function (e.g., ACV, DCV, ACA, DCA, Resistance, Capacitance, Frequency, Temperature, Diode, Continuity).
- **LCD Display Screen:** Large, high-definition display with auto backlight for clear readings in various lighting conditions.
- **Functional Buttons:** Include SELECT, RANGE, REL/ZERO, Hz/INRUSH, HOLD, MAX/MIN, and LPF for advanced functions and settings.
- **Flashlight Button:** Activates the built-in flashlight for illuminating dark work areas.
- **NCV Sensing End:** For non-contact voltage detection.

3.2. Key Features

- **True RMS:** Provides accurate measurements for non-sinusoidal waveforms.
- **Auto Backlight:** Automatically illuminates the display for improved visibility.
- **NCV Function:** Non-Contact Voltage detection with multi-segment display and audio/visual alarm.
- **Inrush Current Capturing:** Measures the initial surge current of motors and other inductive loads.
- **Large Jaws:** Jaws open up to 42 mm, allowing for measurements of multiple conductors.
- **Industrial-Grade Rubber Buttons:** Ensures durability and tactile feedback.
- **LPF (Low-Pass Filter):** Enables stable and accurate voltage and frequency measurements in variable frequency drive (VFD) environments.
- **Optional Flexible Current Probe:** Extends AC current measurement range up to 3000A for tight spaces (probe sold separately).

3.3. Product Overview Video

Your browser does not support the video tag.

Video 1: This video provides a comprehensive overview of the UNI-T UT200 series clamp meters, including the UT205E. It demonstrates key features such as True RMS, auto backlight, NCV function, large jaws, and various measurement capabilities.

4. Specifications

Below are the detailed technical specifications for the UNI-T UT205E Digital Clamp Meter.

Parameter	Value
AC Current (A)	1000A
DC Current (A)	1000A
AC Voltage (V)	1000V
DC Voltage (V)	1000V
Resistance (Ω)	60MΩ
Capacitance (F)	60mF
Temperature (C/F)	-40°C ~ 1000°C / -40°F ~ 1832°F
Frequency (Hz)	10Hz ~ 1MHz
Duty Cycle (%)	10% ~ 90%
Display Count	6000
Jaw Opening	42mm
Category Ratings	CAT III 1000V, CAT IV 600V

Parameter	Value
Product Dimensions	6.5 x 4.33 x 4.72 inches
Item Weight	1.32 Pounds (0.6 Kilograms)
Power Source	Battery Powered (1 Lithium Metal battery included)

UNI-T UT200 SERIES
1000A True RMS Digital Clamp Meters

UT200 series are 6000-count digital clamp meters with auto range, large LCD, true RMS, auto scale memory, and NCV functions. They conform to CAT III 1000V/CAT IV 600V safety rating and certified by CE/ETL. The UT206B, UT207B, and UT208B come with LoZ mode for eliminating' ghost' voltage, LPF ACV function for measuring INV and VFD voltage, and inrush current mode for capturing transient current. The UT206B and UT208B also feature high-precision temperature measurement with 0.1 °C resolution, and can be equipped with a flexible current probe to extend the AC current measurement range to 3000A.

Features
True RMS
NCV (audible/visual alarm)
Data hold/backlight/Flashlight
MAX/MIN/relative mode
Diode/continuity test
Inrush current (UT206B/207B/208B)
LPF ACV (UT206B/207B/208B)
LoZ ACV (UT206B/207B/208B)
Optional flex clamp (UT-CS09D) up to 3000A (UT206B/208B)

