Use Manual

Digital Multimeter

Please read the instruction manual carefully before using this product and keep it properly for easy access at any time.

Overview

This product is a multi-function, multi-range, multi-purpose automatic range digital multimeter. The instrument is battery-driven, has true RMS values, and uses an LCD display with clear readings, convenient operation, easy portability, accuracy, reliability, stable performance, and strong anti-interference ability. It is an indispensable instrument for telecommunications, electric power, computer rooms, electronic and electrician maintenance, and mechanical and electrical installation.

Model Features

- FR17B(4000 words)
- FR17C(6000 words)

Safety instructions

To avoid possible safety accidents such as electric shock, fire and personal injury, please read the safety precautions before use .

· Please follow the "Instruction Manual" to correctly select the input port and gear function, and measure within the range specified in the "Instruction Manual".

· Before using the product, please check whether there are cracks or defects in the plastic parts of the casing and test leads. If there are any, please do not use it.

· Do not use the meter around explosive gas or steam or in a humid environment.

· Do not measure a voltage higher than the rated voltage calibrated at both ends of the terminal. Exceeding the rated voltage may damage the instrument.

· Please disconnect the test leads or circuit before changing the test gear.

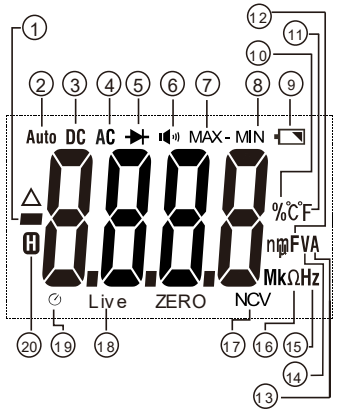
· Please select the correct test gear and range before testing to avoid instrument damage and personal injury. When the measured parameter exceeds the range, the screen will display "OL".

· Please be especially careful when measuring DC voltage higher than 36V or AC voltage higher than 30V. Such voltages may cause electric shock.

· When the battery power is low, it may affect the test accuracy. Please replace the battery before use. Do not use the instrument if the battery back cover is not properly closed.

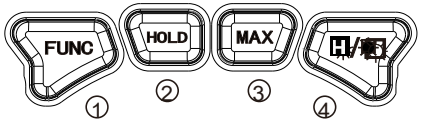
· When measuring AC and DC current, the milliampere and microampere port current should not exceed the 600mA range. If it exceeds the range, please replace it with a large power 10A/20A port immediately. If the current is less than 10A, it can be measured for a long time. When the current is greater than 10A, do not measure for a long time. Use it only within 1 minute, otherwise the meter may be damaged.

Product Description



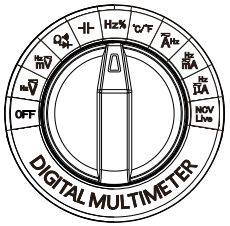
①	—	negative reading
②	Auto	Automatically selects the range with the best resolution
③	DC	DC
④	AC	comminicate
⑤		Diode testing
⑥		Continuity test
⑦	MAX	Display shows maximum reading
⑧	MIN	Display shows minimum reading
⑨		The battery is low, please replace the battery
⑩	%	Duty cycle test
⑪	℃℉	Celsius and Fahrenheit temperature testing
⑫	F	Capacitance test (Farad)
⑬	A	Current test (amps)
⑭	V	Voltage test (volts)
⑮	Hz	Frequency test (Hz)
⑯	Ω	Resistance test (ohms)
⑰	NCV	Non-contact voltage testing
⑱	Live	Zero live wire test
⑲		Power on logo
⑳	H	Display maintains current reading
Mknmu		Units of measurement

Function Button



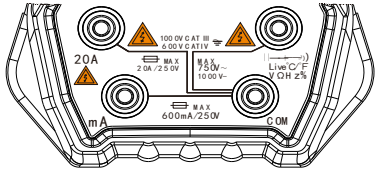
①	Press this key to switch between the gear modes currently pointed to by the rotary switch, including: 1. DC voltage (V)/AC voltage (V) 2. DC voltage (mV)/AC voltage (mV) 3. Resistor/on/off/diode 4. Frequency/duty cycle 5.Celsius℃/Fahrenheit℉ 6. DC current (A)/AC current (A) 7. DC current (mA)/AC current (mA) 8. DC current (μA)/AC current (μA) 9.NCV/Live
②	Press this key and the product will maintain the current reading on the LCD screen: press it again and the product will return to the normal display state.
③	Press this key to switch between (maximum value/minimum value/subtraction value) measurement modes. To exit the (maximum value/minimum value/subtraction value) measurement mode, press and hold this key for two seconds to exit.
④	Press this key to turn on the LCD backlight, and press it again to turn off the backlight. Press and hold this button for 2 seconds to turn on the flashlight lighting function, and press and hold it again for 2 seconds to turn off the flashlight lighting function .

