

# TENMA®

Model 72-7720/72-7725

Operating Manual



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Modern Digital  
Multimeter

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**Model 72-7720/72-7725: OPERATING MANUAL**

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## Overview



### Warning

**To avoid electric shock or personal injury, read the "Safety Information" and "Rules for Safe Operation" carefully before using the Meter.**

Digital Multimeters Model 72-720 and 72-7725 (hereafter referred to as "the Meter") are 3 1/2 digits with steady operations, fashionable structure and highly reliable hand-held measuring instrument. The Meter uses large scale of integrated circuit with double integrated A/D converter as its core and has full range overload protection. The Meter not only can measure AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Temperature, Frequency, Diodes and Continuity, but also has Data Hold, Full Icon Display and Sleep Mode features.

The Meter adopted advanced "co-injection" technique in order to provide sufficient insulation and anti-shaking. In addition, the Automatic Display Backlight feature enables user to work in a dim condition.



**Model 72-7720/72-7725: OPERATING MANUAL**

## **Unpacking Inspection**

Open the package case and take out the Meter. Check the following items carefully for missing or damaged parts:

<b>Item</b>	<b>Description</b>	<b>Qty</b>
1	English Operating Manual	1 piece
2	Test Lead	1 pair
3	Test Clip	1 pair
4	Point Contact Temperature Probe (72-7725 only)	1 piece

In the event you find items missing or damaged, please contact your dealer immediately.

## Safety Information

This Meter complies with the standards IEC61010: in pollution degree 2, overvoltage category (CAT. II 1000V, CAT. III 600V) and double insulation.

CAT. II: Local level, appliance, PORTABLE EQUIPMENT etc., with smaller transient voltage overvoltages than CAT. III

CAT. III: Distribution level, fixed installation, with smaller transient overvoltages than CAT. IV

Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be impaired.

In this manual, a **Warning** identifies conditions and actions that pose hazards to the user, or may damage the Meter or the equipment under test.

A **Note** identifies the information that user should pay attention to.

International electrical symbols used on the Meter and in this Operating Manual are explained on page 8.


## Rules For Safe Operation (1)

### Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:













- 1 Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.
- 1 Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads with identical model number or electrical specifications before using the Meter.
- 1 Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and ground.
- 1 The rotary switch should be placed in the correct position and no changeover of range shall be made during measurement, to prevent damage of the Meter.
- 1 When working at an effective voltage over 60V DC or 30V rms AC, special care should be taken for there is danger of electric shock.
- 1 Use the proper terminals, function, and range for your measurements.
- 1 Do not use or store the Meter in an environment of high temperature, humidity, explosive, flammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.
- 1 When using the test leads, keep your fingers behind the finger guards.

## Rules For Safe Operation (2)

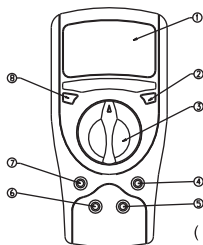
- 1 Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, capacitance or current.
- 1 Before measuring current, check the Meter's fuses and turn off power to the circuit before connecting the Meter .
- 1 Replace the battery as soon as the battery indicator  appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- 1 Remove test leads, test clips and temperature probe from the Meter and turn the Meter power off before opening the Meter case.
- 1 When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.
- 1 The internal circuit of the Meter shall not be altered at will to avoid damage of the Meter and any accident.
- 1 Soft cloth and mild detergent should be used to clean the surface of the Meter when servicing. No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.
- 1 The Meter is suitable only for indoor use.
- 1 Turn the Meter power off when it is not in use and take out the battery when not using for a long time.
- 1 Periodically check the battery as it may leak after some time.If leakage is apparent,the battery should be immediately replaced to prevent damage.



## International Electrical Symbols

	AC (Alternating Current).
	DC (Direct Current).
	AC or DC.
	Grounding.
	Double Insulated.
	Deficiency of Built-In Battery.
	Continuity Test.
	Diode.
	Capacitance Test.
	Fuse.
	Warning. Refer to the Operating Manual.
	Conforms to Standards of European Union.

