DIGITAL MULTIMETER

OPERATION MANUAL

1. SUMMARIZE

The instrument is a stable digital multimeter driven by battery. It uses the LCD with 18mm high make the reading clearly. Backlight displaying and overload protection make it convenient to use .The instrument has the function of measuring DCV, ACV, DCA,ACA, resistance, capacitance, diode, continuity and frequency , thus it is a portable and desirable tool for users .The instrument takes dual-integral A/D converter as key point, is an excellent tools. It’s an ideal tool

for lab, factory and family.

2. SAFETY NOTE

The meter meets the standards of IEC1010.

Read the operation manual carefully before operation.

1. Do not input limit over-ranged.

2. The voltage below 36V is safety. To avoid electric shock, check whether the test leads are connected correctly, whether the insulation is good when measuring over 36DCV or 25ACV.

3. Remove the test leads when changing function and range.

4. To select correct function and range, beware of error operation.;

5. Do not operate the meter if battery case and back cover is not fixed.

6. Do not input voltage when measuring resistance.

7. Remove test leads from test point and turn off the power before replacing battery and fuse.

8. SAFETY SYMBOLS

“⚠”EXISTS DANGEROUS VOLTAGE，“⏚” GND，“⧈”DUAL INSULATION

“⚠”THE OPERATOR MUST REFER TO

THE MANUAL ，“  ”LOW BATTERY

3. CHARACTERISTIC

1．GENERAL

1-1．Display :LCD displaying.

1-2．Max. displaying: 1999（3 1/2digit）auto polarity indication.

1-3．Measuring method: dual slope A/D conversion.

1-4．Sampling rate: approx. 3 times/second.

1-5．Over range indication: the MSD displays“OL”.

1-6．Low battery indication:“  ” appears.

1-7．Operation environment: （0～40）℃，R.H.<80%.

1-8．Power：1.5V×2pcs

1-9．Size: 150×73.5×35mm

1-10．Weight: approx. 156g（including battery）.

1-11.Accessories:operation manual ,holster, gift box, test leads and 1.5V battery.

2．TECHNICAL CHARACTERISTIC

2-1．Accuracy:±(a%×rdg＋d) at (23±5)℃，R.H.<75%，one year guaranteed from the production date.

2-2. TECHNICAL DATA

2-2-1. DCV

RANGE	ACCURACY	RESOLUTION
200mV	±(0.5%+3)	100uV
2V		1mV
20V		10mV
200V		100mV
600V	±(1.0%+10)	1V

Input resistance: All ranges: 10 MΩ

Overload protection: 250V DV or AC peak value at 200mV range.

600V DC or AC peak value at other ranges.

2-2-2. ACV True RMS measurement

RANGE	ACCURACY	RESOLUTION

2V	±(0.8%+5)	1mV
200V		100mV
600V	±(1.2%+10)	1V

Input resistance:All ranges 10MΩ Displaying:

True RMS response

Overload protection: 250V DC or AC peak value at 200mV , 600V DC or AC peak value at other ranges.

Frequency response :sine wave ,triangular wave :(40-1000)Hz, other wave:(40-200) Hz.

2-2-3.DCA

RANGE	ACCURACY	RESOLUTION

20mA	±(1.2%+8)	10uA
200mA		100uA
10A	±(2.0%+5)	10mA

Max. input volt drop: 200mV;

Max. input current: 10A（the test time should be within 10 seconds）

Overload protection: 0.2A/250V fast-melt fuse, no protection at 10A.

2-2-4.ACA True RMS measurement

RANGE	ACCURACY	RESOLUTION
200mA	±(1.5%+15)	100uA
10A	±(3.0%+10)	10mA

Max. measuring volt drop: 200mV.

Max. input current: 10A（the test time should be within 10 seconds）.

Overload protection: 0.2A/250V fuse； no protection at 10A.

Frequency response: (40～200)Hz.

Display:True RMS response.