UT208B

Specifications	Range	UT205E	UT206B	UT207B	UT208B
Certificates	**CE, UKCA, cETLus**				
AC current (A)	1000A	±(2%+5)	±(2%+5)	±(2%+5)	±(2%+5)
DC current (A)	1000A			±(2%+5)	±(2%+5)
AC current frequency response		50Hz~60Hz	50Hz~60Hz	40Hz~400Hz	40Hz~400Hz
Inrush current (A)	1000A		±(10%+10)	±(10%+10)	±(10%+10)
AC voltage (V)	1000V	±(1.2%+3)	±(1.2%+3)	±(1.2%+3)	±(1.2%+3)
DC voltage (V)	1000V	±(0.5%+5)	±(0.5%+5)	±(0.5%+5)	±(0.5%+5)
Low pas filter (LPF ACV)	1000V		±(2%+5)	±(2%+5)	±(2%+5)
AC voltage frequency response		40Hz~400Hz	40Hz~400Hz	40Hz~400Hz	40Hz~400Hz
LoZ ACV	1000V		±(2%+5)	±(2%+5)	±(2%+5)
Resistance (Ω)	60MΩ	±(1%+2)	±(1%+2)	±(1%+2)	±(1%+2)
Capacitance (F)	60mF	±(4%+5)	±(4%+5)	±(4%+5)	±(4%+5)
Temperature	-40°C~1000°C -40°F~1832°F		±(1%+2) ±(1%+4)		±(1%+2) ±(1%+4)
Low voltage frequency (Hz)	10Hz~1MHz	±(0.1%+3)	±(0.1%+3)	±(0.1%+3)	±(0.1%+3)
Duty cycle (%)	10%~90%	±(2.6%+7)	±(2.6%+7)	±(2.6%+7)	±(2.6%+7)
Analog bar			31	31	31
Flexible current probe (optional)	Extends up to 3000A		√		√
Zero mode				√	√
Display count		6000	6000	6000	6000
Jaw opening		42mm	42mm	42mm	42mm
Category ratings	CAT III 1000V, CAT IV 600V				

Characteristics	
Standard accessories	Test leads, batteries, point contact temperature probe (UT206B/UT208B), English manual
Power	1.5V battery (R03) x 3
Display	43 x 45mm
Product size	272 x 81 x 43.5mm
Product net weight	UT205E/UT206B: 465g; UT207B/UT208B: 420g
Standard individual packing	Gift box, carrying bag
Standard quantity per carton	UT205E/UT206B/UT207B: 10pcs; UT208B: 5pcs
Standard carton measurement	UT205E/UT206B/UT207B: 355 x 330 x 315mm; UT208B: 355 x 330 x 165mm
Standard carton gross weight	UT205E/UT206B/UT207B: About 7.1kg; UT208B: About 4.5kg

Figure 2: Detailed technical specifications for the UNI-T UT200 series, including the UT205E.

5. Setup

5.1. Battery Installation

The UT205E requires 1 Lithium Metal battery (included). To install or replace the battery:

1. Ensure the meter is turned OFF and disconnect all test leads from the meter and the circuit under test.
2. Locate the battery compartment cover on the back of the meter.
3. Use a screwdriver to loosen the screw(s) securing the battery cover.
4. Remove the cover and insert the battery, observing the correct polarity (+/-) as indicated inside the compartment.
5. Replace the battery cover and tighten the screw(s) securely.

5.2. Connecting Test Leads

For voltage, resistance, capacitance, frequency, diode, and continuity measurements, connect the test leads as follows:

- Insert the red test lead into the VΩHz% input jack.
- Insert the black test lead into the COM input jack.

Figure 3: The UT205E (similar to UT207B shown) with included test leads and carrying case.

6. Operating Modes

The UT205E offers various measurement functions. Use the rotary switch to select the desired mode.

6.1. AC/DC Current Measurement

To measure AC or DC current:

1. Turn the rotary switch to the ACA (AC Current) or DCA (DC Current) position.
2. Press the trigger to open the clamp jaw.
3. Enclose a single conductor with the clamp jaw. Ensure the jaw is completely closed.
4. Read the current value on the LCD display. For DC current, observe the polarity.

For measurements in tight spaces, an optional flexible current probe can be used (refer to Video 1, segment 02:02 for demonstration).

6.2. AC/DC Voltage Measurement

To measure AC or DC voltage:

1. Turn the rotary switch to the ACV (AC Voltage) or DCV (DC Voltage) position.
2. Connect the red test lead to the live terminal and the black test lead to the neutral/ground terminal of the circuit.
3. Read the voltage value on the LCD display.

For variable frequency voltage measurements, activate the Low-Pass Filter (LPF) function by pressing the LPF button (refer to Video 1, segment 00:55 for demonstration).

