72-14630

Operating Manual

Bench Type Digital Multimeters

Overview

The Tenma 72-14630 Bench Top Digital Multimeter features a 4 1/2 digit display with a maximum reading of 19999. The large backlit LCD makes measurements easy to read. The well-featured meter also provides full range overload protection and dual power sources (AC or DC battery). The unit can be used to test AC/DC voltage, AC/DC current, resistance, frequency, capacitance, temperature (Celsius), hFE transistors, diode, and continuity test.

This operating manual includes relevant precautions and safety information. Please read it carefully and strictly observe all the Warnings and Safety Notes contained in this manual.

Unpacking Inspection

Open the package and take out the unit. Check the following items carefully to see if there is any missing or damaged. If you find anything missing or damaged, please contact your local dealer immediately.

- Operating Manual 1 Copy
- Test Lead 1 pair
- Short Test Lead with Alligator Clip 1 pair
- K Type Temperature Probe 1 piece
  (Only applicable to test below 230℃)
- Socket Adaptor 1 piece
- Power Adapter 1 piece
  (110VAC 60Hz (US) , 9VDC 200mA)

Safety Notes

This unit is designed and produced in strict compliance with IEC61010-1 code. As a unit with double insulation over-voltage protection, it complies with the safety standard contained in CAT II 1000V and Pollution Degree II codes. Any failure to follow the operating instruction contained in this manual may impair or void the protection it has.

1 . Before use, the unit and test leads should be closely inspected. If there appears to be any damage to either the meter or test leads, do not attempt to use either. Do not use the meter if the cover is removed, as it exposes the user to the risk of electric shock.

2. If test leads are damaged, they must be replaced with the one having identical model or electrical specifications.

3. Do not touch fingers or bare skin to any bare cables, connectors, unused terminals, or circuits while being tested.

4. When the meter is used at an effective voltage over 60V in DC or 30V in AC, special care should be taken as there is a danger of electric shock.

5. If the scope of the input value remains unknown, just switch to the maximum range for testing.

6. No voltage or current exceeding the rated voltage or current indicated by the unit should be applied between test leads or between test lead and ground.

7. The rotary switch should be placed in the right position and no changeover of range should be made during measurement so as to prevent the damage of the unit.

8. Do not use or store the unit in an enviroment with high temperatures, high humidity, flammable materials, or excessive exposure to magnetic or radioactive field.

9. The internal wiring of the unit should not be tampered with or altered. Doing so will likely damage the unit and increase risk of electric shock.

10. Replace the battery as soon as the battery indicator " " appears. When working under a low battery, the unit might produce false readings that can lead to electric shock or personal injury.

11. Turn the unit off when it is not in use and take out the battery in case it will not be used for a long time.

General Specifications

1. Maximum voltage between terminal input and COM: 1000V (except for 200mV, 250V)
2. μA mA terminal input protection: (CE)250mA 265V auto recovery fuse
3. 10A terminal input protection: (CE)F1 (10A H 1000V) Fast type melted fuse Φ10.3x38mm
4. Resistance input protection: PTC/250V
5. Capacitance input protection: (CE) F2, F3 (0.5A H 250V) quick-blow fuse Φ5x20mm
6. Frequency input protection: PTC/1000V
7. Temperature input protection: (CE)0.5A 1000V fuse
8. terminal input protection: PTC/1000V
9. hFE input protection: (CE)250mA 265V auto recovery fuse, F3 (0.5A H 1000V) Fast type melted fuse Φ6.35x31.8mm
10. Display: Full functional LCD, maximum reading is 19999, refreshing 2-3 times per second
11. Range: Manual
12. Polarity display: Auto
13. Over-range indication: 1
14. Low battery indication:" "
15. Operating temperature: 0~40℃ (32℉~104℉)
16. Storage temperature: -10~50℃ (14℉~122℉)
17. Relative humidity: 0℃~30℃ ≤75%； 30℃~ 40℃ ≤50%
18. Electromagnetic compatibility: Under a radio frequency field of 1V/m, overall accuracy = specified accuracy + 5% of the range; No specified accuracy if the unit is put under a radio frequency field of more than 1V/m.
19. Power supply: AC (External power adapter AC110V/ DC9V-200mA) or DC (Battery Size R14/1.5V×6 PCS)
20. Product size: (300×245×105) mm
21 .Product Net Weight: about 1500g (accessories not included)
22. Safety Compliance: IEC 61010: CATII 1000V

LCD Display

1. *Manual Range* Manual range indicator
2. *Warning!* Warning indicator
3. Low Battery
4. Indicator for high voltage
5. Indicator for negative reading
6. *AC* Indicator of AC voltage or current (No display for DC voltage or current)
7. Data hold activated
8. Test of diode
9. Continuity buzzer on
10. *Decimal Number* Showing the readout
11. Measurement units

mV, V	Unit of voltage: millivolt, volt
μA, mA, A	Unit of current: microampere, milliampere, ampere
Ω, kΩ, MΩ	Unit of electrical resistance: Ohm, kilohms, megohm
nF/μF	Unit of electrical capacity: nanofarad, microfarad
kHz	Unit of frequency: Kilohertz
℃	Unit of temperature: Celsius degree
β	Unit of triode amplification: times