### The Multimeter Structure (see figure 1)



( figure 1)

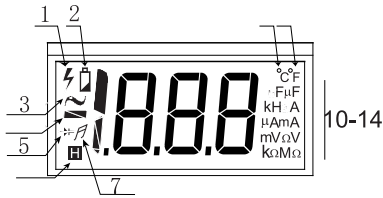
- ① LCD Display
- ② **Data Hold** Button.
- ③ Rotary Switch
- ④ Other Input Terminals
- ⑤ **COM** Input Terminal
- ⑥ **20A** Input Terminal
- ⑦ **Model 72-7720:**  $\mu\text{A}$ mA Input terminal  
**Model 72-7725:** mA Input terminal
- ⑧ Power

### Functional Buttons

The table below provides information about functional button operation

Button	Operation Performed
<b>POWER</b> (Yellow Button)	Turn the Meter on and off. <ul style="list-style-type: none"><li>● Press down the <b>POWER</b> to turn on the Meter.</li><li>● Press up the <b>POWER</b> to turn off the Meter.</li></ul>
<b>HOLD</b> (Blue Button)	<ul style="list-style-type: none"><li>● Press <b>HOLD</b> once to enter hold mode.</li><li>● Press <b>HOLD</b> again to exit hold mode.</li><li>● In Hold mode, <b>H</b> is displayed and the present value is shown.</li></ul>

## Display Symbols (see figure 2)





( figure 2)

No.	Symbol	Meaning
1	⚡	Dangerous Voltages.
2	🔋	The battery is low. ⚠️Warning: To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
3	~	Indicator for AC voltage or current. The displayed value is the mean value.
4	—	Indicates negative reading.
5	➔	Diode test
6	⏸	Data hold is active.
7	🔔	The continuity buzzer is on.
8	°C	Centigrade temperature
9	°F	Fahrenheit temperature
10	μA, mA, A	A: Amperes (amps). The unit of current. mA: Milliamp. $1 \times 10^{-3}$ or 0.001 amperes. μA: Microamp. $1 \times 10^{-6}$ or 0.000001 amperes.
11	mV, V	V: Volts. The unit of voltage. mV: Millivolt. $1 \times 10^{-3}$ or 0.001 volts.

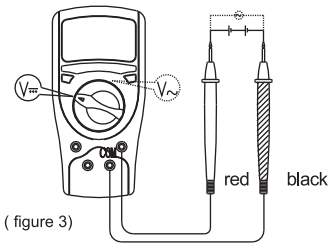
**Display Symbols** (see figure 2)

No.	Symbol	Meaning
12	nF, $\mu$ F	F: Farad. The unit of capacitance. $\mu$ F: Microfarad. $1 \times 10^{-6}$ or 0.000001 farads. nF: Nanofarad. $1 \times 10^{-9}$ or 0.000000001 farads.
13	kHz	The unit of frequency in cycles/second. KiloHertz. $1 \times 10^3$ or 1,000 hertz.
14	$\Omega$ , k $\Omega$ , M $\Omega$	$\Omega$ : Ohm. The unit of resistance. k $\Omega$ : kilohm. $1 \times 10^3$ or 1000 ohms. M $\Omega$ : Megaohm. $1 \times 10^6$ or 1,000,000 ohms.

## Measurement Operation(1)

- Make sure the Sleep Mode is not on if you found there is no display on the LCD after turning on the Meter.
- Make sure the Low Battery Display  is not on, otherwise false readings may be provided.
- Pay extra attention to the  symbol which is located besides the input terminals of the Meter before carrying out measurement.


### A. DC Voltage Measurement (see figure 3)



#### Warning

To avoid harm to you or damage to the Meter from electric shock, please do not attempt to measure voltage higher than 1000V or 750V rms although readings may be obtained.

The DC Voltage ranges are: 200mV, 2V, 20V, 200V and 1000V. To measure DC voltage, connect the Meter as follows:

1. Insert the red test lead into the **VΩ**  input terminal and the black test lead into the **COM** input terminal.
2. Set the rotary switch to an appropriate measurement position in V range.
3. Connect the test leads across with the object being measured.

