

CONTENTS

1. Safety Information.....	1
1.1 Preliminary.....	1
1.2 Usage	1
1.3 Symbols.....	3
1.4 Maintenance.....	3
2. Description.....	4
2.1 Part Name.....	5
2.2 Switch, Button and Input Jack Description.....	7
2.3 LCD Display.....	7
3. Specifications.....	9
3.1 General	9
3.2 Technical Indicators.....	10
4. Operating Guidance.....	13
4.1 Reading Hold.....	13
4.2 Relative Measurement.....	13
4.3 Manual Measuring Range Choice.....	14
4.4 Function Switch.....	14

CONTENTS

4.5 Back light and Clamp Head light.....	14
4.6 Automatic Power-Off.....	15
4.7 Measurement Preparation.....	16
4.8 Current Measurement	16
4.9 AC voltage Measurement.....	17
4.10 DC Voltage Measurement.....	18
4.11 Measure Frequency.....	19
4.12 Resistance Test.....	19
4.13 Diode Test.....	20
4.14 Circuit Continuity Test.....	20
4.15 Capacitance Measurement.....	21
4.16 Temperature Measurement.....	21
5. Maintenance.....	22
5.1 Replace Battery.....	22
5.2 Replace Probe.....	22
6. Accessories.....	22

1. Safety Information

Warning

Please particularly note that inappropriate use may cause shock or damage to the meter. In use, users should comply with common safety procedures and completely follow the safety measures stated in the operation manual. In order to make full use of the meter's functions and ensure safe operation, please carefully read and follow the procedures in the operation manual.

The meter meets GB/T 13978-92 digital multimeter general technology conditions, GB4793.1-1995 (IEC-61010-1, IEC-61010-2-032) electronic measurement instrument safety requirements with secondary pollution and over-voltage standard CATII 1000V.

Please follow the safety operation guidelines to ensure the safe use

The meter will provide satisfactory service to you if you use and protect it appropriately.

1.1 Preparation

- 1.1.1 When using the meter, the user should comply with standard safety rules:
 - General shock protection
 - Prevent misusing the meter
- 1.1.2 After receiving the meter, please check for damage that may have occurred during the transport.
- 1.1.3 If the meter has been stored and shipped under hard conditions, please check and confirm whether or not the meter is damaged.


- 1.1.4 Probe should be in good condition. Before use, please check whether the probe insulation is damaged, and whether metal wire is bare.
- 1.1.5 Use the probe table provided with the meter to ensure safety. If necessary, be replaced with another identical probe or one with the same specification.

1.2 Usage

- 1.2.1 When using, select the right function and measuring range.
- 1.2.2 Don't exceeding indicated values in each measuring range.
- 1.2.3 When measuring circuits with the meter connected, do not touch the probe tip (metal part).
- 1.2.4 When measuring, if the voltage to be measured is more than 60 V DC or 30 V AC (RMS), always keep your fingers behind the finger protection device.
- 1.2.5 Do not measure between measuring end and ground that is more than 600 V.
- 1.2.6 For manual measuring range, when the value to be measured is unknown in advance, choose the highest measuring range first and then lower ranges in sequence until the correct range is found.
- 1.2.7 Before rotating selector switch to change measuring function, remove the probe from the circuit to be measured.
- 1.2.8 Don't measure resistors, capacitors, diodes and circuits connectws to power.
- 1.2.9 During the test of current, resistors, capacitors, diodes and circuit connections, be careful to avoid connecting the meter with the voltage source.
- 1.2.10 Do not measure capacitance before capacitor is discharged completely.

- 1.2.11 Do not use the meter in explosive gas, vapor or dusty environment.
- 1.2.12 If you find any abnormal phenomena or failure on the meter, stop using it immediately.
- 1.2.13 The meter should not be used unless the bottom case and the battery cover are completely fastened in their original places.
- 1.2.14 Don't store or use the meter in direct sunlight, high temperature or high humidity.

