

TECHNI-PRO

Operating Instructions for AC/DC TRMS CLAMP METER



Please read this manual before switching the unit on.
Important safety information inside.


Content	Page
1.Introduction.....	4
2.Safety.....	4
2-1.International Safety Symbols.....	4
2-2.PER IEC1010 OVERVOLTAGE INSTALLATION CATEGORY.....	4
2-3.Safety Notes.....	5
2-4.Input Limits.....	5
3.Description.....	6
3-1.Meter Description.....	6
3-2.Display Icons Description.....	8
4.Function.....	9
4-1.Data Hold.....	9
4-2.LCD Backlight.....	9
4-3.MAX/MIN.....	9
4-4.Peak Hold.....	9
4-5.INRUSH.....	9
4-6.Automatic Power OFF with Disable.....	9
4-7.Low Battery Indication.....	9
5.Operation.....	10
5-1.AC/DC Current Measurement.....	10
5-2.AC/DC Voltage Measurement.....	11
5-3.Resistance Measurement.....	12
5-4.Continuity Measurement.....	13
5-5.Diode Test.....	14
5-6.Capacitance Measurement.....	15
5-7.Frequency/Duty Cycle Measurement.....	16
5-8.Temperature Measurement.....	17
5-9.Non-Contact AC Voltage Measurement.....	18
6.Maintenance.....	19
6-1.Cleaning and Storage.....	19
6-2.Battery Replacement.....	19
7.Specifications.....	20
7-1.Technical Specifications.....	20
7-2.General Specifications.....	22


1. Introduction

- The True RMS Clamp Meter measures DC Current up to 1000A and AC Current up to 3000A.
- Other functions include AC/DC Voltage, Resistance, Continuity, Diode Test, Capacitance, Frequency, Duty Cycle and Temperature.
- A built-in flashlight and non-contact AC voltage detector provide added convenience.
- Bluetooth communication allows readings to be displayed and stored on mobile devices.
- This meter is fully tested and calibrated and, with proper use, will provide many years of reliable service.

2. Safety

2-1. International Safety Symbols

 This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.

 This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present.

 Double insulation.

WARNING This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

CAUTION This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result damage to the product.

2-2. PER IEC1010 OVERVOLTAGE INSTALLATION CATEGORY

OVERVOLTAGE CATEGORY I: Equipment of OVERVOLTAGE CATEGORY I is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.

Note: Examples include protected electronic circuits.

OVERVOLTAGE CATEGORY II: Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation.

Note: Examples include household, office, and laboratory appliances.

OVERVOLTAGE CATEGORY III: Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.

Note: Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

OVERVOLTAGE CATEGORY IV: Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation.

Note: Examples include electricity meters and primary over-current protection equipment.

2-3.Safety Notes

- Do not exceed the maximum allowable input range of any function.
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.
- Remove the battery if meter is to be stored for longer than 60 days.

WARNINGS

- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current/resistance modes.
- Do not measure current on a circuit whose voltage exceeds 600V.
- When changing ranges, always disconnect the test leads from the circuit under test.

CAUTIONS

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery or fuses.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair or replace any damage before use.
- Use great care when making measurements if the voltages are greater than 25VAC rms or 35VDC, these voltages are considered a shock hazard.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the recessed electrical contacts. Other means should be used to ensure that the terminals are not "live".
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- This device is not a toy and must not reach children's hands. It contains hazardous objects, as well as small parts which children could swallow. In the event parts are swallowed, seek medical help immediately.
- Do not leave batteries and packing material lying around unattended; they can be dangerous for children if they use them as toys.
- In case the device is going to be unused for an extended period of time, remove the batteries to prevent them from draining.
- Expired or damaged batteries can damage skin. Wear suitable gloves when handling.
- See that the batteries are not short-circuited, do not throw batteries into fire.