2-2-5. RESISTANCE（Ω）

RANGE	ACCURACY	RESOLUTION
200Ω	±(0.8%+5)	0.1Ω
20kΩ	±(0.8%+3)	10Ω
200kΩ		100Ω
20MΩ	±(1.0%+25)	10kΩ

Open voltage: less than 3V.

Overload protection: 250V DC or AC peak value.

NOTE:

1. at 200Ω range, the test leads should be short-circuit, and measure the down-lead resistance, then, subtract from the real measuring.

2.It is normal of reading slow when measured value above 1MΩ,pls read it after the display value is stable.

2-2-6. CAPACITANCE (C)

RANGE	ACCURACY	RESOLUTION
20nF	±(3.5%+20)	10pF
200nF		100pF
2uF		1nF
20uF	±(5.0%+10)	10nF
200uF		100nF
2000uF		1uF

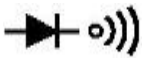
Overload protection: 250V DC or AC peak value

2-2-7.FREQUENCY

RANGE	ACCURACY	RESOLUTION
10Hz	±(1.0%+10)	0.001Hz
100Hz		0.01Hz
1kHz		0.1Hz
10kHz		1Hz
100kHz		10Hz
2MHz		100Hz

Input sensivity:1V RMS , overload protection : 250V DC or AC peak value(less than 15 seconds)

2-2-8.DIODE AND CONTINUITY TEST

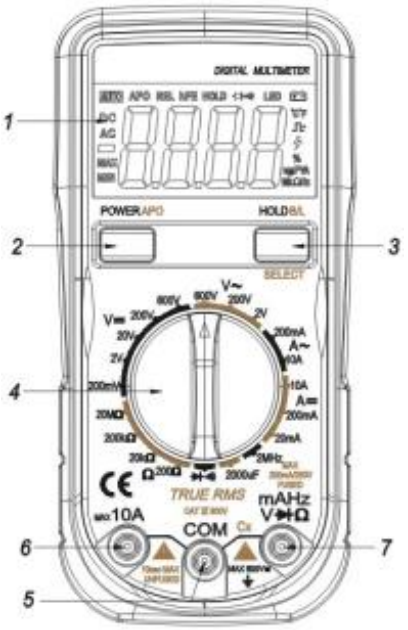
Range	Displaying value	Test condition
	Positive voltage drop of diode	The positive DC current is approx. 1mA , negative voltage is approx. 3V
	Buzzer sounds , the resistance is less than(50±20)Ω	open voltage is approx. 3V

Overload protection: 250V DC or AC peak value

Warning: DO NOT input any voltage at this range for safety!

4. OPERATION

4.1 Front panel description



1. LCD: display the measured value .

2. Power/auto power off key:turn on/off the power and auto power off.

3. Hold/backlight/function selecting key: turn on/off hold and backlight key.

4 .range knob: selecting measuring function

and range .

5. GND.

6. 10A current test jack.

7. “+” pole jack of voltage 、resistance、diode、capacitance and resistance.

4.2 VOLTAGE MEASUREMENT

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

2.Set the range knob to a proper DCV/ACV range, If the measured voltage is unsure beforehand, should set the range knob to the highest range,then reduce it gradually

until get the highest resolution readings.

3.Apply the test leads to the test point ,the LCD display the measured voltage value.

NOTE:

1.If LCD displays “OL”, it means over range, should set the range knob to a higher range.

2.Do not input a voltage over 600V DCA or 600V ACV, the test leads should off the test point when switching the function and range.

3.Do not touch a high voltage circuit when measure high voltage .

4.3 CURRENT MEASUREMENT

1.Insert the black test lead to “COM” jack, the red one to “mA” or “10A”jack.

2. Set the range knob to a proper DC or ACmA/A range, If the measured voltage is unsure beforehand, should set the range knob to the highest range,then reduce it gradually until get the highest resolution readings.

3. connect the test leads to the circuit under tested, the LCD display the measured voltage value.

NOTE:

1.If LCD displays “OL”, it means over range, should set the range knob to a higher range.

2.When measure current,mA hole should not excess 200mA,10A hole should not excess 10A(test time should less than 10 sec.)

