

## 1. SAFETY INFORMATION

The meter is completely portable, LCD, 3 1/2 digit clamp meter with insulation test function (with option 500V insulation tester unit). It has been designed according to IEC1010-1 IEC1010-2:032 concerning electronic measuring instruments with an overvoltage category (CAT II 1000V & CAT III 600V) and pollution 2 and safety requirements for hand-held current clamps for electrical measurement and test.

Follow all safety and operating instructions to ensure that the meter is used safely and is kept in good operating condition.

### 1.1 PRELIMINARY

When using this meter, the user must observe all normal safety rules concerning:

- Protection against the dangers of electronic current.
- Protection of the meter against misuse.
- Full compliance with safety standards can be guaranteed only if used with test leads supplied. If necessary, they must be replaced with the same model or same electronic ratings. Measuring leads must be in good condition.

### 1.2 DURING USE

Never exceed the protection limit values indicated in specifications for each range of measurement.

When the meter is linked to measurement circuit, do not touch unsafe terminals.

When the value scale to be measured is unknown beforehand, set the range selector at the highest position.

Before rotating the range selector to change function, disconnect test leads from the circuit under test.






When carrying out measurements on TV or switching power circuits always remember that there may be high amplitude voltage pulses at test points, which can damage the meter.

Never perform resistance measurements on live circuits.

Always be careful when working with voltage above 60V dc or 30V ac rms. Keep fingers behind the probe barriers while measuring.

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## 1.3 SYMBOLS

-  Important safety information, refer to the operating manual.
-  Dangerous voltage may be present.
-  Double insulation (Protection class II).
-  Application around and removal from HAZARDOUS LIVE conductors is permitted.
-  Earth ground.

## 1.4 MAINTENANCE

Before opening the meter, always disconnect test leads from all sources of electric current.

If any faults or abnormalities are observed, the meter can not be used any more and it has to be checked out.

Never use the meter unless the back cover and the battery cover are in place and fastened fully.

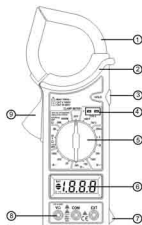
Do not use abrasives or solvents on the meter, use a damp cloth and mild detergent only.

## 2. DESCRIPTION

This meter is one of a series portable 3 1/2 digital clamp meter for measuring DC and AC Voltage, AC current, resistance, continuity test and insulation test. Some models also provide frequency or temperature test. Full overload protection. Low battery indication and over-range indication are providing. Following table shows function of the series of clamp meter. The black spot represents that the product you purchased.

FUNCTION				
ACV DCV	※	※	●	※
ACA	※	※	※	※
Ω	※	※	※	※
▶	※	※	※	※
- )	※	※	※	※
INSULATION	※	※	※	※
TEMPERATURE	※	※	※	※
FREQUENCY	※	※	※	※

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1. TRANSFORMER JAWS
2. BARRIER OR TACTILE INDICATOR
3. DATA HOLD SWITCH
4. TEMPERATURE MEASURING SOCKET
5. ROTARY SWITCH
6. LCD DISPLAY
7. DROP-PROOF WRIST STRAP
8. INPUT JACKS
9. TRIGGER

### 2.1 FUNCTION AND RANGE SELECTOR

A rotary switch is used to measurement functions and ranges. When the switch is set to OFF position, the meter does not operate.

### 2.2 TRANSFORMER JAWS

Pick up the AC current flowing through the conductor. Press the TRIGGER to open the transformer jaws. When the finger press on the TRIGGER is released, the jaws will close again.

### 2.3 DATA HOLD

Depress HOLD Button Switch to toggle in and out of the Data Hold mode. Releasing Data Hold mode again press the button.

### 2.4 INPUT JACKS

This meter has three input jacks that are protected against overload to the limits shown.

During use connect the black test lead to COM jack and connect red test lead to V<sub>Ω</sub> jack. The red test lead is depended on function selected.

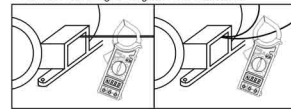
The EXT jack is used for accept insulation tester unit EXT banana Plugs, when measurement insulation resistance.

