

—— 产品使用手册 ——

USERS MANUAL

Digital multimeter
数字万用表



RF-17N

Welcome to use our high-quality products, please read this manual carefully before using
欢迎使用本公司系列优质产品, 使用之前请详细阅读本使用手册

1 概述






本产品是用电池驱动的、带真有效值的自动量程数字万用表。仪表为6000字显示,采用LCD显示器,有背光显示,读数清晰。



2 安全事项

为避免可能的电击、火灾、及人身伤害,在使用之前,请先阅读安全注意事项。

- (1) 测量时,请勿超过“技术规格”中规定的最大测量值。
- (2) 36V以下的电压为安全电压,在测高于36V直流或25V交流电压时,要检查表笔是否可靠接触、是否正确连接、是否绝缘良好等,以避免电击。
- (3) 换功能和量程时,表笔应离开测试点。
- (4) 选择正确的功能和量程,超量程显示为“OL”。
- (5) 安全符号说明:

	存在危险电压		接地
	双绝缘		低电压符号
	操作者必须参阅说明书		

3 规格参数

技术规格						
功能	量程	分辨率	精度	最大测量值	频率响应	
直流电压 (V)	6.000V	0.001V	±(0.5%+3)	100V		
	60.00V	0.01V				
	600.0V	0.1V				
	1000V	1V				
直流电压 (mV)	60mV	0.01mV		600mV		
	600mV	0.1mV				
交流电压 (V)	6.000V	0.001V	±(1.0%+3)	750V	40Hz-1kHz	
	60.00V	0.01V				
	600.0V	0.1V				
	750V	1V				
交流电压 (mV)	60.00mV	0.01mV		600mV		
	600.0mV	0.1mV				
直流电流 (A)	6.000A	0.001A	±(1.2%+3)	20A		
	20.00A	0.01A				
直流电流 (mA)	60.00mA	0.01mA				600A
	600.0mA	0.1mA				
直流电流 (μA)	600.0μA	0.1μA		6000μV		
	6000μA	1μA				
交流电流 (A)	6.000A	0.001A	±(1.5%+3)	20A	40Hz-1kHz	
	20A	0.01A				
交流电流 (mA)	60mA	0.01mA				600mA
	600mA	0.1mA				
交流电流 (μA)	600.0μA	0.1μA		6000μA		
	6000μA	1μA				
电阻	600.0Ω	0.1Ω	±(0.5%+3)	60MΩ		
	6.000KΩ	0.001KΩ				
	60.00KΩ	0.01KΩ				
	600.0KΩ	0.1KΩ				
	6.000MΩ	0.001MΩ				
	60.00MΩ	0.01MΩ	±(1.5%+3)			
电容	9.999nF	0.001nF	±(5.0%+20)	9.999mF		
	99.99nF	0.01nF	±(2.0%+5)			
	999.9nF	0.1nF				
	9.999μF	0.001μF				
	99.99μF	0.01μF				
	999.9μF	0.1μF				
9.999mF	0.001mF	±(5.0%+5)				
频率	99.99Hz	0.01Hz	±(0.1%+2)	9.999MHz		
	999.9Hz	0.1Hz				
	9.999KHz	0.001kHz				
	99.99KHz	0.01kHz				
	999.9KHz	0.1kHz				
	9.999MHz	0.001MHz				
占空比	1%~99%	0.1%	±(0.1%+2)			
二极管	√					
通断	√					
温度	(20~1000)°C	1°C	±(2.5%+5)	1000°C		
	(-4~1832)°F	1°F		1832°F		

通用技术指标	
显示屏(LCD)	6000字
量程	自动/手动
材质	ABS
采样速率	3次/秒
真有效值	√
数据保持	√
背光屏幕	√
底电量提示	√
自动关机	√

机械技术规格		
尺寸	180·90·45 mm	
重量	319 g	
电池类型	1.5 V AA电池·2	
保修期	一年	
环境		
工作环境	温度	0~40°C
	湿度	< 75%
储存环境	温度	-20~60°C
	湿度	< 80%