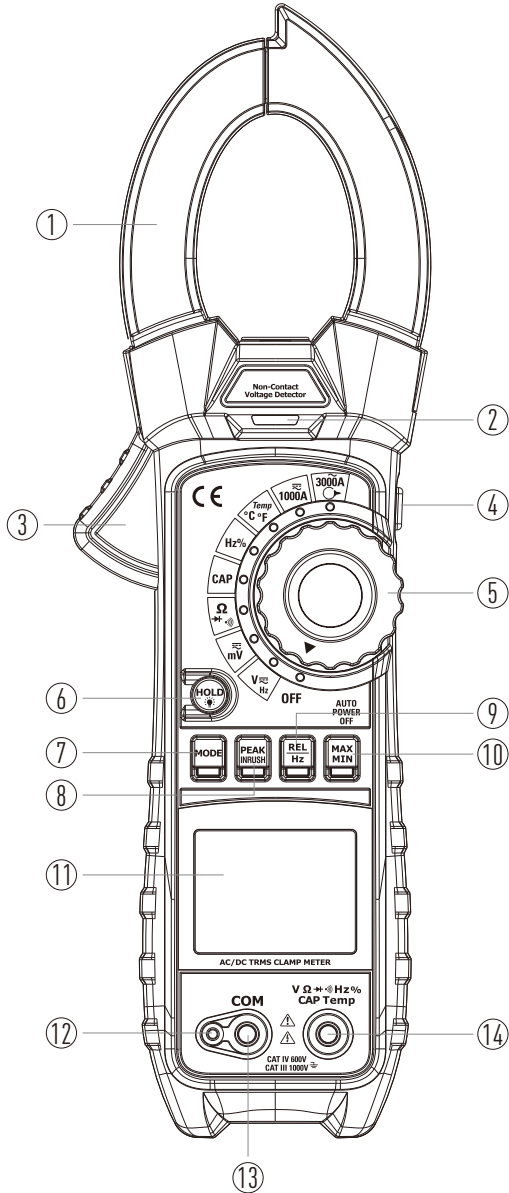
2-4.Input Limits

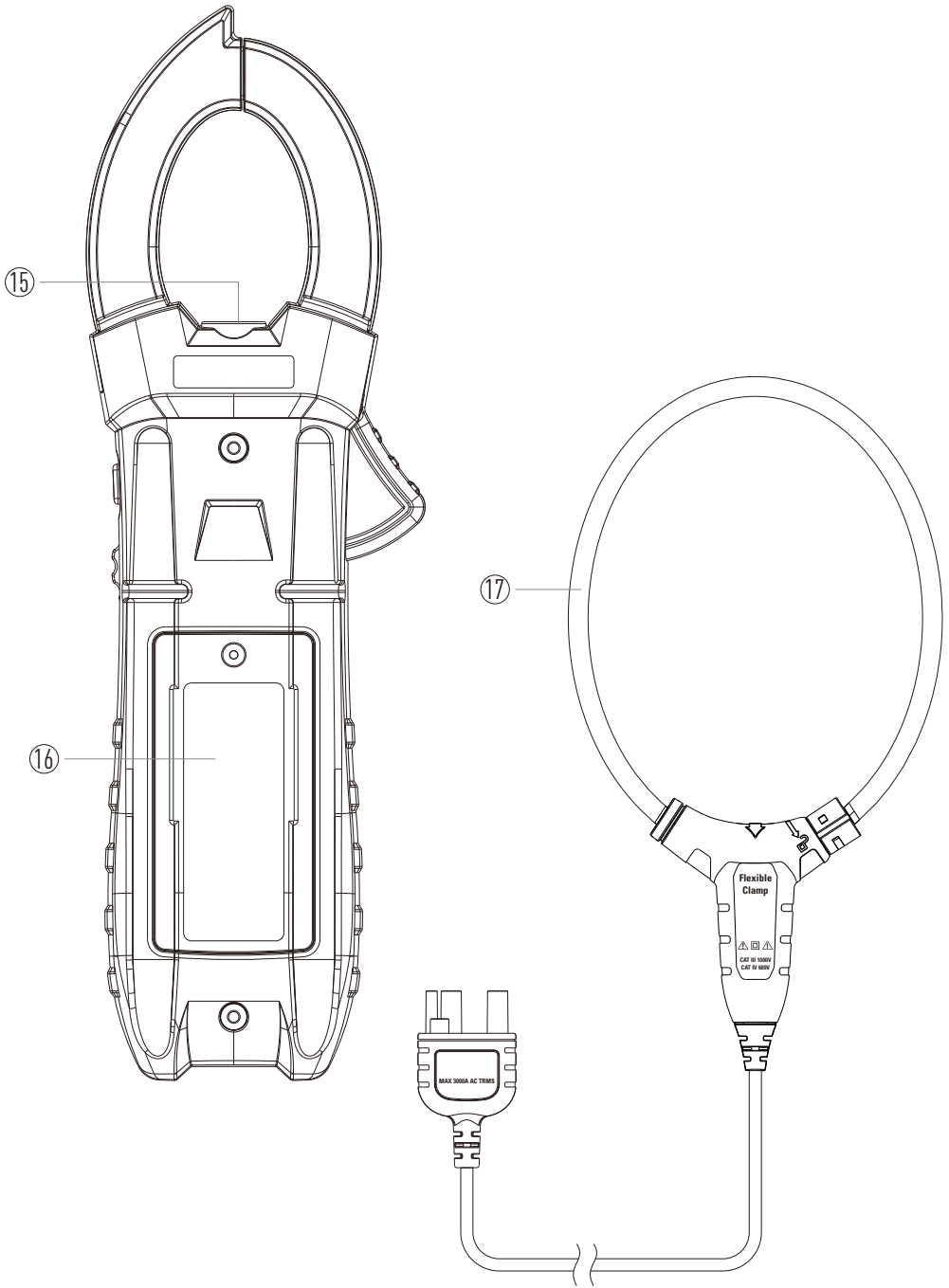
Function	Maximum Input
3000A AC	3000A AC
1000A DC/AC	1000A DC/AC
V DC/AC	1000V DC/AC
Resistance, Capacitance, Frequency, Diode Test	250V DC/AC
Type K Temperature	30V DC, 24V AC

