

Green power, hybrid power

SMART CLAMP METER

Model : CM-9942G

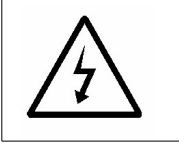


Your purchase of this SMART CLAMP METER marks a step forward for you into the field of precision measurement. Although this CLAMP METER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions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



OPERATION MANUAL

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 !

Environment Conditions

*** Installation Categories III 600V.**

*** Pollution Degree 2.**

*** Altitude up to 2000 meters.**

*** Indoor use.**

*** Relative humidity 80% max.**



Equipment protected throughout by double insulation or reinforced insulation.

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1. SPECIFICATIONS

- * Green power, battery is no need, power supply from the handy generator, operate the generator 30 to 60 seconds will offer 15 to 20 minutes energy typically.
- * Hybrid power, meter's power also can supply by the battery,
- * Green power internal charge system use the Super charge capacitor, fast charge time and high reliability.
- * Meet CAT III-600 V.
- * 6000 counts A/D, high resolution.
- * ACV, ACA, DCV, ohms, continuity, Hz, Capacitance, Diode, Data hold.
- * Smart function, Auto range.
- * Smart operation, Build in 4 intelligent function :
" A ", " Ω ", " V ".
- * " A " function can measure ACA with auto range.
- * " V " function can select ACV, DCV automatically with auto range.
- * " Ω " function can select the Resistance , Diode, Continuity beeper, Capacitance automatically with auto range.
- * Data hold function for ACA measurement.
- * Auto shut off is available to save battery life.
- * 10 M ohm impedance for voltage circuit.
- * Built-in overload protection for most ranges.
- * LSI circuit provides high reliability and durability.
- * Patent.
- * Uses durable, long-lasting components, enclosed in strong, light weight ABS-plastic housing.
- * Full line optional adapters : Clamp adapter, Tachometer adapter, Pressure adapter, Humidity Adapter, Sound level adapter, Anemometer adapter, Light adapter, EMF adapter.

2. SPECIFICATIONS

2-1 General Specifications

Green power and Hybrid power	<p>* Green power, battery is no need, power supply from the handy generator, operate 30 to 60 seconds the generator will offer 15 to 20 minutes energy typically. Green power internal charge system use the Super charge capacitor, fast charge time and high reliability.</p> <p>* Hybrid power, meter also can supply by the battery power.</p>
Display	40 mm x 30.3 mm large LCD display.
Measurement	ACV, ACA, DCV, DCA, ohms, continuity beeper, Hz, Capacitance, Diode, Data hold.
A/D counts no.	6000 counts.
Range selection	Smart function, auto range.
Smart function	" A " function can measure ACA with auto range.
	" V " function can select ACV, DCV automatically with auto range.
	" Ω " function can select the Resistance, Diode, Continuity beeper, Capacitance automatically with auto range.
Data hold	To freeze the display reading on the LCD display. * Available for ACA measurement only.
Power On/Off management	Manual power off.
	Auto power off : If meter is not operated within 10 minutes will auto power switch off.

Polarity	Automatic Switching, " - " indicates negative polarity.
Max. jaw open size	42 mm (1.65 inch) Dia.
Zero adjustment	Automatic.
Sampling time	Approx. 0.5 to 1 second.
Operating temperature	0 to 50 °C (32 to 122 °F).
Operating humidity	Less than 80% RH.
Power Supply	Green power : Power from the handy generator, battery is no need.
	Battery power : DC3V battery (CR-2032) x 2 PCs.
Power consumption	DC 3.9 mA.
Weight	310 g/068 LB.
Dimension	228 x 85.7 x 45.6 mm (9.0 x 3.4 x 1.8 inch)
Accessories Included	Red and Black Test Leads..... 1 Set Instruction Manual..... 1 PC
Optional accessories	Carrying case : CA-05A. Full line adapters : ACA/DCA current adapter, Tachometer adapter, Humidity adapter, Pressure adapter, Light adapter, EMF adapter, Sound level adapter, High voltage probe.

2-2 Electrical specifications (23± 5°C)

DC/AC Voltage * auto range	
Range	6 V /60 V/600 V
Resolution	0.001 V /0.01 V/0.1 V
Accuracy	DCV : ± (1 % + 2d)
	ACV : ± (1.2 % + 5d)
Input impedance	10 M ohm.
Over load protection	AC/DC 600 V.
Remark	<p>* The input impedance is 10 Mega ohm.</p> <p>* ACV specification be tested on sine wave 50/60 Hz.</p> <p>* For smart function ,the ACV start measurement voltage is larger than 400 mV ± 100 mV.</p>

