TENMA®

Mini Clamp Meter

Model: 72-2985

CONTENTS

WHAT'S INCLUDED

- One mini clamp meter
- One pair of probe assemblies
- One zip case
- One user manual

Please read these instructions carefully before use and retain for future reference.

IMPORTANT SAFETY INFORMATION

- When using electrical appliances basic safety precautions should always be followed.
- Use the meter only as specified in this manual, or the protection provided may be impaired.
- Do not operate the meter or use test leads if they appear damaged, or if the meter is not operating properly. Check before each use.
- There are no user-serviceable parts in this product. Refer servicing to qualified personnel.
- Do not use the clamp meter in a circuit with voltage higher than 600V or frequency higher than 400Hz.
- Be cautious when working in an environment with exposed conductors. Contact with conductors may result in electric shock.
- Use caution with voltages above 60V DC, 30V AC rms or 42V AC (peak value). These voltages pose a shock hazard.
- Before removing the battery cover, remove the clamp meter from all energized circuits and disconnect the lead.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Fit a full set of batteries at one time.
- Remove dead batteries from the meter or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.

TECHNICAL SPECIFICATION

Max. voltage between input terminal and earthing	600V
Max. overload protection for clamp head terminals	100A
Max. display	2000 counts, update 2-3 times per second
Over range display	Displays “OL”
Diode (approx)	3.2V
Range	Automatic
Polarity	Automatic
Work temperature	0°C ~ 40°C
Relative humidity	0°C ~ 30°C: 75%, 30°C ~ 40°C: 50%
Storage temperature	-10°C ~ 50°C

Electromagnetic compatibility (In 1V/m radio frequency field)	Overall frequency = designated precision + 5%, radio frequency field above 1V/m has no designated index
Working altitude	0~2000m
Built-in batteries	2 x AAA 1.5V
Low battery	LCD displays “ ”
Dimensions (approx.)	175 x 60 x 33.5mm, max. clamp head size is 17mm
Weight (approx.)	170g (including batteries)

PRODUCT OVERVIEW

1. Clamp head

2. Protective barrier

3. Clamp head trigger: press the trigger to open the clamp head.

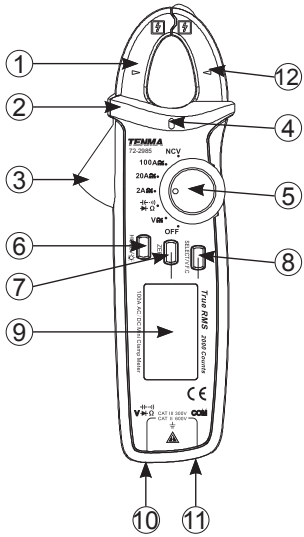
4. NCV Indicator: when the induced AC electric field intensity and induction distance satisfy the designated value, the indicator will flash.

5. Function selection button: rotate to select the functions indicated.

6. HOLD/backlight key: press and hold to turn on or off the display backlight.

7. ZERO key: used for DC current zero, capacitance/ voltage measurement relative value.

8. SELECT key: select function mode, such as ACV/ DCV, resistance/on-off/diode/capacitance, ACA/DCA etc. in AC voltage and current gear. Press and hold for more than 2 seconds to enter or exit VFC function.



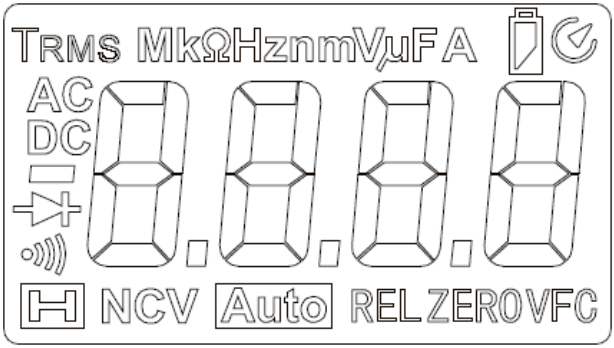
9. LCD screen

10. Positive terminal input jack: when measuring voltage, resistance/on-off/ capacitance/diode, insert the red meter plug into this jack.

11. Input jack at COM terminal: when measuring voltage, resistance/on-off/ capacitance/diode, insert the black meter plug into this jack.