3.Description

3-1.Meter Description

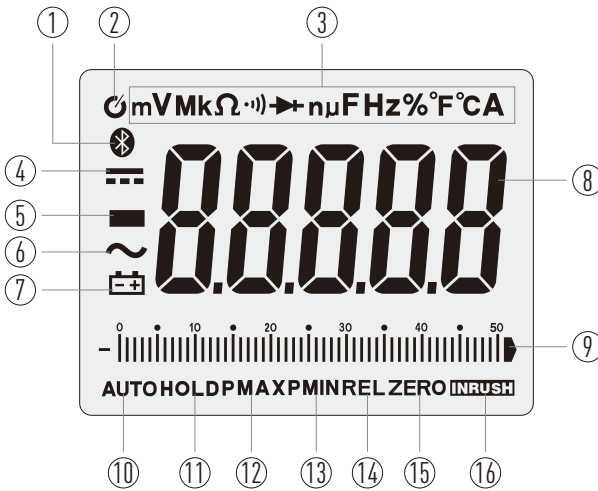
- 1-Current Clamp
- 2-Non-Contact AC Voltage Indicator Light
- 3-Clamp Trigger
- 4-Bluetooth/Flashlight Button
- 5-Rotary Function Switch
- 6-Data Hold/Backlight Button
- 7-MODE Select Button
- 8-PEAK/INRUSH Button
- 9-Relative/Hz Button
- 10-MAX/MIN Button
- 11-LCD Display
- 12-3000A AC Input Jack
- 13-COM Input Jack
- 14-Positive Input Jack
- 15-Flash Light LED
- 16-Battery Cover
- 17-Flexible Current Probe





3-2.Display Icons Description

- | | |
|------------------------------|-------------------------|
| 1-Bluetooth | 9-Analog Bargraph |
| 2-Auto Power Off | 10-Auto Range Mode |
| 3-Units of Measure List | 11-Data Hold |
| 4-Direct Current | 12-Peak Maximum/Maximum |
| 5-Negative Reading Display | 13-Peak Minimum/Minimum |
| 6-Alternating Current | 14-Relative Mode |
| 7-Low Battery | 15-DC Zero |
| 8-Measurement Display Digits | 16-Inrush Current |



4. Function

4-1. Data Hold

- To freeze the LCD reading, press the **HOLD/Backlight** Button. While data hold is active, the **HOLD** icon appears on the LCD.
- Press the **HOLD/Backlight** Button again to return to normal operation.

4-2. LCD Backlight

- The LCD is equipped with backlighting for easier viewing, especially in dimly lit areas.
- Press and hold the **HOLD/Backlight** Button for two seconds to turn the backlight on or off
- The backlight will automatically turn off after 30 seconds.

4-3. MAX/MIN

- Press the **MAX/MIN** Button to activate the MAX/MIN recording mode. The display icon "**MAX**" will appear and the meter will begin recording and displaying the maximum value measured.
- Press the **MAX/MIN** Button again and "**MIN**" will appear. The meter will display the minimum value measured during the recording session.
- Press the **MAX/MIN** Button again and "**MAX MIN**" will appear. The meter will display the present reading, but will continue to update and store the max and min readings.
- To exit MAX/MIN mode, press and hold the **MAX/MIN** Button for 2 seconds.


4-4. Peak Hold

- When ACA or ACV is selected, pressing the **PEAK/INRUSH** Button enables the peak capture circuit.
- The meter will now capture and display the maximum and minimum peaks of the waveform.

4-5. INRUSH

- When ACA is selected, press the **PEAK/INRUSH** Button to activate the inrush capture circuit.
- A transient condition, generally lasting 110-120 milliseconds that occurs during motor start-up.

4-6. Automatic Power OFF with Disable

- In order to conserve battery life, the meter will automatically turn off after approximately 30 minutes.
- To turn the meter on again, turn the function switch to the **OFF** Position and then turn to the desired function position.
- To disable APO:
 1. From the **OFF** Position, hold the **MODE** Button and rotate the function switch to a measurement function, "**APP**  " will appear in the display.
 2. Release the **MODE** Button
 3. APO is now disabled (APO icon is off) and will be reset when the function switch is returned to the **OFF** position.