AC Current * auto range	
Range	600 A/1000 A
Resolution	0.1 A/1 A
Accuracy	600 A range ± (1.5% + 2d)
	1000 A range ± (2% + 8d)
Over load protection	AC 1000A.
Remark	<p>* ACA specification be tested on sine wave 50/60 Hz.</p> <p>* Measurement range : 0.1A to 1000 A</p>

OHMS * auto range	
Range	600/6 K/60 K/600 K/6 M ohm
Resolution	0.1/1/10/100/1 K ohm
Accuracy	± (1% + 3d)
Over load protection	± 400 DCV, 350 ACV

Capacitance * auto range	
Range	6 nF/60 nF/600 nF/6 uF/60 uF
Resolution	0.001 nF/0.01 nF/0.1 nF/0.001 uF/ 0.01 uF
Accuracy	$\pm (3\% + 5d)$
Remark	<i>Discharge capacitor before testing.</i>

Frequency	
Range	40 Hz to 1 KHz.
Resolution	1 Hz.
Accuracy	$\pm (0.3\% + 2d)$
Input impedance	10 M ohm.
Over load protection	AC/DC 600 V.

Diode
Short/non conductance, good/defect test.

Continuity
If measuring resistance is less than 10 ohm, the beeper will sound .

3. FRONT PANEL DESCRIPTION

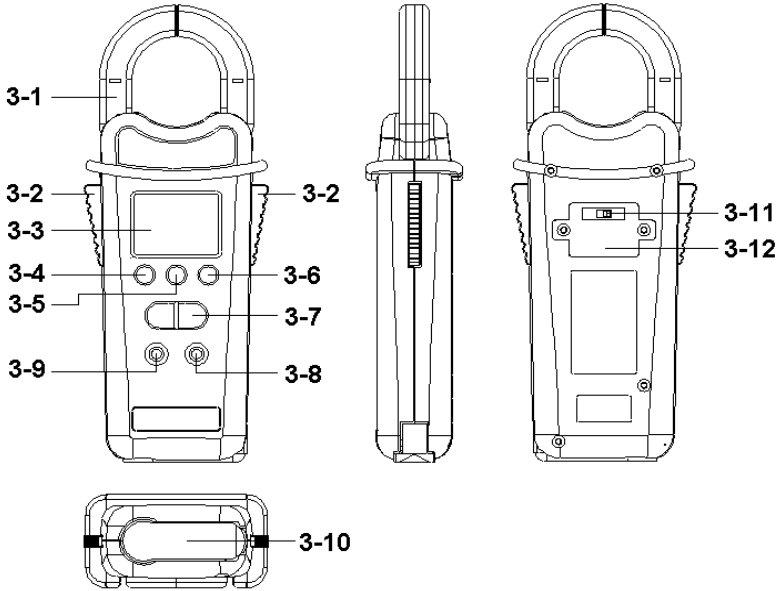


Fig. 1

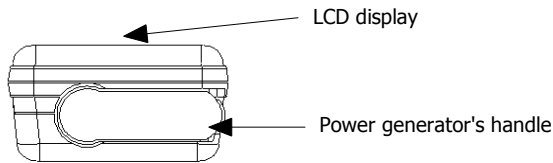
- 3-1 Current Sense Jaws
- 3-2 Trigger
- 3-3 Display
- 3-4 Power On/Off button.
- 3-5 Hold button
- 3-6 Hz button
- 3-7 Function slide switch
- 3-8 V/ Ω terminal
- 3-9 COM terminal
- 3-10 Handle of power generator
- 3-11 Power type switch (G/B switch)
- 3-12 Battery compartment/cover

4. POWER TYPE SELECTION

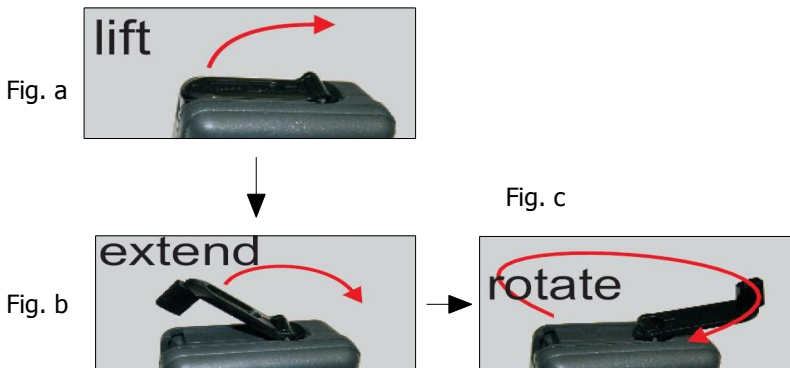
4-1 Power supply from the generator (Green power supply)

- 1) Select the " Power type switch " (3-11, Fig. 1) to the " G position " (Green power position).

