

UT281 Series True RMS Flex Clamp

Thank you for purchasing this brand new UNI-T product. In order to safely and correctly use this device, please read this manual carefully, especially the Safety Instructions. Please keep the manual accessible near the device for future reference.

I. Instruction

UT281A/C/E is a stable, safe and reliable 3000A AC true RMS Rogowski flexible current clamp. It is an indispensable tool for electricians for its superior performance, overload protection, and unique appearance. The Rogowski coil length of UT281A, C, and E are 10", 18" and 18" respectively.

II. Open Box Inspection

Open the package box and take out the device. Please check whether the following accessories are deficient or damaged and contact your supplier immediately if they are.
 User manual -----1 pc
 Test leads-----1 pair (only for UT281E)

III. Safety Instructions

In this manual, a Warning identifies conditions and actions that pose hazard(s) to the user or the test device.

This device strictly follows CE standards: IEC61010-1; IEC61010-2-032; IEC61010-2-033 as well as CAT IV 600V, RoHS, pollution grade II, and double insulation standards.

CAT IV: It is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.

If the clamp is used in a manner that is not specified in this manual, the protection provided by the device might be impaired.

- 1) Before each use, inspect the clamp and its measuring head for any damage. Pay particular attention to the insulation surrounding, the flexible measuring head, or the clamp housing. Do not use the device if it is not working properly.
 - 2) Do not use the device if the rear cover or the battery cover is opened.
 - 3) When measuring, keep fingers behind the finger guard on the measuring head. Do not touch bare cables, connectors, unoccupied input terminals or circuit being measured.
 - 4) Before measuring, the switch should be on correct position. Do not switch positions during measurement.
 - 5) Do not use the clamp on any conductor with voltages higher than AC 600V.
 - 6) Use caution when working with voltages above 33V AC rms. Such voltages pose shock hazard.
 - 7) Do not use the clamp to measure current higher than specified range. If current value being measured is unknown, select highest position and reduce accordingly.
 - 8) To avoid false reading, replace the battery if power indicator flashes. Remove the battery if the clamp is left unused for a long time.
 - 9) Accuracy might be affected by electromagnetic field interference.
 - 10) Do not change the internal circuit of the clamp.
 - 11) Do not store or use the clamp in high temperature, high humidity, and explosive or strong magnetic field environments.
 - 12) Use soft cloth to clean the case, do not use abrasives or solvents.
 - 13) If insulation on probe is damaged, replace it.
- ⚠ WARNING:** Use meet EN 61010-031 standard, rated CAT IV 600V, 10A or better probe.

IV. Symbols

| | | | |
|--|---|--|--|
| | Equipment protected throughout by double insulation or Reinforced insulation | | Both direct and alternating current |
| | Grounding | | Caution, possibility of electric shock |
| | Caution | | Comply with European Union standards |
| | Alternating Current | | Direct Current |
| | Conforms to UL STD. 61010-1, 61010-2-032, 61010-2-033, Certified to CSA STD. C22.2 No. 61010-1, 61010-2-032, 61010-2-033. | | |

V. Structure

- 1) Flexible clamp
- 2) Flexible clamp lock
Rotate the knob according to the arrow mark on the case to lock or unlock
- 3) LCD display
- 4) HOLD
Short press to turn ON/OFF data hold function;
Long press to turn ON/OFF the device (Only for UT281E)
- 5) Backlight and INRUSH
Short press to turn ON/OFF backlight; long press to turn ON/OFF inrush measurement
- 6) RANGE/Hz switch button
UT281E: Short press "RANGE" to cycle switch from AUTO to manual mode (other different range) on A, V position (Except Ω position), Long press go back to Frequency (only AUTO mode) measurement function.
UT281A/C: short press to cycle switch between 30.00A/300.0A/3000A (default 3000A)
- 7) Function switch (only for UT281E)
A-----AC current and frequency measurement
V-----AC voltage and frequency measurement
Ω-----resistance measurement
Power switch (UT281A/C): long press to turn ON/OFF the device
- 8) Voltage and resistance input terminals (only for UT281E)
Maximum voltage: 600V AC, maximum resistance: 6MΩ