4-7. Low Battery Indication

- When the " " icon and "----" appears in the display, the battery should be replaced.
- Refer to the battery replacement procedure in the maintenance section.

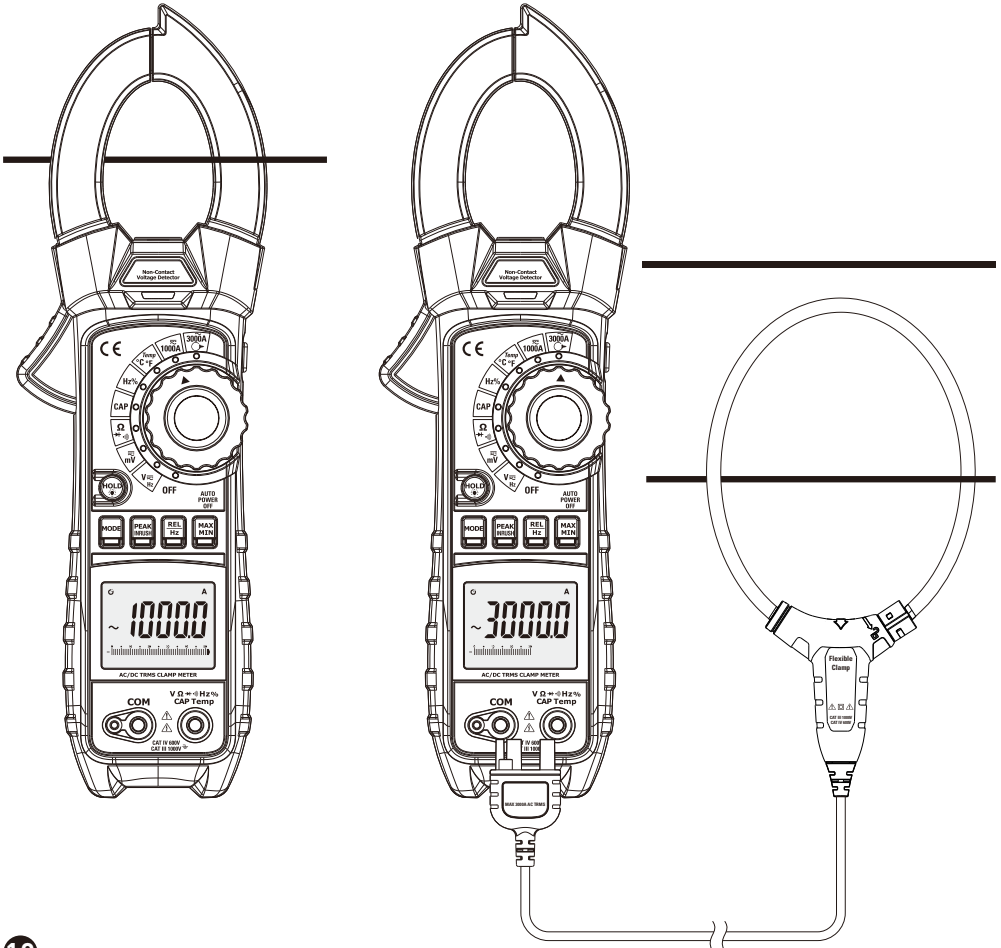
5. Operation

Notes: Read and understand all Warning and Caution statements in this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.

5-1. AC/DC Current Measurement

WARNING: Disconnect the test leads before measuring with clamp.

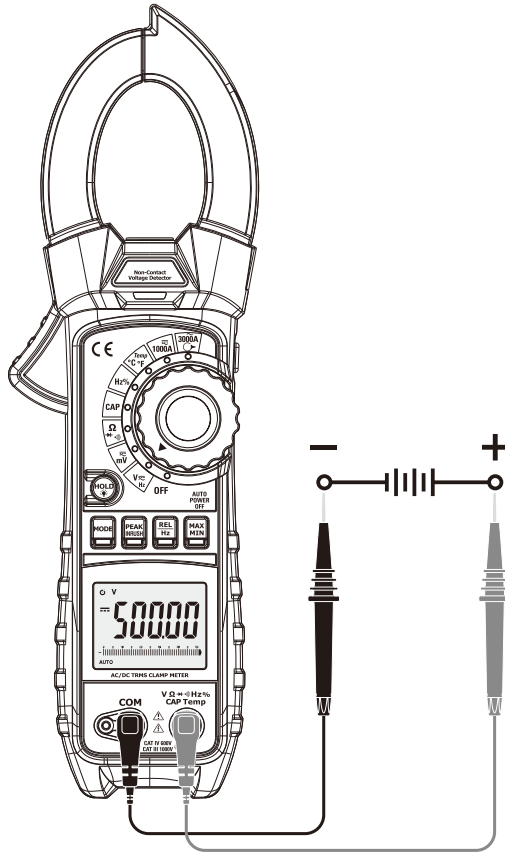
1. Rotate the function switch to the **1000A AC/DC** Position.
2. Press the **MODE** Button to select AC or DC.
3. Press the trigger to open jaw, fully enclose only one conductor.
4. Read the Current value in the display.
5. If the value is more than **1000A AC**, connect Flexible Current Probe in parallel, rotate the function switch to the **3000A AC** Position then read resolution.