1.3 Symbols

 Note (Important safety information. Refer to the operation manual)

 Dangerous electric conductor.

 Double insulation protection (class II)


CAT III According to pulse voltage tolerance protection level provided by IEC 61010-1 standard overvoltage (installation) level III and pollution degree 2.

 The meter complies with EU standard

 Grounding

1.4 Maintenance

- 1.4.1 Don't try to open the meter bottom case to adjust or repair. Such operations can only be performed by technicians who fully understand the meter and electrical shock hazard.
- 1.4.2 Before opening the meter bottom case or battery cover, remove probe from the circuit to be measured.

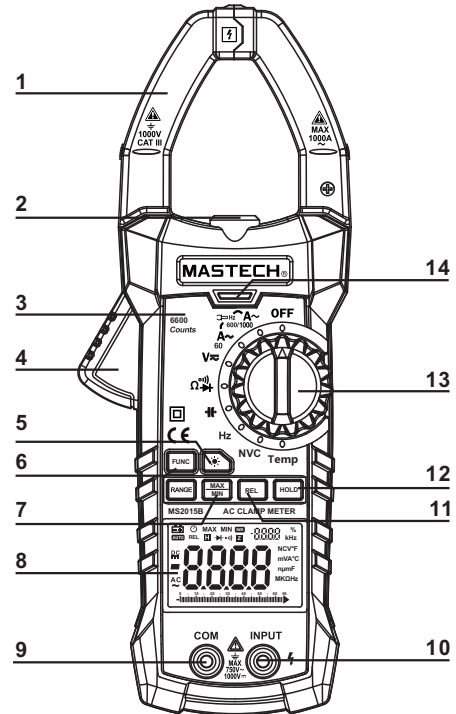
- 1.4.3 To avoid wrong readings causing electric shock, when "" appears on the meter display, replace the battery immediately.
- 1.4.4 Clean the meter with damp cloth and mild detergent. Do not use abrasives or solvents.
- 1.4.5 Power off the meter when the meter is not used. Switch the measuring range to OFF position.
- 1.4.6 If the meter is not used for long time, remove the battery to prevent the meter being damaged.

2. Description

- The meter is a portable, professional measuring instrument with LCD display and back light for easy reading by users. Measuring range switch is operated by single hand for easy operation with overload protection and low battery indicator. It is an ideal multifunction meter for professionals, factories, schools, fans and family use.
- The meter is used to measure AC current, AC voltage, DC voltage, frequency, duty ratio, resistance, capacitance measurement, temperature, NCV and circuit connection, and to make diode tests.
- The meter has an auto measuring range function.
- The meter has a test data dual display function.
- The meter has a reading hold function.
- The meter has a relative test function.
- The meter has max. and min. display function.
- The meter has a manual measuring range selection function.
- The meter has a back light function.
- The meter has a auto power-off function.

2.1 Part Name

- (1) Current clamp head
- (2) Clamp head light
- (3) Panel
- (4) Trigger
- (5) Backlight key
- (6) Function choice button (FUNC)
- (7) Maximum/minimum choice button
- (8) LCD display
- (9) Common end jack
- (10) Input jack
- (11) Relative measurement button (REL)
- (12) Reading hold (HOLD)
- (13) Transfer switch
- (14) NCV indicator



2.2 Switch, Button And Input Jack Description

FUNC button: used for measuring function switch.

☼ button: used for backlight control.

RANGE button: used for switching between automatic measuring range and manual measuring range.

MAX/MIN button: used for maximum/minimum display function.

REL button: used for switch to enter relative measurement state.

HOLD button: used for reading hold.

OFF position: used for shutting off the power.

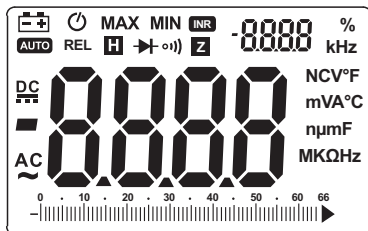
INPUT jack: voltage, resistance, frequency, temperature, capacitance, diode, circuit connection input wire connecting terminal.

