UNI-T UT271C

UNI-T UT271C Ground Resistance Tester Clamp Ammeter Instruction Manual

Model: UT271C

1. Introduction and Overview

The UNI-T UT271 series clamp ground resistance testers (UT271A, UT271B, UT271C) are advanced instruments designed for precise measurement of ground resistance, loop resistance, and AC leakage current. These devices are essential for ensuring the safety and proper functioning of electrical grounding systems. The UT271C model offers an extended resistance range up to 1000Ω and current measurement up to 20A, along with data storage capabilities and a synchronous display for resistance and current.

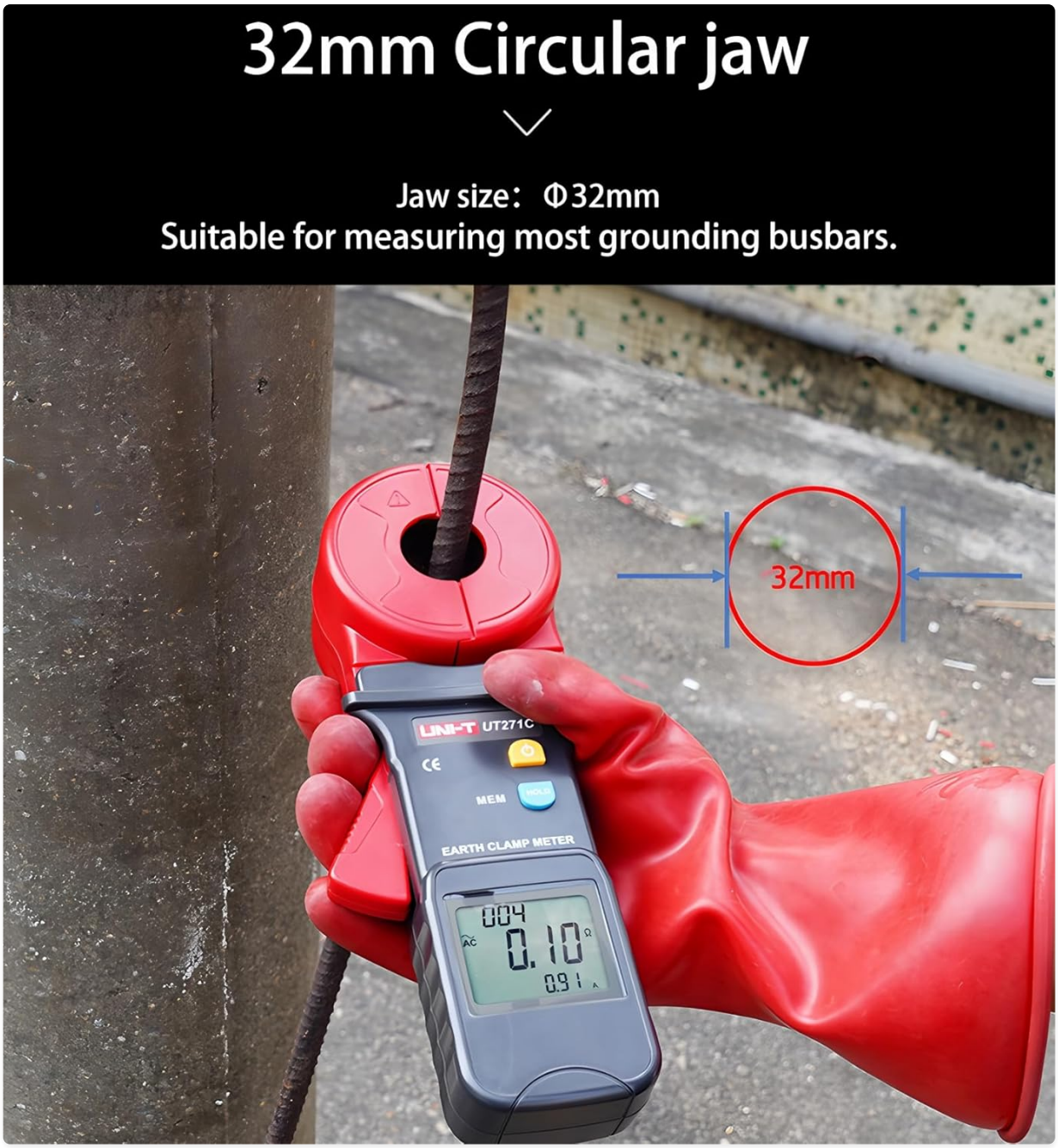

Image 1.1: Overview of UNI-T UT271A, UT271B, and UT271C Ground Resistance Testers. These models offer varying measurement capabilities for ground resistance and AC current.

2. Key Product Features (UT271C)

- **AC Current Range:** 0.01mA to 20.0A
- **Resistance Range:** 0.010Ω to 1000Ω
- **Jaw Opening:** Φ32mm, suitable for most grounding busbars.
- **Data Storage:** Capacity for 500 sets of measurement data.
- **Display:** Simultaneous display of Resistance (Ω) and Current (A) on a 4-digit LCD screen.
- **Operation:** Quick self-check on startup and full automatic gear shifting for ease of use.
- **Measurement Speed:** Rapid measurement at 1 measurement per second.
- **Certification:** CE certified.

Image 2.1: Detailed features of the UNI-T UT271C, highlighting its measurement capabilities and display characteristics.

3. Product Accessories

Upon unboxing your UNI-T UT271C, please verify that all the following accessories are included:

- Instrument (UT271C Clamp Meter): 1 unit
- Standard Test Loops: 1Ω and 10Ω (1 set)
- Warranty Card / Certificate of Conformity: 1 piece
- Cloth Carrying Bag: 1 piece
- Instruction Manual: 1 piece (this document)

Image 3.1: The complete set of accessories provided with the UNI-T UT271C, ensuring you have everything needed for operation and transport.

4. Setup

Before using the UT271C, perform the following initial setup steps:

1. **Battery Installation:** The device requires DC 6V power, typically supplied by four No.5 alkaline dry batteries (LR6 1.5V X 4). Open the battery compartment on the back of the device, insert the batteries according to the polarity indicators, and securely close the compartment.
2. **Power On:** Press the power button to turn on the device. The meter will perform a quick self-check on startup.
3. **Self-Calibration:** Ensure the clamp jaws are fully closed and clean before powering on for accurate self-calibration.

5. Operating Instructions

The UT271C is designed for straightforward operation. Follow these guidelines for accurate measurements:

5.1. Ground Resistance Measurement

1. Ensure the target grounding system is de-energized or safe to clamp.
2. Open the clamp jaws and position them around the grounding conductor or busbar. The jaw size is Φ32mm.
3. Close the jaws firmly. Ensure there is no gap between the jaws for accurate readings.
4. The device will automatically select the appropriate range. The resistance value will be displayed on the LCD screen.
5. For loop resistance tests, ensure the loop is closed and clamp around the conductor forming the loop.

