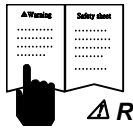
AC/DC CLAMP MULTIMETER

CE

INSTRUCTION MANUAL

APPA 30R

APPA®



⚠ Read First

⚠ Safety Information

- Individual protective equipment must be used if hazardous live parts in the installation where measurement is to be carried out could be accessible.
- The barrier on the JAW is indicating the limit of safe access of the hand-held part, do not over the barrier when in normal use.
- Do not use a flexible current sensor if the inner contrasting color of the insulation of the flexible cord is visible.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAT.Ⅱ - Is for measurement performed on circuits directly connected to the low voltage installation.

CAT.Ⅲ - Is for measurement performed in the building installation.

Symbols as marked on the meter and Instruction manual

	Risk of electric shock
	See instruction manual
	DC measurement
	Equipment protected by double or reinforced insulation
	Battery
	Earth
~	AC measurement
CE	Conforms to EU directives
	Application around and removal from hazardous live conductors is permitted
	Do not discard this product or throw away

INTRODUCTION

1-1 Unpacking and Inspection

Upon removing your new Digital Clamp Multimeter from its packing, you should have the following items:

1. Digital Clamp Multimeter.
2. Test lead set (one black, one red).
3. Carrying case.
4. Instruction manual.
5. Battery.

1-2 Front Panel

Refer to Figure 1 and to the following numbered steps to familiarize yourself with the meter's front panel controls and connectors.

1. **Digital Display** — The digital display has a 3 3/4 digit LCD readout (maximum reading 3999) plus decimal point , AC ∼, DC ⎓, AUTO, HOLD, MAX ,))) and unit annunciators.
2. **Input Terminal** — The black test leads is always connected to the "COM" input terminal and red test lead is always connected to the "V-Ω" input terminal when measuring ACV or DCV or RESISTOR or CONTINUITY.
3. **Drop-Proof Wrist Strap** — Prevents the instrument from slipping off the hand while in use.
4. **Function Switch** — This slide switch is used to select V ∼ , V ⎓ , A ∼, A ⎓, Ω ,))) function.
5. **▮ / MAX Switch** — This switch has two modes one is data hold the other is maximum hold .
   Sliding the function switch to power on , this switch will work in data hold mode. Pressing the ▮ / MAX Switch then slide the function switch from power off to power on , this switch will work in maximum hold mode.
   Data hold mode — This mode is used to hold measured value for all functions , push this switch then AUTO annunciator is displayed, Conversions are made but the display is not updated.
   Maximum hold mode — This mode is used to hold the maximum measured value for all functions.
   Press this switch the "**MAX**" annunciator turns on then enters the maximum hold mode.
   Press this switch again to restart recording. Press this switch more than 1 seconds to exit the maximum hold mode.

6. ZERO Switch —This switch is used to ZERO the reading on display.

7. Ω / 🔊 AC/DC Selection Switch — Push the "Ω / 🔊 , AC/DC" switch alternately to measure AC voltage or DC voltage in the " V ≂ " function or to measure AC current or DC current in the " A ≂ " function or to measure resistor or continuity in " Ω🔊 " function.

Auto power off disable mode — Press this switch until slide the function switch power on for 1 second it will cause the auto power off function disable.

8. Trigger — Press the lever to open the transformer jaws. When the pressure on the lever is released , the jaws will close again.

9. Hand Guard — Designed to protect user for safety.

10. Transformer Jaws — Designed to pick up the AC/DC current flowing through the conductor.

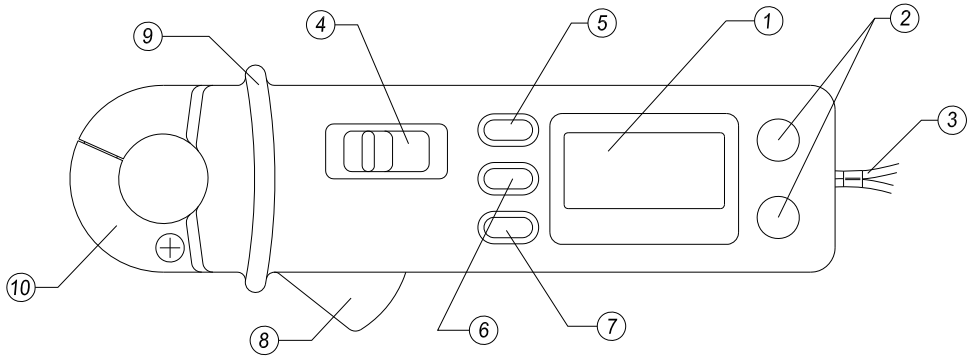


Figure 1

SPECIFICATIONS

2-1 General Specifications

Display : 3 3/4 Digital Liquid Crystal Display (LCD) with a maximum reading of 3999.