COM jack: voltage, resistance, frequency, temperature, capacitance, diode, circuit connection common wire connecting terminal.

Transfer switch: used for selecting function and measuring range.

Clamp head: used for current measurement.

2.3 LCD Display




AC	Alternating Current
DC	Direct Current
▶ 	Diode
o)	Buzzer continuity
AUTO	Automatic measuring range mode
MAX	Maximum measurement state
MIN	Minimum measurement state
REL	Relative measurement mode
⏻	Automatic power-off state
⊖	Low Battery
H	Reading hold state
%	Percentage (duty ratio)
mV,V	Millivolt, Volt (voltage)
A	Amperes (Current)
nF,μF,	Nano farad, Microfarad, Millifarad
Ω,kΩ,MΩ	Ohm, Kilohm, Megohm (resistance)
Hz,kHz,MHz	Hertz, Kilohertz, Megahertz (frequency)

3. Specifications

The meter should be recalibrated under the condition of 18°C~28°C, relative humidity less than 75% .

3.1 General

- 3.1.1 Auto measuring range.
- 3.1.2 Full measuring range overload protection
- 3.1.3 The maximum allowable voltage between measurement end and ground: 1000V DC or 750 AC (no RMS)
- 3.1.4 Operational height: maximum 2000 m
- 3.1.5 Display: LCD
- 3.1.6 Displayed maximum value: digit 6600.
- 3.1.7 Polarity indication: automatic indication, '-' means negative polarity.
- 3.1.8 Exceeding measuring range display: '0L' or '-0L'
- 3.1.9 Sampling rate: about 3 times/sec., simulation bar: 30 times/sec.
- 3.1.10 Unit display: has function and power unit display.
- 3.1.11 Auto off time: 15 mins
- 3.1.12 Operating power supply: 9V battery.
- 3.1.13 Battery undervoltage indication: LCD displays symbol  .
- 3.1.14 Temperature coefficient: less than 0.1×accuracy/°C
- 3.1.15 Operational temperature: 18°C ~28°C
- 3.1.16 Storage temperature: -10°C ~ 50°C
- 3.1.17 Dimension: 225×86×33mm
- 3.1.18 Weight: about 320g (include battery)

3.2 Technical Indicators

Environment temperature: 23±5°C, relative humidity (RH):<75%

3.2.2 AC Current

Measuring	Resolution	Accuracy
66A	0.01A	±(2.5% of reading+6 digits)
660A	0.1A	
1000A	1A	

- Maximum input current: 1000AAC
- Frequency range: 40 ~ 100Hz

Temperature

Frequency range: -20°C ~ 1000°C

Measuring range	Resolution	Accuracy
1000°C	1°C	±(2% of reading+2 digits)

3.2.3 DC voltage

Measuring range	Resolution	Accuracy
660.0mV	0.1mV	±(0.8% of reading+2 digits)
6.600V	0.001V	
66.00V	0.01V	±(0.7% of reading+2 digits)
660.0V	0.1V	
1000V	1V	±(0.8% of reading+2 digits)

- Input impedance: 10MΩ
- Maximum input voltage: 1000V DC

Note:

In the small voltage measuring range, when the probe is not connected with the circuit to be tested, and the meter may have fluctuating readings, which is normal and caused by the meter's high sensitivity. When the meter is connected with the circuit to be tested, you will get actual measured value.

3.2.4 AC Voltage

Measuring range	Resolution	Accuracy
6.600V	0.001V	±(0.8% of reading + 3 digits)
66.00V	0.01V	
660.0V	0.1V	
750V	1V	±(1.0% of reading + 4 digits)

- Input impedance: 10MΩ
- Maximum input voltage: 750V AC
- Frequency range: 40 ~ 400Hz

Note:

In the small voltage measuring range, when the probe is not connected with the circuit to be tested, and the meter may have fluctuating readings, which is normal and caused by the meter's high sensitivity. When the meter is connected with the circuit to be tested, you will get actual measured value.

