

1. SAFETY RULES

- This meter is designed for indoor use at temperatures between 0°C to 40°C and altitudes up to 2,000m.
- To ensure that the meter is used safely, follow all safety and operating instructions in this operation manual. If the meter is not used as described in this operation manual, the safety features of this meter might be impaired.
- Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.
- When using the instrument, keep your fingers behind the finger guards on the plastic casing and probes.
- Disconnect the live test lead before disconnecting the common test lead.
- Make sure power is off before cutting, desoldering, or breaking the circuit wires. Small amounts of current can be dangerous.
- Do not apply more than 500 VDC or 500V AC rms between a terminal and ground.
- To avoid electrical shock, use CAUTION when working above 60V DC or 25V AC rms. Such voltages pose a shock hazard.
- Never make measurements with the battery cover off.
- To avoid electrical shock or damage to the meter, do not exceed the input limits.

2. INTERNATIONAL SYMBOLS

- | | |
|------------------------------------|----------------------|
| ⚠ Important information see manual | ⚡ Dangerous Voltages |
| ~ AC | 🔊 Continuity |
| ⎓ DC | ⏚ Ground |
| | ☐ Double Insulation |

3. TECHNICAL SPECIFICATIONS

3.1 General Specifications

Display:	3-1/2 digits LCD, max. of 1999 display
Polarity:	Automatic, (-) negative polarity indication
Zero adjustment:	Automatic
Sample rate:	0.5 Sec.
Over range indication:	Only the MSD "1" is displayed
Power:	9-volt battery type NEDA 1604, IEC6F22
Battery life:	Approx. 50 hours. (w/ alkaline batteries)
Dimension:	141 x 69 x 36 mm.
Weight:	Approx. 330g (including battery).
Accessories:	User's Manual, Alligator Clip, and 9V alkaline battery

3.2 Electrical Specifications

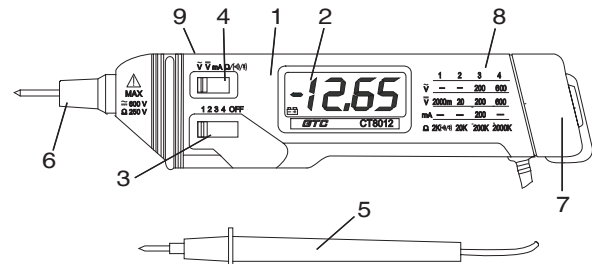
- The mark ⚠ next to the probe tip, is a warning that the input voltage should not exceed the indicated values. This is to prevent personal injuries and damage to the internal circuitry.
- The function switches should be set to the function which you want to test before operation.
- Accuracies are ±(% of reading + number of least significant digits) at 23°C ±5°C, less than 75% RH.

Function	Range	Accuracy	Input Impedance	Remarks	Overload Protection
DC Voltage	2000mV, 20V, 200V, 600V	0.8%+1	1 MΩ	-	600 Vp-p
AC Voltage	200V, 600V	1.5%+10	450 KΩ	50~500Hz	600 Vp-p
DC Current	200 mA	2.0%+2	-	-	200 mA/ 250V Fuse
Resistance	2kΩ, 20kΩ, 200kΩ, 2000kΩ	1%+3	-	-	250 Vp-p
Diode Test	Test Current: 1.0± 0.6mA		Test Voltage: 3.2 V Max.		250 Vrms
Continuity	Beeps when < 100Ω		3VDC Max. Test Voltage		250 Vrms

4. OPERATION

4.1 INSTRUMENT DESCRIPTION

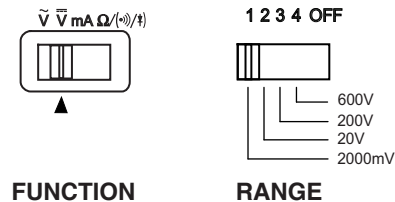
- 1) Case
- 2) 3-1/2 Digit LCD display
- 3) Range switch
- 4) Function switch
- 5) Fixed test lead with probe
- 6) Fixed probe tip and fuse cap
- 7) Battery cover
- 8) Function / Range table
- 9) Display hold push button (back of the unit)



4.2 Measurement Procedures

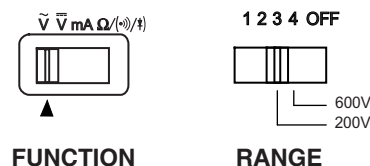
- CAUTION:** Maximum Input Voltage is 500Vrms, do not exceed this rating to avoid personal injuries or damage to the instrument. The range switch should be set to the range you want to test before the operation.