Polarity Indication : Automatic polarity indicated.

Over range Indication : “OL” indicated.

Low Battery Indication : “＋“ is displayed when the battery voltage drops below operating voltage.

Measuring Rate : 2 times/second normal.

Position Error : +/- 1% of reading.

Type of Sensing : Hall effect sensing for AC and DC current.

Shook Proof : 4 feet drops.

Power Requirement : Alkaline AAA size 1.5V x 2.

Battery Life : Alkaline 100 hours.

Maximum Jaw Opening : 25mm.

Max/Conductor Size : 22 mm diameter.

Temperature Coefficient : 0.15 x (spec.Acc'y) / °C < 18°C or > 28°C .

Size : 66 mm (W) x 192 mm (L) x 27 mm (H) .

Weight : 205 grams (including battery)

Accessories : Test leads, battery, manual and carrying case.

2-2 Environmental Conditions

Indoor use.

Maximum Altitude : 2000 Meter.

Installation Category : IEC 61010 CAT. II 600V, CAT. III 300V

Pollution Degree : 2

Operating Temperature : 0°C to 30°C (≦80% RH), 30°C to 40°C (≦ 75% RH), 40°C to 50°C (≦45% RH).

Storage Temperature : -20°C to 60°C .

2-3 Electrical Specifications

Accuracy is ± (% reading + number of digits) at 23°C ± 5°C at less than 80% R.H.

(1) AC Voltage : Auto-ranging

Range	Resolution	Accuracy	Over voltage protection
400.0mV	100μV	±(2.0% rdg + 5dgt) 50Hz ~ 60Hz *	600V rms
4.000V	1mV	±(1.5% rdg + 5dgt) 40Hz ~ 300Hz	
40.00V	10mV	±(1.5% rdg + 5dgt) 40Hz ~ 500Hz	
400.0V	100mV		
600V	1V		

Input Impedance : ≧10MΩ // less than 100pF.

* Less than 30 digital rolling.

LCD display 0 count when the reading ≦1mV

AC Conversion Type : AC conversions are ac-coupled, true rms responding, calibrated to the rms value of a sine wave input . Accuracies are given for sine wave at full scale. For distorted signals, add the following Crest Factor corrections:

For Crest Factor of 1.4 to 2.0, add 1.0% to accuracy.

For Crest Factor of 2.0 to 2.5, add 2.5% to accuracy.

For Crest Factor of 2.5 to 3.0, add 4.0% to accuracy.

(2) DC Voltage : Auto-ranging

Range	Resolution	Accuracy	Over voltage protection
400.0mV	100μV	±(0.5% rdg + 5 dgt)	600V rms
4.000V	1mV	±(0.5% rdg + 2 dgt)	
40.00V	10mV		
400.0V	100mV		
600V	1V		

Input Impedance : ≧ 10MΩ.

(3) Resistance Auto-ranging

Range	Resolution	Accuracy	Overload Protection
400.0Ω	100mΩ	±(1.2% rdg + 6 dgt) *1	600V rms
4.000KΩ	1Ω	±(0.9% rdg +3 dgt) *2	
40.00KΩ	10Ω		
400.0KΩ	100Ω	±(1.2% rdg + 3 dgt) *2	
4.000MΩ	1KΩ		
40.00MΩ	10KΩ	±(2.5% rdg + 5dgt) *1 *3	

* 1: The reading maybe rolling ≦ 6 digits when the reading is close to full scale.

* 2: The reading maybe rolling ≦ 3 digits when the reading is close to full scale.

* 3: The response time is approximate 20 seconds.

* : Put a low resistor in the input terminal before slide the sliding function switch to resistor and continuity function maybe cause a buzzer sound.