3.2.5 Frequency


Measuring range	Resolution	Accuracy
66.00Hz	0.001Hz	±(0.5% of reading + 2 digits)
660.0Hz	0.01Hz	
6.600kHz	0.001kHz	
66.00kHz	0.01kHz	
660.0kHz	0.1kHz	
6.600MHz	0.001MHz	
66.00MHz	0.01MHz	

3.2.6 Resistance

Measuring range	Resolution	Accuracy
660.0Ω	0.1Ω	±(0.8% of reading + 3 digits)
6.600kΩ	0.001kΩ	
66.00kΩ	0.01kΩ	
660.0kΩ	0.1kΩ	
6.600MΩ	0.001MΩ	±(1.2% of reading + 3 digits)
66.00MΩ	0.1MΩ	

- Open circuit voltage: about 0.4V
- Overload protection: 250V DC or AC (RMS)

3.2.7 Diode test

Measuring range	Resolution	Function
	0.001V	Display approximate diode forward voltage value

- Forward DC current is about 1mA
- Backward DC voltage is about 3.3V
- Overload protection: 250V DC or AC (RMS)

3.2.8 Circuit Continuity Test

Measuring range	Resolution	Accuracy
0.1)	0.1Ω	If the resistance of circuit to be measured is less than 30Ω, the meter's built-in buzzer may sound.

- Overload protection: 250V DC or AC (RMS)

3.2.9 Capacitance

Measuring range	Resolution	Accuracy
6.600nF	0.001nF	±(4.0% of reading + 5 digits)
66.00nF	0.01nF	
660.0nF	0.1nF	
6.600μF	0.001μF	
66.00μF	0.01μF	
660.0μF	0.1μF	
6.600mF	0.001mF	
66.00mF	0.01mF	

- Overload protection: 250V DC or AC (RMS)

4. Operating Guidance

4.1 Reading Hold

- 4.1.1 In the process of measurement, if reading hold is required, press "HOLD" key, the value on the display will be locked.
- 4.1.2 Press the "HOLD" key again to cancel reading hold.

4.2 Relative measurement

- 4.2.1 Relative measurement only can be used to measure current, voltage, resistance, capacitance and temperature.
- 4.2.2 Press the "REL" key to enter relative measurement mode. The automatic measuring range will be disabled. Press "REL" key again to restore automatic measuring range.

Note: When measuring, to use relative measurement, input corresponding measuring range first through the probe.

4.3 Manual measuring range choice

Use RANGE key to select automatic or manual measuring range. The preset selection is automatic measuring range.





Press to switch to manual measuring range. In the manual measuring range mode, click once to change to a higher grade, and click again to change to the top grade. Continue to press this key to change to the bottom grade. If this key is pressed more than 2 seconds, the meter will switch back to the automatic measuring range.

4.4 Function switch

- 4.4.1 In the DC current measurement state, press the "FUNC" key, and the meter will enter AC current measurement state. Presses "FUNC" key again, and the meter will enter DC current measurement state again.
- 4.4.2 In the resistance grade, press the "FUNC" button to switch among resistance, diode and continuity detection.

4.5 Back light and clamp head light



- 4.5.1 In the process of measurement, if ambient light is too dark to read, press “☼” key to turn on the backlight. The backlight will automatically turn off after about 30 seconds.
- 4.5.2 During this period, pressing “☼” key will turn off backlight.
- 4.5.3 In the current grade, the meter will turn on backlight and clamp head light. Backlight is LED with high working current. If backlight is used often, it will shorten battery life, so use backlight only when necessary.

Note: When battery voltage $\leq 7V$, LCD displays “” (low voltage) symbol. But when using the backlight, the battery voltage will drop due to the high working current and the “” symbol may display. (When the “” symbol shows, accuracy of measurement is not guaranteed). At this time, don't replace the battery. Continue to use the meter normally without using the backlight, and replace the battery only when the “” symbol shows under normal use.

