

**all@sun®**

**EM266(DT266) SERIES  
DIGITAL CLAMP METER  
OWNERS MANUAL**

<http://www.all-sun.com>

Read this owners manual thoroughly before use

## **WARRANTY**









This instrument is warranted to be free from defects in material and workmanship for a period of one year. Any instrument found defective within one year from the delivery date and returned to the factory with transportation charges prepaid, will be repaired, adjusted, or replaced at no charge to the original purchaser. This warranty does not cover expandable items such as battery.

If the defect has been caused by a misuse or abnormal operating conditions, the repair will be billed at a nominal cost.

## **SAFETY INFORMATION**

The digital multimeter has been designed according to IEC-61010 concerning electronic measuring instruments with a measurement category (CAT II ) and pollution degree 2.

## **ELECTRICAL SYMBOLS**


-  Alternating Current
-  Direct Current
-  Caution, risk of danger, refer to the operating manual before use.
-  Caution, risk of electric shock.
-  Earth (ground) Terminal
-  Fuse
-  Conforms to European Union directives
-  The equipment is protected throughout by double insulation or reinforced insulation.

## **A WARNING**

To avoid possible electric shock or personal injury, follow these guidelines:

- Do not use the meter if it is damaged. Before you use the meter, inspect the case. Pay particular attention to the insulation surrounding the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads before you use the meter.
- Do not use the meter if it operates abnormally. Protection may be impaired. When in doubt, have the meter serviced.
- Do not operate the meter around explosive gas, vapor, or dust.
- To avoid damages to the instrument, do not exceed the maximum limits of the input values shown on the meter.
- Before use, verify the meter's operation by measuring a known voltage.
- When servicing the meter, use only specified replacement parts.
- Use with caution when working above 30V AC RMS, 42V peak, or 60V DC. Such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards on the probes.
- Connect the common test lead before you connect the live test lead. When you disconnect test leads, disconnect the live test lead first.
- Remove the test leads from the meter before you open the battery door.
- Do not operate the meter with the battery door or portions of the

cover removed or loosened.

- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator ("  ") appears.
- When an input terminal is connected to dangerous live potential it is to be noted that this potential at all other terminals can occur!
- After you press the Data Hold button to enter Data Hold mode, caution must be used because hazardous voltage may be present.
- CATII-Measurement Category II is for measurements performed on circuits directly connected to low voltage installation. (Examples are measurements on household appliances, portable tools and similar equipments.) Do not use the meter for measurements within Measurement Categories III and IV.

## CAUTION

To avoid possible damage to the meter or to the equipment under test, follow these guidelines:

- Disconnect circuit power and discharge all capacitors before testing resistance, insulation resistance, continuity or diode.
- Use the proper terminals, function, and range for your easurements.
- Never measure current while the test leads are inserted into the input jacks.
- Before rotating the range switch to change functions, disconnect test leads from the circuit under test.
- Remove test leads from the meter before opening the meter case.

## FRONT PANEL DESCRIPTION



### 1. Transformer Jaws

Pick up the AC current flowing through the conductor.

### 2. "DATA HOLD" Button

Press this button to hold the present reading on the display, press again to release the display.

For model 260D, this button is used for holding peak.

### **3. Function / Range Switch**

Function / Range switch for selecting measurement function and range.

### **4. Display**

3 1/2 digits LCD, Max. reading 1999.

### **5. Drop-proof Wrist Strap:**

Prevent the instrument from slipping off the hand while in use.

### **6. "EXT" Jack**

Plug-in connector for the banana plug "EXT" from the extensional insulation resistance tester unit.

### **7. "COM" Jack**

Plug-in connector for the black test lead while measuring voltage, resistance and continuity; and for connecting the banana plug "COM" from the insulation tester unit while measuring insulation resistance.

### **8. V/ $\Omega$ Input Jack**

Plug-in connector for the red test lead while measuring voltage, resistance and continuity; and for connecting the banana plug "V/ $\Omega$ " from the insulation tester unit while measuring insulation resistance.

### **9. Trigger**

Press the level to open the transformer jaws; when the finger pressing on the level is released, the jaws will close again.

