

CM-2018 Digital AC/DC Clamp Meter Manual

This product is a precision instrument, be sure to read this "Instruction Manual" carefully before use, so as not to cause damage and injury to you due to misuse.

1. Summary

The meter is a stable performance, high reliability 3 5/6 digital AC/DC clamp meter, the meter adopts 14mm word height LCD display, clear readings. It can be used to measure DC voltage, AC voltage, DC current, AC current, variable frequency voltage and current, LoZ (low impedance input) false voltage test, resistance, capacitance, frequency, temperature, diode, continuity test and non-contact AC voltage detection. It is designed with clamp jaw lightning function, backlight display, unit symbol display, data hold, automatic/manual range conversion, automatic power off and alarm function. The whole machine adopts a microprocessor capable of directly driving LCD and double-integral A/D conversion IC, a digital display driver providing high resolution and high accuracy. The meter is fully functional, highly accurate in measurement and easy to use, and is an ideal tool for laboratories, factories, radio enthusiasts and families.

2. Security guidelines

The meter complies with IEC1010-1 (EN61010-1) pollution2, CAT.III 600V and UL3111-1 standards. Please read this manual carefully before use.

2-1. Electrical symbols

"⚠" "CAUTION: Refer to instructions before use. "⚡" "Low voltage symbol. "⚠" "WARNING! Danger of electric shock. "Ⓜ" Double insulation.

2-2. Safety instructions and precautions for use

2-2-1. Read this manual before use, and operate in accordance with the requirements specified in the manual to avoid accidents that endanger personal safety and damage the instrument!

2-2-2. Before opening the case, please disconnect the input signal and remove the test lead, in order to avoid electric shock or damage to the meter, no water should leak into the case.

2-2-3. Do not use this meter for test work when the housing is not installed or its fixing screws are not tightened.

2-2-4. Do not input the value higher than the limit at every range during measurement.

2-2-5. In the resistance range terminal, it is prohibited to access the voltage value.

2-2-6. Do not use the LPF low-pass filter option to verify the presence of dangerous voltages, which may be present in excess of the indicated value. The voltage must be measured without the filter connected to detect the presence of dangerous voltages.

2-2-7. Do not use LoZ mode to measure voltages in circuits that may be damaged by the low impedance (300 kΩ) of this mode.

2-2-8. The power switch should be set to OFF after use.

2-2-9. For long-term storage, please remove the battery to avoid damage to the internal components by battery leakage.

2-2-10. A voltage higher than 60V DC or 30V AC RMS will produce a serious risk of electric shock.

2-2-11. Be especially careful when clamping uninsulated conductors or busbars, accidental contact with conductors can cause electric shock.

3. Integrated specification

3-1. General Characteristics

3-1-1. display mode: LCD liquid crystal display.

3-1-2. Maximum display: 6000 (3 5/6) digit automatic polarity display.

3-1-3. Maximum jaw opening: 28mm.

3-1-4. Over-range display: "OL" is displayed in the highest position.

3-1-5. Hold: Data hold.

3-1-6. Relative value measurement.

3-1-7. Sampling rate: 3 times/second.

3-1-8. Battery low voltage display: "⚡" symbol appears.

3-1-9. Continuity test: buzzer sounds when it is less than 50Ω.

3-1-10. Automatic range or manual range.

3-1-11. Automatic power off.

3-1-12. Power consumption: about 3mA.

3-1-13. Power source: two 1.5V batteries ("AAA" 7# batteries).

3-1-14. Working environment: (0~40)°C, relative humidity <70%RH.

3-1-15. External dimensions: 185mm×65mm×32mm(L×W×H).

3-1-16. Weight: about 200g (including battery).

3-1-17. Accessories: user manual, a certificate of conformity, test leads, temperature sensor TP01 banana probe, handbag, gift box, two 1.5V batteries.

3-2. Technical specifications

3-2-1. Accuracy: ±(a% reading + word count), guaranteed for 1 year. ambient temperature (23±5) °C, relative humidity <70%.

3-2-2. Temperature coefficient: When the temperature is <18°C or >28°C, the additional temperature coefficient error is 0.1×the specified accuracy/°C.