There is a " Power generator's handle " (3-10, Fig. 1) on the bottom of the housing case.



- 2) Lift and extend the " Power generator's handle " and rotate the handle in clockwise direction will generate the power energy into the meter, refer to Fig. a, b, c.



- c. Wind-up the generator 30 to 60 seconds will offer 15 to 20 minutes energy typically. If wind-up the generator more time, the meter will be saved more energy and let the meter be operated for a long period.

4-2 Power supply from the battery

- 1) Install the " DC3V battery (CR-2032) x 2 PCs " into the " Battery compartment " (3-12, Fig. 1)
- 2) Slide the " Power type switch " to the " B " position (battery position), the meter will offer the power source from the battery.

5. MEASURING PROCEDURE

5-1 precautions & preparations for measurement




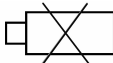




- 1) Place the Red & Black Test Leads into the proper input terminal before making measurement.
- 2) Remove either of the test leads from the circuit when changing the measurement range.
- 3) Do not exceed the maximum rated voltage to the input terminal.
- 4) Do not exceed the maximum rated current to " Current sensing Jaws.
- 5) For safety consideration, when change the new test leads, it should use the replace approval test leads.

5-2 Power management

- 1) Pressing the " Power On button " (3-4, Fig. 1) once, the meter will be power On.
Pressing the " Power On button " (3-4, Fig. 1) once again, the meter will be power Off..
- 2) The meter will be power Off automatically within 10 minutes after power On.


5-3 Symbols & units of display

Symbols	Descriptions
Units	
SMART	Appears when selecting " Smart " mode. The meter default mode is " Smart "
AUTO	Appears when selecting " Automatic range " mode.
 DC	Appears when selecting DC mode. (DC voltage)
 AC	Appears when selecting AC mode. (AC voltage or AC current)
	* Appears when the " Data hold " function is operated. * " Data hold " function is available for the ACA measurement only.
	Power voltage is already under the low condition.
	Appears when the " Continuity " is operated.
mV, V	Units for voltage measurements.
A	Units for " Current " measurement.
Ω ,K Ω ,M Ω	Units for resistance measurements.
nF,uF	Units for " Capacitance " measurement.
KHz	Units for " Frequency " measurement.
	Appears when the " Diode " function is operated.
—	Appears when measuring a DCV value is negative.
OL	Over range indicator for voltage, current, ohm and capacitance function.

5-4 AC Current Measurement

- 1) Select the " Function switch " (3-7, Fig. 1) to the " A " position.
- 2) Power On the meter by pressing the " Power On/Off button " (3-4, Fig. 1) once, the Display will show " \sim AC ", " A " and " AUTO " indicator, now the meter is under " Auto range " current measurement.
- 3) Press the " Trigger " (3-2, fig. 1) to open the " Current Sensor Jaws " (3-1, Fig. 1) and clamp on the measured conductor, the display will show the measurement ACA current value automatically (auto range).

Data hold for Current measurement

- 1) During the current measurement, if press the " Hold button " (3-5, Fig. 1) will freeze the measurement current value. In the same time the Display will show "  " and " MANU " indicator.
- 2) Push the " Hold Button " again to release the data hold function.

Remark :

The Data Hold operation is only available for the " ACA measurement ", not available for other functions.

5-5 Voltage (ACV/DCV) measurement

- 1) Connect BLACK test lead into " COM " terminal (3-9, Fig. 1).
- 2) Connect RED test lead into " V " terminal (3-8, Fig. 1).
- 3) Select the " Function switch " (3-7, Fig. 1) to the " V " position.

- 4) Power On the meter by pressing the " Power On/Off button " (3-4, Fig. 1) once, the Display will show " SMART ", the meter is under " Smart " mode for voltage measurement.
- 5) The meter can measure the ACV, DCV value automatically and with auto range selection.

5-6 Resistance measurement

- 1) Connect BLACK test lead into " COM " terminal (3-9, Fig. 1).
- 2) Connect RED test lead into " Ω " terminal (3-8, Fig. 1).
- 3) Select the " Function switch " (3-7, Fig. 1) to the " Ω " position.
- 4) Power On the meter by pressing the " Power On/Off button " (3-4, Fig. 1) once, the Display will show " SMART ", the meter is under " Smart " mode for resistance measurement.
- 5) The meter can measure the resistance value automatically and with auto range selection.

5-7 Continuity, Diode measurement

Continuity measurement

- 1) Connect BLACK test lead into " COM " terminal (3-9, Fig. 1).
- 2) Connect RED test lead into " Ω " terminal (3-8, Fig. 1).
- 3) Select the " Function switch " (3-7, Fig. 1) to the " Ω " position.
- 4) Power On the meter by pressing the " Power On/OFF button " (3-4, Fig. 1) once, the Display will show " SMART ", the meter is under " Smart " mode for Continuity measurement.