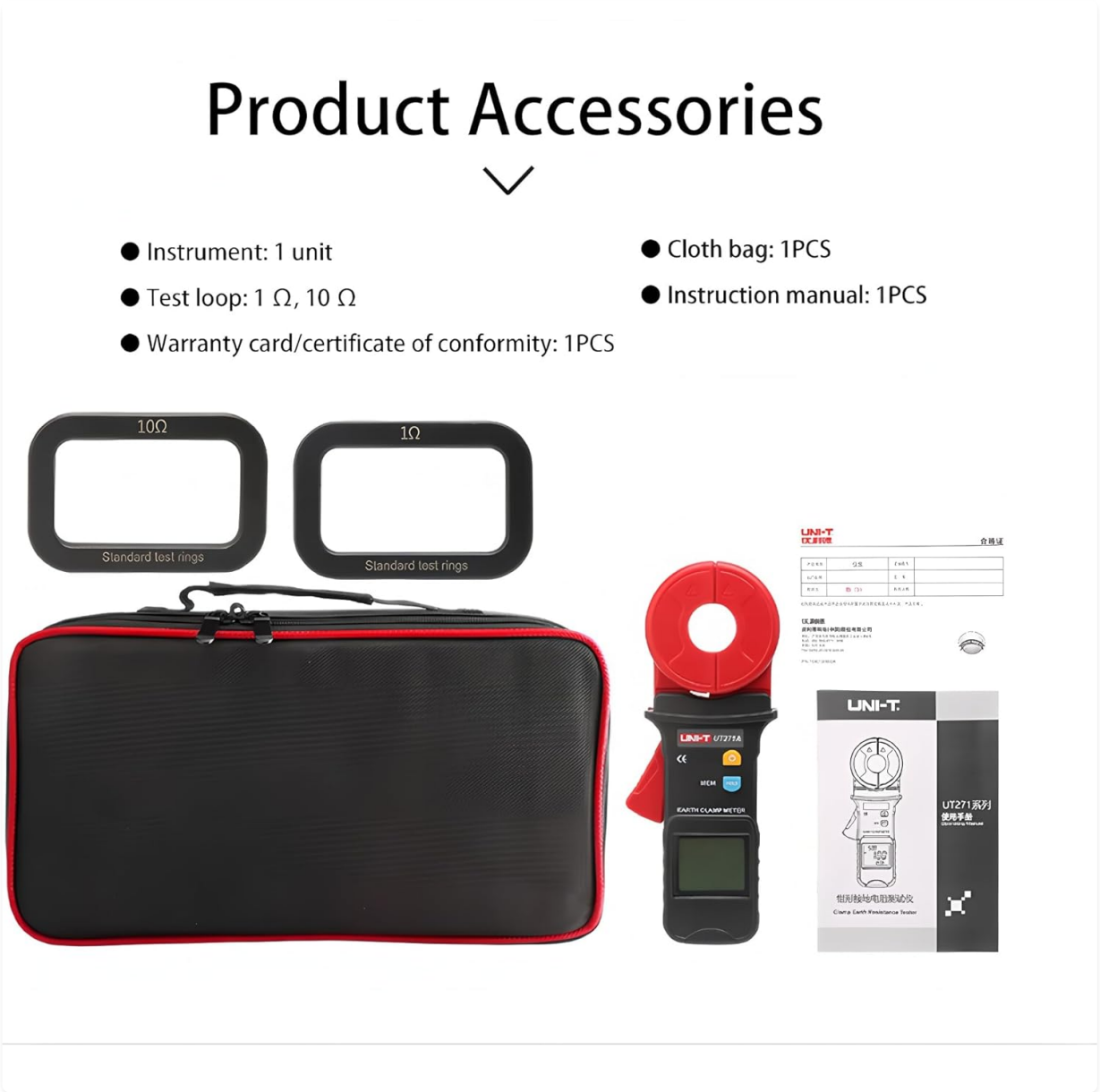

Image 5.1: Demonstrating the use of the 32mm circular jaw for measuring ground resistance on a conductor. The jaw is designed to fit around most standard grounding busbars.

5.2. AC Leakage Current Measurement

1. Select the current measurement mode if not automatically detected.

2. Clamp the jaws around the conductor where leakage current is to be measured.
3. The AC current value will be displayed on the LCD screen. The UT271C can measure currents from 0.01mA up to 20.0A.

5.3. Data Storage

The UT271C can store up to 500 sets of measurement data. Refer to the device's specific button functions (e.g., 'MEM' button) for saving and recalling data. This feature is useful for logging measurements over time or across multiple test points.

6. Applications

The UNI-T UT271C is a versatile tool with various applications in electrical engineering and maintenance:

- **Power Grid Construction:** Essential for checking the resistance value of grounding grids during construction or renovation of substations to meet safety standards.
- **Transmission Tower Measurement:** Used to measure the grounding resistance of transmission towers, providing a critical parameter for evaluating the effectiveness of grounding systems. Effective grounding protects equipment from electrical faults like lightning strikes and overvoltages.
- **High-Rise Buildings:** Necessary for installing lightning protection systems in high-rise buildings, ensuring accurate grounding resistance for effectiveness.
- **Subway Construction Projects:** Grounding resistance testing is required for electrical facilities in underground railway projects to ensure operational safety.