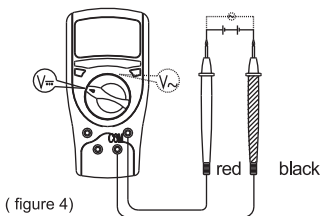
The measured value shows on the display.

## Measurement Operation(2)

### Note

- If the value of voltage to be measured is unknown, use the maximum measurement position (1000V) and reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays "1 "indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- In each range, the Meter has an input impedance of approx10M $\Omega$ . This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k $\Omega$ , the error is negligible (0.1% or less).
- When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

### B. AC Voltage Measurement (see figure 4)



### **⚠ Warning**

**To avoid harm to you or damage to the Meter from electric shock, please do not attempt to measure voltage higher than 1000V or 750V rms although readings may be obtained.**

### Measurement Operation(3)

**Model 72-7720:** AC voltage measurement has five measurement positions on the rotary switch: 200mV, 2V, 20V, 200V and 750V

**Model 72-7725:** AC voltage measurement has four measurement positions on the rotary switch: 2V, 20V, 200V and 750V

To measure AC Voltage, connect the Meter as follows:

1. Insert the red test lead into the **V $\Omega$**  terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to an appropriate measurement position in **V $\sim$**  range.
3. Connect the test leads across with the object being measured. The measured value shows on the display, which is effective value of sine wave (mean value response).

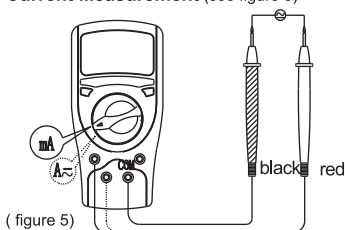
#### Note

- If the value of voltage to be measured is unknown, use the maximum measurement position (750V) and reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays "1 " indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- In each range, the Meter has an input impedance of approx 10M $\Omega$  .This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k $\Omega$ , the error is negligible (0.1% or less).
- When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.



## Measurement Operation(4)

### C. DC Current Measurement (see figure 5)



#### ⚠ Warning

Never attempt an in-circuit current measurement where the open circuit voltage between terminals and ground is greater than 60V DC or 30V rms. If the fuse burns out during measurement, the Meter may be damaged or the operator may be injured.

Use proper terminals, function, and range for the measurement. When test leads are connected to the current terminals, do not place them in parallel across any circuit.

**Model 72-7720:** The DC current measurement has four measurement positions on the rotary switch: 20 $\mu$ A, 2mA, 200mA and 20A.

**Model 72-7725:** The DC current measurement has three measurement positions on the rotary switch: 20mA, 200mA and 20A.

To measure current, do the following:

1. Turn off power to the circuit. Discharge all high-voltage capacitors.

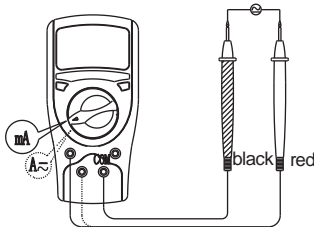
## Measurement Operation(5)

2. Insert the red test lead into the  $\mu\text{mA}$  ( Model 72-7725) or 20A terminal and the black test lead into the COM terminal.
3. Set the rotary switch to an appropriate measurement position in A  $\sim$  range.
4. Break the current path to be tested. Connect the red test lead to the more positive side of the break and the black test lead to the more negative side of the break.
5. Turn on power to the circuit. The measured value shows on the display.

### Note

- 1 If the value of current to be measured is unknown, use the maximum measurement position (20A) and 20A terminal, and reduce the range step by step until a satisfactory reading is obtained.
- 1 When current measurement has been completed, disconnect the connection between the test leads and the circuit under test.

### D. AC Current Measurement (see figure 6)



( figure 6)

## Measurement Operation(6)

### ⚠ Warning

Never attempt an in-circuit current measurement where the voltage between terminals and ground is greater than 60V.

If the fuse burns out during measurement, the Meter may be damaged or the operator may be injured.

Use proper terminals, function, and range for the measurement. When test leads are connected to the current terminals, do not place them in parallel across any circuit.

Model 72-7720: The AC current measurement has five measurement positions on the rotary switch: 200 $\mu$ A, 2mA, 20mA, 200mA and 20A.

