DIGITAL MULTIMETER
OPERATION MANUAL

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1. SUMMARY

The digital multimeter is a steady performance,ba driven 3 3/4 digital multimeter. It uses the LCD with 23mm-high figure to make the reading clear. The fun of 15 Sec. Backlight displaying and overload protecti make operation more convenient.

The digital multimeter has the function of measuri DCV, ACV, DCA, ACA, resistance, capacitance, frequency, temperature ,duty cycle and diode, contin performance test .The meter can provide functions including analog bar and unit symbol display, data holding (HOLD), relative value measuring (REL), maximal/minimal value measuring(MAX/MIN), aut manual range switching (RANGE), auto power off an warning functions .it adopts double integral A/D converter as its core. It is an ideal tool for labs, factor and radio-technology.

2. SAFTEY NOTES:

The instrument is designed according to IEC1010 standard (safety standard issued by International Ele technical Committee). Please read the following befo operation.

1. Ensure that the test leads correct inset and connec good insulation avoiding to electronic shock before measurement.

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t,

2. Do not input the over limit value while measuring to avoid to the electronic shock and meter's damage.

3. Voltage less than 36V is a safety voltage. When measuring voltage higher than DC 36V, AC 25V, check the connection and insulation of test leads to avoid electric shock.

4. Select correct function and range to avoid fault operation.

5. Please move the test leads away from test points when switching the function.

6. Please don't input voltage value when measuring current.

7.Please don't modify the circuit.

8. Introduction for safety symbol:

"⚠" exists high voltage; "⏚" GND "▣" dual insulation "⚠" must refer to manual "🔋"
Low battery

3. SPECIFICATION

1. General features

1-1. Displaying: LCD;

1-2.Max display: 3999(3 3/4) digits automatic polarity and unit symbol display;

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

1-4. Sampling rate: approx.3 times/sec. For the analog stick. 30times/sec.

1-5. Over-range display: "OL" displayed in the highest digit.

1-6. Low battery display: "🔋"

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

1-8.Store environment: (0-50℃), relative humidity:<80%;

1-9.Power supply: 1pcs 9V battery(NEDA1604/6F22);

1-10. Dimension: 189mm×97mm×35mm (length×width×height);

1-11. Weight: approx.400g (including battery);

1-12.Accessories: test leads, user manual, temperature probe, holster, gift box, and 1×9V battery.

2. TECHNICAL FEATURES

2-1. Accuracy:±(a%×reading data + digits), environment temperature at (23±5)℃, relative humidity<75%, One year guarantee since production date.

2-2.DC Voltage（DCV）

Range	Accuracy	Resolution
400mV	±(0. 5%+4)	0.1mV
4V		1mV
40V		10mV
400V		100mV
1000V	±(1.0%+4)	1V

Input impedance: 400mV Range ＞10MΩ,
other range is 40MΩ;

Overload protection: 1000V DC or 750 V AC peak value.

2-3.DC voltage (DCmV)

Range	Accuracy	Resolution
40mV	±(1.5%+4)	0.01mV
400mV		0.1mV

Input impedance：＞10MΩ，
other range is 40MΩ；

Overload protection：1000V DC or 750 V AC peak value.

2-4.AC Voltage（ACV）

Range	Accuracy	Resolution
4V	±（0. 8%+6）	1mV
40V		10mV
400V		100mV
750V	±(1.0%+8)	1V

Input impedance：400mV Range＞10MΩ，
other range is 40MΩ peak value.

Overload protection：1000V DC or 750V AC.

Frequency response：750V range:(40～200)Hz，
other range:（40～400）Hz.

Display :Sine wave RMS (Average value response).

2-5.AC current (ACmV)

Range	Accuracy	Resolution
40mV	±（1. 6%+6）	0. 01mV
400mV		0. 1mV

Input impedance：＞10MΩ

Overload protection：1000V DC or 750 V AC peak value.

Frequency is：(40～400)Hz .

Display :Sine wave RMS (Average value response).

2-6.DC Current（DCA）

Range	Accuracy	Resolution
400μA	±(1.0%+10)	0.1μA
4mA		1μA
40mA		10μA
400mA		100μA
20A	±(1.2%+10)	10mA

MAX measurement voltage drop:
full range mA :1.2V，A:100mV .