5-2.AC/DC Voltage Measurement

CAUTION: Do not measure voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

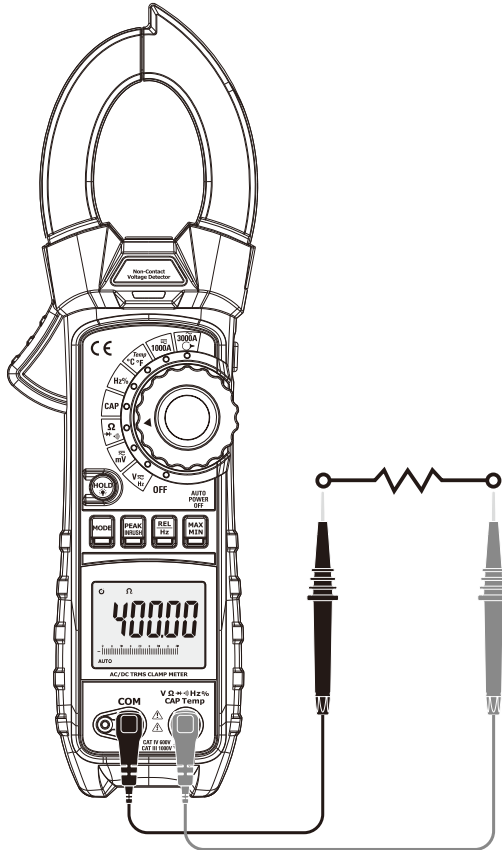
- 1.Set the function switch to the **VAC/DC** or **mVAC/DC** Position.
- 2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
- 3.Press the **MODE** Button to select AC or DC Voltage.
- 4.Touch the black test probe tip to the negative side of the circuit; touch the red test probe tip to the positive side of the circuit.
- 5.Read the voltage value in the display.



5-3. Resistance Measurement

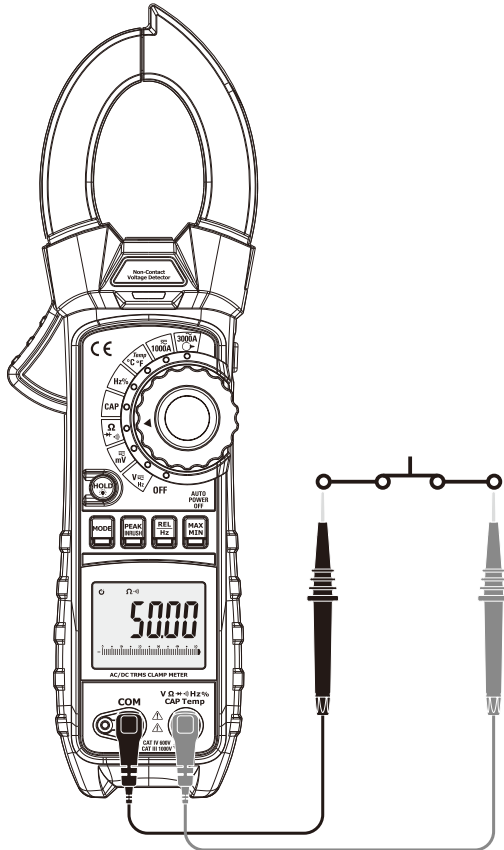
Note: Remove power from the device under test before measuring resistance.

1. Set the function switch to the Ω \rightarrow \rightarrow Position.
2. Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
3. Touch the test probe tips across the circuit or component under test.
4. Read the Resistance on the LCD display.



