

# Aneng M118A Multimeter manual

## Automatic Scanning Digital Multimeter

### User' Manual

### Overview

This series multimeter is a pocket 3 5/6 bit true effective value automatic scanning digital meter. Depending on the input voltage/current/resistance/equal signal, the instrument is capable of automatic identification measurement. The series of instruments have the characteristics of stable performance, high precision and clear reading. With the extra convenience of flash-light and non-contact voltage test, it is an ideal instrument for factory, teaching and electronics enthusiasts



### Security matters

Design of the series of meters in accordance with the IEC1010 provisions {safety standards issued by the International Electrotechnical Commission}, please read the safety precautions carefully before using the meter, the use of strict compliance with safety regulations, so as not to cause injury or instrument damage

1. When measuring the voltage, do not exceed the voltage limit: DC 600V or AC 600V;
2. The voltages below 36V are safe voltages, when measuring the voltage above 36V, please be sure to pay attention to safety precautions. Exceeding 36V of voltage may cause injury.
3. When changing function and range, the test leads should be removed from the circuit.
4. Select the correct function and range, beware of incorrect operation, although the series of instruments with full range protection function, but for the sake of safety, please pay more attention to safety;
5. Safety symbol states

|                                                                                     |                                      |
|-------------------------------------------------------------------------------------|--------------------------------------|
|  | "hazardous voltage exists"           |
|  | "ground"                             |
|  | "low voltage symbol"                 |
|  | "double insulation"                  |
|  | "operator must refer to instruction" |

## Characteristics

### 1. General characteristics

- 1-1. Display mode: LCD;
- 1-2. Maximum display: 5999(3 5/6 bit automatic display);
- 1-3. How to measure: conversion A/D double integral fraction;
- 1-4, Sampling rate: about 3 times per second;
- 1-5. Excess range display, display "OL"
- 1-4. Low voltage display: symbol appears. 
- 1-7, Working environment (0-40) °C, relative humidity <80%;
- 1-8. Electricity: 2 x batteries AAA (1.5V).
- 1-9. Volume size: 118\*68\*30mm
- 1-10, Weight: 100g without battery

### 2 Technical characteristics

Accuracy: + (reading a%+ minimum effective digit), guaranteed accuracy environment temperature (23+/-5°C), relative humidity <75%, calibration guarantee date one year.

2-2, performance (✓ means the table has this function)

#### Function

|                          |   |
|--------------------------|---|
| DC voltage               | ✓ |
| AC voltage               | ✓ |
| DC current               | ✓ |
| AC current               | ✓ |
| Resistance/Diode,        | ✓ |
| on-off test              | ✓ |
| Capacitance testing      | ✓ |
| Capacitance              | ✓ |
| NCV                      | ✓ |
| Zero line/fire line test | ✓ |
| Full unit symbol         | ✓ |
| Backlight                | ✓ |
| manual/automatic         | ✓ |
| shutdown                 | ✓ |
| AC Validity              | ✓ |
| Measurement:             | ✓ |
| Flash-light lighting     | ✓ |

### 3-1. DC/AC voltage measurement (DCV/ACV)

| Range DC/AC | Accuracy      | Resolution |
|-------------|---------------|------------|
| 6V          | +/- (0.5% +3) | 0.001 V    |
| 60V         |               | 0.01 V     |
| 600V        |               | 0.1 V      |

Input impedance: 10 M $\Omega$ ; Overload protection: 600 V DC or 600 V AC peak

### 3-2. Resistance Measurement ( $\Omega$ )

| Range                   | Accuracy      | Resolution                                                 |
|-------------------------|---------------|------------------------------------------------------------|
| 600                     | +/- (0.8% +5) | 0.1 $\Omega$                                               |
| 6k<br>60k<br>600k<br>6M | +/- (0.8% +3) | 1 $\Omega$<br>10 $\Omega$<br>100 $\Omega$<br>100k $\Omega$ |
| 60M                     | +/- (2.5% +3) | 10k $\Omega$                                               |