Max input current: 20A (within 10 seconds)

Over load protection: 0. 5A/ 250V ; 20A/ 250V
fast -blown fuse protect.

2-7.AC Current（ACA）

Range	Accuracy	Resolution
400μA	±(1.5%+5)	0.1μA
4mA		1μA
40mA		10μA
400mA		100μA
20A	±(2.0%+15)	10mA

MAX measurement voltage drop:
full range mA :1.2V，A:100mV .

Max input current: 20A (within 10 seconds)

Over load protection: 0. 5A/ 250V ; 20A/ 250V
fast -blown fuse protect.

Frequency response：20A range:40～100Hz,
other range:40～400Hz.

2-8.Resistance（Ω）

Range	Accuracy	Resolution
400Ω	±(0.8%+5)	0.1Ω
4kΩ	±(0.8%+4)	1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40 MΩ	±(1.2%+5)	10kΩ

Open circuit voltage：400mV

Over load protection: 250V DC or AC peak value;

NOTE:

At range 400Ω, short-circuit the test leads to measure the wire resistance, then subtracts it from the real measurement.

2-9.Capacitance（C）

Range	Accuracy	Resolution
40nF	±(3.5%+6)	10pF
400nF	±(2.5%+8)	100pF
4μF		1nF
40μF		10nF
200μF	±(5.0%+8)	100nF

Over load protection: 250V DC or AC peak value;

2-10.Frequency（F）

Range	Accuracy	Resolution
100Hz	±(0.5%+4)	0.1Hz
1000Hz		1Hz
10kHz		10Hz
100kHz		100Hz
1MHz		1kHz
10MHz		10kHz

Input sensitivity:1.2V

Over load protection: 250V DC or AC peak value;

2-11. Diode and continuity performance test

Range	Value displayed	Testing condition
▶|•)))	Forward voltage drop of diode	Forward DCA is approx. 0.5mA, the backward voltage is approx 1.5V
	Buzzer makes a long sound while resistance is less than (30±20) Ω	Open circuit voltage is approx.0.5V.

Over load protection: 250V DC or AC peak value;

Caution:

Don`t input voltage at this range!

2-12. Temperature（℃/℉）

Range	Accuracy	Resolution
(-20～1000)℃	<0℃ ±(1.0%+5) 0℃-400℃ ±(1.0%+4) ≥400℃ ±(1.5%+15)	1℃
0℉-1832℉	<750℉ ±(0.8%+5) ≥750℉ ±(1.5%+15)	1℉

Sensor：TP01(K type thermocouple)

CAUTION：

Don`t input voltage at this range!

4. OPERATION

4-1. Panel description

1. LCD: display the measuring value and unit.

2.Function key:

2-1. “SELECT” key：DC /AC mode , temperature ℃/℉, Diode / Continuity performance switch.

2-2.RANGE key：select auto range or manual range mode, Auto range is the original states, it will display “AUTO” symbol，press it change to manual range . Press it more than 2 second , it will return to auto range states

2-3.HOLD key：press it, the presently measured value is held on LCD and HOLD symbol displays. Press it again, HOLD symbol disappears, and the meter is exited the holding mode. Press it for 2 seconds,the back light on.

2-4.REL key：press it，re
value measurement sta
Press it again, “REL”
meter is exited the rela

2-5.MAX/MIN key :press
hold the max value of
into MIN mode, it will
No auto power off and
Mode. Press it more th
MIN states.

2-6.Hz/DUTY key：When
(Current)，press it，it
cycle/Voltage(Current
Frequency ,it will swit
(1~99%).

3.Knob:select measuring function and range.

4.Temperature terminal.

5.Voltage,resistance, frequency terminal

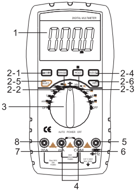
6.GND

7.Less than 400mA current testing terminal

8.20A current testing terminal

ading clear，turn into relative
ates，“REL”symbol displays,
symbol disappears, and the
ative mode.
it, turn into MAX mode, it will
measuring, press it again ,turn
hold the min value of measuring.
analog bar display under this
an 2 second , it will exit MAX/

measuring the AC Voltage
will switch Frequency/duty
)，When measuring the
ch frequency/duty cycle



4-2. DCV measurement

1 .Insert the black test lead to“COM”terminal and the red one to“V/Ω/Hz”terminal.