3-2-3. DC Voltage

Measurement range	Accuracy	Resolving power
600mV	±(1.0% reading + 5)	0.1mV
6V	±(0.5% of reading + 5)	0.001V
60V		0.01V
600V		0.1V
LoZ 0V-600V	±(2.0% reading + 10)	0.1V

Input impedance: mV range > 40MΩ. Other ranges input impedance is 10MΩ. LoZ V is 300kΩ. mV range open circuit will have unstable digital display can be stable after connected to the load < ±3 words).

Maximum input voltage ±600V, ≥610V with alarm sound. LCD display "OL" when input >610V.

3-2-4. AC Voltage (ACV True RMS)

Measurement range	Accuracy	Resolving power
6V	±(0.8% of reading + 5)	0.001V
60V		0.01V
600V		0.1V
LPF 0V-600V	±(4.0% reading + 5)	0.1V
LoZ 0V-600V	±(2.0% reading + 10)	0.1V

Input impedance: 10MΩ, LoZ V is 300kΩ. Accuracy guarantee range: 5~100% range, short circuit allows less than 10 words of remaining reading.

Sine wave true RMS value is displayed. Frequency response: 40Hz~1kHz for the 600V range, 40Hz~2kHz for the rest of the range.

Maximum input voltage 600Vrms, ≥610V with alarm sound. LCD display "OL" when input >610V.

3-2-5. DC Current

Measurement range	Accuracy	Resolving power
60A	±(1.5% of reading + 5)	10mA
600A		100mA
800A		1A

Overload protection: 1000A (input time not exceeding 60 seconds)

Note: Clear to zero before measurement. The measured current conductor should be placed through the middle of the clamp jaw.

3-2-6. AC Current (True RMS)

Measurement range	Accuracy	Resolving power
60A	±(1.5% of reading + 5)	10mA
600A		100mA
800A		1A

Frequency response: 40Hz- 1kHz for sine wave and triangle wave. 40Hz-200Hz for others.

Overload protection: 1000A (input time not exceeding 60 seconds)

Note: The measured current conductor should be placed through the middle of the clamp jaw.

3-2-7. Resistance (Ω)

Measurement range	Accuracy	Resolving power
600Ω	±(0.8% of reading + 5)	0.1Ω
6 k Ω	±(0.8% of reading + 1)	1Ω
60kΩ		10Ω
600kΩ		100Ω
6 MΩ	±(1.0% of reading + 5)	1kΩ
60MΩ		10kΩ

Open circuit voltage: 500mV.

Overload protection: 250 V rms.

Warning: Input of voltage values in this range is prohibited!

3-2-8. Capacitance (C)

Measurement range	Accuracy	Resolving power
6nF	±(5.0% of reading + 10)	1pF
60nF		10pF
600nF		100pF
6μF	±(2.5% of reading + 5)	1nF
60μF		10nF
600μF		100nF
6mF	±(5.0% of reading + 10)	1μF
60mF		10μF

Overload protection: 250V rms.

Warning: Input of voltage values in this range is prohibited!

3-2-9. Frequency: (F)

Measurement range	Accuracy	Resolving power
10Hz~10MHz	±(0.5% of reading + 4)	0.001Hz~1kHz

Input sensitivity: >0.7V. Overload protection: 250V rms

3-2-10. Temperature

Measurement range	Accuracy	Resolving power
(-40~1000) °C	<400°C: ±(1.0% of reading + 5) ≥400°C: ±(1.5% of reading + 15)	1 °C
(-40~1832) °F	<750°F: ±(1.0% of reading + 5) ≥750°F: ±(1.5% of reading + 15)	1°F

Sensor: K-type banana plug (NiCr-NiSi).

Warning: Input of voltage values in this range is prohibited!

3-2-11. Diode – Continuity Test

Measurement	Display value	Test conditions
→))	Diode forward voltage drop.	Forward DC current 0.8mA, open circuit voltage about 2.2V.
	The buzzer sounds long when the resistance value of two points is less than 50Ω.	Open circuit voltage is about 2V, press "SELECT/LPF" function to switch.

Overload protection: 250V rms.

Warning: Input of voltage values in this range is prohibited!

4. OPERATION

4-1. Panel Description

- Clamp: 0A to 800A DC AC current and non-contact voltage detecting.
- Plier head trigger: pulling the plier head trigger can open the plier head.
- Hand protection: a safety design to protect the user's hands from touching the dangerous area.
- Clamp light: open the clamp lightning function to illuminate the measured area in the dark to avoid danger.
- NCV indicator: detect the existence of the high voltage in the surrounding area to prevent the risk of electric shock.
- Knob switch: Used to switch and select the function and range, turn on/off the meter.