Functions

Symbol	Terminal Input	Explanation
V⎓	V ⟷ COM	DC voltage measurement
V~	V ⟷ COM	AC voltage measurement
Ω	V ⟷ COM	Resistance measurement
	V ⟷ COM	Diode/continuity test using buzzer
kHz	V ⟷ COM	Frequency measurement
A⎓	mA μA ⟷ COM	mA/μA for DC current measurement
	10A ⟷ COM	A for DC Current measurement
A~	mA μA ⟷ COM	mA/μA for AC current measurement
	10A ⟷ COM	A for AC current measurement
F	V⟷ mA μA	Capacitance measurement
(Use socket adaptor)		
℃	V ⟷ mA μA	Temperature measurement
(Use socket adaptor)		
hFE	V ⟷mA μA	Triode amplification times measurement
(Use socket adaptor)		

Functional Buttons

⏻	Power switch
LIGHT	Backlight on or off (battery powered, backlight remain on about 10 seconds before auto shut down.)
HOLD	Press Hold to enter or exit the hold mode when in any mode, the meter beeps.

Operational Guide (See Diagram 1, 2, 3)

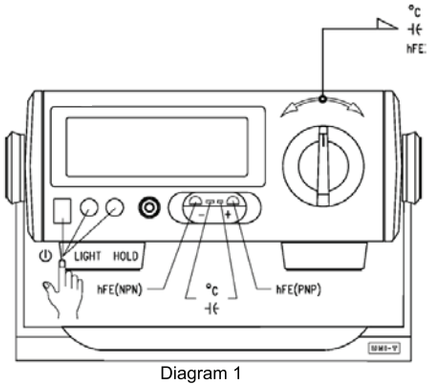

Diagram 1

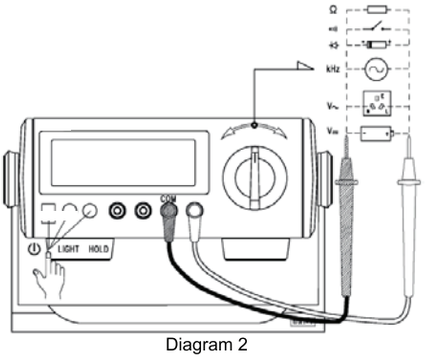

Diagram 2

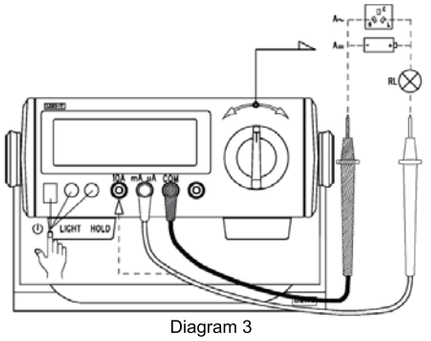

Diagram 3

⚠ Warning:
1. Please select correct terminal input and also turn the rotary switch to select correct measuring function and range. If not, the buzzer beeps and the warning signal flashes.

Range	Alarm sounds on false terminal input
V Hz Ω	10A mAμA
mAμA ℃ hFE F	10A
10A	mAμA

2.DC or AC Voltage Measurement

● To avoid personal injury or damage to the unit due to electric shock, please do not attempt to measure any voltage higher than 1000 V though reading may be obtained.

● The unit has an input impedance of approximately 10MΩ (ACV input impedance of approximately 2MΩ), which can cause measurement errors for high impedance circuits, so input impedance must be taken into account.

3. DC or AC Current Measurement

● Before measuring the current, the circuit under test should be de-energized first. Remember that it should be connected in series with the circuit to be test.

● Never use it to measure current higher than 10A. Though it is possible to get a readout for any current below 20A, but it may damage the unit or endanger yourself.

4. Measuring Resistance, Diodes, Continuity or Capacitance

● For an accurate measurements, de-energize the circuit to be tested and discharge any capacitors.

● When measuring a resistance equal or higher than 1MΩ, it is normal for the unit to take several seconds to obtain a stable reading. In order to obtain a stable reading, choose shorter test leads to carry out measurement.

● When measuring low resistance, the test leads and the internal wiring of the unit will incur a resistance around 0.1Ω~0.2Ω. To obtain accurate reading, short-circuit the test leads beforehand and record the reading obtained, such reading should be deducted from the final readout to ensure the accuracy of the measurement.