2.Select the knob to “V⎓” range;

3. Auto range is the original states, it will display “AUTO”symbol，press “RANGE”key change to manual range mode，400mV、4V、40V、400V、1000V range is selective;

4. Connect the leads crossly to the electric circuit under test, LCD displays polarity and voltage under test connected by the red test lead.

Note:

1.Firstly users should select the knob to the highest range, if users had no idea about the range of voltage under test, and then select the proper range based on displaying value. If LCD displays“OL”it means meter is over the max. Value of this range, thus should select the knob to a higher range.

2. Do not input a voltage over DC 1000V. Otherwise it will damage the meter

3. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.

4-3. ACV measurement

1 .Insert the black test lead to“COM”terminal and the red one to“V/Ω/Hz”terminal.

2. Select the knob to “V～” range;

3. Auto range is the original states, it will display “AUTO”symbol，press “RANGE”key change to manual range mode，400mV、4V、40V、400V、750V range is selective; (remark：when measuring ACV under auto range states, press“RANGE”key will display AC mV range)

4.connect the leads crossly to the electric circuit under test, LCD displays voltage by the test lead.

Note:

1. Firstly users should select the knob to the highest range, if users had no idea about the range of voltage under test, and then select the proper range based on displaying value. If LCD displays“OL”it means meter is over the max. Value of this range, thus should select the knob to a higher range.

2. Do not input a voltage over AC 750V.

3. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.

4-4.DCA measurement

1.Insert the black test lead to“COM”terminal and the red one to“mA”terminal (the Max. 400mA) or to “20A”the Max.20A);

2.Select the knob to a proper DCA range, press “SELECT”key to select the measurement mode, then connect the leads crossly to the electric circuit under

test; LCD displays polarity and current under test connected by the red test lead.

Note:

1.Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value .

2.If the LCD displays “OL” ， it means the current is over range. Now you need to select the knob to the higher.

3.Max. input current is 400mA or 20A（subject to where the red test lead insert to）, too large current will damage the fuse.

4-5.ACA measurement

1.Insert the black test lead to “COM” terminal and the red one to “mA” terminal (the Max. 400mA) or to “20A” the Max.20A);

2. Select the knob to a proper ACA range, press “SELECT” key to select the measurement mode ,and connect the leads crossly to the electric circuit under test. LCD displays current by the test lead.

Note:

1.Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value .

2.If the LCD displays “OL” ， it means the current is over range. Now you need to select the knob to the higher.

3.Max. input current is 400mAor 20A（subject to where the red test lead insert to）, too large current will damage the fuse.

4-6.Resistance measurement

1. insert the black lest lead to “COM” terminal and the red one to “V/Ω/Hz” terminal.

2. Select the knob to a proper resistance range, and connect the leads crossly with the resistor under tested.

3.Auto range is the original states ,press “RANGE” key change to manual range mode

4.When measuring the min. resistance ,please short-circuit the test leads at first, press “REL” ,then test the resistance ,it will display the actual resistance.

Note:

1. The LCD displays “OL” when the resistance is over the selected range. The knob should be adjusted to a higher range. When measuring value is over 1MΩ the reading will take a few seconds to be stable. It's normal for high resistance measuring.

2. When input terminal is in open circuit, overload displays “OL” .

3. When measuring in line resistor, be sure that the power is off and all capacitors are released completely.

4. Do not input any voltage at resistance range eve meter has voltage protection functions at this r

5.Don't input voltoge in resistance level

4-7.Capacitance measurement

1.Select knob to “⊣⊢” range;

2. Insert the black lest lead to “COM” terminal ar red one to “V/Ω/Hz” terminal.

3.If the LCD doesn't display “0” press “REL” to the reading;

4.Select the knob to proper capacitance range, and the measuring accessories or test leads into “C and “V/Ω/Hz” terminal.(Note :the red test lead positive pole “＋”).LCD displays capacitance

Note:

1.Don't input voltage or current to the “V/Ω/ terminal when measuring the capacitance o capacitance isn't away from the “Cx” termi

2.In order to assure the accuracy ,please press to clear the reading before testing.

3. there is only the auto range mode under the capacitance range.

4.the capacitance must be complete discharge testing.