4 使用方法

操作面板说明(见右图)

(1) 液晶显示屏

显示仪表测量的数值及单位。

(2) 功能键

2a. “SELECT”键:按下该键,可在交/直流、小电压/频率/占空比、电阻/通断/二极管、或°C/°F量程间转换。

2b. “HOLD”键:如要保持当前读数,按下此键,屏幕显示

“HOLD”符号;再按退出保持状态。如要开启背光,长按此键大于2秒;再按关闭背光。

(3) 旋钮开关

用于改变测量功能及量程。(从OFF开始顺时针方向)

3a. OFF档:关机档位

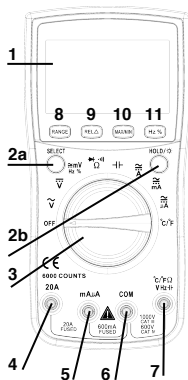
3b. 交流电压v档

3c. 直流电压v档

3d. 交直流电压(mV)/频率/占空比档(以下简称小电压档)

3e. 电阻/通断/二极管档

3f. 电容档



- 3g. 交/直流电流 (A) 档 (以下简称A档)
- 3h. 交/直流电流 (mA) 档 (以下简称mA档)
- 3i. 交/直流电流 (μ A) 档 (以下简称 μ A档)
- 3j. 温度档

(4) 20A

用于电流 (A) 测量的输入端。

(5) mA/ μ A

用于电流 (mA和 μ A) 测量的输入端。

(6) COM

用于所有测量的公共接线端。

(7) VHz

用于电压、频率、占空比、电阻、通断、二极管、电容、温度测量的输入端。

(8) RANGE

如要进入手动量程模式,按下该键;之后每按一次该键将会按增量递增量程当达到最高量程时,仪表会回到最低量程;如要退出手动量程模式,长按该键两秒。

(9) REL

该产品可对电压、电流、电容使用相对测量;按下此键,进入相对值测量模式;再按退出相对值测量模式。

(10) MAX/MIN

按一次为最大值测量;按两次为最小值测量;长按两秒可退出该功能。

电压测量

- (1) 将黑色表笔插入“COM”端,红表笔插入“VHz”端;
- (2) 将旋钮开关转至交流电压 (V) 档、直流电压 (V) 档或小电压档;
- (3) 按SELECT键可在交/直流间进行切换;

- (4) 用表笔探头接触电路上的正确测试点；
- (5) 读取显示屏所显示的电压值。

注意：

- a. 所测电压不可超过额定的最大测试值，否则有损坏仪表及危及人身安全的可能。
- b. 当测量高压电路时，必须避免触及高压电路。

电流测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“20A”端（最大测试值20A）或“mA/ μ A”端（最大测试值600mA）；
- (2) 将旋钮开关转至A档、mA档或 μ A档；
- (3) 按SELECT键可在交/直流间进行切换；
- (4) 断开待测的电路路径，将表笔串入电路并通上电源；
- (5) 读取显示屏所显示的电流值。

注意：

- a. 所测电流不可超过额定的最大测试值，否则有损坏仪表及危及人身安全的可能。
- b. 如果待测电流大小未知，应先在20A端进行测试判定，然后根据显示值选定测试档位。

在测试电流的状态下，严禁输入高于36V直流或25V交流峰值的电压。

电阻测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“VHz”端；
- (2) 将旋钮开关转至电阻档，此时屏幕默认显示“OL”；
- (3) 用表笔探头接触想要的电路测试点；
- (4) 读取显示屏上测出的电阻值。

注意：

- a. 测量在线电阻前，要确认被测电路所有电源已关断，且所有电容都已完全放电。
- b. 严禁在电阻档输入电压。

通断测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“VHz”端；
- (2) 将旋钮开关转至电阻档，按SELECT键一下，切换至通断档；
- (3) 用表笔探头接到待测电路的两点；
- (4) 电阻值若小于 50Ω ，蜂鸣器将响起，表明出现短路。