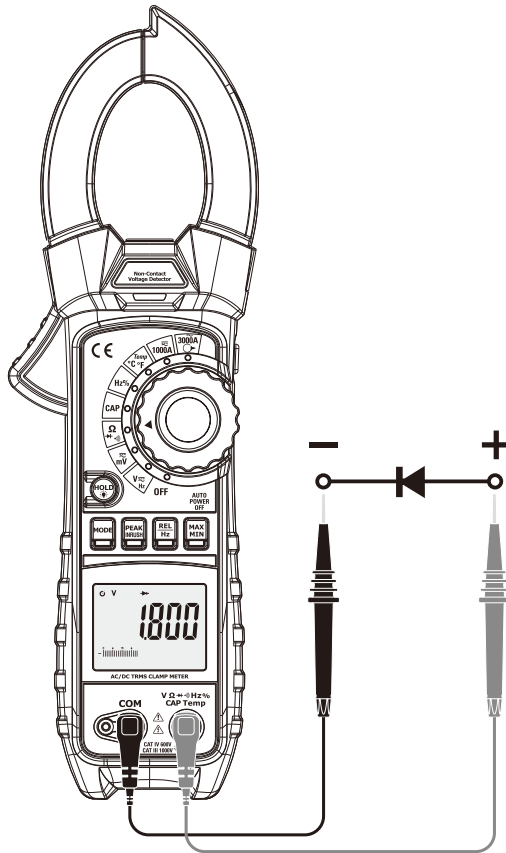
5-4.Continuity Measurement

- 1.Set the function switch to the Ω \gg \rightarrow Position.
- 2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
- 3.Press the **MODE** Button to select continuity “ \gg ”.
- 4.Touch the test probe tips across the circuit or component under test.
- 5.If the resistance is $<50 \Omega$, a tone will sound.



5-5. Diode Test

1. Set the function switch to the Ω \rightarrow \rightarrow Position.
2. Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
3. Press the **MODE** Button to select continuity " \rightarrow ".
4. Touch the test probe tips to the diode or semiconductor junction under test.
5. Reverse the test lead polarity by reversing the red and black leads.
6. The diode or junction can be evaluated as follows:
 - If one reading displays a value (Typically 0.4V to 1.8V) and the other reading displays "**OL**", the diode is good.
 - If both readings display "**OL**" the device is open.
 - If both readings are very small or "**0**", the device is shorted.

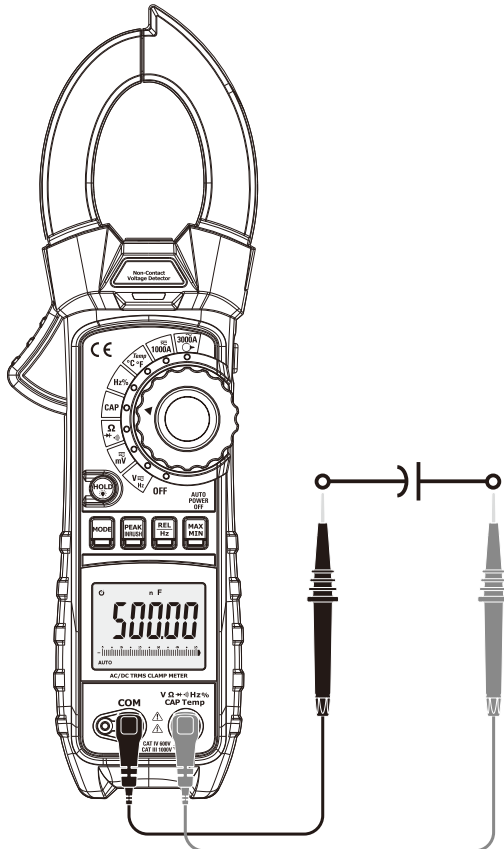


5-6.Capacitance Measurement

WARNING: To avoid electric shock, discharge the capacitor under test before measuring.

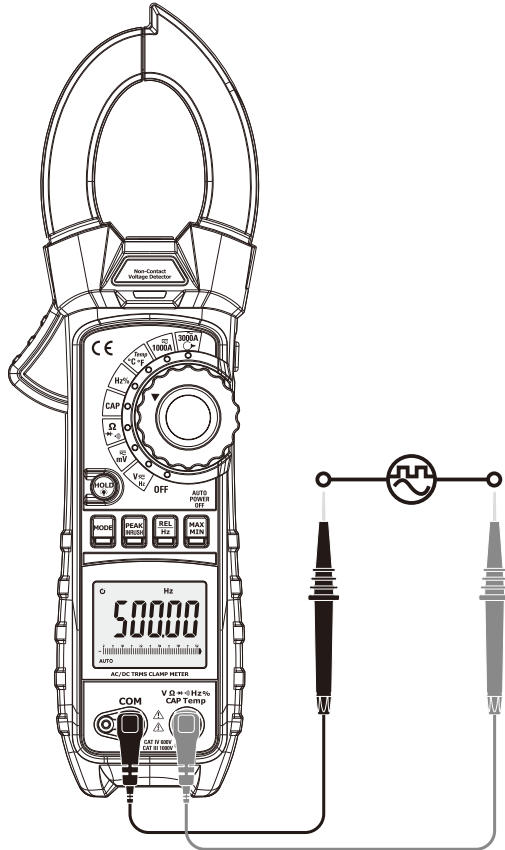
- 1.Set the function switch to the **CAP** Position.
- 2.Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
- 3.Touch the test probe tips across the part under test.
- 4.Read the Capacitance value in the display.

