

DIGITAL  
CLAMP METER

Users Manual

65749

**MARS**<sup>®</sup>

This meter is completely portable, LCD, 3 ½ digits clamp meter with insulation test function (with option 500V insulation tester unit). Designed for use by electricians, technicians, serviceman and hobbyists who required an instrument that is accurate, reliable, and always ready for use. It is powered by a standard 9V battery, providing 100-150 operating hours, depending upon the type of battery and usage. It has rugged structure design, good feeling held in operator's hand and convenient use.

## 1. Operating Features

AC Current	0.1A to 600A
Insulation Test	100KΩ to 2000MΩ (With option 500V insulation tester unit)
AC Voltage	1V to 750V
DC Voltage	1V to 1000V
Resistance	100mΩ to 20KΩ
Continuity Test	30±20 with audio tone

This meter display is a liquid crystal assembly providing a readably display in all light conditions. The decimal point is automatically positioned, and the polarity sign (minus) is lighted for negative DC measurement (plus is understood if no sign appears), so that the display is direct reading in units selected at the rotary switch. Over range measurements are indicated by blanking all but the MSD, decimal point and polarity sign (if negative). In addition the display includes a low battery indication. If low battery is indicated, operator should replace the used battery with a new one.

## 2. Specifications

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

### 2.1 AC Voltage (Average sensing, calibrated to rms of sine wave)

Range	Resolution	Accuracy (50Hz-500Hz)
750V	1V	±(1% of reading + 4 digits)

Input impedance: 9MΩ

Overload Protection: 750V AC/DC on all ranges

## 2.2 AC Current (Average sensing, calibrated to rms of sine wave)

Range	Resolution	Accuracy (50Hz-60Hz)
200A	100mA	±(2% of reading + 5 digits)
600A	1A	

Jaw Opening: 2.4" (60mm)

## 2.3 Insulation Test (With option 500V insulation tester unit)

Range	Resolution	Accuracy
20MΩ	10KΩ	±(2% of reading + 2 digits)
2000MΩ	1MΩ	±(4% of reading + 2 digits) for 500MΩ and below
		±(5% of reading + 2 digits) for others

## 2.4 DC Voltage

Range	Resolution	Accuracy
1000V	1V	±(0.5% of reading + 1 digits)

Input impedance: 9MΩ

Overload Protection: 1000V DC/peak AC on all ranges

## 2.5 Resistance

Range	Resolution	Accuracy
200Ω	100mΩ	±(1% of reading + 3 digits)
20KΩ	10Ω	±(1% of reading + 1 digits)

Overload Protection: 500V DC/rms AC on all ranges.

## 2.6 Continuity Test

Range	Buzzer sound	Protection
200Ω	30±20Ω	500V DC/rms AC

## 2.7 Environment

Normal Operation: 18°C-28°C (64°F-82°F)

Usable Condition: 0°C-50°C (32°F-122°F)

Storage: -20°C-+60°C (30°F-140°F)

Battery removed and <80% R.H.

Relative Humidity: max.80%

## 2.8 Function Characteristics

Measurement method:	Dual slope integration technical.
Reading rate:	3 reading/Sec.
Polarity:	Automatic, indicated minus, assumed plus.
Overload indication:	Blanking of all digits except MSD, decimal point and sign appropriate.
Power requirements:	9V Battery.
Battery life:	Up to 150 hours typical with Alkaline. Up to 100 hours typical with Zinc carbon.
Battery indication:	Display indicates "⎓" when approx. 20% of battery life remains.
Display:	LCD 3 ½ digits (1999 count) 0.5" high
Data hold:	All Function and Ranges with this feature.
Dimension:	9"L×2.7"W×1.5"H (230×70×37cm)
Weight:	11 ounces (310g) including battery approx.

## 2.9 Accessories

Operation manual  
Test leads  
9V battery  
Carrying case  
Holster

# 3. Operation and Recalibration

## 3.1 AC current Measure

1. Make sure that "Data Hold" Switch is not pressed.
2. Set Function/Range Switch to the ACA 600A range. If the display indicates one or more leading zeros. Shift to the 200A range to improve the resolution of the measurement.
3. Press the trigger to open the transformer jaws and clamp one conductor only if it is impossible to make measurements when two or three conductors are clamped at the same time.
4. Display reading is flow the conductor AC current.

## 3.2 Insulation Resistance Tester:

- 1) Set Function/Range Switch to the insulation tester 2000MΩ range. This condition the display value is unstable that is

normal.

- 2) The insulation tester unit V/ $\Omega$ -COM-EXT three banana plugs insert to clamp meter V/ $\Omega$ -COM-EXT three input connector.
- 3) Set the insulation tester unit range switch to the 2000M $\Omega$  position.
- 4) Use the insulation tester unit of the test leads connect its L-E input connect to being tested installation's (test installation'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 19M $\Omega$ , change clamp meter and insulation tester unit to 20M $\Omega$  range, can be increase 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.

### **3.3 DCV & ACV MEASURE**

- 1) Set the Function range switch at the required position.
- 2) Connect black test lead to "COM" terminal and red test lead to the "V/OHM" input terminal.
- 3) Connect test leads to measuring point and read the display value the polarity of the red lead connection will be indicated at the same time as the voltage.
- 4) Never try to measure the voltage above 1000V! Although the indication is possible to show, there is danger of damaging the internal circuitry.

### **3.4 RESISTANCE MEASURE**

- 1) Connect black test lead to "COM" terminal and red test lead to the "V/OHM" input terminal.
- 2) Set the function range switch to the OHM range.
- 3) Connect the test leads across the resistance under measurement and read the display value.