5) When the resistance value is less than 10 ohm, the beeper sound will be generated, the Display will show " $\cdot\Omega$ " and " Ω " indicator.

Diode measurement

- 1) Connect BLACK test lead into " COM " terminal (3-9, Fig. 1).
- 2) Connect RED test lead into " Ω " terminal (3-8, Fig. 1).
- 3) Select the " Function switch " (3-7, Fig. 1) to " Ω " position.
- 4) Power On the meter by pressing the " Power On/Off button " (3-4, Fig. 1) once, the Display will show " SMART ", the meter is under " Smart " mode for Diode measurement.
- 5)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 " OL " (open circuit) will be displayed.

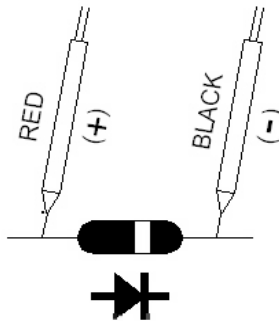


Fig. 2

- b. When connected as shown in Fig. 3, a reverse check on the diode is made. If the diode under test is good, " OL " 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.

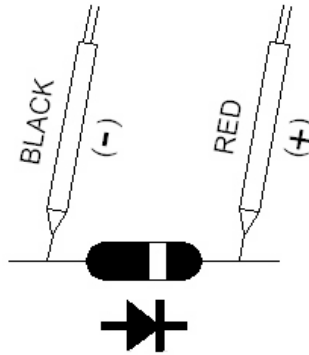


Fig. 3

5-8 Capacitance Measurement

- 1) Connect BLACK test lead into " COM " terminal (3-9, Fig. 1).
- 2) Connect RED test lead into " Ω " terminal (3-8, Fig. 1).
- 3) Select the " Function rotary switch " (3-7, Fig. 1) to the " Ω " position.
- 4) Power On the meter by pressing the " Power On/Off button " (3-4, Fig. 1) once, the Display will show " SMART ", the meter is under " Smart " mode for capacitance measurement.
- 5) The meter can measure the capacitance value automatically and with auto range selection.

5-9 Frequency measurement

During the measurement :

a. AC Current measurement (Chapter 5-4, page 10)

b. Voltage (ACV/DCV) measurement (Chapter 5-5, page 10)

If press the " Hz button " (3-6, Fig. 1) once, the Display will show " AUTO " and " K Hz " indicator, now the meter is ready for frequency measurement of the measurement signal with auto range indication.

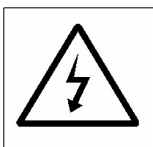
If press the " Hz button " (3-6, Fig. 1) once again will release the Hz measurement function and return to normal measuring Display.

5-10 Auto power off

The meter build the auto power off after power On to extend the battery life. After auto power off.

Press the " Power On/Off button " (3-4, Fig. 1) once will Power On again.

6. MAINTENANCE




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

6-1 Cleaning




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

6-2 Replacement of batteries (Battery power)

- 1) When use the battery power, if the Display show Low battery indicator "  , it need to change the batteries.
- 2) open the " Battery Cover " (3-12, Fig. 1) away from the instrument and remove the battery.
- 3) Replace with batteries (DC 3V, CR2032 X 2 PCs) and reinstate the cover.
*** When install the batteries, should make attention the battery polarity.**
- 4) Make sure the battery cover is secured after changing the batteries.

Remark :

During the LCD show the Low battery indicator "  if the buzzer sound continuously, it is normal.

For power supply from the generator

Wind-up the Generator, until the meter is charged completely, will switch off the buzzer sound and return to normal condition.

For power supply from the battery

Replace with batteries (DC 3V, CR2032 X 2 PCs) will switch off the buzzer sound and return to normal condition.

7. OPTIONAL ACCESSORIES and ADAPTERS

<i>Item</i>	<i>Model</i>
<i>Carrying Case</i>	<i>CA-03, CA-05A</i>
<i>Light Adapter</i>	<i>LX-02</i>
<i>EMF Adapter</i>	<i>EMF-824</i>
<i>Pressure Adapter</i>	<i>PS-403</i>
<i>Anemometer Adapter</i>	<i>AM-402</i>
<i>Tachometer Adapter</i>	<i>TA-601</i>
<i>Sound Adapter</i>	<i>SL-406</i>
<i>High Voltage Probe</i>	<i>HV-40</i>

8. PATENT

CHINA : ZL200620012764.3

GERMANY : Nr.202006007329.9

TAIWAN : M299401

JAPAN : 3130269

U.S.A. : PATENT PENDING

9. THE ADDRESS OF AFTER SERVICE CENTER