5.The reading of 200µF range delay 15 second

4-8.Frequency measurement

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Hz”
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“REL”

before

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1. insert the black lest lead to “COM” terminal and the red one to “V/Ω/Hz” terminal.
2. select the knob to “Hz” range, insert the test leads or shielded cable to the signal source or the load which is tested.
3. Press “Hz/DUTY” key to switch frequency/duty cycle, it will display the frequency or duty cycle of the signal source which is tested.

Note:

1. There is only the auto range mode under the frequency range;
2. The meter can still work if the input is higher than 1.5Vrms, but the accuracy is not guaranteed;
3. In noise environment, you'd better use shield cable To measure a low signal;
4. When measuring high voltage circuit, any parts of your body should not touch the high voltage circuit;
5. Don't input voltage higher than 250V DC or AC peak value ,or it may damage the meter.

4-9. Diode and Continuity performance test:

1. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal (the polarity of red lead is “+”
2. Select the knob to “→|•))” range ,press “SELECT” key to select the measurement mode.

3. connect test leads with the diode under tested, the red test leads connect to diode positive polarity, the black test leads to diode cathode polarity, the reading is the approx. value of diode forward volt drop.
4. the red test connect to diode cathode polarity, the black test leads to diode positive polarity ,the LCD display “OL”;
5. The complete diode testing include forward and backward measurement, if the result isn't meet the above, it means the diode is bad.
6. press “SELECT” key to select the Continuity measurement mode.
7. Insert test leads to two points of tested circuit, if the inner buzzer sounds, the resistance is less than (30±20)Ω.

Note:

Don't input voltage at “→|•))” range.

4-10. Temperature measurement

1. Select the knob to “℃/℉” range.
2. Insert the cathode(black pin) of cold end (free end) of thermocouple into “mA” jack, anode (red pin) into “V/Ω/Hz” jack, put the working end (temperature measurement end) of thermocouple on the surface or inside the object to be tested. Then you can read temperature from the screen, and the data is in Centigrade.

3.press “SELECT” key to select Fahrenheit, the data is in Fahrenheit.

Note:

1.when the input terminal open-circuit ,it will display the normal temperature.

2.Don't change the temperature probe optionally ,or the value accuracy isn't guarantee.

3.Don't input voltage at temperature range.

4-11. Data holding

presently measured value is held on LCD and HOLD symbol displays. press it again ,the function is cancelled.

4-12.Auto power off

1. When the meter stops work about 15 minutes, the built-in buzzer will be sound 5 times and turn into sleeping mode, 1 minute later, the buzzer sound a long voice 1 time, the meter will be power off. Press any key to restart the power.

5. Meter maintenance

the meter is a high accuracy instrument, please don't modify the circuit.

1. Keep the meter away from water, dust and shock.
2. Do not store and operate the meter under the condition of high temperature, high humidity, combustible, explosive and strong magnetic place.
3. Wipe the case with a damp cloth and detergent, do not use abrasives and alcohol.

4. If do not operate for a long time, should take out the battery to avoid leakage.
5. When “🔋” symbol displays, should replace the battery following the steps:

5-1. Unlock the button and remove the battery case;

5-2. Take out the old battery and replace the new one. It's better to use alkaline battery for longer life.

5-3. Fit on the battery case and lock the button;

6. fuse change: When replacing fuse, please change another same type and specification fuse.

Note:

1.Don't input the voltage value higher than DC 1000V or AC 750V

2.Don't measuring the voltage at current ,resistance , diode and continuity rage.

3.Don't use the meter when the battery isn't install or the back case isn't firm.

4. When replacing fuse, please take away the test leads from the measuring point and power off at first.

6.Trouble shooting

If the meter does not work properly, check the meter as following:please contact the maintoion center or lontact salesman, if this method still can not solve the trouble

Fault	Solution
No reading on LCD	■Turn on the power ■Set the HOLD key to a correct mode ■Replace battery
🔋 signal appears	■Replace battery
No current or temperature input	■Replace fuse
Big error Value	■Replace battery

- ● The specifications are subject to change without notice.
- ● The content of this manual is regarded as correct, error or omits Pls. contact with factory.
- ● We hereby will not be responsible for the accident and damage caused by improper operation.
- ● The function stated for this User Manual cannot be the Reason of special usage.

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