4.4 RESISTANCE MEASUREMENT

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

2.Set the range knob to a proper resistance range, connect the test leads across to the resistance under measured.

NOTE:

1.If the resistance value being measured exceeds the max value of the range selected, LCD displays "OL", thus, should set the range knob to a higher range. When the resistance is over 1MΩ, the meter may take a few seconds to stabilize. This is normal for high resistance readings.

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

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

4.Do not input any volt at this range.

4.5 CAPACITANCE MEASUREMENT

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

2.Set the range knob to a proper capacitance range, connect the test leads to the capacitor under measured（note: the polarity of red test lead is “+”）.

NOTE:

1. If the resistance value being measured exceeds the max value of the range

selected, LCD displays "OL".

2.Before measuring, LCD display might not be zero, the residual reading will be decreased

gradually and could be disregarded.

3.When measuring large capacitance, if creeps seriously or break capacitance, LCD will display some instability value.

4.Discharge all capacitors completely before capacitance measurement to avoid damage.

5.Do not input any volt at this range.

6.This range is for automatic range

test,Measuring the range from 10nF to 2000uF.

7.UNIT: 1mF=1000uF 1uF =1000nF 1nF=1000pF

4.6 FREQUENCY MEASUREMENT

1.Apply the test lead or shield to cable to “COM” or ““V/Ω/Hz”terminal.

2.Switch the knob to frequency range,and connect crossly the test leads with the signal source or the measured load.

NOTE:

1.When input 10Vrms,reading is possible but

maybe over-range.

2.Shielding cable be recommended when measuring small signal under noisy condition.

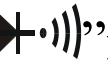
3.Be careful when measuring high volt circuit.

4.Do not input a voltage over DC 250V or AC peak factor to avoid damage to the meter.

5.This range is for automatic range test,Measuring the range from 10Hz to 2MHz.

4.7 DIODE AND CONTINUITY TEST

1.Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” jack(Note: the polarity of red test lead is“+”).

2.Set the range knob to“  ”range, connect the test leads to the diode under measured,

reading is the approximation of the diode positive volt drop.

3.Connect the test leads to two points of the measured circuit, if buzzer sounds, the resistance is

lower than approx.（50±20）Ω.

4.8 DATA HOLD

Pressthe “HOLD/BL”,LCD displays “HOLD”,the present value is held on LCD,Press it again , the function is cancelled.

4.9 AUTO POWER-OFF

After stop working for 15±10 minutes,the meter will be into sleep mode.press “POWER APO” key for 2 seconds to restart the power.Press the “POWER APO” key for 2 seconds to cancel the function of auto power off and “APO”disappear;press it again for 2

seconds to restart the auto power off function and “APO”showing on LCD.

4.10.POWER ON/OFF

Press “POWER APO” key for 2 seconds to turn on the power and the meter into working mode ,Press it again to turn it off.

4.11 BACKLIGHT INDICATION

Press “POWER BL”key to turn on the backlight ;press it again to turn it off ;It will be auto power off after 15 sec.

5.MAINTENANCE

DO NOT try to verify the circuit for it’s a

precision meter.

1.Beware of waterproof, dustproof and shockproof.

2.Do not operate and store the meter in the circumstance of high temperature, high humidity, and flammability, explosive and strong magnetic field.

3.Use the damp cloth and soft solvent to clean the meter, do not use abrasive and alcohol.

4.If do not operate it for a long time, should

take out the battery.

4-1.When LCD displays “  ” symbol, should replace the battery as below:

4-1-1.Take out the holster and drop out the battery case.

4-1-2.Take out the battery and replace a new one. It’s better to use alkalescence battery for long time use.

4-1-3.Fix the battery case and take on the holster.

4-2.Replacing fuse

Please use the same type and specification

fuse as replacement.

6. If the meter does not work properly, check the meter as following:

CONDITIONS	WAY TO SOLVE
NO DISPLAYING	●Power is off ●Replace battery
 symbol displays	●Replace battery
NO CURRENT INPUT	●Replace fuse
BIG ERROR	●Replace battery