2000counts

Digital Multimeter Instructions User Manual

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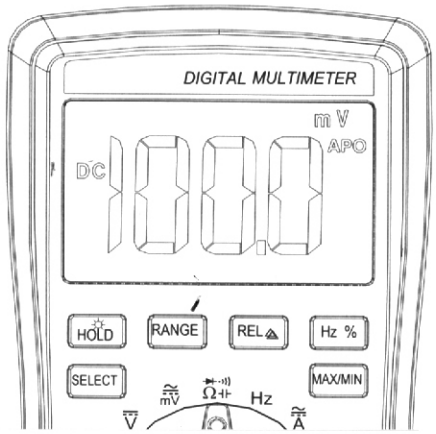
Digital Multimeter Operating Manual



一、Overview

2000 Counts with 31/2 automatic digital instrument, performance stable ,reliability and high precision; battery-driven automatic, adopts 21mm high LCD display, 15 seconds delay backlight, high pressure alarm and overload protection ,measure the DC voltage and AC voltage DC current and AC current、 resistance、 Capacitance Diode 、on-off test 、True RMS measurement 、frequency parameters

二、Safety Precautions:

Comply with IEC1010 (International Electrotechnical Commission promulgated safety standards), before use, please read the safety precautions.

1. When measure the voltage, please input the limit voltage of DC 1000V or AC 700V
2. Under 36V is safe for Body. when measured is over 36V DC and 25V AC voltage you be more careful about to use this multimeter
3. Test pen should leave the test point before Change function and range,
4. Select the correct function and range, for human safe ,you still pay more attention.
5. When measuring current, should not over 10A.

Safety Symbol Description

" ⚠ "Exist dangerous voltage . " ⏚ " Ground . " ▣ " Double insulation. " ⚠ "

Operator must refer to the **instruction manual.** " 🔋 "Low voltage symbol

三、Characteristics

1.Characteristics

1-1 Display, liquid crystal display (LCD)

1-2 Maximum display: 1999 (3 1/2) bits Automatic polarity display

1-3 Measurement: double integral A / D conversion;

1-4 Sampling rate: about 3 times per second;

1-5.Over range display: "0L"

1-6.Low voltage display: " 🔋 " symbol appears;

1-7.Working environment: (0 ~ 40) ° C, relative humidity <80%;

1-8. Power Battery supply: 9V.

1-9. Volume (size): 184 90 46 nm (LWH);

1-10.Weight: about 320g (including 9V battery);

1-11.Attachment: a manual, a certificate, a box, a pair of pen, K-type thermocouple

2. Technical characteristics

2-1 Accuracy (reading data of a%+ least significant digits), guaranteed accuracy environment temperature: (23.5) °C., Relative humidity <75%, calibration guarantee period from the date of manufacture for one year.

2-2 Performance:

Symbol function	2000counts
DC voltage DCV	▲
AC voltage ACV	▲
AC DC current mA/uA	▲
AC DC current 10A	▲
Resistor \diode\ on-off	▲
Capacitance C	▲
AUTO ON OFF	▲
BACKLIGHT DISPLAY	▲
unit symbol display	▲
True RMS measurement	▲
Electricfield measurement	▲
Voice value	▲

2-3 Technical Specifications

2-3-1 DC voltage(DCV)

Range \ Accuracy	2000counts	Resolution
200mV	(0.5%+3)	0.1mV
2V		0.001V
20V		0.01V
200V		0.1V
1000V	(0.8%+10)	1V

Input impedance: 10MΩOverload protection: 200mV range is 550V DC or AC peak; the rest is 1000V DC or 750V AC peak.

2-3-2 AC voltage RMS (ACV)

Range \ Accuracy	2000counts	Resolution
200mV	(0.8%+5)	0.1mV
2V		1mV
20V		10mV
200V		100mV
750V	(1.2%+10)	1V

Input impedance: 10MΩ.Standard sine wave and triangular wave frequency response:40 Hz-1kHz;

other waveform frequency response: 40Hz-200Hz

2-3-3 DC current

Range \ Accuracy	2000counts	Resolution
20uA	(0.8%+10)	0.1uA
2mA		0.001mA
20mA	(2.0%+30)	0.01A
200mA		0.1A
10A		1A

The maximum measured pressure drop: 200mv Overload protection:200： 200mA / 250V speed Glass Fuse: 10A: 10A / 250V ceramic speed fuse