4.6 Automatic power-off

- 4.6.1 If there is no operation during any 15 minute period after turning the machine on, the meter will enter a suspended state and automatically power off to save the battery. Within 1 minute before shutdown, the buzzer will sound 3 times. Immediately before shutting down, the buzzer will make a long sound.
- 4.6.2 After automatic power-off, press the “**FUNC**” key to restore the meter to normal function.
- 4.6.3 Holding any other key except “**FUNC**” key and “**HOLD**” more than 2 seconds when powering on will cancel the automatic power-off function.


4.7 Measurement preparation

- 4.7.1 Turn the transfer switch to turn on the power. When battery voltage is low (about $\leq 7V$), LCD displays “” symbol. Replace the battery immediately.
- 4.7.2 “” symbol means that input voltage or current should not be more than the indicated value. This is to protect the internal line from damage.
- 4.7.3 Place transfer switch to the required measuring function and range.
- 4.7.4 When connecting line, please connect the common test line first, then connect charged test line. When removing line, remove charged test line first.

4.8 Current Measurement

Warning

**Electric shock hazard.
Remove the probe from the meter before
measuring with current clamp.**

- 4.8.1 Place measuring switch in position A~. At this time, the meter is in the AC current measurement state.
- 4.8.2 Hold the trigger, open clamp head, and clip one lead of measurement circuit to be tested in the clamp.
- 4.8.3 LCD will show readings.
Note:
 - 1) Clamping two or more leads of circuit to be tested simultaneously will give invalid readings.
 - 2) To get accurate readings, place the lead to be tested at the center of current clamp.
 - 3) “” indicates that maximum input AC current is 1000A and DC current 1000A.

4.9 AC voltage measurement

Warning

**Electric shock hazard.
Pay special attention to avoid shock when
measuring high voltage.
Don't input voltage more than AC600V RMS.**

- 4.9.1 Insert black probe to the **COM** jack and insert red probe to the **INPUT** jack.
- 4.9.2 Place transfer switch to AC voltage **V_~** position. Press the "**FUNC**" key to select AC voltage measurement state.
- 4.9.3 Connect the probe with voltage source or both ends of load in parallel for measurement.
- 4.9.4 LCD will show readings..

Note:

- 1) In the small voltage measuring range, the probe is not connected with the circuit to be tested, and the meter may have fluctuating readings, which is normal and caused by the meter's high sensitivity. When the meter is connected with the circuit to be tested, you will get actual measured value.
- 2) In the relative measurement mode, the automatic measuring range is disabled.
- 3) "**△**" means that maximum input voltage is 750V AC.

4.10 DC voltage measurement

Warning

**Electric shock hazard.
Pay special attention to avoid shock when
measuring high voltage.
Don't input voltage more than DC1000V RMS.**

- 4.10.1 Insert black probe to the COM jack and insert red probe to the INPUT jack.
- 4.10.2 Place transfer switch to AC voltage **V_~** position. Press the "**FUNC**" key to select AC voltage measurement state.
- 4.10.3 Connect the probe with voltage source or both ends of load in parallel for measurement.
- 4.10.4 LCD will show readings. Polarity indication shows the load connected with the red probe.

Note:

- 1) In the small voltage measuring range, the probe is not connected with the circuit to be tested, and the meter may have fluctuating readings, which is normal and caused by the meter's high sensitivity. When the meter is connected with the circuit to be tested, you will get actual measured value.
- 2) In the manual measuring range mode, the LCD only shows "OL" or "-OL", which indicates overrange. Choose a higher measuring range.
- 3) "**△**" means that maximum input voltage is 1000V DC.

4.11 Measure frequency



Electric shock hazard.

Pay special attention to avoid shock when measuring high voltage. Don't input voltage more than AC 250V RMS.

