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INTRODUCTION

The UT91 is a multi-meter which equipped with a 3 1/2 digits liquid Crystal Display. The unit can measure DC Voltage, AC Voltage, DC Current, AC current, Resistance, Batteries, Diode and Continuity check. It can be used for laboratory testing, different workshop industry repairing, etc.

* The meter complies with IEC 1010-1 CAT I 1000V.
* CAT I- For signal level, telecommunication, electronic with small transient over voltage.
* Use the Meter only as specified in this manual, otherwise the protection provided by the Meter may be impaired.
* Do not operate the Meter before the case has been closed and screwed safely as terminal can carry voltage.
* Make sure before each measurement the Meter is set to the suitable range.
* Before using the Meter, please inspect the case and test leads for damaged insulation or exposed metal.
* Connect the red and black test lead to the correct measuring input jack properly.
* Do not input values over the maximum range of each measurement to avoid damages of the Meter.
* Do not turn the rotary function switch during Voltage and Current measurement, otherwise the Meter could be destroyed.
* Make sure to use new fuse with proper rating in stead of bad fuse.
* To avoid electric shock or damages, do not apply more than 1000V between the “COM” terminals and “ ⏚ ” earth ground.
* Use caution when working with Voltages above 60V(DC) or 30Vrms (AC).These Voltages pose shock hazard.
* Replace the battery as soon as the battery indicator “ 🔋 ” appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.

* Turn off the Meter once finished measuring.
* Fetch out the battery, when the meter will not be used for long period.
* Test leads must be away from the circuit before open the case.
* Do not operate the Meter under adverse environmental condition especially humid area.
* To avoid damages and dangers, do not change the circuit.
* Periodically wipe the case with a damp cloth and mild detergent. DO not use abrasives or solvents.

The following legend applied to this manual:

⚡ Dangerous voltage (Take care not to get an electric shock in voltage measurement).
⏚ Ground (Allowable applied voltage range between the input terminal and earth.)
⚠ Refer to instruction manual (Very important description for safe use.)
⎓ Direct current(DC)
~ Alternating current (AC)
Replace fuse with Amp/Volt ratings shown
⧈ Double Insulation

1. SAFETY BULES AND WARNING

1.1 Do not operate the unit before the cabinet has been closed and screwed safely as terminal can carry voltage.
1.2 Make sure before each measurement the unit is set to the right range.
1.3 Check before each measurement the measuring unit & your test leads to make sure they are not damaged.
1.4 Put the red and black test probes in the correct measuring Sockets to ensure connection is fine.
1.5 Do not input the value over the maximum range of each measurement, otherwise unit may be damaged!
1.6 Never turn the rotary function switch during Voltage and Current measurement, otherwise the measuring unit could be destroyed and this could be dangerous to life.
1.7 Make sure to use new fuses of the proper rating. Do not use repaired fuses and do not bridge the fuse holders.
1.8 To avoid an electrical shock or damage, do not apply more than 500VDC/VACrms between the V/ Ω terminal of the measuring unit and the earth ground.
1.9 Pay special caution when working with voltage above 50V(DC) and 36V(AC).
1.10 Battery needs to be changed immediately to make the accuracy of the unit when the LCD displays " "

1.11 Turn off the unit once measuring is finished and take out the battery if the unit will not be used for a long time.
1.12 Do not use this measuring unit in environments or rooms with adverse environmental conditions especially misty area.
1.13 To avoid damage and dangerous, don't change the circuit.

2. GENERAL FEATURES

2.1 Maximum Display: "1999" (3 1/2 digits)
2.2 Accuracy of DC Current: ±0.5%
2.3 Overrange Display: Maximum value "1"
2.4 Max. Measurement Rate: 2 to 3 Measurements per second
2.5 Low Battery Voltage Display: " "
2.6 Overload protection
2.7 Operating Temperature: 0 ℃-40 ℃ (32 ℉-104 ℉)
Relative Humidity: <75%
Storing Temperature: -10 ℃-50 ℃(14 ℉-122 ℉)
Relative Humidity: <80%
2.8 Energy: 9V Battery (NEDA1604, 6F22 or equivalent)
2.9 Dimension: 17.8 x 8.3 x 3.3cm(L x W x H)
2.10 Weight: Approximately 250 gram (exclude testing probes)

3.ELECTRICAL

Accuracy: +(a% reading + digits), One Year Warranty.
Operating Temperature: 23℃+ 5 ℃, Relative Humidity<75%.