#### **Note:**

- a) The polarity of the red test lead is "+".
- b) When the input is not connected, i.e. at open circuit the

- figure “1” will be displayed for the over range condition.
- c) If the resistance value being measured exceeds the maximum value of the range selected an over range indication “1” will be displayed and function range switch must be set to a higher range.

### **3.5 CONTINUITY TEST**

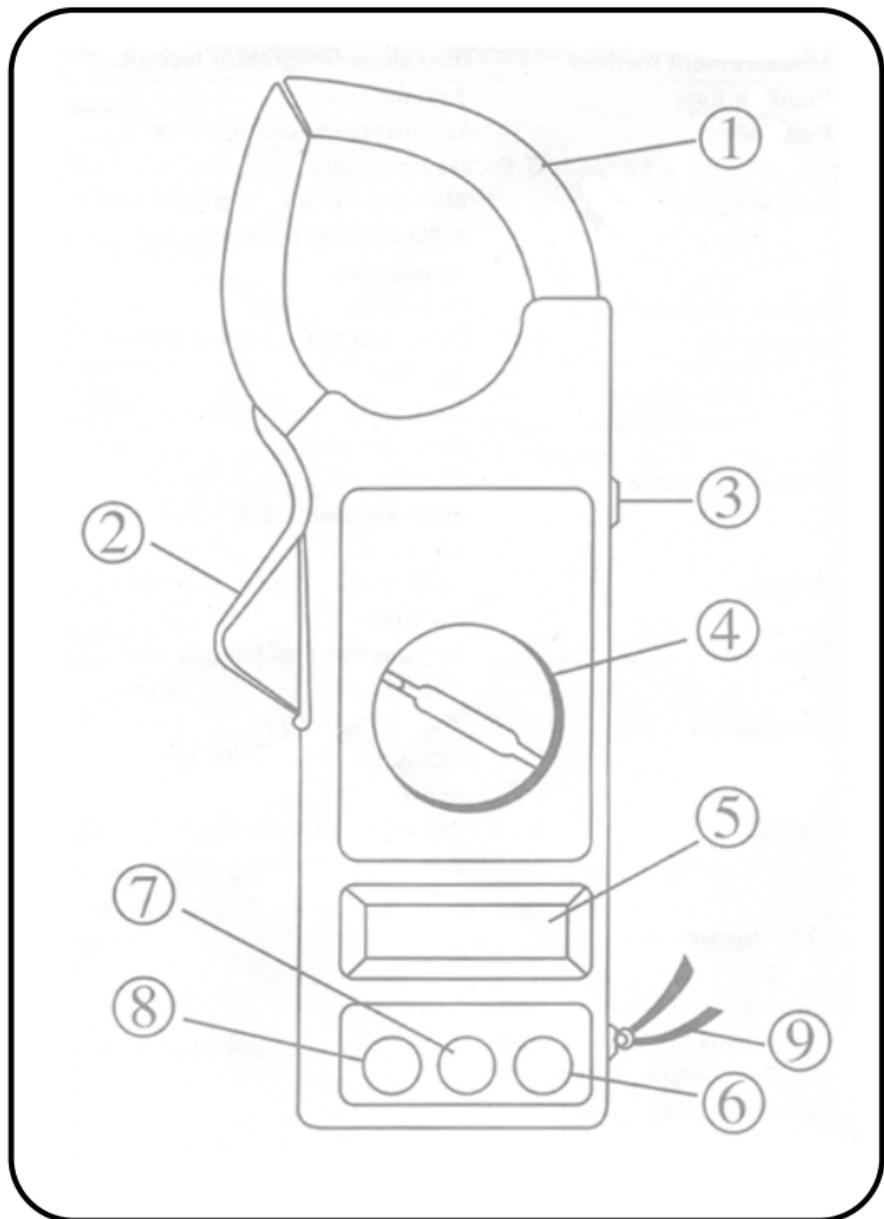
- 1) Set the function range switch at the “200Ω $\llcorner$ ” position.
- 2) Connect the black test lead to “COM” terminal and red test lead to “V/OHM” input terminal; (Note: the polarity of the red test lead is “+”).
- 3) This range with “AUDIBLE CONTINUITY TEST” function. Built-in buzzer sounds if the resistance between two probes is less than  $30\pm 20\Omega$ .
- 4) Connect the test leads across the diode and read the display value.

#### **Note:**

- a) When the input is not connected, i.e. at open circuit, the figure “1” will be displayed.
- b) Test condition: Forward DC current approx. 1mA.  
Reversed DC voltage approx. 2.8V.

## **4. BATTERY REPLACEMENT**

- 1) Battery replacement should only done after the test leads have been disconnected and power is off.
- 2) Remove cabinet of battery.
- 3) The meter is power by a single 9V battery (IEC 6F22, NEDA 1604, JIS 006P). Snap the battery connector leads to the terminals of a new battery and reinsert the battery into the case top. Dress the battery leads so that they will not be pinched between the case bottom can case top.



### Transformer Jaws

Pick up the AC Current flowing through the conductor

### Trigger

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

### Data Hold Switch

A push switch (push on, push off, do not pull to select function) .

All function and ranges with this feature.

### Rotary Switch

A rotary switch is used to select measurement Function and Range switch.

### Display

3 ½ digits (1999 counts), decimal point, minus polarity, Overrange and "□□" indicators.

### EXT Input Connect

Used for accept insulation tester unit EXT banana plugs, when measurement insulation resistance.

### COM Input Connect

Low input for all voltage, resistance, and continuity measurement will accept banana plugs. When measurement insulation resistance, used for accept insulation tester unit COM banana plugs.

### V/OHM Input Connect

High input for all voltage, resistance, and continuity measurement will accept banana plugs. When measurement insulation resistance, used for accept insulation tester unit V/OHM banana plugs.

### Drop-Proof Wrist Strap

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