2-3-4 AC current

Range \ Accuracy	2000counts	Resolution
20mA	(2.0%+30)	0.01A
200mA		0.1A
10A		1A

The maximum measured pressure drop: 200mv.Overload protection: 200mA： 200mA / 250V speed Glass Fuse: 10A: 10A / 250V ceramic speed fuse

Frequency response:Sine wave and triangular wave is 40HZ-1KZ; other waveform is 40Hz-200Hz;Display:

True RMS;

2-3-5. Resistance (Q)

Range \ Accuracy	2000counts	Resolution
200Ω	（0.8%+5）	0.1Ω
2KΩ	（0.8%+3）	1Ω
20KΩ		10Ω
200KΩ		100Ω
2MΩ		1KΩ
20MΩ	(1.0%+25)	10KΩ

measurement; Open circuit voltage: less than 3V; overload protection: 550V DC or AC peak;

A: In the use of 200Ω range, you should first short-circuit test leads, measured lead resistance, and then subtracted from the real

B: when measures larger than 1MΩ resistance, the slow reading is a normal phenomenon, please read the value after show stability.

2-3-6: NCV measurement;

When the dial to the measurement ncv function, the instrument approached electric field. beep sound changes according to the strength of the electric beep intermittent sounds also from strong. to weak.

2-3-7 Capacitance

Range \ Accuracy	2000counts	Resolution
20 nF	（3.5%+20）	10pF
200nF		100pF
2uF		1nF
20uF		10nF
200uF	（5.0%+10）	100nF
2mF		1uF
20mF		10uF

Overload protection: 550V DC or AC peak

Input sensitivity: 1V RMS; overload protection; 550V DC or AC peak (not more than 10 second

2-3-8 Diodes power-on test

Range	Display value	Test Conditions
Ω⊣⊢	Diode forward voltage drop	Forward DC current about 1mA Open circuit voltage about 3V
	The buzzer long sounds Test the resistance of two points less than (50 20) Ω	Open circuit voltage about 3V

Overload protection: 550V DC or AC peak

Warn :

for safety. within this range, It is Prohibited to input the voltage value

2-3-9. Voice value

Voice value is our company after years of research, constantly summed up the development of a full intelligent digital voice report form, according to the requirements of customers choose to use Chinese or English voice value, voice table for the user to bring great convenience, such as in the light of the dark situation, do not have to see the LCD display, only the reading is stable, it will automatically reporting, some older maintenance staff, because the eyes are not good, a series of numbers will be easy to wrong, with the voice value, completely solve the light dim and vertigo brought trouble.The table design is reasonable, in the case of non-value, in a low power state, is very worthy of the letter-resistant digital multimeter, in order to enable users to use in the use of accurate and reasonable voice value, in the course of the need to pay attention the following:

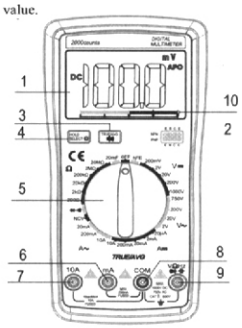
1. DC200mV, AC2V file due to a very small magnetic field interference in the instrument there is data changes, so the end of the two files at the end of 20 words do not report the number of communication stalls, there are 5 words in the exchange of the base number is not reported value , other files the bit has a base word of 2 words that do not report the value, which is set to prevent interference, DC voltage, DC current, resistance file, after the initial measurement of the value, the end of the two words to change the second voice to pay the value, or as interference data is not reported value, AC current, the end of the voltage to change the word 3 words to the second voice reported otherwise the interference data is not reported value, in the test, only data stability can be reported

2. Diode / buzzer, electric field sensor stall cancellation function. If the buzzer alarm, stop the voice value, that is, voice and beep at the same time have test points, can only choose buzzer such as DC1000V, AC750V, high current 10A alarm point, you can only choose buzzer alarm , while canceling the voice function.

3. 890S for the intelligent voice automatically reported value, beyond the traditional switch to pay attention to the trouble, the use of ordinary table pen to achieve the voice can be reported for the maintenance staff to provide a more convenient test, especially for light dark environment, accurate and timely give the value.