Mode	Range	Resolution	Accuracy + (a% reading + digits)	Max. Protection	Comment
DCV	200mV	100μV	± (0.5%+2)	230Vrms	Input RESISTANCE 10MΩ
	2V	1mV		1000VDC 750VAC	
	20V	10mV			
	200V	100mV			
	1000V	1V	± (0.8%+3)		
ACV	20V	10mV	± (0.8%+5)	1000VDC 750VAC	Input Resistance 10MΩ Frequency: 40 ~ 400Hz Display: SQUARE WAVE rms
	200V	100mV			
	750V	1V	± (1.0%+5)		
DCA	2mA	1μA	± (0.8%+2)	Fuse 0.2A 250V	
	20mA	10μA			
	200mA	100μA			
	20A	10mA	±(1.2%+5)	20A 250V	Measurement not last more than 15 seconds
ACA	2mA	1μA	±(1%+5)	Fuse 0.2A 250V	Display: SQUARE WAVE rms Frequency:40～400Hz Measurement of 20A not last more than15 seconds
	20mA	10μA			
	200mA	100μA			
	20A	10mA	±(2%+5)	20A 250V	

Ω	200Ω	0.1Ω	± (0.8%+3)	230Vrms	Voltage at open circuit about 2.8V
	2KΩ	1Ω			
	20KΩ	10Ω			
	200KΩ	100Ω			
	2MΩ	1KΩ			
	20MΩ	10KΩ	± (1.2%+5)		
Diode	→|←	1mV		230Vrms	Voltage at open circuit about 3V
Continuity Test	•))	1Ω		230Vrms	Audible signal for resistance<100Ω
Batteries Test	1.5V				Load Current 40mA
	9V				Load Current 20mA

4.FUNCTIONAL PANEL

4.1 LCD ①
4.2 Range Switch with Power Switch ②
4.3 VΩ:V⎓, Ω, →|←, •)) BAT input Socket ③
4.4.COM:Test Probes Socket ④
4.5 mA: Below 200mA current input socket ⑤
4.6 20A: 200mA ~ 20A current input socket ⑥

5.MEASURING PROCEDURE

Switch on the unit before doing measurement to see it the battery has run out. If the battery symbol appears in the display, it is time to change battery.

The ⚠ display next to the test probes Socket is a warning to you not to input the value of Voltage and Current higher than the maximum. Besides, please set the rotary function to proper position before doing measurement.

5.1 Voltage Measurement VDC

5.1.1 Connect the black test probes to the COM-socket and the red test probes to the VΩ socket.

5.1.2 Set the rotary switch to "V ⎓ "Connect the test probes across the object to be measured.
LCD shows the measuring value, also it shows the polarity of the red test probe.

⚠ ATTENTION

a) If magnitude of the current is unknown, always start with the highest range and until satisfactory reading is obtained.
b) Do not exceed the maximum input limits-Maximum 1000VDC.

5.2 Voltage Measurement VAC

5.2.1 Set the rotary switch to 'V ~ '.

5.2.2 The rest of the procedure is same as VDC Measurement.

5.3 CURRENT MEASUREMENT DC

5.3.1 Connect the black test probes to COM socket. If measuring below 200mA, then connect the red test probe to the mA socket.Connect to the 20A Socket if measuring is between 200mA and 20A.

5.3.2 Set the rotary function switch to 'A ⎓ '.Connect the test probes in series with the object to be measured.
LCD displays the measuring value, also it shows the polarity of the red test probe.

5.4 Current Measurement AC

5.4.1 Set the rotary function switch to 'A ~ '

5.4.2 The rest of the procedure is same as DCA Current Measurement.

5.5 Resistance Measurement

5.5.1 Connect the black test probe to COM Socket and the red test probe to V Ω socket.

5.5.2 Set the rotary function switch to ' Ω '

5.5.3 Connect the test probes to the device being measured.

⚠ ATTENTION

a) As soon as '1' is displayed you exceeded the measuring range.

b) Make sure all objects, circuits and componets to be measured are without voltage supplied.

c) For resistors over 1 MΩ ,the display needs a few seconds to stabilize. It is normal.

5.6 Continuity Check and Diode Test

5.6.1 Connect the black test probe to the COM socket and the red test probes to the V/ Ω socket.

5.6.2 Set the rotary function switch to ⊣◀ •)) .

5.6.3 Connect the test probes with the object to be measured. The measuring value of Diode with mV unit display on the LCD.

5.6.4 If the line resistance is less than 100 Ω an acoustic signal is emitted. The display reading does not correspond with the line resistance!

5.7 Battery Check

5.7.1 Connect the black test probes with the COM Socket and the red test probe with the V Ω socket.

5.7.2 Set the rotary function switch to 'BAT'.

5.7.3 Connect the lest probes with the batteries to be measured.Observe the correct polarity. The voltage in the display is the voltage of the battery under load. A.1.5V battery.

⚠ SAFE USE OF MULTITESTER

Be sure to follow the WARNINGS in this manual. Erroneous use may put human bodies in danger. The following legend applies to this manual:

- Dangerous voltage (Take care not to get an electric shock in voltage (measurement).
- Ground (Allowable applied voltage range between the input terminal end earth).
- ⚠ Refer to instruction Manual (Very important description for safe use).
- Direct current (DC)
- Alternating current (AC)
- Fuse