- 4.11.3.1 Insert black probe to the **COM** jack and insert red probe to the **INPUT** jack.
- 4.11.3.2 Place transfer switch in position "**HZ**".
- 4.11.3.3 Connect the probe with signal or both ends of load in parallel for measurement.
- 4.11.3.4 LCD will show readings..

4.12 Resistance test



Electric shock hazard.

When measuring circuit impedance, determine that the power supply is disconnected and the capacitor in the circuit is completely discharged.

- 4.12.1 Insert black probe to the **COM** jack and insert red probe to the **INPUT** jack.
- 4.12.2 Place measuring range switch in $\Omega \rightarrow$ position. The meter is in the measurement state.
- 4.12.3 Connect the probe to the both ends of resistor or circuit to be tested for measurement.
- 4.12.4 LCD will show readings.

Note:

- 1) When the input end is open, LCD shows "0L" out-of-range condition.
- 2) When the resistance to be tested > 1M Ω , the meter reading will stabilize after a few seconds, which is normal for high resistance readings

4.13 Diode Test

- 4.13.1 Insert black probe to the **COM** jack and insert red probe to the **INPUT** jack.
- 4.13.2 Place measuring switch in position $\Omega \rightarrow$.
- 4.13.3 Press the "**FUNC**" key to switch to \rightarrow measuring state.
- 4.13.4 Connect the red probe to diode anode and connect the black probe to diode cathode to make test.
- 4.13.5 LCD will show readings.

Note:

- 1) What the meter shows is an approximation of diode forward voltage drop.
- 2) If the probe has reverse connection or the probe is open, the LCD will show "0L"

4.14 Circuit continuity test



Electric shock hazard.

When measuring circuit continuity, determine that the power supply is disconnected and the capacitor in the circuit is completely discharged.

- 4.14.1 Insert black probe to the **COM** jack, insert red probe to the **INPUT** jack.
- 4.14.2 Place measuring switch in position $\Omega \rightarrow$.
- 4.14.3 Press the "**FUNC**" key to switch to \rightarrow circuit continuity measuring state.
- 4.14.4 Connect the probe to the both ends of circuit to be tested for measurement.
- 4.14.5 If the resistance of circuit to be measured is less than 40 Ω , the meter's built-in buzzer may sound.
- 4.14.6 LCD will show readings.

Note:

If the probe is open or circuits resistance to be tested is more than 400Ω , the display will show “OL”.

4.15 Capacitance measurement



Electric shock hazard.

To avoid electric shock, before measuring capacitance, discharge capacitance completely.

- 4.15.1 Insert black probe to the **COM** jack, insert red probe to the **INPUT** jack.
- 4.15.2 Place measuring switch in position **⚡**.
- 4.15.3 After discharging capacitor completely, connect the probe to the ends of capacitor to be tested.
- 4.15.5 LCD will show readings.

Note:

- 1) When measuring bulk capacitor, stable readings will take some time.

4.16 Temperature Measurement


- 4.16.1 Insert the temperature probe into the **COM**, **INPUT** jack.
- 4.16.2 Place measuring switch in position **Temp**.
- 4.16.3 LCD will show readings.

5. Maintenance

5.1 Replace battery



Before opening the meter battery cover, the probe should be removed from the circuit to be measured to avoid electric shock.

- 5.1.1 When the battery indicator “” appears, replace the battery immediately.
- 5.1.2 Unscrew the fastening screw of the meter battery cover and remove it.
- 5.1.3 Replace the battery.

Note: Do not reverse the battery polarity.

5.2 Replace probe



When replacing the probe, be replaced with another identical probe or one with the same level. The probe should be in good condition, probe level: 1000V, 10A.

If the probe is damaged, such as bare metal wire, replace the probe.

6. Accessories

- | | | | |
|----|-------------|------------------|----------|
| 1) | Probe | Level: 1000V 10A | One pair |
| 2) | User Manual | | 1 pc |
| 3) | Battery | 9V | 1 pc |