Model 72-7725: The AC current measurement has three measurement positions on the rotary switch: 20mA, 200mA and 20A.

To measure current, do the following:

1. Turn off power to the circuit. Discharge all high-voltage capacitors.
2. Insert the red test lead into the  $\mu$ mA ( Model 72-7720) or mA ( Model 72-7725) or 20A terminal and the black test lead into the COM terminal.
3. Set the rotary switch to an appropriate measurement position in A $\sim$ range.
4. Break the current path to be tested. Connect the red test lead to the more positive side of the break and the black test lead to the more negative side of the break.
5. Turn on power to the circuit.

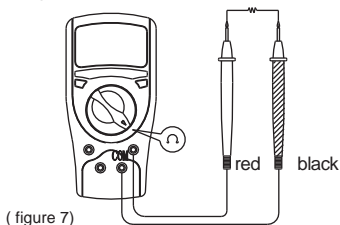
The measured value shows on the display.

### Note

- 1 If the value of current to be measured is unknown, use the maximum measurement position (20A) and 20A terminal and reduce the range step by step until a satisfactory reading is obtained.
- 1 When current measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

## Measurement Operation(7)

### E. Measuring Resistance (see figure 7)



#### ⚠ Warning

To avoid damage to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

The resistance ranges are:

Model 72-7720: 200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$ , 20M $\Omega$  and 200M $\Omega$ .

Model 72-7725: 200 $\Omega$ , 2k $\Omega$ , 20k $\Omega$ , 200k $\Omega$ , 2M $\Omega$  and 200M $\Omega$ .

To measure resistance, connect the Meter as follows:

1. Insert the red test lead into the V $\Omega$  terminal and the black test lead into the COM terminal.
2. Set the rotary switch to an appropriate measurement position in  $\Omega$  range.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

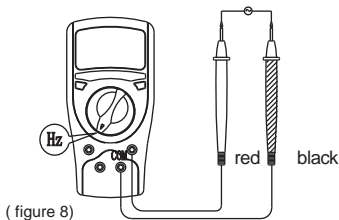
#### Note

- 1 The test leads can add 0.1 $\Omega$  to 0.3 $\Omega$  of error to the resistance measurement. To obtain precision readings in low-resistance, that is the range of 200 $\Omega$ , short-circuit the input terminals beforehand and record the reading obtained (called this reading as X). (X) is the additional resistance from the test lead.

## Measurement Operation(8)

- 1 For high resistance ( $>1\text{M}\Omega$ ), it is normal to take several seconds to obtain a stable reading.
- 1 When there is no input, for example in open circuit condition, the Meter displays "1".
- 1 When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

### F. Model 72-725: Frequency Measurement (see figure 8)



#### ⚠ Warning

To avoid harm to you or damage to the Meter, do not attempt to measure voltages higher than 60V in DC or 30V rms in AC although readings may be obtained. When the frequency signal to be tested is higher than 30V rms, the Meter cannot guarantee accuracy of the measurement.

The frequency measurement ranges are 2kHz and 20kHz. To measure frequency, connect the Meter as follows:

1. Insert the red test lead into the  $\text{V}\Omega$  terminal and the black test lead into the COM terminal.
2. Set the rotary switch to an appropriate measurement position in kHz range.
3. Connect the test leads across with the object being measured.

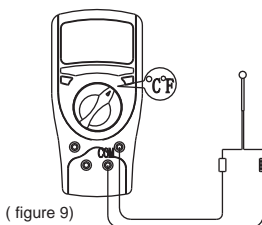
The measured value shows on the display.

## Measurement Operation(9)

### Note

- 1 When Hz measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

### G. Model 72-7725: Temperature Measurement (see figure 9)



### ⚠ Warning

To avoid harm to you or damage to the Meter, do not attempt to measure voltages higher than 60V in DC or 30V rms in AC although readings may be obtained.

The temperature measurement range is from  $-40^{\circ}\text{C}$ ~ $1000^{\circ}\text{C}$  or  $-40^{\circ}\text{F}$ ~ $1832^{\circ}\text{F}$ . To measure temperature, connect the Meter as follows:

1. Insert the red temperature probe into the V  $\Omega$   $\rightarrow$  terminal and the black temperature probe into the COM terminal.
2. Set the rotary switch to  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ .
3. Place the temperature probe to the object being measured.