Rotary Switches



OFF	**Turn off the product in this position.** ·If no function switching or knob operation is performed within 15 minutes after being turned on, the product will automatically shut down. ·One minute before automatic shutdown, the built-in buzzer of the product will sound five "beep" sounds as a reminder. ·If you want to restart the instrument after it shuts down automatically, you can press the FUNC key or turn the knob switch back to the OFF position and then to the required test position. · If you want to cancel the automatic shutdown function, press and hold FUN until five beeps sound. If the cancellation is successful, the built-in buzzer will beep five times.
Hz⎓V	DC voltage range: ≤1000V Over range display "OL" AC voltage range: ≤750V Over range display "OL" Press and hold the FUNC key for 2 seconds in the AC voltage range to switch to: 1: Low frequency and high voltage: ≤10KHz 2: Duty ratio: 1% ~ 99%
Hz⎓mV	DC voltage range: ≤600mV, over-range display “OL” AC voltage range: ≤600mV, over-range display “OL” Press and hold the FUNC key for 2 seconds in the AC voltage range to switch to: 1: Low frequency and low voltage: ≤100KHz 2: Duty ratio: 1% ~ 99%
Ω	Resistance range: ≤60MΩ, over range display “OL” On-off gear: The buzzer sounds when it is less than 50Ω Diode level: If it exceeds 3V, "OL" will be displayed.
⊣⊢	Capacitance level: ≤100mF, over-range display “OL”
Hz%	High frequency and low voltage range: ≤10MHz Duty ratio: 1%~99% Voltage range: <AC10V
℃/℉	Temperature range: -20～1000℃ -4～1832℉
Ã Hz	DC current range: 10A/20A, over-range display “OL” AC current range: 10A/20A, over-range display “OL” In AC current mode, press and hold the FUNC key for 2 seconds to enter frequency/duty cycle. Measurement: ≤1KHz 1%～99% duty cycle
Hz mA	DC current range: ≤600mA, over-range display “OL” AC current range: ≤600mA, over-range display “OL” In AC current mode, press and hold the FUNC key for 2 seconds to enter frequency/duty cycle. Measurement: ≤100KHz 1%～99% duty cycle
Hz μA	DC current range: ≤6000uA, over-range display “OL” AC current range: ≤6000uA, over range display “OL” In AC current mode, press and hold the FUNC key for 2 seconds to enter frequency/duty cycle. Measurement: ≤100KHz 1%～99% duty cycle
NCV Live	Non-contact voltage detection, zero live wire detection

Input Port



20A	For current measurement (10A/20A) input port (depending on model). **Note: When the current is greater than 10A, avoid continuous measurement for more than 1 minute.**
mA	Input port for current measurement (≤600mA).
COM	Input common port used for all measurements.
VΩHz	Input port for the following measurements: 1.AC/DC voltage 2. Resistance. 3. Capacitor. 4. Frequency. 5. On and off. 6. Diode. 7. Duty cycle. 8. Temperature. 9. Zero fire judgment.

Measurement methods

Measure AC and DC voltages

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to Hz⎓V or Hz⎓mV files.
3. Press the FUNC key to switch between AC/DC.
4. Use the test lead probe to touch the correct test point on the circuit.
5. Read the voltage value displayed on the display screen.

▲ The measured voltage must not exceed the rated maximum test value, otherwise the instrument may be damaged and personal safety may be endangered.
▲ When measuring high-voltage circuits, you must avoid touching the high-voltage circuit.

Measure AC and DC Current

1. Insert the black test lead into the COM terminal and the red test lead into the mA/uA terminal or 10A/20A terminal.
2. Turn the rotary switch to , or position.
3. Press the FUNC key to switch between AC/DC.
4. Disconnect the circuit path to be tested, connect the test leads to the circuit and turn on the power supply.
5. Read the current value displayed on the display screen.

