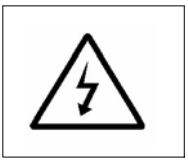
DCA/ACA
CLAMP METER

Your purchase of this DCA/ACA CLAMP METER marks a step forward for you into the field of precision measurement. Although this CLAMP METER is a complex and delicate instrument, its ruggedness will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

Caution Symbol



Caution :

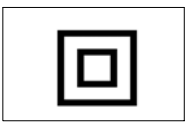
*** Risk of electric shock !**

Caution :

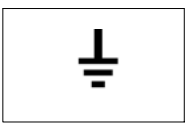
*** Do not apply the overload voltage, current to the input terminal !**

*** Remove test leads before open the battery cover !**

*** Cleaning - Only use the dry cloth to clean the plastic case !**



*** Double insulation**



*** Function earth**

Environment Conditions

**** Jaw Section : CAT III 600 V, 600 A.***

**** Terminal : CAT II 600 V.***

**** Pollution Degree 2.***

**** Altitude up to 2000 meters.***

**** Relative humidity 80 % max.***

TABLE OF CONTENTS

1. FEATURES

* Design meet IEC 1010 CATIII 600V safety requirment.
* 4000 counts, Auto range & multi-functions.
* Measurement for ACA, DCA, ACV, DCV, Ohms, Diode, Hz, Continuity beeper.
* Water resistance for the front panel.
* Data hold.
* Wide ranges (600 A, 400 A) clamp on current measurement both for ACA & DCA.
* Overload protection circuit is provided for all range.
* LSI circuit provides high reliability and durability.
* Pocket & slim housing case, easy carryout.
* Compact & heavy duty ABS housing fireproof plastic case.

2. SPECIFICATIONS

2-1 General Specifications

Display	10.8 mm (0.43") LCD, 4 digits, Max. indication 5000.
Measurement Range	ACA, DCA, ACV, DCV, Ohms, Diode, Hz, Continuity beeper, Relative.
Polarity	Automatic Switching, " - " indicates negative polarity.
Current Sensor	Hall effect sensor.
Zero adjustment	DCA : Push bottom adjustment. Other ranges : Automatic adjustment.
Over-input	Indication of " 1 " or " -1 ".
Sampling Time	Approx. 0.35 second.
Battery	2 x 1.5V AA (UM-3) batteries.
Operating Temperature	0 ℃ to 50 ℃ (32 ℉ to 122 ℉).

Operating Humidity	Less than 80% RH.
Weight	230 g/0.50 LB (including battery).
Dimension	HWD : 178 x 64 x 33 mm (7.0 x 2.5 x 1.3 inch)
Max. Jaw Open Size	30 mm (1.18 inch) Dia.
Accessories Included	Operation manual..... 1 PC. Test lead (red & black)..... 1 PC.
Optional Accessories & Adapters	Carrying case, Temperature Adapter, Light Adapter, Anemometer Adapter, Pressure Adapter, RH Adapter, Tachometer Adapter, High Voltage Probe.

2-2 Electrical Specifications (23± 5 ℃)

Function	Range	Reso-lution	Accuracy	Overload Protection
DC/AC Voltage	400 mV (DC only)	0.1 mV	± (0.5 % + 2d)	
	4 V	0.001V	*DCV:*	
	40 V	0.01V	± (1 % + 2d)	
	400 V	0.1 V	*ACV:*	AC/DC 600 V.
	600 V	1 V	± (1.2 % + 5d)	
DC /AC current	400 A *ACA :* *0.5 to 400A*	0.1 A	± (2 % + 5 d)	
	600 A	1 A	± (2 % + 8 d)	AC/DC 600 A
Remark	** Input impedance for ACV & DCV range is 10 Mega ohm.* ** ACA, ACV specification be tested on sine wave 50/60 Hz.*			

Function	Range	Reso-lution	Accuracy	Overload Protection
Ohms	400 ohm	0.1 ohm		
	4 K ohm	1 ohm		
	40 K ohm	10 ohm	± (1 % + 5 d)	
	400 K ohm	100 ohm		
	4 M ohm	1 K ohm	± (2 % + 2 d)	AC / DC 400 V
	40 M ohm	10Kohm	± (3.5 % + 5d)	
Frequency (5 V)	5 Hz	0.001 Hz		
	50 Hz	0.01 Hz		
	500 Hz	0.1 Hz		
	5 KHz	1 Hz	± (1 % + 5 d)	
	50 KHz	0.01 KHz		AC / DC 250 V
	100 KHz	0.1 KHz		
Diode	Short/non conductance, good/defect test.			
Continuity	If measuring resistance is less than 10 ohm, the beeper will sound .			