● If the diode to be tested is a silicon diode junction, it is normal if the reading falls into a scope between 500mV and 800mV. For continuity tests, if the resistance between two terminals is greater than 100Ω, it is considered to be an open circuit. If the resistance is less than 10Ω, then it is a close continuous circuit, signaled by an audible alert. The readout then is nearly equal to the resistance of the circuit.

Technical Specifications

Accuracy: ± (% of the reading + digits), 1 year guarantee
Environmental temperature: 18℃~ 28`C
Environmental humidity: Less than 75% RH

1. DC Voltage

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
200mV	0.01mV	±(0.1%+5)
2V	0.1mV	±(0.1%+3)
20V	1mV	
200V	10mV	
1000V	0.1V	±(0.2%+5)

Input Impedance:Average 10MΩ
Maximum Voltage Input: 1000V (Except for 200mV 250V)

2. AC Voltage

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
2V	0.1mV	±(0.5%+20)
20V	1mV	±(0.8%+40)
200V	10mV	
750	0.1V	

Input Impedance: about 2MΩ.
Maximum Voltage Input: 750Vrms
Frequency: 45Hz~400Hz
Displays effective value of sine wave(mean value response).

3. DC Current

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
200μA	0.01μA	±(0.5%+20)
2mA	0.1μA	
20mA	1μA	
200mA	0.01mA	
10A	1mA	±(1.5%+40)

* When ≥5A, continuous measurement should be less than 10 seconds at an interval more than 15 minutes.

4. AC Current

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
2mA	0.1μA	±(0.8%+40)
20mA	1μA	
200mA	0.01mA	
10A	1mA	±(2.0%+40)

* Frequency response: 45Hz~400Hz
When ≥5A, continuous measurement should be less than 10 seconds at an interval more than 15 minutes.

5. Resistance

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
200Ω	0.01Ω	±(0.5%+10)
2kΩ	0.1Ω	
20kΩ	1Ω	
200kΩ	10Ω	
2MΩ	100Ω	
200MΩ	10kΩ	±(5%+40)

When >100MΩ, the result is for reference only.

6. Capacitance

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
20nF	1pF	±(4%+10)
2μF	100pF	
200μF*	10nF	±5%+10)

* When >40μF, the result is for reference only.

7. Frequency

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
2kHz	0.1Hz	±(1.2%+10)
200kHz	10Hz	

Input Amplitude a:
(2kHz range) 50mV≤a≤30Vrms
(200kHz range) 150mV≤a≤30Vrms

8. Temperature

Range	Resolution	Accuracy Tolerance:±(% of the reading + digits)
-40～-20℃	0.1℃	-(8%+40)
>-20℃0℃		±(1.2%+30)
>0～100℃		±(1.2%+25)
>100～1000℃		±(2.5%+20)

* Temperature Transducer: K type thermocouple (Point contact, made of nickel-chromium or nickel-silicon) is included as an accessory, which can only be used to measure temperature less than 230℃.

9. Diode Test

Range	Resolution	Remarks
▶|	0.1mV	Open circuit voltage is around 3V; for Silicon P-N junction, 0.5~0.8V is considered as a normal value.

10. Continuity Test

Range	Resolution	Remarks
•))	0.1Ω*	Open circuit voltage is approximately 3V

If the resistance between two terminals is tested to be more than >100Ω, it is considered as open circuit, the buzzer does not beep or it is in good connection if it is equal or less than ≤10Ω, the buzzer keeps beeping.

11. Triode hFE

Range	Resolution	Remarks
hFE	0.1β*	1 b0 is about 10μA, Vce is about 2.5V

Replacing the battery or the fuse (See Diagram 4)

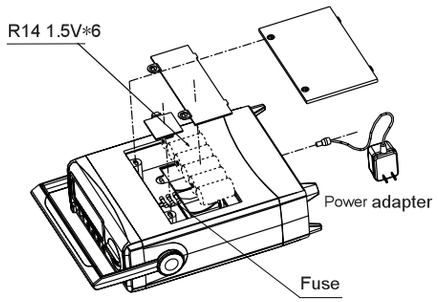

Diagram 4

Specifications and safety information contained in this manual are subject to change without further notice.

Tenma Test Equipment
300 S. Riverside Plaza #2200
Chicago IL, 60606
USA
www.Tenma.com

说明书菲林做货要求：

序号	项目	内容
1	尺寸	展开尺寸：(210x285)±1mm. 折叠成形尺寸:(70*142.5)±1mm
2	材质	60g书纸
3	颜色	黑色
4	外观要求	印刷完整清晰,版面整洁.无分层.残损.毛边等缺陷
5	装订方式	按折叠线折叠
6	表面处理	无
7	其它	
版本		0

DWH 设 计	邓捷睿19/8/6	MODEL 72-14630(UT802改) 机型: 客说明书	Part NO. 物料编号:110401108720X
CHK 审 核		UNI-T® 优利德科技(中国)有限公司 UNI-TREND TECHNOLOGY (CHINA) LIMITED	
APPRO. 批 准			