4.2.1 DC Voltage measurement



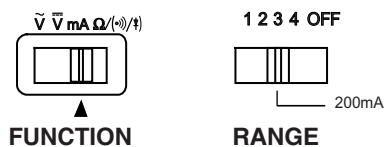
Set the **FUNCTION** switch to \overline{V} and the **RANGE** switch to the desired range position, according to the **Function/Range Table**. Proceed to connect the test leads across the source or load under measurement. If the voltage range is not known beforehand, set the range switch to the highest range and work down. The polarity will be indicated when the tip probe is connected.

4.2.2 AC Voltage measurement



Set the **FUNCTION** switch to \tilde{V} and the **RANGE** switch to desired position, according to the **Function/Range Table**. Proceed to connect the test leads across the source or load under measurement, and read the measurement on the LCD screen.

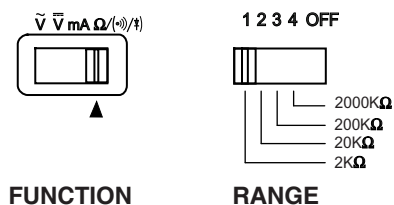
4.2.3 DC Current measurement



Set the **FUNCTION** switch to **mA** and the **RANGE** switch to the 200mA position. Proceed to connect test leads IN SERIES with the load in which current is to be measured, and read the measurement on the LCD screen.

4.2.4 Resistance measurement

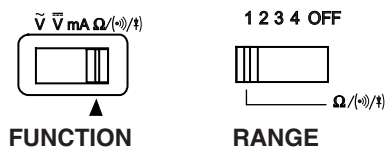
CAUTION: Maximum Input Voltage for these functions is 250 Vrms for less than 10 Sec., do not exceed this rating to avoid personal injuries or damage to the instrument. Also ensure there is no power applied to the circuit and all capacitors are discharged.



Set the **FUNCTION** switch to $\Omega/(\cdot/)/\#$ and the **RANGE** switch to desired **k Ω** range, if the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before applying probes. Proceed to connect the test leads across the component or circuit under test, and read the measurement on the LCD screen.

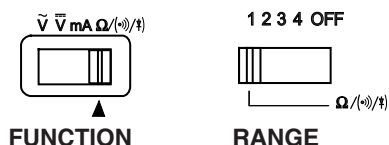
4.3 Other Functions

4.3.1 Diode test



Set the **FUNCTION** switch to $\Omega/(\cdot/)/\#$, and **RANGE** switch to 2K/ $\Omega/(\cdot/)/\#$ position, Proceed to connect the test leads across the diode observing the polarity: red probe to the anode (+) of the diode and black test lead to the cathode (-).

4.3.2 Continuity Test



Set the **FUNCTION** switch to $\Omega/(\cdot/)/\#$, and **RANGE** switch to 2K/ $\Omega/(\cdot/)/\#$ position, connect test leads across the circuit to be tested. If resistance is less than approximately 100 Ω , the buzzer will be activated.


4.3.3 Display Hold

A push button switch at the back of the unit is used to hold display readings during measurements. Pressing and holding the button, holds the display reading. Releasing the button will resume normal operation.

5. MAINTENANCE

CAUTION: Before attempting battery removal or replacement, disconnect test leads and remove the instrument from any energized circuit to avoid shock hazard.

5.1 Battery Replacement

When the battery needs replacement, the battery symbol  will appear in the lower left hand side of the LCD display. To replace the battery, remove the screw at the back **Battery Cover** and replace with a new 9 V alkaline battery type NEDA 1604 or IEC6F22.

5.2 Fuse replacement

To replace the internal fuse, turn the **Fuse Cap** counter clockwise, release the Fuse Cap assembly. Take out the blown fuse and replace with a type IEC60127-2 or UL248-14 (5 x 20mm) fast acting fuse, rated at 200mA/250V.

5.3 Cleaning

Periodically wipe the case with a soft damp cloth and mild household cleanser. Do not use abrasives or solvents. Ensure that no water gets inside the instrument to prevent possible shorts and damage.

6. WARRANTY

One year limited warranty, excluding batteries and fuses. For details see Standard Warranty Information in our webpage or you may request a printed copy.

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