The measured value shows on the display.

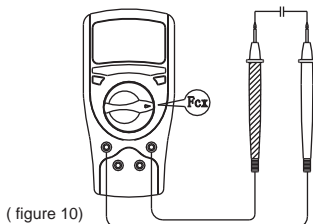
### Note

- 1 The Meter automatically displays the temperature value inside the Meter when there is no temperature probe connected.

## Measurement Operation(10)

- 1 The included temperature probe may only be used for measurement up to 250°C For any measurement higher than that, the rod type temperature probe must be used .
- 1 When temperature measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

### H.Capacitance Measurement (see figure 10)



Model 72-7720:Capacitance measurement has four measurement positions on the rotary switch : 2nF, 20nF, 2 $\mu$ F and 100 $\mu$ F.

Model 72-7725: Capacitance measurement has four measurement positions on the rotary switch: 20nF, 200nF, 2 $\mu$ F and 100 $\mu$ F.

To measure capacitance, connect the Meter as follows:

1. Insert the red test clip or red test lead into the  $V\Omega$  terminal and the black test clip or black test lead into the  $\mu$ mA ( Model: 72-7720) or mA ( Model: 72-7725) terminal.
2. Set the rotary switch to an appropriate measurement position in Fcx range.
3. Connect the test leads across with the object being measured.

The measured value shows on the display.

## Measurement Operation(11)

### Note

- 1 When testing polarized capacitors , connect the red test lead to anode & black test lead to cathode
- 1 If the capacitor is shorted or the capacitor value is overloaded, the LCD will display "1".
- 1 To minimize the error , the test lead should be as short as possible.  
When the tested capacitor is greater than 30  $\mu\text{F}$ , reading is for reference only.
- 1 It is normal to take a while for zeroing when changing the measurement range. This process will not affect the accuracy of the final readings obtained.

### I. Measuring Diodes & Continuity



#### Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring diodes and continuity.

#### Testing Diodes

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test out a diode out of a circuit, connect the Meter as follows:

1. Insert the red test lead into the  $V\Omega$   terminal and the black test lead into the COM terminal.
2. Set the rotary switch to   $\overline{f}$ .
3. For forward voltage drop readings on any semiconductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode.

The measured value shows on the display.



## Measurement Operation(12)

### Note

- 1 In a circuit, a good diode should still produce a forward voltage drop reading of 0.5V to 0.8V; however; the reverse voltage drop reading can vary depending on the resistance of other pathways between the probe tips.
- 1 Connect the test leads to the proper terminals as said above to avoid error display. The LCD will display "1" indicating open-circuit for wrong connection. The unit of diode is Volt (V), displaying the positive-connection voltage-drop value.
- 1 When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test.

### Testing for Continuity

To test for continuity, connect the Meter as below:

1. Insert the red test lead into  $V\Omega$  terminal and the black test lead into the COM terminal.
2. Set the rotary switch to  $\rightarrow \text{}$ .
3. Connect the test leads across with the object being measured.

The buzzer sounds if the resistance of a circuit under test is less than  $70\Omega$  .

The LCD displays the resistance value of a circuit under test.

### Note

- 1 The LCD display "1" indicating the circuit being tested is open.
- 1 When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test.

### Sleep Mode

To preserve battery life, the Meter automatically turns off if you do not turn the rotary switch or press any button for approximately 10 minutes. At that time, the Meter consumes around  $10\mu\text{A}$  current.

The Meter can be activated by pressing the **POWER** two times.

### Turning on the Auto Display Backlight

The Meter has a built-in sensor. Therefore the Display Backlight turns on and off automatically depending on the brightness of the environment.