Remark :

** Spec. tested under the environment RF Field Strength less than 3 V/M & frequency less than the 30 MHz only.*

3. FRONT PANEL DESCRIPTION

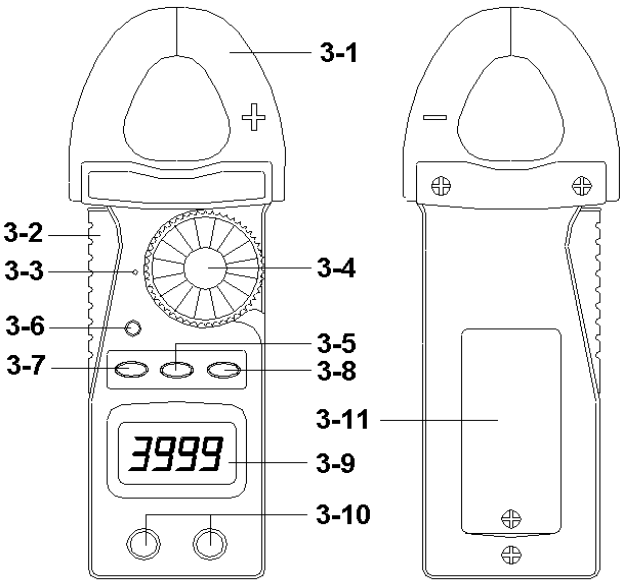


Fig. 1

3-1 Current Sense Jaws
3-2 Trigger
3-3 Function Indicator
3-4 Function rotary switch
3-5 Range button
3-6 Hold button
3-7 FUNC. button (Function button)
3-8 Relative button (REL. button)
3-9 Display
3-10 Input terminal
3-11 Battery compartment/Cover

4. PRECAUTIONS & PREPARATIONS FOR MEASUREMENT

1) Ensure that the DC 1.5V x 2 batteries are connected with the right polarity and placed in the battery compartment correctly.
2) Place the Red & Black Test Leads into the proper input terminal before making measurement.
3) Remove either of the test leads from the circuit when changing the measurement range.
4) Except operate the " Data Hold " function, it should cancel the " Data Hold " function, otherwise the display reading will freeze permanently.
5) Do not exceed the maximum rated voltage to the input terminal.
6) Always switching the " Function Rotary Switch " to the " Off " position when the instrument is not operation.
7) Remove the battery if the instrument is not to be used in a long period of time.
8) Though the most ranges build the overload protection circuit, however it is prohibited to apply any voltage to input terminal when making the measurement.
9) The water resistance structure is apply for the *front panel only. Do not throw the instrument into water, otherwise the meter will be damaged permanently.*
10) *For safety consideration, when change the new test leads, it should use the replace test leads that already approval of " CATIII-600V " at least.*

5. MEASURING PROCEDURE

5-1 Symbols & units of display

Symbols / Units	Descriptions
	Appears when selecting DCV or DCA mode.
	Appears when selecting ACV & ACA mode.
	Appears when the " Data hold " function is operated.
	Appears when the " Relative " (DCA zero) function is operated.
	Battery voltage is under the low condition already.
	Appears when operating the " Automatic range " mode.
	Appears when the " Continuity beeper " is operated.
mV, V	Units for voltage measurements.
Ω , KΩ , MΩ	Units for resistance measurements.
	Appears when the " Diode " function is operated.
	Appears when measuring a DCV or DCA value is negative.
A	Units for " Current " measurement.
Hz, KHz	Units for " Frequency " measurement.

5-2 DCV, ACV Measurement

1) Connect BLACK test lead into " COM " terminal.
2) Connect RED test lead into " V " terminal.
3) If measure " DCV ", select the " Function rotary switch " (3-4, Fig. 1) to the " V " position then push the " FUNC. button " (3-7, Fig. 1) for display show " ⎓ ".
4) If measure " ACV ", select the " Function rotary switch " (3-4, Fig. 1) to the " V " position then push the " FUNC. button " (3-7, Fig. 1) for display show " ~ ".
5) When LCD show the " AUTO " marker, the meter is under the " auto range " mode. Meter will select the suitable measurement range automatically.
6) Under the operation of " auto range " mode, push the " Range button " (3-5 Fig. 1) will hold the range.

5-3 Resistance Measurement

1) Connect BLACK test lead into " COM " terminal.
2) Connect RED test lead into " Ω " terminal.
3) Select the " Function rotary switch " (3-4, Fig. 1) to the " Ω " position then push the " FUNC. button " (3-7, Fig. 1) for display show " Ω ".
4) When LCD show the " AUTO " marker, the meter is under the " auto range " mode., the meter will select the suitable measurement range automatically.
5) Under the operation of " auto range " mode, push the " Range button " (3-5 Fig. 1) will hold the range.

5-4 Continuity Check

1) Connect BLACK test lead into " COM" terminal.
2) Connect RED test lead into " Ω " terminal.
3) Select the " Function rotary switch " (3-4, Fig. 1) to the

" •)) " position then push the " FUNC. button "
(3-7, Fig. 1) for display show " •)) ".

4) when the resistance value is less than 10 ohm, the beeper sound will be generated.

5-5 Diode Test

1) Connect BLACK test lead into " COM " terminal.
2) Connect RED test lead into " V " terminal.
3) Select the " Function rotary switch " (3-4, Fig. 1) to the " ⊣◁ " position then push the " FUNC. button " (3-7, Fig. 1) for display show " ⊣◁ ".
4) a. When connected with polarity as shown in Fig. 2, a forward current flow is established and the approx. Diode Forward Voltage (VF) value in volt will appears on the display reading. If the diode under test is defective, " .000 " or near " .000 " value (short circuit) or " 1 " (open circuit) will be displayed.