12. Indication mark for geometric centre of clamp head.

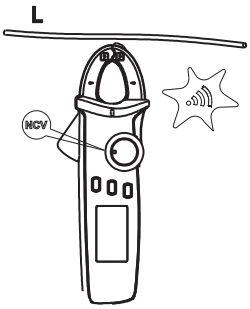
LCD OVERVIEW



Indicator	Meaning
TRMS	True valid value measurement status
AC/DC	AC/DC voltage measurement
▬	Negative reading
▶|–	Diode measurement
•))))	Circuit continuity measurement
H	Data hold
Ω kΩ MΩ	Resistance unit
Hz, kHz, MHz	Frequency unit
mV, V	Voltage unit
mA, A	Current unit
nF, μF, mF	Capacitance unit
(EF) NCV	Non-contact AC voltage induction
Auto	Auto range
ZERO/REL	Zero/relative measurement
VFC	Variable frequency voltage/current measurement
▭	Low battery
◷	Auto power-off

- Open the clamp head, insert the electric wire and close the clamp head.
- Ensure the electric wire is held in the geometric centre, indicated on the clamp head and make sure the clamp heads are closed.
- Read the measurement data from the LCD. When the reading is positive it means the current flows from the positive side to the negative side and vice versa.

NCV NON-CONTACT ELECTRIC FIELD MEASUREMENT



- If you want to measure whether there is AC voltage/ electromagnetic field, place the front end of the clamp head 8~15mm close to the test piece.
- When the amplitude of the inductive AC voltage is approximately ≤ 100V, it displays “EF”.
- If the detected voltage is > 100V, it displays “-” and it has four “----” levels based on voltage with different buzzing at each level with NCV light flashing to proportionate to the field intensity.
- WARNING: When ranges switch to NCV measurement, unplug the test plug to avoid electric shock.

OTHER FUNCTIONS

- Press and hold the **HOLD** button for two seconds to turn on or off the LCD backlight function.
- Automatic power-off: If the rotary button has not been moved for 15 minutes the instrument will automatically switch off to save energy. Turn the rotary button to **OFF**, then select the required range, or press any button.
- To turn off the automatic power-off function, press and hold the **SELECT** key, then turn the instrument on. You will hear five buzzing sounds, which means the automatic power-off function has been cancelled.
- Turn off and restart the meter, and the automatic power-off function will be re-enabled.
- The buzzer will send out five warnings one minute before the automatic power-off. A long buzz will then be heard before turning off. When the automatic power-off function is cancelled, you will hear five continuous warnings every 15 minutes.
- Buzzer: press any button or rotate the function switch. If such function key is valid, the buzzer will beep once. When the circuit under test is conductive (<10Q), the buzzer will sound continuously.
- When measuring voltage or current out of range, the buzzer will beep to indicate this.
  - When AC or DC voltage is >600V, the buzzer will beep.
  - When AC or DC current is >100A, the buzzer will beep.
- Low voltage detection: when the battery voltage is lower than 2.5V, the low battery symbol appears. Measurement accuracy may be lower once this symbol shows, so replace the battery as soon as possible. If it is lower than 2.2V, only the low battery symbol will show after starting up and the instrument will not work.
- When the battery supply voltage lowers to 2.6V, the LCD backlight will be in weak or non-functional state, but the measurement functions will still work.

TECHNICAL INDEX

- Accuracy: ± (a% reading + b count).
- Environment temperature: 23°C ± 5°C (73.4°F ± 9°F), relative humidity: ≤75%.

DC VOLTAGE MEASUREMENT

Range	Resolution	Accuracy
200.0mV	0.1mV	± (0.7% + 5)
2.000V	1mV	± (0.7% + 3)
20.00V	10mV	
200.0V	100mV	
600V	1V	

- Input impedance: approx. 10MΩ.
- As the input impedance on the meter is high, when measuring a source of lower voltage and lower impedance (less than 10MΩ), the measurement may be unstable for a short time, but will stabilize.
- Warning: Maximum input voltage: ±600V

AC VOLTAGE MEASUREMENT

Range	Resolution	Accuracy
2.000V	1mV	± (1.0% + 3)
20.00V	10mV	
200.0V	100mV	± (1.0% + 3) VFC mode: ± (4.0% + 3)
600V	1V	± (1.2% + 3) VFC mode: ± (4.0% + 3)

- Input impedance: approx. 10MΩ.
- Show true virtual value: frequency response: 45~400Hz.
- Accuracy guarantee range: 5-100% range, short circuit allows <10 residue readings.
- Non-sinusoidal wave counts add error by crest factor:
  - When crest factor is 1~2, add 3%.
  - When crest factor is 2~2.5, add 5%.
  - When crest factor is 2.5~3, add 7%.
- Warning: Maximum input voltage: 600Vrms.