Function	Description
NCV	Non-contact AC voltage detection.
A ≈	DC current and AC current measurement, press "SELECT/LPF" to switch the measurement.
V ≈	AC/DC voltage measurement. Long press "SELECT/LPF" key to switch low-pass filter measurement. Press Hz/DUTY to toggle frequency/duty cycle measurement to accommodate high frequency and voltage amplitude measurement.
LoZ V ≈	Low impedance voltage measurement to determine if there is a spurious voltage in the circuit.
Ω	Press "SELECT/LPF" to select resistance measurement, diode, continuity measurement, and capacitance measurement cycle switching.
Hz %	Frequency measurement, press Hz/DUTY key to switch the frequency/duty cycle measurement, adapt to frequency voltage amplitude below 10V signal measurement.
°C/°F	For temperature measurement, press the "SELECT/LPF" key to switch between °C or °F.

(7) Function Keys

SELECT/LPF keys.

1) This is key fo selecting function, base on a working principle of trigger action. Short press this key to choose measurement modes: choose DC or AC in ≈ state, choose the Ω / →|)) / →|)) / →|)) in →|)) state, choose °C or °F in temperature measurement state. switch frequency/duty cycle measurement in AC voltage measurement state.

2) In ACV/ACA mode, press SELECT/LPF to enter LPF low-pass filter.

An internal specific filtering circuit to filter out high-frequency beyond 1kHz interference signals to ensure the accuracy. It can be applied to the occasions with variable frequency voltage and current.

3) The meter will be auto power off when there is no operation within 15minutes, then it will enter the sleeping mode, the buzzer will sound 5 times of alarm reminder within 1 minute before auto power off, please press this key to turn on the meter if you need to restart the device.

4) Press this key and put it on Hold and then turn on the Power to awake the meter from sleeping mode, and then auto power off function will be canceled.

REL/ RANGE keys.

1) In A ≈ and →|)) measurement is "REL" function, press this key to clear the reading to zero and enter the relative value measurement, the display appears "REL" symbol, press again to exit the relative value measurement. (In A ≈ and →|)) measurement, the display does not return to zero before measurement, you need to press this key to make the display to "0" before measurement.)

2) In the voltage and resistance measurement is "RANGE" function, press this key to select the automatic range or manual range working mode. The instrument starts in the auto range state, displaying the "AUTO" symbol, press this function to change to manual range, press once to increase one gear, cycle from low to high. Press this key continuously for more than 2 seconds to return to the automatic range state.

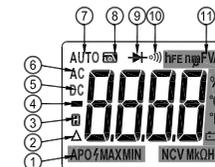
HOLD/* key.

It is a key for Data Hold function to keep the display reading, based on a working principle of trigger action, short press this key to lock the display value on screen, kept unchanged, and then press other keys HOLD function is canceled. Press this key for more than 2 seconds to turn on the display Backlight function, press this key again for 2 seconds to turn off the backlight, if you do not press this key after opening it will automatically go out after 30 seconds.

Hz/DUTY/□ key.

1) When measuring AC voltage (current), follow this function to switch the frequency/duty cycle/voltage (current), and switch the frequency/duty cycle (1-99%) when measuring frequency.

2) Lighting control key, press for more than 2 seconds lighting on, and then press for more than 2 seconds, the lighting will turn off.



(8) Display: Shows the value and unit measured by the meter.

Serial number	Function	Meaning
1	APO  MAX-MIN	Auto power off display symbol, high voltage alarm symbol, MAX-MIN invalid.
2		Clear or Relative (REL) mode is enabled.
3	HOLD	The data hold function is enabled.
4	-	The sign is displayed when the measurement result is negative.
5	DC	The multimeter is in the DC voltage or DC current measurement state.
6	AC	The multimeter is in AC voltage or AC current measurement state.
7	AUTO	The multimeter is in auto-range mode.
8		Variable frequency voltage measurement.
9		Diode measurement.
10	-)	The connectivity buzzer is activated.
11	hFE nF, μ F mV, V uA, mA, A %, °C, °F NCV M Ω , k Ω , Ω Hz, kHz, MHz 	Triode (for triode amplification measurements) Nano farad, micro farad. Milli volt, volt (V). Micro ampere, milli ampere, ampere (A). Percentage (for duty cycle factor measurements), Celsius temperature, Fahrenheit temperature. Non-contact AC voltage detection display symbols. Meg ohm, kilohms, ohms. Hertz, kilohertz, mega hertz The battery is low. WARNING: To avoid incorrect readings that could result in electric shock or personal injury, replace the batteries as soon as the battery indicator appears.