## General Specifications

- 1 Maximum voltage between any Terminals and Ground : 1000V rms.
- 1  $\Delta$ Fused Protection for mA Input Terminal : 0.5A, 250V fast type,  $\phi$ 5x20mm.
- 1  $\Delta$ Fused Protection for 20A Input Terminal : Un-fused.
- 1 Range : Manual ranging.
- 1 Maximum Display : Display :1999.
- 1 Measurement Speed : Updates 2~3 times/second.
- 1 Temperature : Operating: 0°C~40°C (32°F~104°F);  
Storage : -10°C~50°C (14°F~122°F).
- 1 Relative Humidity :  $\leq$ 75% @ 0°C~30°C;  
 $\leq$ 50% @ 31°C~40°C.
- 1 Altitude: Operating : 2000m;  
Storage : 10000m.
- 1 Battery Type : 9V NEDA1604 or 6F22 or 006P.
- 1 Low Battery : Display "⏻".
- 1 Data Hold : Display "H".
- 1 Negative read : Display "—".
- 1 Overload : Display "1".
- 1 Dimensions (HxWxL) : 165x80x38.3mm.
- 1 Weight : Approx.275g (battery included).
- 1 Safety/Compliances : IEC61010 CAT II 1000V overvoltage and double insulation standard.
- 1 Certificate : CE

## Accuracy Specifications(1)

Accuracy:  $\pm$  (a% reading + b digits), guarantee for 1 year.

Operating temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

Relative humidity:  $< 75\%$ .

Temperature coefficient:  $0.1 \times$  (specified accuracy) /  $1^{\circ}\text{C}$ .

### A. DC Voltage

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
200mV	100 $\mu$ V	$\pm(0.5\%+1)$		250VDC or ACrms.
2V	1mV			
20V	10mV			
200V	100mV			
1000V	1V	$\pm(0.8\%+2)$		1000V DC or 750V AC rms.

Remark: Input impedance: 10M $\Omega$

### B. AC Voltage

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
200mV	100 $\mu$ V	$\pm(1.2\%+3)$	----	250V DC or AC rms
2V	1mV	$\pm(0.8\%+3)$		1000V DC or 750V AC rms.
20V	10mV			
200V	100mV			
750V	1V	$\pm(1.2\%+3)$		

Remarks:

1 Input impedance: 10M $\Omega$  .

1 Frequency response: 40Hz~400Hz.

1 Display effective value of sine wave (mean value response).

## Accuracy Specifications(2)

### C. DC Current

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
20 $\mu$ A	0.01 $\mu$ A	$\pm(0.8\%+1)$	----	0.5A, 250V fast type fuse, $\phi 5 \times 20$ mm
2mA	1 $\mu$ A		----	
20mA	10 $\mu$ A	----	$\pm(0.8\%+1)$	
200mA	100 $\mu$ A	$\pm(1.5\%+1)$		Un-Fused
20A	10mA	$\pm(2\%+5)$		

#### Remarks:

- 1 At 20A Range: For continuous measurement  $\leq 10$  seconds and interval not less than 15 minutes.
- 1 Measurement voltage drop: Full range at 200mV.

### D. AC Current

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
200 $\mu$ A	0.1 $\mu$ A	$\pm(1\%+3)$	----	0.5A, 250V fast type fuse, $\phi 5 \times 20$ mm
2mA	1 $\mu$ A			
20mA	10 $\mu$ A	----	$\pm(1\%+3)$	
200mA	100 $\mu$ A	$\pm(1.8\%+3)$		Un-Fused
20A	10mA	$\pm(3\%+5)$		

#### Remarks:

- 1 At 20A Range: For continuous measurement  $\leq 10$  seconds and interval not less than 15 minutes.
- 1 Measurement voltage drop: Full range at 200mV.
- 1 Frequency response: 40Hz~400Hz
- 1 Display effective value of sine wave (mean value response).

## Accuracy Specifications(3)

### E. Resistance Test

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
200Ω	0.1Ω	±(0.8%+3)		250V DC or AC rms
2kΩ	1Ω	±(0.8%+1)		
20kΩ	10Ω			
200kΩ	100Ω			
2MΩ	1kΩ			
20MΩ	10kΩ	±(1%+2)	----	
200MΩ	100kΩ	±[5%(reading-10)+10]		

#### Remarks:

- Open circuit voltage: ≤700mV (At 200MΩ range, it is approx. 2.8V)
- At 200MΩ range, test lead is in short circuit, and it is normal to display 10 digits. During measurement, subtract the 10 digits from the reading.

