

# 3 1/2 DIGIT MINI DIGITAL MULTIMETER WITH CONTINUITY & TEMPERATURE OPERATION MANUAL

## 1. SAFETY RULES

- This meter is designed and tested in accordance with IEC publication 1010, pollution degree II and installation category (overvoltage category) II.
- This meter has been tested according to the following EC Directives
  - ◆ 89/336/EEC (EMC of Nov., 1992, Electromagnetic Compatibility)
  - ◆ 73/23/EEC (Product safety law of June 11, 1979, Low Voltage Directive of February 19, 1973)
- This meter is designed to be indoor use at temperature 5°C to 40°C and altitude 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.

## 2. INTERNATION SYMBOLS

	Important information see manual		Diode
	AC		Continuity
	DC		Ground
			Double insulation

## 3. SPECIFICATIONS

### 3.1 General Specifications

Display	: 3 1/2 digit LCD with max. reading of 1999.
Polarity	: Automatic, (-) negative polarity indication.
Zero adjustment	: Automatic.
Measuring Method	: Dual slope integration A to D converter system.
Over range indication	: Only the MSD "1" is displayed.
Power	: Single, standard 9 volt battery NEDA 1604, JIS 006P, IEC6F22.
Dimension	: 72 (W) x 134 (H) x 28 (D) mm.
Weight	: Approx. 240gm. (including battery and packaging).

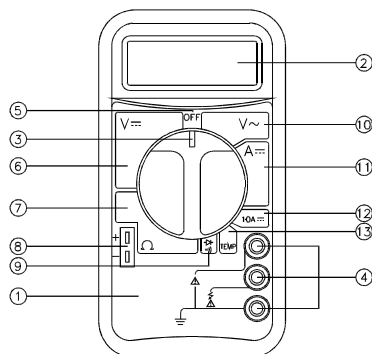
### 3.2 Electrical Specifications

Accuracies are ± (% of reading + number of least significant digits) at 23°C ± 5°C, <75% RH.

DC Voltage	Range	Resolution	Accuracy	Input Impedance	
	200mV	100µV	±(0.8%+1)	1MΩ	Overload Protection: 600V DC/AC rms
	2000mV	1mV			
	20V	10mV			
	200V	100mV			
	600V	1V			
AC Voltage	Range	Resolution	Accuracy	Frequency (Hz)	Input Impedance: 450KΩ Overload Protection: 600V DC/AC rms
	200V	100mV	±(1.5%+10)	40-400	
	600V	1V			
DC Current	Range	Resolution	Accuracy	Voltage drop	Overload Protection: Fast 200mA/250V Fuse
	200µA	0.1µA	±(1.0%+2)	200mV	
	2000µA	1µA			
	20mA	0.01mA			
	200mA	0.1mA			
	10A	0.01A			
Resistance	Range	Resolution	Accuracy	Open circuit voltage	Overload Protection: 250V DC/AC rms <10 sec.
	200Ω	0.1Ω	±(1.0%+3)	<=3.0V	
	2000Ω	1Ω			
	20kΩ	0.01kΩ			
	200kΩ	0.1kΩ			
2000kΩ	1kΩ				
Temperature	TEMP	Temp range	Accuracy	Resolution	K type thermocouple
		-50°C - 400°C	±(0.75%+3)	1°C	
		400°C - 1000°C	±(1.5%+10)		
		0°C - 40°C	±2		
Diode Test	▶+ ·  )		Test voltage	Test current	Open circuit voltage
			(0 - 1999mV)	1.0±0.6mA	
Continuity Test	▶+ ·  )	Test range		Test current	Open circuit voltage
		Buzzer sounds when resistance value < 100Ω			

## 4. PANEL DESCRIPTIONS

- 1) Case
- 2) 3 1/2 digit LCD display
- 3) Range switch
- 4) Input and common terminal
- 5) Power off
- 6) DC voltage range
- 7) Resistance range
- 8) K probe socket
- 9) Diode / continuity test
- 10) AC voltage range
- 11) DC current range
- 12) 10A DC current range
- 13) Temperature range