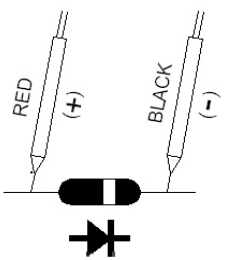


Fig. 2

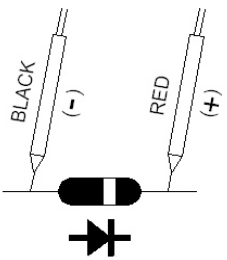


Fig. 3

b. When connected as shown in Fig. 3, a reverse check on the diode is made. If the diode under test is good, " 1 " will be displayed. If the diode under test is defective, " .000 " or other numbers will be displayed. Proper diode testing should include both steps a. and b. above.

5-6 AC Current Measurement

1) Select the " Function rotary switch " (3-4, Fig. 1) to the " 600A " position then push the " FUNC. button " (3-7, Fig. 1) for display show " ~ ".
2) Press the " Trigger " (3-2, fig. 1) to open the " Current Sensor Jaws " (3-1, Fig. 1) & clamp on the measure conductor only.
3) When LCD show the " AUTO " marker, the meter is under the " auto range " mode. Meter will select the suitable measurement range automatically.
4) Under the operation of " auto range " mode, push the " Range button " (3-5 Fig. 1) will hold the range.

Remark :
No ACA signal input, if the display show few counts (lesss than 0.5 A, such as 0.2 A, 0.3 A...), it is normal & not effecting the measurement value.

5-7 DC Current Measurement

1) Select the " Function rotary switch " (3-4, Fig. 1) to the " 600A " position then push the " FUNC. button " (3-7, Fig. 1) for display show " ⎓ ".
2) Press the " Trigger " (3-2, fig. 1) to open the " Current Sensor Jaws " (3-1, Fig. 1) & clamp on the measure conductor only.
3) When LCD show the " AUTO " marker, the meter is under the " auto range " mode. Meter will select the suitable measurement range automatically.
4) Under the operation of " auto range " mode, push the " Range button " (3-5, Fig. 1) will hold the range.

ZERO consideration of DCA measurement

Under above auto mode DCA measurement, no signal input (not measuring current), if LCD show certain digits, it is normal.
However we recommend :

1) If the zero value less than 1 A, it may ignore it if for the general operation,
2) **For the precisely measurement or the " DCA zero value " large than 1A, then please execute the " DCA ZERO " procedures as :**
   - *** Push the " REL. button " (3-8, Fig. 1), the " AUTO " indicator will disappear instead of the " REL. " mark. In the same time, display will change to zero value.**
   - *** After push the " REL. button ", the meter will under the manual mode (not auto range). If intend change the DCA range (400A to 600A, or 600A to 400A), then should push the " Range button " (3-5, Fig. 1).**

5-8 Frequency Measurement

1) Connect BLACK test lead into " COM " terminal.
2) Connect RED test lead into " V " terminal.
3) Select the " Function rotary switch " (3-4, Fig. 1) to the " Hz " position, LCD will show the mark of " Hz " .
4) For the FREQUENCY measurement, the meter is always under the " auto range " mode, it will select the suitable measurement range automatically.

5-9 Relative Measurement

1) During the measurement of ACV, ACA, DCV, DCA & ohm, the circuit will memorize the last measured values if push the " REL. button " (3-8, Fig. 1) at once, then LCD will show zero value & a " REL. " indicator.
2) The input measured values will deduct last measured values " automatically, then show those new value on the display.
3) It will release the Relative Measurement function if push the REL. button at once again, at same time the " REL ." marker will disappear.

5-10 Data Hold Operation

1) During the measurement, pushing the " Hold button " (3-6, Fig. 1) once a while will freeze the measured value & the LCD will indicate " HOLD " symbol.
2) Push the " Hold Button " again to release the data hold function.

6. MAINTENANCE

6-1 Battery replacement

Caution : ***Remove test leads before opening the battery cover !***

1) When the LCD display showing the mark of " ", it is necessary to replace the battery, However in-spec. measurement may still be made for several hours after " Low battery indicator " appears before the instrument become inaccurate.
2) Open the screw of " Battery Cover " by screwdriver, then move the battery.
3) Replace with 1.5 V x 2 batteries (AA, UM3 type) and reinstate the cover.

6-2 Cleaning

Caution : ***Cleaning - Only use the dry cloth to clean the plastic case !***

7. OPTIONAL ACCESSORIES AND ADAPTERS

Item	*Model*
Carrying Case	*CA-52A*
Humidity Adapter	*HA-702*
Light Adapter	*LX-02*
EMF Adapter	*EMF-824*
Pressure Adapter	*PS-403*
Anemometer Adapter	*AM-402*
Tachometer Adapter	*TA-601*
Sound Adapter	*SL-406*
High Voltage Probe	*HV-40*
Test lead with alligator clips	*TL-02AS*

8. THE ADDRESS OF AFTER SERVICE CENTER