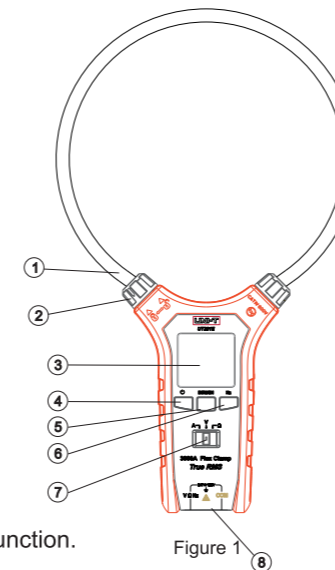
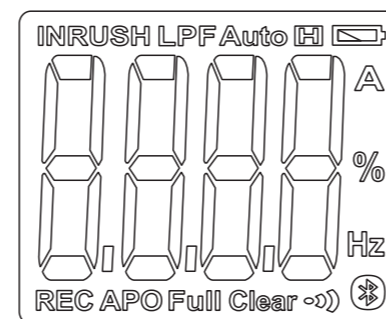


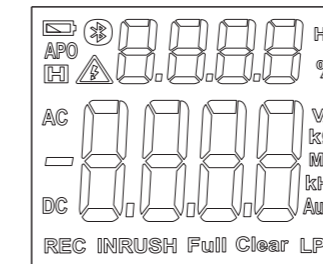
Figure 1

VI. Display



← UT281A/C

| | | | |
|--|--------------------------|--|----------------|
| | 80 mS inrush measurement | | Current unit |
| | Buzzer | | Auto power off |
| | Low power | | Data hold |



← UT281E

| | | | |
|--|--------------------------|--|----------------------|
| | 80 mS inrush measurement | | A, Hz, V, Ω, kΩ, MΩ, |
| | Buzzer | | Auto power off |
| | Low power | | Data hold |

VII. Operations

- ⚠ Warning:** Before measuring, switch off the conductor to be measured. Do not turn on the conductor before the clamp is locked around the conductor to be measured.
- ⚠ Caution:** Keep your hands away from the Rogowski ring and conductor to be measured.
1. Turn off the device as well as the conductor being measured.
 2. Unlock the clamp according to figure 3
 3. Use the measuring head to wrap and lock around the conductor to be measured. (Only one wire can be tested at one time) (See figure 4)

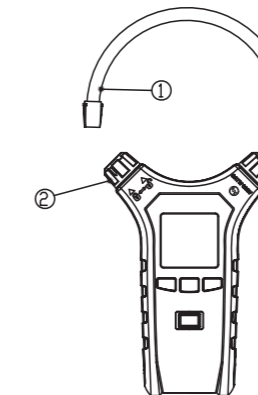


Figure 3

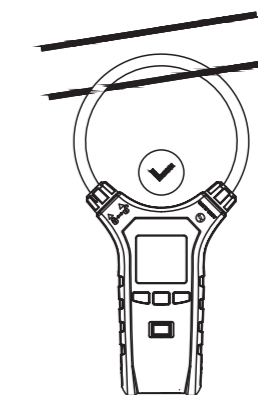


Figure 4

4. Turn on the clamp, then turn on the conductor.
5. Read the value displayed on the LCD. If the current to be measured is over the range, OL appears on the LCD. Please select appropriate range. (30.00A/300.0A/3000A)
6. Improper operation examples (see figure 5a, 5b)