注意：

- a. 严禁在通断档输入电压。

二极管测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“VHz”端；
- (2) 将旋钮开关转至电阻档，按SELECT键两下，切换至二极管档；
- (3) 用红色表笔探头接到待测二极管的正极，黑色表笔探头接到待测二极管的负极；
- (4) 读取显示屏所显示的正向偏压；
- (5) 若测试导线极性与二极管极性相反，或二极管损坏，则屏幕显示为“OL”。

注意：

- a. 严禁在二极管档输入电压。
- b. 测试前应断开电路的电源，并将所有的高压电容器放电。

电容测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“VHz”端；
- (2) 将旋钮开关转至电容档；
- (3) 将红色表笔探头接到待测电容正极，黑色表笔探头接到待测电容负极；
- (4) 待读数稳定后，读取显示屏所显示的电容值。

注意：

- a. 测试前应断开电路的电源，并将所有的高压电容器放电。

频率和占空比测量

- (1) 将黑色表笔插入“COM”端，红表笔插入“VHz”端；
- (2) 将旋钮开关转至小电压档，若要测量频率，按两次SELECT键；若要测占空比，按三次SELECT键；
- (3) 用表笔探头接触想要的电路测试点；
- (4) 读取显示屏所显示的频率值/占空比值。

注意：

a. 频率档只适用于高频率、低电压情况的测量。

温度测量

- (1) 将热电偶的黑色插头插入“COM”端，红色插头插入“VHz”端；
- (2) 将旋钮开关转至温度档，此时屏幕默认显示常温，若要切换°C/°F，按SELECT键；
- (3) 将热电偶的测温探头置于待测温场中；
- (4) 读取显示屏所显示的温度值。

注意：


a. 严禁在温度档输入电压。

自动关机

- (1) 当仪表停止使用15分钟后，仪表将自动关机；
- (2) 关机前1分钟，内置蜂鸣器会发出五声提示；
- (3) 自动关机后若想重新开机，按SELECT键即可接通电源；
- (4) 如想取消自动关机功能，应按住SELECT键再开机，蜂鸣器发出五声提示，表明自动关机已取消。

5 保养维护

除更换电池和保险丝外，除非您具有合格资质且拥有相应的校准、性能测试和维修操作说明，否则请勿尝试修理本产品或更改电路。

- (1) 本品不宜在高温、高湿、易燃、易爆及强磁场环境下存放或使用。
- (2) 请使用湿布和温和的清洁剂清洁外壳，不要使用腐蚀性或溶剂。
- (3) 清洁产品前应先清除输入信号。
- (4) 若长时间不使用，应取出电池，防止电池漏液腐蚀仪器。
- (5) 注意电池使用情况，当显示屏显示出“”符号时，应更换电池，步骤如下：
 - 拧出后盖上固定电池的螺丝，打开电池门；
 - 取下电池，换上两节新的同类型电池；
 - 装上电池门，上紧螺丝。
- (6) 更换保险丝时，请使用相同规格和型号的保险丝，步骤同(5)

注意：

1. 请勿接入高于额定“最大测量值”的电路；
2. 请勿在电流档、电阻档、二极管档、通断档、温度档测量电压值；
3. 在电池没有装好或后盖没有上紧时，请勿使用本仪器；
4. 在更换电池或保险丝前，请将测试表笔从测试点移开，并关机。

6 故障排除

如果您的仪表不能正常工作，以下方法可以帮助您快速解决一般问题。如果故障仍然排除不了，请与维修中心或经销商联系。

故障现象	检查部位及方法
显示屏未显示	电源未接通换电池
 符号出现	换电池
电流未输入	换保险丝

有限保修及责权范围

本产品自购买之日起,将可享受一年保修服务,但此保修不包括保险丝(熔断)、一次性电池(用完)、或者由于意外事故、疏忽、滥用、改造、污染、及操作环境的反常而导致的损害。

- 本说明书如有改变,恕不另行通知;
- 本说明书的内容被认为是正确的,若用户发现有错误、遗漏等,请与生产厂家联系;
- 本公司不承担由于用户错误操作所引起的事故和危害;
- 本说明书所讲述的功能,不作为将产品用作特殊用途的理由。

A Introduction






This product is a battery-powered, true-rms, auto-ranging digital multimeter with a 6000 counts, LCD display and backlight.