四、Use Method :

(一) operation panel instructions (see right graphic)



1. LCD display;
2. Manual range selection
3.RMS/AGV4 selection key;
4. Function selection switch,
5. mA / uA current inputsocket;
6. 10A current input socket;
7. COM input, negative input,black table into the pen.
8.voltage,resistance,diodes,capacitors,frequency,"+" Input

(二)DC voltage measurement

1. Insert the black test lead into the "COM" socket. The red test pen into the "V /Ω/ Hz" jack;
2. Turn the range switch to the DC voltage measurement mode.
3. The test pen to reliably touch the test point, the screen shows the measured voltage value, display the DC voltage measured, the red pen is connected to the point of the polarity of the voltage.

Note:

1)Do not input voltage exceed DC1000V or AC750V, if do, there will damage the instrument circuit;

2)When measuring high voltage circuit, pay special attention to avoid electric shock;

3) After completing all measuring operations, disconnect the test leads from the circuit under test.

三、 AC voltage measurement

1.Insert the black test lead into the "COM" socket while the red test lead into the "V /Ω/ Hz" jack.

2. Turn the range switch to the AC voltage auto measurement mode.

Note:

1). Before test there exits some residual numbers in the range, but does not affect the measurement accuracy;

2). Do not input voltage exceed 750Vrms, if do, there will damage the instrument circuit;

3). When measuring high voltage circuit, pay special attention to avoid electric shock;

4). After completing all the measuring operations, disconnect the test leads from the circuit under test

（四） DC current measurement

1.Insert the black test lead into the "COM" socket, insert the red test lead into the "mA / uA" jack (max. 200mA), or insert the red test lead into "10A" (max. 10A);

2. Turn the range switch to the corresponding DCA position, then insert the instrument into the circuit pending to test. The current value of the measured current and the polarity of the red test point will also be displayed on the screen at the same time.

Note:

1). the instrument series connection to the circuit pending to test before the circuit should be power off first

2). The maximum input current is 200mA or 10A (depending on the location of the red test pen inserted), excessive current will damage the mA file fuse. when measures

10A to be careful, each measurement time shall not exceed 10 seconds , Too much current will make the circuit heat, or even damage the instrument;

3). When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.

4). After the completion of all measurement, at first you should turn off the power and disconnect the test leads than measured circuit connection,this is more important to high current

5). forbidden to input more than 36V DC, 25V AC voltage between the current jack and the "COM" jack.

（五）、 AC current measuremen

1. Insert the black test lead into the "COM" socket, insert the red test lead into the "mA / uA" jack (max. 200mA), or insert the red test lead into "10A" (max. 10A); Default value for the dc current. Choose"SELECT" key to switch between AC and DC current;

2Adjust the range switch to the corresponding DCA position, and then insert the instrument into the circuit pending to test. The measured current value and the current polarity of the red test point will also be displayed on the screen at the same time.

Note:

1) the instrument series connection to the circuit pending to test,before the circuit power off firstly;

2) If you don't know how to measure current range, the range switch should be transferred to the highest range, and then according to the display value to the corresponding file; such as the screen display "0L" that has exceeded the range, needed to turn the range switch to the appropriate gear;

3) The maximum input current is 200mA or 10A (depending on the location of the red test pen inserted),

excessive current will damage the mA file fuse in the measurement of 10A to be careful, each time when you measured the reading shall not exceed 10 seconds , Too much current will make the circuit heat, or even damage the multimeter;

4) When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel as it will damage the fuses and the instrument.

5) After completion of all measurement operation, you should firstly turn off the power,disconnect the test leads to the measured circuit, especially to high current measurement

6) Forbidden to input more than 36V DC, 25V AC voltage between the current jack and the "COM" jack.

(六) Resistance Measurement

1.Insert the black test pen into the "COM" socket while the red test pen leads into the "V /Ω/ Hz" jack.

2. Rotate the dial to the "^" position, trigger the "SELECT" key and select the resistance grade for automatic measurement.

3. Connect the two test pens leads across the measured resistance.

Note:

1) If the measured resistance is working or resistance exceeds the selected range, the display will show "0L". When the measured resistance value exceeds 1MQ, the reading takes several seconds to stabilize. It is normal when measuring high resistance ;

2) When measuring low resistance, the table will bring the internal resistance, in order to obtain accurate readings, you can firstly record the short-circuit value of the table pen, by testing value minus the short-circuit value.

3).When measuring the on-line resistance, pls make sure that all the circuits under test must be turned off and all capacitors fully discharged in order to ensure the measured value accurately.

4).Do not enter the voltage in the resistance range, which is absolutely prohibited, although the instrument in the gear on the voltage protection.