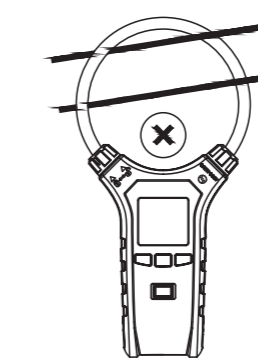


Figure 5a

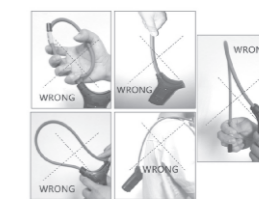
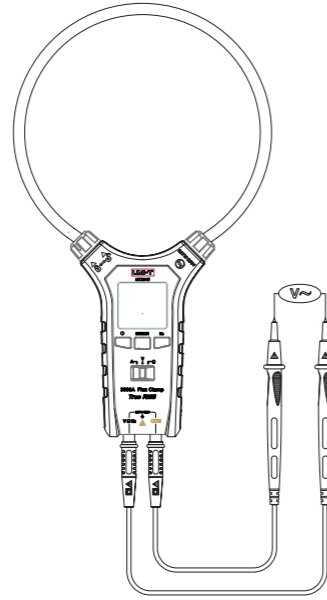


Figure 5b

AC voltage and frequency measurement (only for UT281E)

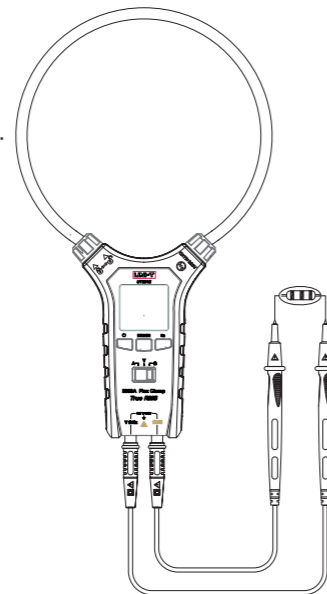
1. Insert black test lead to COM jack, red test lead to V jack
2. Switch the functional switch to V position
3. Long press RANGE to turn on frequency measurement
4. Connect test leads to the voltage, the meter will automatically select the range. Main display will show the AC voltage RMS, auxiliary display will show frequency value.



⚠Warning: Do not input over AC 600V.

Resistance measurement (only for UT281E)

1. Insert black test lead to COM jack, red test lead to V jack
2. Switch the functional switch to Ω position
3. Connect test leads to the resistance, the meter will automatically select the range. Main display will show the resistance value.



⚠Warning: Before measuring, please disconnect the power supply and fully discharge all capacitors. The result will be more accurate if the resistor is departed from the whole circuit.

Auto power off

During measurement, if there is no operation within 10 minutes, the meter will power off automatically to save energy. Long press HOLD to turn on the UT281E, or press POWER button to turn on the UT281A/C. Press backlight and range button at the same time to turn on or off APO function. Default: APO is ON.

Buzzer

The buzzer will go off at effective range.

VIII. Technical specifications

A. General specifications

| | |
|----------------------------|---|
| Max Display | Maximum 3000 |
| Overload indication | OL |
| Low power indication | |
| Sampling rate | 3 times/s |
| Sensor | Rogowski coil |
| Drop test | 1m |
| Clamp head length | UT281C/E: 18 inches(45.7cm) UT281A: 10 inches (25.4cm) |
| Maximum conductor diameter | UT281C/E: 14cm UT281A: 9cm |
| Battery | 3*AAA-1.5V |
| Auto power off | 10 mins |

B. Operating environment

| | |
|-----------------------|---|
| Operating environment | Indoor |
| Maximum altitude | 2000m |
| Safety standard | IEC61010-1; IEC61010-2-032; IEC61010-2-033; CAT IV 600V |
| Pollution grade | 2 |
| Operating temperature | 0°C~30°C @ ≤80%RH |
| | 30°C~40°C @ ≤75%RH 40°C~50°C @ ≤45%RH |
| Storage temperature | -20°C~+60°C @ ≤80%RH |

C. Electric specifications

| | |
|-------------------------|--|
| Accuracy | ±(%of reading+ numerical number of least significant digit) 1 year warranty |
| Environment temperature | 23 °C ± 5 °C |
| Environment humidity | ≤80%RH |
| Temperature coefficient | 0.1×(specified accuracy)/ °C |