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## 3. OPERATING INSTRUCTION

### 3.1 MEASURING CURRENT

1. Set the rotary switch at desired A – range position. Press the trigger to open the transformer jaws and clamp onto one conductor only (Fig.1). The transformer jaws pick up the AC current flowing through the conductor.
2. When only the figure "1" displayed, it indicates overrange situation and the higher range have to be selected.



### 3.2 INSULATION TEST

- (Option 500V insulation tester unit)
1. Connect the insulation tester unit V<sub>Ω</sub> COM. EXT three-banana plugs to the clamp meter V<sub>Ω</sub> COM. EXT.
  2. Set the rotary switch of clamp meter at 2000MΩ position.
  3. Set the insulation tester unit range switch to the 2000MΩ position.
  4. Uses the insulation tester unit of the test leads connects its L, E input connect to being tested installations. (Test installer's must be power OFF)
  5. Set the insulation tester power switch to the ON position.
  6. Depress the PUSH 500V push-push switch; the 500V on red LED lamp will light. Clamp meter display reading is the insulation resistance value. If the reading is below 19MΩ, change clamp meter and insulation tester unit to 20MΩ range, can be increasing the accuracy.
  7. If the insulation tester unit is not use, the power switch must shift to power OFF position, and the test leads must leave the E, L input connect. That can be increase battery life and prevent electrical shock hazard.

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## 3.3 MEASURING VOLTAGE

1. Connect the black test lead to the COM jack and the red test lead to the V<sub>Ω</sub> jack.
2. Set the rotary switch at the desired V – range position and connect test leads across the source or load under measurement. The polarity of the red lead connection will be indicated along with the voltage value when making DC voltage measurement.

3. When only the figure "1" is displayed, it indicates overrange situation and the higher range has to be selected.

### 3.4 MEASURING RESISTANCE

1. Connect the black test lead to the COM jack and the red test lead to the V<sub>Ω</sub> jack.
2. Set the rotary switch at desired R position and connect test leads across the resistor under measurement.

#### NOTE:

1. If the resistance being measured exceeds the maximum value of the range selected or the input is not connected, an overrange indication "1" will be displayed.
2. When checking in - circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

### 3.5 TESTING DIODE

1. Connect the black test lead to the COM jack and the red test lead to the V<sub>Ω</sub> jack. (The polarity of red lead is " + " )
2. Set the rotary switch at ▶ position and connect red lead to the anode, black lead to the cathode of the diode under testing. The meter will show the approx. forward voltage of the diode. If the lead connection is reversed, only figure " 1 " displayed.

### 3.6 CONTINUITY TEST

1. Connect the black test lead to the COM jack and the red test lead to the V<sub>Ω</sub> jack. (The polarity of the red lead is positive " + " )

2. Set the rotary switch at -|) position and connect test leads across two points of the circuit under testing. If continuity exists (i.e. resistance less than about 100Ω), built-in buzzer will sound.

### 3.7 MEASURING TEMPERATURE

1. Set the rotary switch at C or T position and the LCD display will show the current environment temperature.
2. Insert " K " type thermocouple into the temperature measuring socket on the front panel and contact the object to be measured with the thermocouple probe. Read LCD display.

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## ⚠ WARNING:

To avoid electric shock, be sure the thermocouple has been removed before charging to another function measurement.

## 3.8 MEASURING FREQUENCY

1. Connect the black test lead to the COM jack and the red test lead to the V<sub>Ω</sub> jack.
2. Set the rotary switch at Hz position and connect test leads across the source or load under measurement.

#### NOTE:

1. Reading is possible at input voltage above 10V rms., but the accuracy is not guaranteed.
2. In noisy environment, it is preferable to use shield cable for measuring small signal.

## 4. SPECIFICATIONS

Accuracy is specified for a period of one year after calibration and at 18°C to 28°C (64°F to 82°F) with relative humidity to 80%.