6.3. Resistance Measurement

To measure resistance:

1. Turn the rotary switch to the Ω (Resistance) position.
2. Ensure the circuit is de-energized before connecting the test leads across the component to be measured.
3. Read the resistance value on the LCD display.

Refer to Video 1, segment 01:15 for a demonstration of 10MΩ resistance measurement.

6.4. Capacitance Measurement

To measure capacitance:

1. Turn the rotary switch to the capacitance (usually shared with resistance or diode) position and press SELECT if necessary to choose capacitance.
2. Ensure the capacitor is fully discharged before connecting the test leads across its terminals.
3. Read the capacitance value on the LCD display.

6.5. Frequency Measurement

To measure frequency:

1. Turn the rotary switch to the Hz (Frequency) position. This may be combined with voltage or current functions, requiring the Hz button to be pressed.
2. Connect the test leads to the circuit for voltage frequency, or use the clamp for current frequency.

3. Read the frequency value on the LCD display.

Refer to Video 1, segment 01:45 for a demonstration of frequency measurement.

6.6. Temperature Measurement

To measure temperature:

1. Turn the rotary switch to the °C/°F (Temperature) position.
2. Connect the appropriate temperature probe (if included or purchased separately) to the meter's input jacks.
3. Place the probe tip on the surface or in the medium whose temperature is to be measured.
4. Read the temperature value on the LCD display.

Refer to Video 1, segment 01:12 for a demonstration of high-precision temperature measurement using a blackbody heat source.

6.7. Diode Measurement

To perform a diode test:

1. Turn the rotary switch to the diode (usually shared with resistance or continuity) position and press SELECT if necessary to choose diode.
2. Connect the red test lead to the anode and the black test lead to the cathode of the diode.
3. Read the forward voltage drop on the LCD display. Reverse the leads to check for open circuit.

Refer to Video 1, segment 01:23 for a demonstration of diode measurement.

6.8. Non-Contact Voltage (NCV) Detection

To use the NCV function:

1. Turn the rotary switch to the NCV position.
2. Move the NCV sensing end of the meter close to the conductor or electrical outlet.
3. The meter will indicate the presence of AC voltage through a multi-segment display, audible beeps, and visual alarms.

Refer to Video 1, segment 01:27 for a demonstration of non-contact voltage measurement.

6.9. Inrush Current Measurement

To measure inrush current:

1. Turn the rotary switch to the ACA (AC Current) position.
2. Press the INRUSH button.
3. Clamp the meter around the single live conductor of the device you wish to test.
4. Turn on the device. The meter will capture and display the peak inrush current.

Refer to Video 1, segment 01:42 for a demonstration of measuring the starting current of a single-phase motor.

7. Maintenance

7.1. Cleaning

- Wipe the meter casing with a soft, damp cloth. Do not use abrasives or solvents.
- Keep the input terminals and rotary switch clean and free from dust or debris.

7.2. Battery Replacement

Replace the battery when the low battery indicator appears on the display to ensure accurate measurements. Refer to section 5.1 for battery installation instructions.

7.3. Storage

When not in use for extended periods, remove the battery and store the meter in a cool, dry place, away from direct sunlight and extreme temperatures.

8. Troubleshooting

If the meter does not function correctly, check the following common issues:

- **No display or dim display:** Check battery level and replace if necessary. Ensure battery is installed with correct polarity.
- **"OL" (Overload) displayed:** The input value exceeds the selected range. Select a higher range or ensure the measurement is within the meter's capabilities.
- **Inaccurate readings:** Ensure test leads are properly connected and not damaged. Verify the correct function and range are selected. Clean input terminals.
- **No NCV detection:** Ensure the NCV function is selected and the sensing end is close enough to the AC voltage source.

If problems persist, contact UNI-T customer support for assistance.

9. What's in the Box

The UNI-T UT205E Digital Clamp Meter package typically includes:

- UNI-T UT205E Digital Clamp Meter
- Test Leads
- 1 Lithium Metal Battery
- Carrying Bag
- User Manual

10. Warranty and Support

For warranty information, technical support, or service inquiries, please refer to the official UNI-T website or contact your local distributor. Keep your purchase receipt as proof of purchase for warranty

claims.