## MODELS AND FUNCTIONS

		266	266 C	266C +	260 D	266 F	266F T
<b>ACV</b>	200mV						*
	200V		*	*	*	*	*
	750V	*	*	*	*	*	*
<b>ACA</b>	20A		*	*	*		*
	200A	*	*	*	*	*	*
	1000A	*	*	*	*	*	*
<b>DCV</b>	200mV		*	*	*		*
	2V		*	*		*	
	20V		*	*	*	*	*
	200V		*	*	*	*	
	1000V	*	*	*	*	*	*
<b>Ω</b>	200Ω	*	*	*	*	*	
	2kΩ				*	*	*
	20 kΩ	*	*	*	*	*	*
	200 kΩ				*	*	
	2MΩ		*	*	*	*	
<b>Insulation</b>	20MΩ– 2000MΩ	*	*	*	*	*	*
<b>TEMP</b>	°C, °F		*	*			*
<b>F</b>	2kHz					*	*
<b>→</b>	1mA, 2.8V				*	*	
<b>)))</b>	<50Ω	*		*	*	*	*

## INTRODUCTION

The meter is a portable, 3-1/2 digits LCD clamp meter with insulation test function (with optional 500V insulation tester unit), designed for being used by electricians, technicians, serviceman and hobbyists who need an instrument that is accurate, reliable, and always ready for use. It is powered by a standard 9V battery, and can provide 150-200 operating hours, which depends on the type of battery and using conditions. It has rugged structure design, good feeling held in operator's hand and convenient use.

## TECHNICAL SPECIFICATIONS

The following specifications assume a 1-year calibration cycle and operating conditions of temperature scale of 18°C to 28°C (64°F to 82°F ) with relative humidity up to 80% unless otherwise noted.

Accuracy specifications take the form of:

$$\pm [(\% \text{ of Reading}) + (\text{Number of Least Significant Digits})]$$

### AC Current

Range	Resolution	Accuracy(50Hz - 60Hz)
20A	10mA	+ (2.5% + 8)
200A	100mA	+ (2.5% + 5)
1000A	1A	+ (2.5% + 5) for 800A and below If >800A, the reading is only for reference.

Frequency response: 50~60Hz

Indication: Average (rms of sine wave)

Overload protection: 1200A within 60seconds,

Jaw opening: 2"(5cm)



## Insulation Test (with optional 500V insulation tester unit)

Range	Resolution	Accuracy
20M $\Omega$	10k $\Omega$	+(2% + 2)
2000M $\Omega$	1M $\Omega$	500M $\Omega$ : +(4% + 2) >500M $\Omega$ : +(5% + 2)

## AC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	+(1.2% + 5)
200V	100mV	
750V	1V	+(2.0% + 5)

Frequency range: 45 - 400Hz

Input impedance: 9M $\Omega$

Indication: Average (rms of sine wave)

Overload protection: 200mV range: 250V AC;

the other ranges: 750V rms AC

## DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	+(0.8% + 3)
2V	1mV	
20V	10mV	
200V	100mV	
1000V	1V	+(1.2% + 5)

Overload protection: 200mV range: 250V AC;

the other ranges: 1000V DC/AC peak.

Input impedance: 9M $\Omega$

## Resistance

Range	Resolution	Accuracy
200 $\Omega$	0.1 $\Omega$	+(1.2% + 5)
2k $\Omega$	1 $\Omega$	+(1.0% + 3)
20 k $\Omega$	10 $\Omega$	
200 k $\Omega$	100 $\Omega$	
2M $\Omega$	1k $\Omega$	+(1.5% + 5)

Overload protection: 250V rms AC

## Temperature

Range	Resolution	Accuracy
0 $^{\circ}$ C - 750 $^{\circ}$ C	1 $^{\circ}$ C	0 $^{\circ}$ - 400 $^{\circ}$ : $\pm(1\%+5)$ 400r~750IC: $\pm(2\%+5)$
32 $^{\circ}$ F~1382 $^{\circ}$ F	1 $^{\circ}$ F	32T-752T: $\pm(1\%+9)$ 752T-1382T: $\pm(2\%+9)$


Use K type thermocouple

### Note:

1. Accuracy does not include error of the thermocouple probe.
2. Accuracy specification assumes ambient temperature is stable to  $\pm 1^{\circ}$ C. For ambient temperature changes of  $\pm 5^{\circ}$ C, rated accuracy applies after 1 hour.

Range	Resolution	Accuracy
2 kHz	1Hz	+(1.5% + 5)

## Diode and Continuity Test

Range	Description
	The approx. forward voltage drop of the diode will be displayed on the LCD.
	When the resistance is less than about 50Ω, the built-in buzzer will sound.

## GENERAL SPECIFICATIONS

**Display:** 3 1/2-digit LCD, with a max. reading of 1999

**Overrange Indication:** only figure " 1 " displayed on the LCD

**Negative Polarity Indication:** " - " displayed automatically

**Sampling Rate:** about 2-3 times/sec

**Operating Temperature:** 0°C~40°C, <75%RH

**Storage Temperature:** -10°C~50°C, <85%RH

**Battery:** 9V, 6F22 or equivalent

**Low Battery Indication:** " " shown on the display

**Dimensions:** 240 X 102 X 47mm

**Weight:** about 300g (including battery)

# OPERATING INSTRUCTION

## AC Current Measurement

1. Make sure the "Data Hold" switch is not pressed.
2. Set the Function/Range switch to the desired ACA range.
3. Press the trigger to open the transformer jaws and clamp one conductor only. It is impossible to make measurements when two or three conductors are clamped at the same time.
4. The value displayed on the LCD is the AC current flowing through the conductor.