Note: For very large values of capacitance measurement it can take several minutes before the final reading stabilizes.



5-7. Frequency/Duty Cycle Measurement

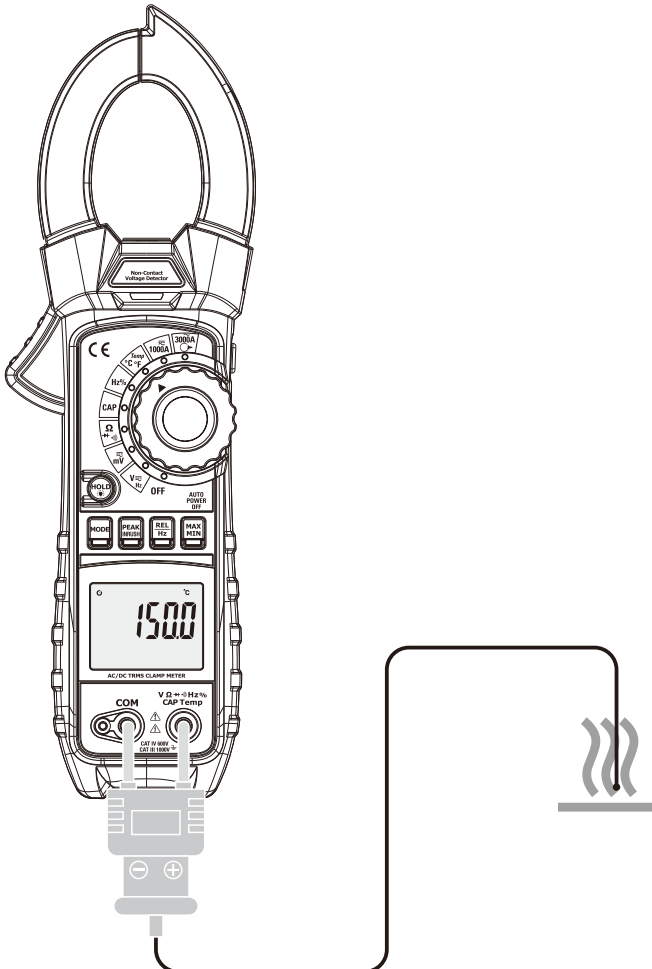
1. Set the function switch to the **Hz%** Position.
2. Insert the black test lead into the **COM** Input Jack and the red test lead into the **Positive** Input Jack.
3. Touch the test probe tips across the part under test.
4. Read the Frequency value on the display.
5. Press the **REL/Hz** Button to select the Duty cycle (%) measurement.
6. Read the Duty cycle value on the display.



5-8. Temperature Measurement

1. Set the function switch to the **TEMP** Position.
2. Use the **MODE** Button to select °C or °F.
3. Insert the Temperature Probe into the **COM** and **Positive** Input Jack, observing polarity.
4. Touch the Temperature Probe head to the device under test, continue to touch the part under test with the probe until the reading stabilizes.
5. Read the Temperature on the display.

WARNING: To avoid electric shock, be sure the thermocouple probe has been removed before changing to another measurement function.



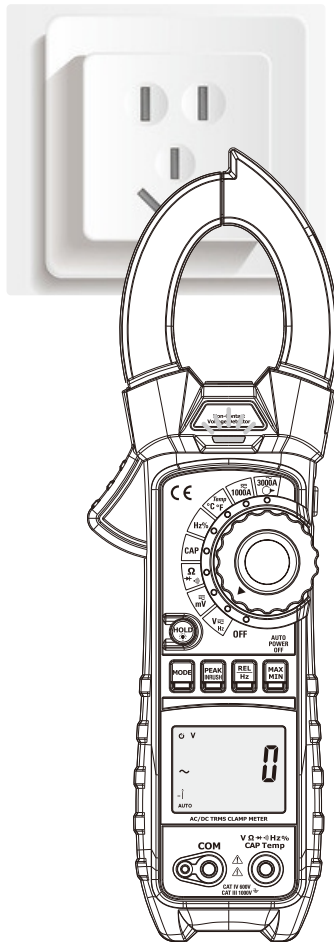
5-9. Non-Contact AC Voltage Measurement

WARNING: Risk of Electrocutation. Before use, always test the Voltage Detector on a known live circuit to verify proper operation.

- Rotate the Function switch to any measurement position.
- Place the detector probe tip on the conductor to be tested. If AC voltage is present, the NCV detector will turn on with a steady red light.