### F. Model 72-7725: Frequency

Range	Resolution	Accuracy	Overload Protection
2kHz	1Hz	±(2%+5)	250V AC
20kHz	10Hz	±(1.5%+5)	

Remarks: Input Sensitivity: ≤200mV.

### G. The Model 72-7725: Temperature

Range	Resolution	Accuracy	Overload Protection
-40°C~0°C	1°C	±(3%+3)	250V AC
0°C~400°C		±(1%+3)	
400°C~1000°C		± 2.5%	
-40°F~32°F	1°F	±(3%+4)	
32°F~752°F		±(1%+4)	
752°F~1832°F		±(1.5%+15)	

## Accuracy Specifications(4)

### H. Capacitance

Range	Resolution	Accuracy		Overload Protection
		72-7720	72-7725	
2nF	1pF	$\pm(4\%+3)$	----	250V AC
20nF	10pF		$\pm(4\%+3)$	
200nF	0.1nF	----		
2 $\mu$ F	1nF	$\pm(4\%+3)$		
100 $\mu$ F	0.1 $\mu$ F	$\pm(5\%+4)$		

Remarks: Testing signal: approx. 400Hz 40mV rms.  
When the tested capacitor is greater than 30  $\mu$ F, reading is for reference only.

### I. Diodes and Continuity Test

Range	Resolution	Input Protection	Remark
$\rightarrow$	1mV	250V DC or AC	Open circuit voltage approx. 2.8V
$\mathcal{A}$	1 $\Omega$		<70 $\Omega$ buzzer beeps continuously

## Maintenance(1)

This section provides basic maintenance information including battery and fuse replacement instruction.

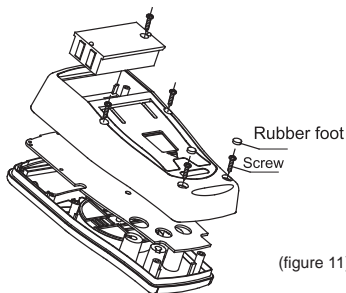
### ⚠Warning

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information. To avoid electrical shock or damage to the Meter, do not get water inside the case.

#### A. General Service

- 1 Periodically wipe the case with damp cloth and mild detergent. Do not use chemical solvent.
- 1 To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- 1 Turn the Meter OFF when it is not in use and take out the battery when not using for a long time.
- 1 Do not store the Meter in place of humidity, high temperature, explosive, inflammable and strong magnetic field

#### B. Replacing the Battery (see figure 11)




(figure 11)



## Maintenance(2)

### ⚠ Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator  appears.

To replace battery:

1. Disconnect the connection between the test leads and the circuit under test, and move the test leads away from the input terminals of the Meter.
2. Turn the Meter OFF
3. Remove the rubber feet and screws from the battery compartment, and separate the battery compartment from the case bottom
4. Remove the battery from the battery compartment.
5. Replace the battery with a new 9V battery (NEDA 1604 or 6F22 or 006P).
6. Rejoin the battery compartment and the case bottom, and install the screw and rubber feet

### C. Replacing the Fuses

#### ⚠ Warning

To avoid electrical shock, arc blast, personal injury or damage to the Meter, use specified fuses ONLY in accordance with the following procedure.

To replace the Meter's fuse:

1. Disconnect the connection between the test leads and the circuit under test, and move the test leads away from the input terminals of the Meter.
2. Turn the Meter OFF.
3. Remove the rubber feet and screws from the case bottom, and separate the case bottom from the case top.
4. Remove the fuse by gently prying one end loose, and then take out the fuse from its bracket.

### Maintenance(3)

1. Install ONLY replacement fuses with the identical type and specification as follows and make sure the fuse is fixed firmly in the bracket. 0.5A. 250V fast type fuse,  $\phi$  5x20mm.
2. Rejoin the case bottom and the case top, and install the screw and rubber feet

Replacement of fuses is seldom required. Burning of a fuse always results from the improper operation.

~ END ~

This operating manual is subject to change without notice.



Model 72-7720/72-7725: OPERATING MANUAL

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