(9) V Ω input terminal: measurement of input voltage, resistance, diode, capacitance, frequency, temperature, etc. "+" input positive (insert the red test lead).
COM common ground input terminal: negative side of the measurement input (insert the black test lead).

(10) Anti-drop wristband.

4.2. AC/DC Voltage Measurement

- Turn the function switch to the V \approx range position, then insert the red test lead into the "V Ω " input terminal and the black test lead into the "COM" terminal.
- The default is DC voltage measurement, press "SELECT/LPF" to select DC or AC measurement method.
- When the test lead is connected across the circuit under test, and the voltage and polarity of the point to which the red test is connected are displayed on the screen at the same time.
- When measuring AC voltage, press Hz/DUTY to display the frequency and duty cycle of the voltage being measured.
- Press and hold the "SELECT/LPF" key to select the  low-pass filter for AC voltage measurement.



Caution.

- There may exist some residual figures for small ranges before testing, which do not affect the accuracy of the measurement.
- The input voltage must not exceed the limit, and if it does, there is a risk of damage to the instrument circuitry.
- When measuring high voltage circuits, the human body must take care to avoid touching the high voltage circuits.
- After completing all measurement operations, disconnect the test leads from all circuits.

4.3. True RMS Voltage Measurement of Variable Frequency Voltage

- Press "SELECT/LPF" for more than 2 seconds while measuring voltage to enter the  low-pass filter function.
- Selecting this filter function will intercept voltages above 1 kHz, enabling measurement of composite sinusoidal signals generated by inverters and inverter motors.
- When the test lead touches the test point, and the voltage of the two points connected to the test lead is displayed on the screen.

Caution.

- Manual range mode, such as LCD display: "OL", indicating that the range has exceeded the range, the range switch must be turned to a higher gear.
- The measurement voltage must not exceed ACV 600V, if over, there is a risk of damage to the instrument circuit.
- When measuring high-voltage circuits, always take care to avoid touching high-voltage circuits.
- When the measured voltage is over 610V, the built-in buzzer of the instrument will sound to alert the operator to use with Caution.

4.4. Low Impedance Voltage Measurement

- Turn the function switch to the LoZV \approx range position. the default is DC voltage measurement, press the "SELECT/LPF" key to select DC or AC measurement mode.
- The test lead is connected across the circuit under test, and the voltage and polarity of the point to which the red test lead is connected are displayed on the screen at the same time.
- When measuring AC voltage, press Hz/DUTY to display the frequency and duty cycle of the voltage being measured.
- Press and hold the "SELECT/LPF" key to select the  low-pass filter for AC voltage measurement.



Caution.

- Pay high attention to use this low impedance voltage measuring function for the standard source devices when the output power is unknown, or long measurements may damage the device under test.

4.5. AC/DC current measurement

- Turn the function switch to the A \approx range position. the default is DC current measurement, press the "SELECT/LPF" key to select DC or AC measurement mode.
- The display may not return to zero due to the ambient magnetic field, please press "REL" to clear the value to zero before measurement.

- Press and hold the trigger to open the clamp jaw, use the forceps to clamp the conductor to be measured, and then slowly release the trigger until the forceps are completely closed.
- The reading shows the value of the current on the conductor under test. To obtain the most accurate reading, the conductor must be placed through the middle of the closed jaws.

Caution.

- The instrument uses Hall components to sense current, and Hall parts are a sensitive device, in addition to magnetic sensitivity, temperature, mechanical stress are sensitive to varying degrees, the impact will cause a short time reading changes. Therefore, it will cause the phenomenon that the DC range reading does not return to zero, it is necessary to press REL key to clear the zero after the measured reading to be accurate.
- Open the jaws by pressing the trigger, grip the jaws on the conductor to be measured, then slowly release the trigger until the jaws are completely closed. Determine if the conductor to be measured is clamped in the center of the jaws. Only one conductor can be measured at a time. If two or more conductors are measured at the same time, the measurement reading will be incorrect. Not placed in the center of the jaws will produce $\pm 1.0\%$ additional error in the reading. The current value on the conductor under test is displayed.
- In DC current measurement, if the reading is positive, the direction of the current is from top to bottom (top for the panel and bottom for the bottom cover, the measuring meter is face up).
- The maximum test current is 800A. Long time exceeding the rated current will damage the instrument.

