

## Cotent

1. Safety.....
2. Symbols.....
3. Cautions.....
4. Maintenance.....
5. Summary.....
6. Instrument structure.....
7. Operation.....
8. Technic specifications.....
9. Warning.....
10. Accessory.....


## Safety:


HD90A is designed and produced according to the safety standard of electronic test instrument and hand-held current clamp meter: IEC1010-1 and IEC1010-2-03, strictly follow to the standard of double insulation DC 600V CAT or 300V CATIII and pollution degree 2.


## Symbols:

 DC


 AC


 buzzer


 low battery

 warning

 double insulation (CAT II)

 high voltage

 earth

 data holds

**Cautions:**

- Only the leads supplied with the instrument guarantee compliance with the safety standard. They must be in a good condition and they must be replaced with an identical model.
- Check the instrument & leads before use the multimeter. If any unusual condition appears, such as breakage of testing end (metal part), no LCD display and deformation or fracture of the meter's shell, do not conduct any measuring.
- When the meter is on test, don't touch the available input end.
- You must be very careful when measuring voltage over DC 60V & AC 30V. Do not touch the exposed part of the test leads.
- If the voltage value is unknown, select the highest range. Don't attempt to take any voltage measurement that exceeds the limits.
- Don't measure the voltage over allowed input value.
- Keep the test lead and the circuit under test in open -circuit mode.
- Before measuring the resistance on circuit, remove power from the circuit being tested and let the capacitor release all the charge.
- Before the capacitance test, please let the capacitor release all the charge.
- Don't keep the meters exposed in strong light, hot temperature or moisture.
- Don't touch the exposed wire, joints and the circuit under test.

**Maintenance:**

- Make sure the test lead is removed from the measuring circuit before opening the back cover of the instrument.
- For cleaning the instrument, use a wet cloth and a little scour. Never use solvents.
- Please ask the trained technicians or with their help to do calibration or repairs.
- If there is any unusual condition, please stop using at once and send to repair.

**Description:**

HD90A is 3 1/2 digital clamp meter with steady performance、 safety and reliability、 full function. The instrument has a unique and more attractive outline, molding is more beautiful and convenient operation.

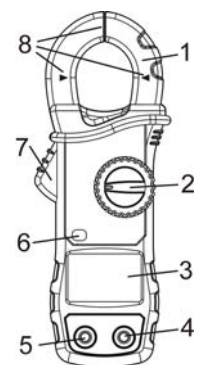
The instrument applies high-performance A/D transformer, all the components are SMD surfaced. And all the range positions have overloading protection function, not easy to damage.

AC current is measured through the clamp jaw with four positions of 2000mA、 20A、 200A、 600A, the rest input through the test lead, and can test AC Voltage、 DC Voltage、 Resistance、 Diode and continuity.

The meter has "HOLD" key to read and record for the users during the measurement.

**Instrument structure**

- 1、 AC Current jaw: pick up AC current
- 2、 Function/Range switch: select function and range
- 3、 Display: 3 1/2 digits, word height: 15mm
- 4、 Voltage、 Resistance、 Diode and Continuity test jack: when having resistance measurement, the red lead (positive pole) inputs into terminal.
- 5、 COM jack: the black lead (negative pole) inputs into terminal except AC Current.
- 6、 Data-hold: press HOLD key, the meter's LCD will hold the last measuring reading and display symbol "H"; press it again, the instrument return to the normal measuring state.
- 7、 Jaw trigger: press down the trigger to open the jaw; release it to close the jaw.
- 8、 Jaw central position mark: make the tested cable through the center of the jaw as much as possible.



## Operation

AC current measurement

1. Set the Function/Range switch to AC Current position.
2. Press down the trigger to open the jaw, and insert the lead into the clamp jaw. Close the jaw then you can get the current value of the lead. You can't measure two or three leads simultaneously.
3. Set the tested object in the center of the jaw to ensure the measurement accuracy.
4. Read the measuring result on the LCD screen.

Remark:

If you don't know the current range of the tested object, please set the Function/Range to 600A position, and then cut down gradually until you get the satisfying resolution.

## DC Voltage measurement

1. Insert the red test into the "V" jack and the black one into the "COM" jack.
2. Set the Function/Range switch to the DC Voltage position and connect the test lead to the power or load to be tested, the polarity of the terminal connected to the red test lead will be displayed on LCD at the same time.
3. Read the measuring result on the LCD screen.

Remark:

1. If the tested voltage range is unknown, set the Function/Range switch to the Max. range then cut down gradually until you get the satisfying resolution.
2. If the LCD only displays "1", it indicates overrange, the Function/Range switch should be set to a higher position.
3. Don't input voltage over 600V, it is possible to display higher voltage but it is dangerous to the inner line of the instrument.
4. Specially pay attention to your safety as measuring high voltage.

## AC Voltage measurement

1. Insert the red test lead into the "V" jack, and the black one into the "COM" jack.
2. Set the Function/Range switch to the AC voltage position and connect the test lead to the power or the load to be tested.
3. Read the measuring result on the LCD screen.