Note: The conductors in electrical cord sets are often twisted. For best results, rub the probe tip along a length of the cord to assure placing the tip in close proximity to the live conductor.

Note: The detector is designed with high sensitivity. Static electricity or other sources of energy may randomly trip the sensor - this is normal operation.



6. Maintenance

WARNING: To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input terminals, and turn OFF the meter before opening the case. Do not operate the meter with an open case.

6-1. Cleaning and Storage

- Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents.
- If the meter is not to be used for 60 days or more, remove the battery and store it separately.

6-2. Battery Replacement

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover.

1. Remove the Phillips head screw secures the rear battery door.
2. Open the battery compartment.
3. Replace the 9V battery.
4. Secure the battery compartment door with the screw.

WARNING: To avoid electric shock, do not operate the meter until the battery cover is in place and fastened securely.

NOTE: If your meter does not work properly, check the batteries to make sure that they are still good and that they are properly inserted.

7. Specifications

7-1. Technical Specifications

Function	Range & Resolution	Accuracy
DC Current	1000.0A	$\pm(2.5\% + 5 \text{ digits})$
AC True RMS Current (50 to 1000Hz)	3000.0A (Flexible Current Probe) 1000.0A	$\pm(2.8\% + 8 \text{ digits})$
All AC Current ranges are specified from 5% of range to 100% of range.		
DC Voltage	500.00mV 5.0000V 50.000V 500.00V 1000.0VDC	$\pm(0.1\% + 4 \text{ digits})$ $\pm(0.2\% + 5 \text{ digits})$
AC True RMS Voltage (50 to 1000Hz)	400.00mV 4.0000V 40.000V 400.00V 750.0V	$\pm(1.0\% + 9 \text{ digits})$
All AC Voltage ranges are specified from 5% of range to 100% of range.		
Resistance	400.00 Ω 4.0000k Ω 40.000k Ω 400.00k Ω 4.0000M Ω 40.000M Ω	$\pm(1.0\% + 9 \text{ digits})$ $\pm(1.0\% + 4 \text{ digits})$ $\pm(2.0\% + 9 \text{ digits})$ $\pm(3.0\% + 9 \text{ digits})$
Capacitance	500.00nF 5.0000 μ F 50.000 μ F 500.00 μ F 5.0000mF	$\pm(3.5\% + 40 \text{ digits})$ $\pm(3.5\% + 9 \text{ digits})$ $\pm(5.0\% + 9 \text{ digits})$

Function	Range & Resolution	Accuracy
Frequency	50.000Hz	$\pm(0.3\% + 2 \text{ digits})$
	500.00Hz	
	5.0000kHz	
	50.000kHz	
	500.00kHz	
	5.0000MHz	
	10.000MHz	


Sensitivity: 0.8Vrms min. at 20% to 80% Duty Cycle and <100kHz; 5Vrms min at 20% to 80% Duty Cycle and >100kHz.

Duty Cycle	5.0 to 95.0%	$\pm(1.0\% + 2 \text{ digits})$
Pulse width: 100 μ s-100ms; Frequency: 10Hz to 100kHz		

Temp (Type-K)	-100.0 to 1000.0°C	$\pm(1.0\% + 2.0^\circ\text{C})$
	-148.0 to 1832.0°F	$\pm(1.0\% + 3.6^\circ\text{F})$

Probe accuracy not included.

7-2. General Specifications

Clamp Jaw Opening	1.9" (48mm) approx.
Display	50.000 count backlit LCD
Flexible Coil	140x180mm
Continuity Check	Threshold 50 Ω ; Test current <0.5mA
Diode Test	Test current of 0.3mA typical; Open circuit voltage 2.8VDC typical
Low Battery Indication	"  " symbol is displayed
Over Range Indication	"OL" display
Measurement Rate	2 readings per second, nominal
Peak Detector	>1ms
Thermocouple Sensor	Type K thermocouple required
Input Impedance	10M Ω (VDC and VAC)
AC Bandwidth	50 to 400Hz (AAC and VAC)
AC Response	True rms (AAC and VAC)
Crest Factor	3.0 in 40A and 400A ranges, 1.4 in 1000A range (50/60Hz and 5% to 100% of range)
Operating Temperature	5 to 40°C (41 to 104°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)
Operating Humidity	Max 80% up to 31°C (87°F) decreasing linearly to 50% at 40°C (104°F)
Storage Humidity	<80%
Operating Altitude	2000meters (7000ft.) maximum.
Battery	One 9V Battery (NEDA 1604)
Auto Power Off	After approx. 30 minutes
Dimensions	230x76x40mm
Weight	315g
Safety	For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (2001); EN61010-1 (2001) Overvoltage Category III 1000V and Category IV 600V, Pollution Degree 2.
Approvals	CE