⚠ **Warning:** If the measured current is less than 10A, it can be measured for a long time. Current greater than 10A will cause internal components to heat up. The measurement time is limited to 1 minute, otherwise the instrument may be damaged and personal safety may be endangered.
▲ The measured current must not exceed the rated maximum test value, otherwise the instrument may be damaged and personal safety may be endangered.
▲ If the size of the current to be measured is unknown, you should first use the A gear at the 10A or 20A end to test and determine, and then select the test port and gear according to the displayed value.
▲ It is strictly prohibited to input voltage in this gear.

Measure Resistance

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to gear, the screen displays “0L” by default.
3. Touch the test lead probe to the desired circuit test point.
4. Read the resistance value measured on the display.

▲ Before measuring resistance, make sure that all power sources of the circuit under test have been turned off and all capacitors have been fully discharged.
▲ It is strictly prohibited to input voltage in this gear.

Measure Continuity

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to gear press the FUNC key to switch to the on-off gear.
3. Use the test lead probe to touch two points of the circuit to be tested.
4. If the resistance value is less than 50Ω, the buzzer will sound, indicating a short circuit. It is strictly prohibited to input voltage in this gear.

Measuring Diode

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to mode, press the FUNC key twice to switch to the diode mode.
3. Use the red test lead probe to connect to the positive pole of the diode to be tested, and the black test lead probe to the negative pole of the diode to be measured.
4. Read the forward bias voltage displayed on the display.
5. If the polarity of the test lead is opposite to that of the diode or the diode is damaged, the screen will display "OL".

▲ It is strictly prohibited to input voltage in this gear.
▲ Before testing, the circuit power supply should be disconnected and all high
The piezocapacitor discharges.

Measure Capacitance

1. Insert the black test lead into the COM terminal and the red test lead into the VΩHz terminal.
2. Turn the rotary switch to turn on the capacitor file.
3. Connect the red test lead probe to the positive terminal of the capacitor to be measured, and the black test lead probe to the negative terminal of the capacitor to be measured.
4. After the reading is stable, read the capacitance value displayed on the display. Circuit power should be disconnected and all high voltage capacitors discharged before testing.

Measurement frequency

1. Insert the black test lead into the COM terminal, and the red test lead into the VΩHz terminal or the 10A/20A, mA terminal.
2. When the red test lead is at the VΩHz end, turn the knob switch to or mode, short press the FUNC button to switch to AC voltage measurement, then long press the FUNC button to enter frequency measurement (measuring low frequency and high voltage), or turn the knob switch to Hz% to enter the frequency mode (measuring high frequency and low voltage).
3. The red test lead is at the 10A/20A and mA end, and turn the knob switch to or mode, short press the FUNC key to switch to AC current measurement, and then long press the FUNC key to enter frequency measurement.
4. Use the test lead probe to touch the desired circuit test point.
5. Read the frequency value displayed on the display screen.

Measure Duty Cycle

1. Insert the black test lead into the COM terminal, and the red test lead into the VΩHz terminal or 10A/20A, mA terminal.
2. Turn the rotary switch to or gear, short press the FUNC button to switch to AC voltage measurement, then long press the FUNC button to enter frequency measurement, then short press the FUNC button to switch to the duty cycle gear (measuring low frequency and high voltage), or turn the knob switch to **Hz%** gear, short press the FUNC key to switch to the duty cycle gear (measuring high frequency and low voltage).
3. The red test lead is at the 10A/20A and mA end, and the knob switch is turned to or or mode, short press the FUNC key to switch to AC current measurement, then long press the FUNC key to enter frequency measurement, and then short press the FUNC key to enter duty cycle measurement.
4. Use the test lead probe to touch the desired circuit test point.
5. Read the duty cycle value displayed on the display screen.

Non-Contact Voltage Detection

1. Turn the knob switch to the right NCV Live position, and the screen will display Live and NCV characters.
2. Move the meter around. If the meter sensor senses an AC voltage field, the built-in buzzer will make a "beep" sound. The stronger the voltage, the faster the "beep" sound, and the meter head LED will Flash quickly.
3. When using the zero fire detection function, insert the red test lead at the VΩHz end.
4. Use the test lead probe to touch the desired circuit test point. The one with high voltage and electric field intensity can be judged as the live wire.

Replacement Battery

When “ ”, it should be replaced in time battery, the steps are as follows:

1. Before replacing the battery, please remove the test leads and turn off the phone.
2. Unscrew the screws fixing the battery on the back cover of the battery and open the battery door.

Replace Fuse

When a fuse blows or fails, follow these steps to replace the fuse:

1. Before replacing the fuse, please remove the test leads and turn off the machine.
2. Unscrew the four screws holding the back cover on the back of the product and remove the back cover.
3. Remove the old fuse and replace it with a new fuse of the same model.
4. Replace the back cover and battery door and tighten the screws.