Input impedance: 10 M $\Omega$ ; Overload protection: 600 V DC or 600 V AC peak

### 3-3. Diode/on-off test

| Range | Display Value                                                               | Test Conditions                                                      |
|-------|-----------------------------------------------------------------------------|----------------------------------------------------------------------|
| ....  | Diode forward pressure drop                                                 | Forward DC current<br>Approx. 1mA open circuit<br>voltage V approx 3 |
| ....  | Buzzer sounds long & the two-point resistance is<br>< (50 +/- 20 $\Omega$ ) | Approx. 0.4V open circuit<br>voltage                                 |

Input impedance: 10 M $\Omega$ ; Overload protection: 600 V DC or 600 V AC peak

### 3-4. Measurement of Capacitance (C) (JS330 models only)

| Range | Accuracy       | Resolution |
|-------|----------------|------------|
| 10nF  | +/- (3.5% +20) | 100pF      |
| 100nF |                | 100pF      |
| 1uF   |                | 1nF        |
| 10uF  |                | 10nF       |
| 100uF |                | 100nF      |
| 1mF   |                | 1uF        |
| 10mF  |                | 10uF       |
| 60mF  | +/- (5% +3)    | 100uF      |

Overload protection: 600 V DC of 600 V AC peak.

### 3-5. AC/DC current (DC/AC A)

| Range | Accuracy     | Resolution |
|-------|--------------|------------|
| 6A    | +/- (2% +30) | 0.001A     |
| 10A   |              | 0.01A      |

Maximum measured pressure drop: 600 mV; Overload protection 10A

### Operation Key Description



1. Flash-light trigger button;
2. NCV measurement key, long press NCV key can measure electric field induction signal;
3. H/BL, long press 2 Seconds to light LCD screen backlight, after approx. 15 seconds the backlight automatically turns off;
4. Power button, long press 2 seconds to turn on/off the power supply, boot state this key for the function selection button, each light press switch once measurement function;

## Operational guidance

### 5.1 DC/AC voltage automatic scan test (DCV/ACV)

1. Press the power key for more than 2 seconds to turn on the meter. The boot is shown as automatic scan AUTO".
2. Insert black lead into "COM" jack, red lead into "V/ $\Omega$ " jack, test leads on a reliable contact test point.
3. When the voltage between the input port "COM" and "V/ $\Omega$ " is greater than 0.5V, the meter will compare according to the size of the DC component and AC component, take its larger component signal, and then automatically switch the range according to the size of the measured value, and then display the measured value on the LCD.
4. If it can not measure in the environment of greater interference, trigger the power key to manually select DC or AC voltage measurement mode for measurement,

Note:

1. **The input voltage must not exceed the DC 600V or AC 600V, if there is a risk of damage to the instrument circuit; when Measuring more than 36V voltage should pay special attention to safety to avoid the danger caused by electric shock:**
2. After completing all measurement operations, disconnect the meter leads from the circuit under test.

### 5-2. Resistance measurement

1. Press the power key for more than 2 seconds to turn on the meter, boot auto scan status "AUTO".
2. Insert black lead into "COM" jack, red lead into "V/ $\Omega$ " jack, test leads on reliable contact test point.
3. If the measuring resistance at both ends of the meter leads is less than 50 $\Omega$ , the buzzer will make a continuous noise and requires a fast buzzer measurement, press the power key to manually select the buzzer fast measurement function.
4. If the resistance of the closed loop is measured, the two ends of the measured resistance must be shorted to discharge, otherwise if the voltage in the loop is greater than 0.6V, the instrument will be mistaken for the voltage measurement and enter the voltage measurement mode.
5. The resistance between the red and black leads is greater than 50 $\Omega$ , the meter will automatically switch the range according to the actual resistance measurement value, and then the measured value will be displayed in the LCD.