B Safety Information

To avoid possible electrical shock, fire, or personal injury, please read all safety information before you use the product.

- (1) Do NOT exceed the “maximum value” indicated in the Specification.
- (2) Examine the connection of the test leads and the insulation of the product before measuring voltage higher than 36V DC or 25V AC.
- (3) Disconnect the test leads from the circuit before changing the mode.
- (4) Misuse of mode or range can lead to hazards, be cautious. “OL” will be shown on the display when the input is out of range.
- (5) Safety symbols:

	Hazardous Voltage		Earth
	Double Insulated		Low Battery
	Risk of Danger. Check the User Manual.		

C Specifications

Electrical Specifications							
Function	Range	Resolution	Accuracy	MAX.Value	Other		
DC Voltage (V)	6.000V	0.001V	$\pm(0.5\%+3)$	100V			
	60.00V	0.01V					
	600.0V	0.1V					
	1000V	1V					
DC Voltage (mV)	60mV	0.01mV		600mV			
	600mV	0.1mV					
AC Voltage (V)	6.000V	0.001V		$\pm(1.0\%+3)$		750V	40Hz-1kHz
	60.00V	0.01V					
	600.0V	0.1V					
	750V	1V					
AC Voltage (mV)	60.00mV	0.01mV	600mV				
	600.0mV	0.1mV					
DC Current (A)	6.000A	0.001A	$\pm(1.2\%+3)$		20A		
	20.00A	0.01A					
DC Current (mA)	60.00mA	0.01mA		600AV			
	600.0mA	0.1mA					
DC Current (μ A)	600.0 μ A	0.1 μ A		6000 μ V			
	6000 μ A	1 μ A					
AC Current (A)	6.000A	0.001A		$\pm(1.5\%+3)$	20A		40Hz-1kHz
	20A	0.01A					
AC Current (mA)	60mA	0.01mA	600mA				
	600mA	0.1mA					
AC Current (μ A)	600.0 μ A	0.1 μ A	6000 μ A				
	6000 μ A	1 μ A					
Resistance	600.0 Ω	0.1 Ω	$\pm(0.5\%+3)$		60M Ω		
	6.000K Ω	0.001K Ω					
	60.00K Ω	0.01K Ω					
	600.0K Ω	0.1K Ω					
	6.000M Ω	0.001M Ω					
	60.00M Ω	0.01M Ω					
Capacitance	9.999nF	0.001nF	$\pm(5.0\%+20)$	9.999mF			
	99.99nF	0.01nF					
	999.9nF	0.1nF					
	9.999 μ F	0.001 μ F	$\pm(2.0\%+5)$				
	99.99 μ F	0.01 μ F					
	999.9 μ F	0.1 μ F					
	9.999mF	0.001mF					
	99.99mF	0.01mF					
Frequency	99.99Hz	0.01Hz	$\pm(0.1\%+2)$	9.999MHz			
	999.9Hz	0.1Hz					
	9.999KHz	0.001kHz					
	99.99KHz	0.01kHz					
	999.9KHz	0.1kHz					
	9.999MHz	0.001MHz					
Duty Cycle	1%~99%	0.1%	$\pm(0.1\%+2)$				
Diode	$\sqrt{\quad}$						
Continuity	$\sqrt{\quad}$						
Temperature	(20~1000) $^{\circ}$ C	1 $^{\circ}$ C	$\pm(2.5\%+5)$	1000 $^{\circ}$ C			
	(-4~1832) $^{\circ}$ F	1 $^{\circ}$ F		1832 $^{\circ}$ F			