Maintenance

Other than replacing the battery and fuse, do not attempt to repair this product or change the circuitry unless you are qualified and have the appropriate calibration, performance testing, and service instructions.

Cleaning products

▲ Please remove all input signals before cleaning the product.
Please use a damp cloth and mild detergent to clean the case. Do not use corrosives or solvents. Dust or moisture on the test port may affect the accuracy of the reading.

Warranty

Users can enjoy one-year warranty service on this product starting from the date of purchase.

This warranty does not cover batteries (used out), fuses (blown), or instrument damage caused by accident, neglect, water intrusion, modification, abuse, or irregular operation.

General technical parameters

Measuring range	Auto Range
Sampling rate	3 times/second
FR17B	4000 words
FR17C	6000 words
Data retention	Have
true valid value	Have
screen backlight	Have
Low battery prompt	Have
Automatic shut-down	Have
Lighting function	Have
Operating temperature	0～40℃
Working humidity	<70%
storage temperature	-20~60℃
Storage humidity	<70%
Battery	1.5v AA battery*2
size	188*88*52mm
1.5V AA battery*2	332g (without battery)

Accuracy Index

1. AC Voltage Measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
40.00mV	60.00mV	0.01mV	±(0.8%+5)
400.0mV	600.0mV	0.1mV	
4.000V	6.000V	0.001V	
40.00V	60.00V	0.01V	
400.0V	600.0V	0.1V	
600V	750V	1V	

2. DC voltage measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
40.00 mV	60.00mV	0.01mV	±(0.5 % + 3)
400.0mV	600.0mV	0.1mV	
4.000V	6.000V	0.001V	
40.00V	60.00V	0.01V	
400.0V	600.0V	0.1V	
750V	1000V	1V	

3. AC current Measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
400.0uA	600.0uA	0.1uA	±(1.5 %+ 3)
4000uA	6000uA	1uA	
40.00mA	60.00mA	0.01mA	
400.0mA	600.0mA	0.1mA	
4.000A	6.000A	0.001A	
10.00A	20.00A	0.01A	±(2.5 %+ 3)

4. DC Current Measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
400.0uA	600.0uA	0.1uA	±(1.5 %+ 3)
4000uA	6000uA	1uA	
40.00mA	60.00mA	0.01mA	
400.0mA	600.0mA	0.1mA	
4.000A	6.000A	0.001A	
10.00A	20.00A	0.01A	±(2.5 %+ 3)

5. Resistance Measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
400.0 Ohms	600.0 Ohms	0.1 Ω	±(1.0 %+ 3)
4,000K Ohms	6,000K Ohms	0.001K Ohm	
40.00K Ohms	60.00K Ohms	0.01K Ohm	
400.0K Ohms	600.0K Ohms	0.1K Ohm	
4,000 MΩ	6,000 MΩ	0.001 MΩ	
40.00 MΩ	60.00 MΩ	0.01 MΩ	±(3.0. %+ 5)

6. Capacitance Measurement

Measuring range		resolution	Accuracy
FR17B	FR17C		
3.999nF	9.999nF	0.001nF	±(3.0 %+ 5)
39.99nF	99.99nF	0.01nF	
399.9nF	999.9nF	0.1nF	
3.999uF	9.999uF	0.001uF	
39.99uF	99.99uF	0.01uF	
399.9uF	999.9uF	0.1uF	
39.9mF	99.9mF	0.1mF	±(5.0. %+ 5)

7. Temperature Measurement

type	scope	Accuracy
Celsius	-20~0℃	±5.0 % of reading or ± 3 ℃
	0~400℃	±1.0 % of reading or ± 3 ℃
	400~1000℃	±2.0 % of reading
°F	-4~32°F	±5.0 % of reading or ± 5 °F
	32~752°F	±1.0 % of reading or ± 5 °F
	752~1832°F	±2.0 % of reading

8. Frequency Measurement

Measuring range	resolution	Accuracy
99.99Hz	0.01Hz	±(1. 0 %+ 3)
999.9Hz	0.1Hz	
9.999KHz	0.001KHz	
99.99KHz	0.01KHz	
999.9KHz	0.1KHz	
9.999MHz	0.001MHz	

9. Duty Cycle Measurement

Measuring range	resolution	Accuracy
1%~99%	0.1	±(1. 0 %+ 3)

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