The following practices will make DC current measurements more accurate.

- Turn off the current to the conductor to be measured. Press the trigger to open the jaws, clamp the jaws on the conductor to be measured, then slowly release the trigger until the jaws are completely closed to determine if the conductor to be measured is clamped in the center of the jaws.
- Please press REL to clear the value to zero when the the reading to stabilize at the minimum value.
- Turn on the current of the conductor to be measured and read the value after stabilization.
- The current measurement function is advised to be operated between 0°C and 40°C, so that the results of the measurement will give a more accurate DC current reading.

4.6. Resistance measurement

- Turn the function switch to the Ω range position and press the "SELECT/LPF" key to select the Ω measurement method.
- Insert the red test lead into the "V Ω " input terminal and the black test lead into the "COM" input terminal.
- Connect the test leads across the resistance under test and read the measured value.

Caution.

- When using the manual range measurement method, the switch should be set to the highest gear if there is no prior concept of the resistance range to be measured.
- If the LCD shows "OL", it indicates that the range has been exceeded and must be adjusted up a gear. When the measured resistance is more than 1M Ω , the reading takes a few seconds to stabilize, which is normal when measuring high resistance.
- When the input is open circuit, the overload condition "OL" is displayed.
- When measuring in-line resistance, make sure that all power supplies to the circuit under test are turned off and all capacitors are fully discharged.
- If there exists relatively large error in the measurement, it may be due to the influence of other originals in the line or a potential at both ends of this resistor.
- Do not input voltage at the resistance range.

4.7. Diode and continuity measurement

- Put the range on the , press the "SELECT/LPF" key, select the diode measurement (the screen displays the symbol of ), insert the black test lead into the "COM" jack, the red test lead into the "V Ω " jack. (Note that the polarity of the test lead is "+").
- Positive measurement: the red test lead is connected to the positive terminal of the diode under test, the black test lead is connected to the negative terminal of the diode under test, the reading is the approximate value of the positive voltage drop of the diode; For the silicon PN junction, it shows 500 ~ 800 to confirm the normal value; If the diode under test is open or the polarity is reversed, it shows "OL".
- Reverse measurement: the red test lead is connected to the negative terminal of the diode under test, the black test lead is connected to the positive terminal of the diode under test, the screen will show "OL". if the diode under test leaks or breaks down, it will show a certain value.
- A complete diode test including forward and reverse direction measurements, if the measurements do not match the above, the diode is damaged.
- Press the "SELECT/LPF" key to select the on-off measurement method. (the screen displays the  symbol).
- Connect the test leads to the two points of the line to be tested, and if the built-in buzzer sounds, the resistance value between the two points is lower than 50 Ω .

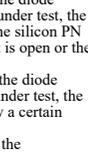
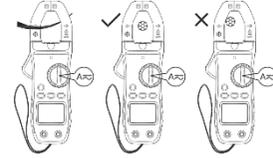
Caution.

- It is forbidden to input voltage at the  range to avoid damage to the meter.
- When measuring online, make sure the power is off and all capacitors are discharged. Any negative potential or AC signal will cause the buzzer to sound.

4.8. Capacitance measurement

- Turn the function switch to the  range position and press the "SELECT/LPF" key to select  measurement.
- Insert the red test lead into the "V Ω " input terminal and the black test lead into the "COM" terminal.
- Before measurement, if the display shows that it is not zero, press the "REL" key  to clear the zero.
- The test leads to connect the corresponding polarity of the capacitor under test (note that the polarity of the red test lead is "+") to the input of "COM" and "V Ω ", and the screen will show the capacitance.

Caution.



- It is strictly forbidden to input voltage or current signals in the measuring capacity range.
- Before each test, if the display has readings, you must press the "REL" key  to clear the value to zero to ensure the accuracy of the measurement.
- Capacitance range is only with the automatic range operation.
- The capacitor under test should be completely discharged to prevent damage to the meter.