Note:

1. When measuring low resistance, in order to obtain an accurate reading, you can first record the meter lead short circuit value, subtract the meter in the measurement reading

The value of the lead in short circuit;

2. When measuring the on-line resistance, the power supply of the circuit must be turned off and all the capacitors discharged to ensure the accuracy of the measured value.

#### 5-3. Diode measurements

1. Press the power key for more than 2 seconds to turn on the meter, boot display as automatic scan state "AUTO", press power key to manually select diode measurement function.

2, Insert black lead into "COM" jack, red lead into "V/ $\Omega$ " jack, test lead on reliable contact test point.

3, meter will show the positive pressure drop of the measured diode on the LCD. If the polarity of the two ends of the diode in contact with the lead is reversed or the diode is open, the LCD of the meter will show "**OL**".

#### 5-4. Capacitance measurements

1. Press the power key for more than 2 seconds to turn on the meter, boot display as automatic scan state "AUTO", press power key manually switch to capacitance measurement function

2. Insert the black lead into "COM" jack, insert the red lead "V/ $\Omega$ " jack, test lead on reliable contact test point.

3. Meter will automatically switch the range according to the capacitance value between the test leads, and the specific value of the measured capacitance will be displayed on the LCD, The measuring range of the capacitance is 10nF/100nF/1uF/10uF/100uF/1mF/10mF/60mF..

Note:

1. Please allow the measured capacitance to discharge fully before measuring the capacitance, otherwise it will enter the voltage measurement mode.

2. When measuring capacitance with 10nF, the LCD display value may have residual reading, the distributed capacitance of this digital meter leads, the bit accurate reading can subtract this value after measurement.

3. The LCD will show some values and instability when measuring serious leakage or breakdown capacitance at large capacitance files; the reading will take a few seconds to stabilize, when measuring large capacitance.

4. Unit 1      F=1000mF      1mFF=1000uF      uF=1000nF      nf=1000pF

#### 5-5. Current Test Function (DC/AC A)

1. Press the power key for more than 2 seconds to turn on the meter, boot display as automatic scan state "AUTO", press power key manually switch to capacitance measurement function

2. Insert the black lead into "COM" jack, insert the red lead into "10A" jack, test leads on reliable contact test point.

3. Connecting a current greater than 20mA between the input port "COM" and "10A", the meter will display the current value with large de-component on the LCD according to the magnitude of the AC / DC component.

Note:

1. Before the instrument is connected in series to the circuit to be tested, the power in the circuit should be turned off;

2. Maximum input current is 10A (depending on the red lead insertion position), too much current will burn out the internal fuse, be careful, ensure measurement time is not more than 10 seconds, too much current or too long measurement time may heating the circuit, or even damage the instrument;

3, Do not connect the meter lead test pin parallel to any circuit when the red lead is inserted in the "10A" port, this will damage the fuse and meter.

4. After all the measurement operations are completed, the power supply should be turned off first and then the connection between the meter leads and the measured circuit should be disconnected,

5. No more than 36V DC or 25V AC voltage is connected between the 10A and "COM" ports.

#### 5-5. NCV measurements

1. Press the power key for more (than 2 seconds to turn on the meter. Press 'NCV' key to enter EF measurement, keep pressing the key,

2. Instrument has the NCV test induction end, the induction end is close to the AC voltage side, according to the signal intensity, the buzzer will make a continuous sound of different frequencies, at the same time, the LCD will still display different segments according to the signal strength.

## **Automatic Switching Machine**

The instrument has the function of automatic shutdown, when the instrument is idle for 15 minutes, the instrument will automatically power off; to restart, hold down the power for more than 2 seconds to wake up the instrument into the automatic scanning measurement state, the LCD shows "AUTO".

If you want to cancel the automatic shutdown function, press "HOLD" key & power key simultaneously to wake up the instrument from the dormant state. At this stage the automatic shutdown function will be cancelled.