General Specifications	
Display (LCD)	6000 counts
Ranging	Auto/Manual
Material	ABS
Update Rate	3 times/second
Ture RMS	√
Data Hold	√
Backlight	√
Low Battery Alert	√
Auto Power Off	√

Mechanical Specifications		
Dimension	180 *90 *45 mm	
Weight	319g	
Battery Type	1.5 V AA Battery * 2	
Warranty	One year	
Environmental Specifications		
Operating	Temperature	0~40°C
	Humidity	< 75%
Storage	Temperature	-20~60°C
	Humidity	< 80%

D Instruction

Front Panel (see the picture on the right)

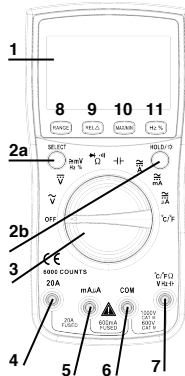
1. LCD display

2. buttons

2a. SELECT: To toggle between AC/DC, Voltage(mV) / Frequency / Duty Cycle/ Resistance / Continuity / Diode, or °C/°F, press this button.

2b. HOLD: To hold the current reading, press this button and you will see "HOLD" on the display; press again to cancel.

To turn on the backlight, press this button for more than 2 seconds; long-press again to turn off.



3. Rotary Switch

To change mode or range. (from OFF, clockwise)

3a. OFF

3b. AC Voltage (V)

3c. DC Voltage (V)

3d. Voltage(mV)/Frequency/Duty Cycle/

3e. Resistance/Continuity/Diode

3f. Capacitance

- 3g. AC/DC Current (A)
- 3h. AC/DC Current (mA)
- 3i. AC/DC Current (μ A)
- 3j. Temperature

4. 20A

Input terminal for current (V) measurements.

5. mA/ μ A

Input terminal for current (mA and μ A) measurements.

6. COM

Common terminal for all measurements.

7. V Ω Hz

Input terminal for voltage, frequency, duty cycle, resistance, continuity, diode, capacitance, and temperature measurements.

8. RANGE

press this button to enter the manual range; each push increases the range; when the highest range is reached, next push will go back to the lowest range; to exit the manual range mode, press the button for 2 seconds.

9. REL

the product allows relative measurements for the Modes of Voltage, Current, and Capacitance; press this button to enter the relative measurements mode; press again to exit.

10. MAX/MIN

press the button once to measure the MAX Value; press twice to measure the MIN Value; to exit the mode, press the button for 2 seconds.

11. Hz%

press this button when you measure AC Voltage or AC Current to measure their frequency/duty cycle

Measure AC/DC Voltage

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the AC Voltage (V) Mode, the DC Voltage (V) Mode, or the Voltage (mV) Mode;
3. Press SELECT to toggle between AC/DC;
4. Touch the probes to the correct test points of the circuit to measure the voltage;
5. Read the measured voltage on the display.

Caution:

- a. Do not measure voltage that exceeds the MAX Value as indicated in the Specifications;
- b. Do not touch high voltage circuit during measurements.

Measure AC/DC Current

1. Connect the black test lead to the COM Terminal and connect the red test lead to the 20A Terminal or the mA/ μ A Terminal (choose based on the value of current) ;
2. Turn the rotary switch to the AC/DC Current (A) Mode, the AC/DC Current (mA) Mode, or the AC/DC Current (μ A) Mode;
3. Press SELECT to toggle between AC/DC;
4. Break the circuit path to be measured. Then connect the test leads across the break and apply power;
5. Read the measured current on the display.

Caution:

- a. Do not measure current that exceeds the MAX Value as indicated in the Specifications;
- b. Use the 20A Terminal and the Current-A Mode when you are measuring an unknown current. Then switch to the mA/ μ A Terminal and the smaller Current Mode if necessary.

Do not input voltage exceeds 36V DC or 25V AC when you are at the setting of measuring current.

Measure Resistance

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the Resistance Mode, and the display will show "OL";
3. Touch the probes to the desired test points of the circuit to measure the resistance;
4. Read the measured resistance on the display.