4.9. Frequency, Duty cycle measurement

- Turn the function switch to the Hz range position, then insert the red test lead into the "V Ω " input terminal and the black test lead into the "COM" terminal.
- Connect the test leads across the circuit under test and read the measured value.
- Press Hz/DUTY to toggle frequency and duty cycle measurement.

Caution.

- When the input exceeds 10Vrms, please operate in ACV range and press Hz/DUTY to switch the frequency duty cycle measurement.
- In a noisy environment, it is best to use shielded cables when measuring small signals.
- Do not touch high voltage circuits when measuring high voltage circuits.
- Input of voltage values higher than 250 V rms is prohibited in this range.

4.10. Temperature measurement

- Turn the function switch to °C/°F range position, then insert the cold end (free end) of the thermocouple sensor's negative pole (black plug) into the "COM" hole, the positive pole (red plug) into the "V Ω " jack, the working end (measuring end) of the thermocouple is placed on top of or inside the object to be measured, then read the temperature measurement value directly from the screen, press the "SELECT/LPF" key to switch between °C or °F. The working end (measuring end) of the thermocouple is placed above or inside the object to be measured, then read the temperature measurement value directly from the screen, and press "SELECT/LPF" to switch °C or °F.

Caution.

- The instrument should be kept away from high temperatures during measurement, and the thermocouple temperature probe should be used within the range specified for testing.
- Do not replace the temperature measurement sensor at will, otherwise the measurement accuracy will not be guaranteed.
- It is strictly forbidden to enter voltage values in this range.

4.11. Non-contact AC voltage detection

Warning: This function is subject to different sources of external interference, false alarms may occur, when using, the measurement results are for reference only.

- Put the function switch in the "NCV" position, when the line to be tested against the top of the clamp head, the instrument induction voltage indicator light, buzzer issued a drop - drop - drop alarm sound. Or insert the red test lead into the "V Ω " input terminal, the probe touches the charged line (for narrow special test environment), there will be an audible and visual alarm.
- NCV measurement results are displayed in 5 levels, 0~50mV display LO, 50~100mV/100~150mV/150~200mV/250mV and above display 1~4 ' ' characters respectively, accompanied by different rhythm buzzer sound.

Attention:

- Even if there is no indication, voltage may still be present. Do not rely on a non-contact voltage detector to determine if voltage is present on the wire.
- Detecting results may be affected by factors such as socket design, insulation thickness and different types.
- When voltage is input to the input terminal of the instrument, the voltage sense indicator light may also be on due to the presence of the induced voltage.
- External environmental sources of interference (such as flash, motor, etc.) may be misjudged.

4.12. Auto Power OFF

When the instrument stops using for about 15 minutes, the instrument will automatically power off and enter the hibernation state; To restart the power, dial to OFF, turn the rotary dial to other gears. press and hold the "SELECT/LPF" key, while turning on the power switch, the "APO" symbol on the screen will disappear, and the automatic shutdown function will be canceled.

5. Trouble Shooting

If the meter does not work properly, please check the meter as following steps:
(If the problem is still not solved, please refer to repairing center or contact the local dealers.)

Fault	Solution
No display on LCD	<ul style="list-style-type: none"> ■ Power not connected. ■ Replace the battery.
 Symbols appear	<ul style="list-style-type: none"> ■ Replace the battery.
Large display error	<ul style="list-style-type: none"> ■ Replace the battery.

6. Instrument Maintenance

The meter is a precision instrument, random changes to the circuit should be avoided.

- Please pay attention to keep the meter away from the water, dust and shock.
- The meter is not suitable for storage and use in high temperature and high humidity, flammable and explosive and strong magnetic field environment.
- Use a damp cloth and a mild detergent to clean the exterior of the instrument, do not use abrasives and strong solvents, like alcohol.
- To avoid leakage damage, please take out the battery if the meter will not be used for a long time.

Caution.

- When the screen shows the symbol , replace the battery, step 3 below.
- Unscrew the screws securing the battery cover and withdraw it.
- Remove the 1.5V batteries and replace them with two new batteries, although any standard 1.5V batteries can be used, but to extend the use time, it is best to use alkaline batteries.
- Put on the battery cover and tighten the screws.
- The specifications are subject to changes without prior notice.
- The content of this manual is regarded as correct. If users find out any mistakes or omissions, please kindly contact the manufacturer.
- The manufacturer will not be responsible for accidents and damage caused by improper operations.
- The functions described in this User Manual shall not be considered as the reason for any special usage.