RESISTANCE MEASUREMENT

Range	Resolution	Accuracy
200.0Ω	0.1Ω	± (1.0% + 2)
2.000kΩ	1Ω	
20.00kΩ	10Ω	
200.0kΩ	100Ω	
2.000MΩ	1kΩ	± (1.2% + 3)
20.00MΩ	10kΩ	

- Range: measured value = measurement display value - meter pen short circuit value.
- Open circuit voltage is about 1V.
- Overload protection: 600Vrms.

CIRCUIT ON-OFF DIODE MEASUREMENT

Range	Resolution	Remarks
•))	0.1Ω	Resistance value for circuit disconnect: >150Ω, buzzer makes no sound.
▶|	1mV	Open circuit voltage is 3.2V: normal voltage for silicon PN junction is 0.5~0.8V.

- Overload protection: 600V rms

CAPACITANCE MEASUREMENT

Range	Resolution	Accuracy
2nF	1pF	± (4.0% + 10)
20.00nF~200.0μF	10pF~100nF	± (4.0% + 5)
2.000mF~20.00mF	1μF~10μF	± 10%

- Overload protection: 600V rms
- ≤1μF measured capacitance. It is suggested to use ZERO measurement mode to ensure accuracy.

DC CURRENT MEASUREMENT

Range	Resolution	Accuracy
2.000A	1mA	± (2.0% + 8)
20.00A	10mA	± (2.0% + 3)
100.0A	100mA	± (2.0% + 3)

- Overload protection: 100A.
- Due to the presence of external electromagnetic fields, press **ZERO** before measurement to ensure accuracy of measurement.
  Note: If the reading does not zero after the initial press, press it several times until the reading is zero.
- The orientation of the meter during measurement should be the same as when zeroed.

AC CURRENT MEASUREMENT

Range	Resolution	Accuracy
2.000A	1mA	± (3.0% + 10) VFC mode: ± (4.0% + 10)
20.00A	10mA	± (2.5% + 8) VFC mode: ± (4.0% + 10)
100.0A	100mA	± (2.5% + 5) VFC mode: ± (4.0% + 10)

- Overload protection: 100A.
- Accuracy warranty coverage: 5~100% range, 2A open circuit allows <20 residue readings.
- Displays are rms value. Frequency response: 50~60Hz.
- Non-sinusoidal wave counts add error by crest factor:
  - When crest factor is 1~2, add 3%.
  - When crest factor is 2~2.5, add 5%.
  - When crest factor is 2.5~3, add 7%.

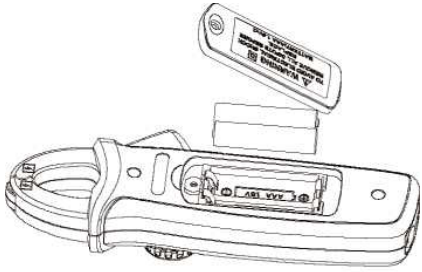
CLEANING & MAINTENANCE

WARNING: Before removing the rear cover of the instrument, make sure that the meter is switched off, the meter plugs have been removed from the input port and the lead disconnected from the circuit under test.

- To clean the instrument, use a clean damp cloth and a mild detergent.
- Do not use any chemicals, abrasives or solvents that could damage the meter.
- If any maintenance is required, refer to qualified personnel.

Replacing the Batteries

- When the LCD displays the low battery symbol, replace the batteries immediately to preserve measurement accuracy.
- Move the rotary switch to the "**OFF**" position and remove the meter plug from the input jack.
- Unscrew the screw on the rear cover of the battery and remove the old batteries.
- Replace both batteries with replacements of the same specification (AAA 1.5V).



INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT.

This symbol indicates that separate collection of Waste Electrical and Electronic Equipment (WEEE) or waste batteries is required. Do not dispose of these items with general household waste. Separate for the treatment, recovery and recycling of the materials used. Waste batteries can be returned to any waste battery recycling point which are provided by most battery retailers. Contact your local authority for details of the battery and WEEE recycling schemes available in your area.