Caution:

- a. Do not measure voltage that exceeds the MAX Value as indicated in the Specifications;
- b. Do not touch high voltage circuit during measurements.

Measure Continuity

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the Resistance Mode, press SELECT once to toggle to the Continuity Mode;
3. Touch the probes to the desired test points of the circuit;
4. The built-in beeper will beep when the resistance is lower than 50Ω , which indicates a short circuit.

Caution:

- a. Do not input voltage at the Continuity Mode.

Measure Diode

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the Resistance Mode, press SELECT twice to toggle to the Diode Mode;
3. Connect the red probe to the anode side and the black probe to the cathode side of the diode being tested;
4. Read the forward bias voltage value on the display;
5. If the polarity of the test leads is reversed with diode polarity or the diode is broken, the display reading shows "OL".

Caution:

- a. Do not input voltage at the Diode Mode.
- b. Disconnect circuit power and discharge all capacitors before you test diode.

Measure Diode

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the Capacitance Mode;
3. Connect the red probe to the anode side and the black probe to the cathode side of the capacitor being tested;
4. Read the measured capacitance value on the display once the reading is stabilized.

Caution:

- a. Disconnect circuit power and discharge all capacitors before you test capacitance.

Measure Frequency and Duty Cycle

1. Connect the black test lead to the COM Terminal and connect the red test lead to the VHz Terminal;
2. Turn the rotary switch to the Voltage(mV) Mode; press SELECT twice to toggle to the Frequency Mode or press SELECT three times to toggle to the Duty Cycle Mode;
3. Touch the probes to the desired test points of the circuit;
4. Read the measured frequency/duty cycle value on the display.

Caution:

- a. The Frequency Mode only applies to measure high frequency with low voltage.

Measure Temperature

1. Connect the black thermocouple probe to the COM Terminal and connect the red thermocouple probe to the VHz Terminal;
2. Turn the rotary switch to the Temperature Mode, and the display will show the room temperature, to toggle between

°C/°F, press SELECT button;

3. Touch the probes to the desired test points;

4. Read the measured temperature on the display.

Caution:

a. Do not input voltage at the Temperature Mode.

Auto Power Off

1. The product automatically powers off after 15 minutes of inactivity;


2. The built-in beeper beeps 5 times 1 minute before power off;

3. To restart the product, press SELECT button;

4. To disable the Auto Power Off function, hold down the SELECT button when turning on the product, you will hear five beeps if you have successfully

E General Maintenance

Beyond replacing batteries and fuses, do not attempt to repair or service the product unless you are qualified to do so and have the relevant calibration, performance test, and service instructions.


- (1) Do not operate the product around hot, wet, flammable, explosive or magnetic environments.
- (2) Clean the product with damp cloth and mild detergent; do not use abrasives or solvents.
- (3) Remove the input signals before you clean the product.
- (4) Remove the batteries if you will not use the product for a long time to prevent possible battery leak.
- (5) When “” is shown on the display, batteries shall be replaced as below:
 - Loosen the screw and remove the battery cover;
 - Replace the used batteries with new batteries of the same type;
 - Place the battery cover back and fasten the screw.
- (6) Replace fuses as above steps. Use only fuses of the same type as the original ones.

Warning:

1. Do NOT exceed the “maximum value” indicated in the Specification;
2. Do NOT input voltage at the Current Mode, the Resistance Mode, the Diode Mode, the Continuity Mode, or the Temperature Mode;
3. Do NOT use the product when the batteries or the battery cover is not placed properly;
4. Turn off the product and remove the test leads from the test points before changing batteries or fuses.

F Troubleshooting

If your product do not function as normal, the following steps may help you. If the problem still cannot be solved, please contact your dealer.

Problem	Possible Reason
Display Malfunction	Low battery; replace batteries
 Symbol	Replace batteries
No current input	Replace fuse

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Customers enjoy one-year warranty from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alternation, contamination, or abnormal conditions of operation or handling.

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