(4) Continuity

Built-in buzzer sound when measured resistance is less than 30Ω and sound off when measured resistance is more than > 300Ω .
Between 30Ω to 300Ω the buzzer maybe sound or off either.

(5) DCA : Auto-ranging

Range	Resolution	Accuracy	Over voltage protection
0 ~ 40.00A	10mA	±(1.0% rdg + 2 dgt)	400A rms
40.0A ~ 200.0A	100mA		
200.0A ~ 300.0A	100mA	±(2.0% rdg + 2 dgt)	

For DCA & ACA :

1. Temperature Coefficient : 0.2 x (Spec.Acc'y) / °C < 20 °C or > 26°C .
2. Operating Temperature : 0°C to 30°C (≦ 80%RH) , 30°C to 40°C (≦ 75%RH)

(6) ACA : Auto-ranging

<table>
<tr><th>Range</th><th>Resolution</th><th>Accuracy</th><th>Frequency Response</th><th>Overload Protection</th></tr>
<tr><td>0 ~ 4.00A</td><td>10mA</td><td>±(1.0% rdg + 5 dgt)</td><td rowspan="4">50Hz ~ 60Hz</td><td rowspan="8">400A r.m.s.</td></tr>
<tr><td>4.00A ~ 40.00A</td><td>10mA</td><td rowspan="2">±(1.0% rdg + 3 dgt)</td></tr>
<tr><td>40.0A ~ 200.0A</td><td>100mA</td></tr>
<tr><td>200.0A ~ 300.0A</td><td>100mA</td><td>±(3.0% rdg + 3 dgt)</td></tr>
<tr><td>0 ~ 4.00A</td><td rowspan="2">10mA</td><td>±(2.0% rdg + 7 dgt)</td><td rowspan="4">40Hz ~ 1KHz</td></tr>
<tr><td>4.00A ~ 40.00A</td><td rowspan="2">±(2.0% rdg + 5 dgt)</td></tr>
<tr><td>40.0A ~ 200.0A</td><td>100mA</td></tr>
<tr><td>200.0A ~ 300.0A</td><td>100mA</td><td>±(5.0% rdg + 5 dgt)</td></tr>
</table>

LCD display 0 count when the reading ≦0.1A

AC Conversion Type : AC conversions are ac-coupled, true rms responding, calibrated to the rms value of a sine wave input . Accuracies are given for sine wave at full scale. For distorted signals, add the following Crest Factor corrections :
For Crest Factor of 1.4 to 2.0, add 1.0% to accuracy.
For Crest Factor of 2.0 to 2.5, add 2.5% to accuracy.
For Crest Factor of 2.5 to 3.0, add 4.0% to accuracy.

(7) Maximum Hold

7-1 In maximum hold function the accuracy is changed as following.
Original Accuracy + 10 digitals/ change steps of range .

For example :
At First , the maximum hold reading on display is 100.0mV on 400.0mV range. f a voltage vibration changes the maximum hold reading to 120.0V. The change steps of range are 3 steps (400.0mV to 4.000V to 40.00V to 400.0V) so the accuracy is needed to add 3 steps x 10 digitals / change steps of range = 30 digits.
7-2 On maximum hold mode the accuracy of resistance is specified from 400.0Ω to 400.0kΩ range only.

(8) Auto Power Off
The meter will automatically shut itself off after approximately 30 minutes without operation.

OPERATION

This instrument has been designed and tested in accordance with IEC 61010, Safety Requirements for Electronic Measuring Apparatus and has been supplied in a safe condition. This instruction manual contains some Information and warnings which have to be followed by the user to ensure safe operation and to retain the instrument in safe condition.

3-1 Preparation and Caution before Measurement

1. If the meter is used near equipment that generates electro-magnetic interference, the display may be unstable or indicate incorrect measurement values.
2. Make sure that the battery is properly connected.
3. The instrument should only be operated between 0°C ～ 50°C and at less than 80% R.H. except current function is operated between 0°C ～ 40°C .
4. Do not use or store this instrument in a high temperature or high humidity environment and do not store the unit in direct sunlight.
5. Do not replace battery with power on condition.
6. If the unit is not to be used for a long period of time , remove the battery.
7. Do not forget to turn off after use.
8. ⚠ Maximum rated voltage to earth for voltage measurement terminals is 600V CAT.II , 300V CAT. III

⚠ THIS INSTRUMENT MUST NOT BE USED ON UNINSULATED CONDUCTORS AT A VOLTAGE GREATER THAN 600V ac/dc.