## 5. OPERATION

### ⚠ WARNING

- 1) When measuring voltage ensure that the instrument is not connected or switched to a current or resistance or temperature or to the diode check/continuity range. Always ensure that the correct terminals are used for the type of measurement to be made.
- 2) Use extreme care when measuring voltage above 50V, especially from sources where high energy exists.
- 3) Avoid making connections to "live" circuits whenever possible.
- 4) When making current measurements ensure that the circuit is not "live" before opening it in order to connect the test leads.
- 5) Before making resistance measurements or continuity / diode test, ensure that the circuit under test is de-energised.
- 6) Always ensure that the correct function and range is selected. If in doubt about the correct range, start with the highest and work downwards.
- 7) Extreme care should be taken when using the instrument to conjunction with a current transformer connected to the terminals. High voltage may be produced at the terminals if an open circuit occurs.
- 8) Ensure that the test leads and prods are in good condition with no damage to the insulation.
- 9) Take care not to exceed the over-load limits as given in the specifications.
- 10) Fuse for replacement must be of the correct type and rating.

### 5.1 DC and AC Voltage measurement

- 1) Connect the black test lead to the "COM" socket and red test lead to the "VΩmA" socket.
- 2) Set the selector switch to desired DC V or AC V position and connect the test prods across the source or load under measurement.

### 5.2 DC Current measurement

- 1) Connect the black test lead to the "COM" socket and red test lead to the "VΩmA" socket for measurement up to 200mA.
- 2) Set the selector switch to the desired current range position.
- 3) Connect the prods in series with the current source to be measured.
- 4) For current measurement from 200mA to 10A (Unfused) follow generally the above procedure but connect the red test lead to "10A" socket.

### 5.3 Resistance measurement

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "VΩmA" socket.
- 2) Set the selector switch to desired resistance range position.
- 3) Connect the prods across the circuit to be tested.  
⚠ CAUTION: Ensure that the circuit to be tested is "dead".  
Max. input over-load : 250V rms < 10sec.

### 5.4 Diode test

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "VΩmA" socket.
- 2) Set the selector switch to ▶+ (same as ·||) position.
- 3) Connect the black and red test prods to the cathode (-) and anode (+) ends of the diode to be tested respectively.
- 4) Read the forward voltage drop (junction) value from the display. If reverse connected the prods to diode, display shows over-load.

### 5.5 Continuity check

- 1) Connect the black test lead to the "COM" socket and the red test lead to the "VΩmA" socket.
- 2) Set the selector switch to ·||) (same as ▶+ ) position.
- 3) Connect the prods across the circuit to be tested, if the resistance less than approx. 100Ω, buzzer will be activated.

### 5.6 Temperature measurement

- 1) Measure temperature with K type thermocouple: Set the selector switch to TEMP position and insert the K type thermocouple plug into K probe socket following the ± signs.
- 2) Measure ambient temperature without probe: On the same TEMP position but no K type thermocouple connected, display readings indicate the ambient temperature in °C.

## 6. MAINTENANCE

### ⚠ CAUTION

BEFORE ATTEMPTING BATTERY AND FUSE REMOVAL OR REPLACEMENT, DISCONNECT TEST LEADS FROM ANY ENERGISED CIRCUITS TO AVOID SHOCK HAZARD.

### 6.1 Fitting and replacing the battery and fuse

- 1) Ensure that the instrument is not connected to any external circuit, set the selector switch to OFF position and remove the test leads from the terminals.
- 2) Remove the screw of the battery compartment on the bottom of the back case.
- 3) Replace the spent battery or fuse with the same type and rating.
- 4) Reinststate the battery compartment, tighten and securing screw.

### 6.2 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 equipment to prevent possible shorts and damage.

**FOR TECHNICAL ASSISTANCE,  
PLEASE CONTACT:**