(1) UT281A AC current measurement

| Range | Resolution | Accuracy (at central position) | Remark |
|--------------------|--------------------|--------------------------------|------------------------------|
| 30.00A | 0.01A | ±(3%+5) | Specification at the center. |
| 300.0A | 0.1A | | |
| 3000A | 1A | | |
| Inrush current | Range: 0.50A~3000A | Only for reference | |
| Frequency response | 45Hz~500Hz | | |

Main display: Current true RMS

| Additional accuracy range when measuring outside of optimum location (Assume no external electric or magnetic field) | Central optimum measurement location | Accuracy | Zone | |
|--|--------------------------------------|-----------------|--------|--|
| 15mm(0.6") away from center | | ±(3%+5) | Zone A | |
| 25mm(1.0") away from center | | Additional 2.0% | Zone B | |
| 35mm(1.4") away from center | | additional 2.5% | Zone C | |

(2) UT281C/E AC current measurement

| Range | Resolution | Accuracy (at central position) | Remark |
|--------------------|--------------------|--------------------------------|------------------------------|
| 30.00A | 0.01A | ±(3%+5) | Specification at the center. |
| 300.0A | 0.1A | | |
| 3000A | 1A | | |
| Inrush current | Range: 0.50A~3000A | Only for reference | |
| Frequency response | 45Hz~500Hz | | |

Main display: Current true RMS

Auxiliary display: AC voltage frequency

| Additional accuracy range when measuring outside of optimum location (Assume no external electric or magnetic field) | Central optimum measurement location | Accuracy | Zone | |
|--|--------------------------------------|-----------------|--------|--|
| 35mm(1.4") away from center | | ±(3%+5) | Zone A | |
| 50mm(2.0") away from center | | Additional 1.0% | Zone B | |
| 60mm(2.4") away from center | | additional 1.5% | Zone C | |

(3) AC voltage measurement (UT281E)

| Range | Resolution | Accuracy (at central position) | Overload protection |
|--------------------|------------|--------------------------------|---------------------|
| 6.000V | 0.001V | ±(1.2%+3) | 600V AC |
| 60.00V | 0.01V | | |
| 600.0V | 0.1V | | |
| Frequency response | 45Hz~500Hz | | |

Main display: Current true RMS

Auxiliary display: AC voltage frequency

Input impedance: ≥10MΩ

(4) Resistance measurement (UT281E)

| Range | Resolution | Accuracy | Overload protection |
|----------|------------|-----------|---------------------|
| 600.0Ω | 0.1Ω | ±(1.2%+3) | 600V AC |
| 6.000kΩ | 0.001 kΩ | | |
| 60.00kΩ | 0.01 kΩ | | |
| 600.0 kΩ | 0.1kΩ | | |
| 6.000 MΩ | 1kΩ | | |
| 60.00MΩ | 10 kΩ | | |

Main display: resistance value

(5) Frequency measurement (UT281E)

| Range | Resolution | Sensitivity | Accuracy | Overload protection |
|------------|------------|---|----------|---------------------|
| 20Hz~30kHz | 0.1Hz | 20~1kHz (2V) 1k~20kHz(10V) 20k~30kHz(30V) | ±(1%+2) | 600V AC |

Main display: frequency value

IX. Maintenance

A. General maintenance

⚠Warning: remove the test probes before open the rear cover or it may pose a shock hazard.

- a. The maintenance and service must be implemented by qualified professionals or designated maintenance departments.
- b. Clean the case with a dry cloth. Do not use abrasives or solvents

B. Battery installation & replacement

The clamp uses 3pcs AAA 1.5V alkaline batteries for operation.

To install or replace the battery:

- a. Switch off the meter and remove the test probes from the terminal input.
- b. Unscrew the battery cover, remove the cover and install new batteries ensuring that the correct polarity is observed.
- c. Use batteries of the same type
- d. Replace the battery cover and screw up.