### 4.1 GENERAL

Display : 3 1/2 digit LCD, with automatic polarity indication

Terminals and earth ground : 1000V dc or 750V rms ac (sine)

Measuring Method : Dual-slope integration A-D converter

Overrange Indication : "1" Figure only in the display

Polarity indication : "-" displayed for negative polarity

Operating Temperature : 0°C to 40°C (32°F to 104°F)

Storage Environment : -10°C to 50°C (14°F to 122°F)

Power : 9V alkaline or carbon-zinc battery (6F22 or equivalent)

Accessories : Operating manual, set of test leads

Low Battery Indication : "BAT" to left of display

Optional Accessories : Thermocouple (K type)

Dimension : 96(W)×235(D)×46(H) mm

Weight : 330g (including battery)

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### 4.2 AC CURRENT

Range	Resolution	Accuracy
20A	0.01A	±4.0% of rdg ± 5 digits
200A	0.1A	±2.5% of rdg ± 5 digits
1000A	1A	±3.0% of rdg ± 10 digits

Frequency Range: 50Hz to 60Hz  
Response: Average, Calibrated in rms of sine wave  
Overload protection: 1200A within 60 seconds. Jaw Opening: φ50mm

### 4.3 INSULATION TEST

(With option 500V insulation tester unit)

Range	Resolution	Accuracy	Note
20MΩ	10KΩ	±2.0% of rdg ± 2 digits	
2000MΩ	1MΩ	±4.0% of rdg ± 2 digits	≤ 500MΩ
		±5.0% of rdg ± 2 digits	> 500MΩ

### 4.4 AC VOLTAGE

Range	Resolution	Accuracy
200V	0.1V	±1.0% of rdg ± 5 digits
750V	1V	±1.2% of rdg ± 5 digits

Input Impedance: ≥9MΩ on all ranges  
Overload protection: 1000V DC or 750V AC on all ranges  
Frequency Range: 50Hz to 400Hz / ≤ 600V, (50Hz to 200Hz) / 750V.  
Response: Average, calibrated in rms of sine wave

### 4.5 DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mV	±0.5% of rdg ± 1 digit
2V	1mV	
20V	10mV	±0.5% of rdg ± 3 digits
200V	0.1V	±0.5% of rdg ± 3 digits
1000V	1V	±0.8% of rdg ± 3 digits

Input Impedance: ≥9MΩ  
Overload protection: 250Vrms AC for 200mV range, 1000V DC or 750V AC for other range.

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### 4.6 RESISTANCE

Range	Resolution	Accuracy
200Ω	0.1Ω	±1.0% of rdg ± 5 digits
2KΩ	1Ω	
20KΩ	10Ω	
200KΩ	100Ω	±1.0% of rdg ± 8 digits
2MΩ	1KΩ	

Overload protection: 250V DC or 250Vrms AC on all ranges.

Open circuit voltage: 700mV

### 4.7 TEMPERATURE

RANGE	RESOLUTION	Accuracy	
		0°C to 400°C (32°F to 752°F)	401°C to 750°C (754°F to 1382°F)
0°C to 750°C	1°C	±1.0% of rdg ± 3 digits	±2.0% of rdg ± 3 digits
32°F to 1382°F	1°F		

### 4.8 FREQUENCY

Range	Resolution	Accuracy
2kHz	1Hz	±2.0% of rdg ± 5 digits

## 5. ACCESSORIES

COME WITH THE CLAMP METER

Test Leads Model: T3000

Battery : 9V 6F22 or equivalent

Operation Manual

Temperature probe

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## 6. BATTERY REPLACEMENT

If the sign "BAT" appears on the LCD display, it indicates that battery should be replaced. Remove the battery cover of case. Replace the exhausted battery with a new one.

### ⚠ WARNING

Before attempting to open the battery cover, be sure that test leads have been disconnected from measurement circuits to avoid electric shock hazard.

### ⚠ WARNING

Using this appliance in an environment with a strong radiated radio-frequency electromagnetic field (approximately 3V/m) may influence its measuring accuracy.

# DIGITAL CLAMP MULTIMETER

## OPERATOR'S INSTRUCTION MANUAL