Remark

Consult the remark 1、2、3 and 4 of DC voltage.


## Resistance measurement

1. Insert the red test lead and the black one to the "V" and "COM" jack respectively.
2. Set the Function/Range switch to the related  $\Omega$  position, and connect the test lead to the tested object.
3. Read the measuring result on the LCD screen.

Remark

1. If the tested resistance value is over the max value of the selected range, the symbol "1" will appear on the LCD.
2. When measuring on-circuit resistance, cut off all the power supply first of the tested circuit and let the capacitor release all the storage charge completely.
3. The open circuit voltage of the two test leads is about 2.5V, short circuit current is about 1.6mA.


## 7. Diode measurement

1. Inset the red test lead and the black one into "V"、"COM" jack respectively .("V" is the positive pole of the circuit)
2. Set the Function/Range switch to the position "", connect the test leads to the two ends of the tested diode, it displays the forward inductance voltage, unit is " $\Omega$ ", it displays overloading when the diode connected in reverse.

Remark

1. It displays overloading when the two test leads on open circuit, (1 appears in the screen).
2. The current through the tested device is about 1mA.
3. Max input protection is 250V, it will damage the instrument with higher voltage.
4. The open circuit voltage of the two test leads is about 2.5V, short circuit current is about 1.6mA.

## Circuit continuity test

1. Insert the red test lead into the "V" jack and the black one into the "COM" jack. At this time, the polarity of the red lead is "+" of the inner circuit.
2. Set the Function/Range switch to the  position, connect the test lead to the ends of being tested circuit. If the resistance between the two ends is lower than  $30\Omega$ , the inner buzzer beeps to indicate it is continuity.
3. The open circuit voltage of the two test leads is about 2.5V, short circuit current is about 1.6mA.

**Technic specification:**Accuracy:  $\pm(\% \text{reading} + \text{digit})$  one year guaranteeEnvironment temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Relative humidity:  $< 75\%$ Temperature coefficient:  $0.1 \times \text{accuracy}/1^{\circ}\text{C}$ **General characteristic**

Max voltage between the voltage input end and earth: DC 600V CAT II or 300V CAT III.

Display model: LCD display, max reading "1999".

Measurement principle: double integration A/D transform.


Range select: manual

Measurement speed: 2.5~3 times/sec

Polarity display: it displays "—" as inputting negative polarity.

Overloading display: only 1 appears on the display screen.

Data hold function: "H" is shown on the top of LCD.

Low battery display: it displays "  " on the left of LCD.Power supply:  $2 \times 1.5\text{V}$ Dimensions:  $170 \times 65 \times 27 \text{ mm}$ 

Weight: approx. 140g (without battery)

Max jaw opening: 25mm

Measuring environment temperature:  $5^{\circ}\text{C} - 35^{\circ}\text{C}$ Storage temperature:  $-10^{\circ}\text{C} - 50^{\circ}\text{C}$ **AC Current**

Range	Resolution	Accuracy
2000mA	1mA	$\pm (3.0\%+5)$
20A	10mA	$\pm (2.5\%+5)$
200A	0.1A	$\pm (2.5\%+5)$
600A	1A	$\pm (3.0\%+5)$

Measuring frequency range: 50Hz—60 Hz

Max input current: 120% of full value, time  $< 60$  seconds

It can't guarantee the accuracy if the current is lower than 200mA.

**AC Voltage**

Range	Resolution	Accuracy
600V	1V	$\pm (2.0\%+5)$

Input impedance:  $10\text{M } \Omega$ .

Measuring frequency range: 40Hz—400 Hz.

Max input voltage: AC 600V virtual value.

**DC Voltage**

Range	Resolution	Accuracy
600V	1V	$\pm (1.2\%+2)$

Input impedance:  $10\text{M } \Omega$ .

Max input voltage: DC 600V.

**Resistance**



Range	Resolution	Accuracy
$2000 \Omega$	1	$\pm (2\%+5)$

Overload protection: 250V DC or AC virtual value.

Test voltage is about 2.8V.

The open circuit voltage of the two test leads is about 2.5V, short circuit current is about 1.6mA.

## Diode and continuity test

Range	Remark	Test condition
	indicate forward voltage drop of diode	forward current is approx 1mA Reverse circuit voltage is approx 2.5V
	the buzzer will beep when conductance resistance approx <math>30\Omega</math>	Open circuit voltage is approx 2.5V short circuit current is about 1.6mA



### Warning

Before opening the back cover, make sure the test lead doesn't connect to the circuit, and examine if the back cover is fastened as you use the instrument. If there is the symbol " " on the display screen, it indicates that the battery needs to be replaced and do as the following:

1. Disconnect the test lead and the tested circuit. Rotate the Function/Range to the position "OFF" and pull the test lead out of the input jack.
2. Use the screwdriver to screw the screw on the battery cover and open the cover.
3. Take out the old battery and replace it with the new one.
4. Close the battery cover and fasten the screw.

### Accessories

《User's manual》	one piece
Test lead	one piece
Power supply: $2 \times 1.5V$	two pieces
Warranty card	one piece