Power Engineering:
Power grid construction: When constructing or renovating substations, this equipment is needed to check whether the resistance value of the grounding grid meets safety standards.
Transmission Tower: Measuring the grounding resistance of transmission towers is an important parameter for evaluating the effectiveness of grounding systems. A good grounding system can effectively protect equipment from electrical faults such as lightning strikes and overvoltages
Construction:
High rise buildings: When installing lightning protection systems in high-rise buildings, it is necessary to accurately measure the grounding resistance to ensure its effectiveness.
Subway construction project: For the electrical facilities of underground railway projects, grounding resistance testing is required to ensure the safety of subway operation.

Image 6.1: Examples of the UT271C in practical applications, including measuring tower resistance, charging pile resistance, AC current, and leakage current in various electrical installations.

7. Maintenance

Proper maintenance ensures the longevity and accuracy of your UT271C:

- **Cleaning:** Use a soft, dry cloth to clean the instrument. Do not use abrasive cleaners or solvents. Keep the clamp jaws clean and free of debris.
- **Battery Replacement:** Replace batteries promptly when the low battery indicator appears. Always use the specified battery type (No.5 alkaline dry battery, LR6 1.5V X 4).
- **Storage:** When not in use for extended periods, remove the batteries to prevent leakage. Store the device in its cloth bag in a dry environment with a temperature range of -20°C to 60°C and relative humidity below 80% RH.
- **Calibration:** Regular calibration by qualified personnel is recommended to maintain measurement

accuracy.

8. Troubleshooting

If you encounter issues with your UT271C, consider the following common troubleshooting steps:

- **No Display/Power On:** Check battery installation and ensure batteries are not depleted. Replace if necessary.
- **Inaccurate Readings:** Ensure the clamp jaws are fully closed and clean. Verify that the conductor is properly centered within the jaws. Check for external electromagnetic interference.
- **"Low Battery" Prompt:** Replace all four batteries with new ones.
- **Interference Indication:** The device automatically identifies interference signals. If the interference current is high, a "Noise" symbol will be displayed. Try to minimize external electrical noise sources.

For persistent issues, contact UNI-T customer support.

9. Specifications

Technical Specifications

Function	Range	resolution	Accuracy	UT271A	UT271B	UT271C
Resistance	0.010Ω-0.099Ω	0.001Ω	± (1%rdg+0.01Ω)	√	√	√
	0.10Ω-0.99Ω	0.01Ω	± (1%rdg+0.01Ω)	√	√	√
	1.0Ω-49.9Ω	0.1Ω	± (1%rdg+0.1Ω)	√	√	√
	50.0Ω-99.5Ω	0.5Ω	± (1.5%rdg+0.5Ω)	√	√	√
	100Ω-199Ω	1Ω	± (2%rdg+1Ω)	√	√	√
	200Ω-395Ω	5Ω	± (5%rdg+5Ω)	√	√	√
	400Ω-590Ω	10Ω	± (10%rdg+10Ω)	-	√	√
	600Ω-1000Ω	20Ω	± (20%rdg+20Ω)	-	-	√
Current	0.00mA -9.99mA	0.01mA	± (2.5%rdg+1mA)	-	√	√
	10.0mA -99.9mA	0.1mA	± (2.5%rdg+5mA)	-	√	√
	100mA -299mA	1mA	± (2.5%rdg+10mA)	-	√	√
	0.30A-2.99A	0.01A	± (2.5%rdg+0.1A)	-	√	√
	3.0A-9.9A	0.1A	± (2.5%rdg+0.3A)	-	√	√
	10.0A-20.0A	0.1 A	± (2.5%rdg+0.5A)	-	√	√
Power supply	DC 6V, No.5 alkaline dry battery (LR61.5VX4)					
Jaw size	Φ32mm					
Ω+A Display	Support (only UT271B, UT271C)					
Data Storage	500 sets					
interference test	Automatically identify interference signals, indicated by the "Noise" symbol when the interference current is high					
Battery voltage	Low battery voltage prompt					
Power waste	Max is about 60mA					
measure time	Once per second					
LCD Size	46mm×36mm					
Host size	260mm×105mm×60mm					
Insulation	20MΩ					
Pressure resistance	AC 3700V/rms					
Weight	818g					
Operation	-10℃~40℃; 70%RH					
Storage	-20℃~60℃; 80%RH					
Magnetic field	<40A/m; <1V/m					
Safety regulations	IEC61010-1 (CATII 300V, CATIV150V, pollution level 2); IEC61010-031; IEC61557-1 (Grounding Resistance); JJG 1054-2009 Verification Regulations for Clamp on Grounding Resistance Meter					