## Insulation Resistance Test

1. Set the rotary switch of the clamp meter to the  $2000M\Omega$  range. In this condition, it is normal that the reading is unstable.
2. Insert the three banana plugs V/Q, COM, EXT of the insulation tester unit to the corresponding V/Q, COM, EXT input jacks on the clamp meter.
3. Set the range switch of the insulation tester unit to the  $2000M\Omega$  position.
4. Connect the test leads from the insulation tester unit to the appliance to be tested.
5. Set the insulation tester Power switch to the "ON" position.
6. Push the "500V" button, the red LED "500V" will light. The reading on the LCD of the clamp meter is the insulation resistance value; if the reading is below  $19M\Omega$ , set the rotary switch of the the clamp meter and the range switch of the insulation tester unit to  $20M\Omega$  range position to increase the measurement accuracy.

7. If the insulation tester unit is not used, the power switch must set to OFF position. And the test leads must be removed from the input jacks; this can extend the battery life and prevent electrical shock hazard.

## **DC Voltage Measurement**

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the rotary switch to the desired DCV range. If the voltage to be measured is not known beforehand, set the range switch to the highest range and then turn down range by range until satisfactory resolution is obtained.
3. Connect the test leads to the source or load to be measured.
4. Read the voltage value displayed on the LCD along with the polarity of the red test lead.

## **AC Voltage Measurement**

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the rotary switch to the desired ACV range. If the voltage to be measured is not known beforehand, set the range switch to the highest range and then turn down range by range until satisfactory resolution is obtained.
3. Connect the test leads to the source or load to be measured.
4. Read the voltage value displayed on the LCD.


## Resistance Measurement

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the rotary switch to the desired  $\Omega$ . range.
3. Connect the test leads to the resistor to be measured and read the value displayed on the LCD.

### Note :

For resistance about 1 M $\Omega$  and above, the meter may take a few seconds to stabilize. This is normal for high resistance readings.

## Diode Test

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack. (The polarity of the red test lead is positive "+". )
2. Set the rotary switch to  range.
3. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode of the diode. The approximate forward voltage drop of the diode will be displayed on the LCD. If the connection is reversed, only figure "1" will be shown.

## **Audible Continuity Test**

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the rotary switch to  $\bullet\Omega$  range.
3. Connect the test leads to the two terminals of the circuit to be tested. If the resistance is less than about 50 $\Omega$ , the built-in buzzer will sound.

## **Temperature Measurement**

### **Note**

To avoid possible damage to the meter or other equipment, remember that while the meter is rated for 0°C to +750°C and 32°F to 1382°F, the K Type Thermocouple provided with the meter is rated to 250°C. For temperatures out of that range, use a higher rated thermocouple.

The K Type Thermocouple provided with the meter is a present, it is not professional and can only be used for non-critical reference measurements. For accurate measurements, use a professional thermocouple.

1. Connect the K type thermocouple to the corresponding measurement socket.
2. Set the rotary switch to the desired temperature range.
3. Touch the K type thermocouple to the object to be measured.
4. Wait a while, read the temperature value displayed on the LCD.


## Frequency Measurement

1. Connect the red test lead to the "V/ $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the rotary switch to the frequency (2kHz) range.  
Connect the test leads to the source or load to be measured.
3. Read the frequency value displayed on the LCD.

## MAINTENANCE

- Before opening the case, always disconnect the test leads from all live circuits.
- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

## BATTERY REPLACEMENT

When the symbol " " appears on the display, it shows that the battery should be replaced. To replace the battery, open the battery door, replace the exhausted battery with a new one of the same type, reinstall the battery door. Some models of this series use screws for fastening the door, please install the screws.



## ACCESSORIES

Instruction manual:	1 copy
Test leads:	1 pair

Note:

In normal condition, the insulation tester is not provided. If needed, you can buy from our company.

## PRESENT

K Type Thermocouple: 1 piece (only 266C, 266C+, 266FT)

## NOTE

1. This manual is subject to change without notice.
2. Our company will not take the other responsibilities for any loss.
3. The content of this manual can not be used as the reason to use the meter for any special applications.

<http://www.all-sun.com>

## DISPOSAL OF THIS ARTICLE

Dear Customer,

If you at some point intend to dispose of this article, then please keep in mind that many of its components consist of valuable materials, which can be recycled. Please do not discharge it in the garbage bin, but check with your local council for recycling facilities in your area.