(七) Capacitance Measurement

1. Insert the black test pen leads into the "COM" socket while the red test pen leads into the "V /Ω/ Hz" jack.

2. Rotate the dial to the "^" position, trigger the "SELECT" key, and select the capacitance profile for automatic measurement.

3. Then connect the test leads across the measured capacitance.

Note:

1).When measuring the capacitance with 10nF range,It may be residual reading on the screen display value. which is the distributed capacitance of the test pen. For an

4accurate reading which can be subtracted after measurement.

2). When large capacitance stalls is measuring serious leakage or breakdown capacitor, it will show some unstable values ;it is normal that be measuring large capacitors, the reading takes a few seconds to stabilize.

3).Please test the capacitor capacity before the capacitor should be fully discharged to prevent damage to the fuse and instrumentation.

4). Unit: lF = 1000mF ImF = 1000uF luF = 1000nF lnF = 1000p

(八) Diodes and on-off test

1. Insert the black test lead into the "COM" socket while the red test lead into the "V /Ω/ Hz" jack (note the

polarity of the red test pen is "+");

2.Setting the range switch to ""grade, trigger the "SELECT" key, select the diode measurement, and connect the test leads to the diode was not tested. The reading is an approximation of forward voltage drop of the diode. For silicon PN junction, 500niV ~800niV

confirmed as normal; if the measured diode open circuit or reverse polarity, then display "0L";

3. Trigger the "SELECT" key to select the buzzer measurement and connect the test leads to two points of the circuit pending test. If the built-in buzzer sounds and the on-off alarm indicator is on, the resistance between the two points is below (50 20) Q.

Note :

Do not input voltage symbol, so as not to damage the instrument.

(九) Frequency Measurement

1. Insert the test leads or shielded cable into the "COM" and "V /Ω/ Hz" jacks; dial to "Hz".

2.Turn the range switch to the frequency range, and connect the test leads or cables across the signal source or load under test.

Note:

1).when the input exceeds IOV rnis, you can read, but may be weak;

2).In noisy environment, it is better to use shielded cable when measuring small signal;

3).In the measurement of high voltage circuit, with particular attention to avoid electric shock;

4).Do not input more than 250V DC or AC peak voltage, so as not to damage the instrument.

（十）keep data/backlight is on/off

Press "HOLD" key for data retention, keep press "HOLD" for 3 seconds, backlight is on.

And press 3 seconds again, backlight will be off, 15 seconds after the backlight will auto close.

(十一) automatic Start up & Shutdown

When the instrument stops using for about 15 minutes, the meter will automatically power off to enter the sleep state; To restart the power, dial to the OFF position, turn the knob to other gears. Hold down the "SELECT" button, and turn on the power switch at the same time, the screen "APO" symbol disappears, will cancel the automatic shutdown function.

五、Troubleshooting

If your instrument does not work, the following method can help you solve the general problem, if the fault still can not be excluded, please contact the service center or dealer..

Failure phenomenon	Check the location and methods
Not shown	Battery not connected Replace the battery
Symbol exit	Replace the battery
Current is not input	Replace fuse
Display error	Replace the battery

Once this manual is being changed without notice.

These contents of this manual included are considered to be correct, if the user found errors, omissions, etc., please contact the manufacturer directly.

The company does not undertake due to user error operation and the harm caused by the accident

The functions described in this manual are not intended to reasons of the product for special purposes.

六、Instrument maintenance

The series of instruments is a accurate instrument, the user should not arbitrarily change the circuit.

1.Please pay attention to waterproof and dustproof.

2.Should not be work the high temperature and high humidity ,flammable and explosive environments and strong magnetic field to store and use the instrument.

3. Please use a wet cloth and mild detergent to clean the appearance of the instrument, do not use abrasive or other strong solvents like alcohol and so on.

4.If you do not use for a long time, you should remove the battery to prevent leakage of the battery corrosion instrument.

Note the battery usage, when the screen shows the "" symbol, you should replace the battery, the steps are as follows:

4-1-1 Unscrew the screws that fixed the battery cover and eject the battery cover.

4-1-2 Remove the battery and replace it with a new one. Although any standard battery can be used, it is best to use alkaline batteries for extended use.

4-1-3 Attach the battery cover and tighten the screws.

4-2 Fuse Replacement

When replacing the fuse, use the same type of fuse.

6000-0890S-000ZJ