Image 9.1: Comprehensive technical specifications for the UT271 series, including ranges, resolutions, and accuracies for each model.

Function	Range	Resolution	Accuracy	UT271A	UT271B	UT271C
Resistance	0.01Ω-0.099Ω	0.001Ω	± (1%rdg+0.01Ω)	√	√	√
	0.10Ω-0.99Ω	0.01Ω	± (1%rdg+0.01Ω)	√	√	√
	1.0Ω-49.9Ω	0.1Ω	± (1%rdg+0.1Ω)	√	√	√
	50.0Ω-99.5Ω	0.5Ω	± (1.5%rdg+0.5Ω)	√	√	√
	100Ω-199Ω	1Ω	± (2%rdg+1Ω)	√	√	√
	200Ω-395Ω	5Ω	± (5%rdg+5Ω)	-	√	√
	400Ω-590Ω	10Ω	± (10%rdg+10Ω)	-	√	√
	600Ω-1000Ω	20Ω	± (20%rdg+20Ω)	-	-	√

Function	Range	Resolution	Accuracy	UT271A	UT271B	UT271C
Current	0.00mA-9.99mA	0.01mA	± (2.5%rdg+1mA)	√	√	√
	10.0mA-99.9mA	0.1mA	± (2.5%rdg+5mA)	√	√	√
	100mA-299mA	1mA	± (2.5%rdg+10mA)	√	√	√
	0.30A-2.99A	0.01A	± (2.5%rdg+0.1A)	-	√	√
	3.0A-9.9A	0.1A	± (2.5%rdg+0.3A)	-	√	√
	10.0A-20.0A	0.1A	± (2.5%rdg+0.5A)	-	√	√
Power supply	DC 6V, No.5 alkaline dry battery (LR6 1.5VX4)					
Jaw size	Φ32mm					
Ω+A Display	Support (only UT271B, UT271C)					
Data Storage	500 sets					
Interference test	Automatically identify interference signals, indicated by the "Noise" symbol when the interference current is high					
Battery voltage	Low battery voltage prompt					
Power waste	Max is about 60mA					
Measure time	Once per second					
LCD Size	46mm X 36mm					
Host Size	260mm X 105mm X 60mm					
Insulation	20MΩ					
Pressure resistance	AC 3700V/rms					
Weight	818g					
Operation	-10°C~40°C; 70%RH					
Storage	-20°C~60°C; 80%RH					
Magnetic field	<40A/m; <1V/m					

10. Safety Regulations

The UNI-T UT271C complies with the following safety and verification regulations:

- IEC61010-1 (CATII 300V, CATIV150V, pollution level 2)
- IEC61010-031
- IEC61557-1 (Grounding Resistance)
- JJG 1054-2009 Verification Regulations for Clamp on Grounding Resistance Meter

Always adhere to local safety regulations and best practices when working with electrical systems. Do not use the device if it appears damaged or is operating abnormally.

11. Warranty and Support

UNI-T products are manufactured to high-quality standards. For warranty information, please refer to the warranty card included with your product. In case of technical issues, repair, or calibration needs, please contact UNI-T customer support or your local distributor. Keep your purchase receipt as proof of purchase for warranty claims.

Manufacturer: UNI-TREND TECHNOLOGY (CHINA) CO., LTD.