3-2 AC/DC Current Measurement

1. Set the slide switch at " A ≂ " position.
2. Open Spring-loaded clamp by pressing trigger on left side of meter.
3. Position clamp around wire or conductor and release clamp trigger smoothly , do not release quickly, make sure that the clamp is entirely closed. Position the conductors at the center of the clamp jaws for accurate measurement . The clamp must be positioned around only one conductors of a circuit .
   If the clamp is placed around two or more current-carrying conductors , the meter reading will be FALSE.
4. For DC measurement , the reading is positive value when the current flows from the upper side to the lower side of the instrument as Fig. 2.
5. Using the zero switch to zero the reading. Due to the high sensitivity of the clamp meter, must zero in the same direction as in measurement to avoid interference by external magnetic field. (see Fig.3)

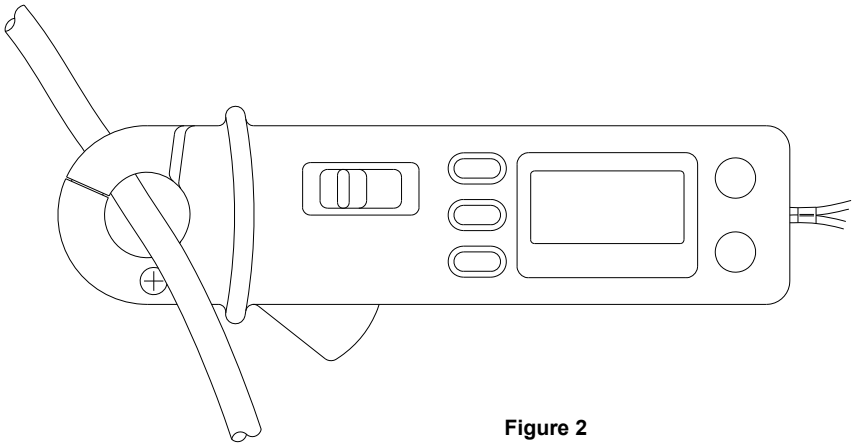


Figure 2

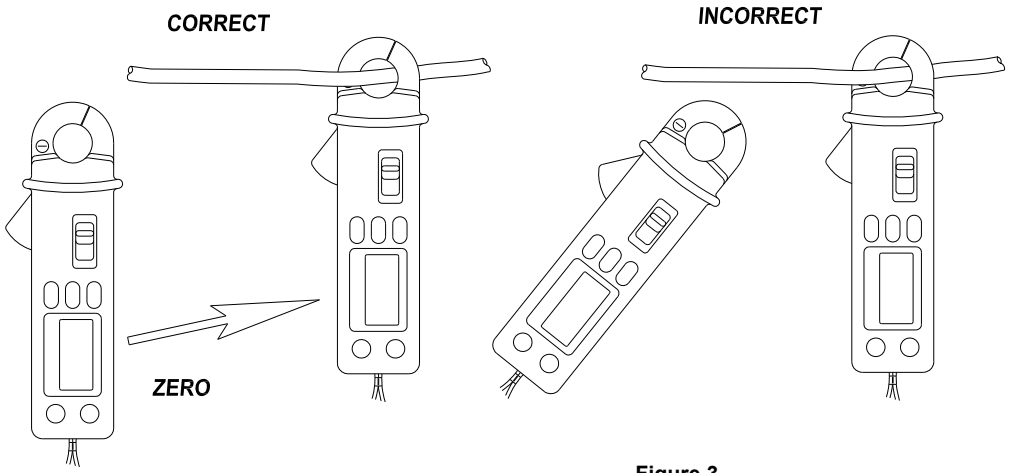


Figure 3

3-3 AC/DC Voltage Measurement

1. Set the slide switch at " V ⎓ " position.
2. Connect the black test lead to the "COM" terminal on the bottom of the meter and the red test lead to the " V-Ω" terminal . You can now place the test probes on the conductors to make the measurement.
3. Pushing the AC/DC switch to select AC mode or DC mode.

3-4 Resistance Measurement

1. Set the slide switch at "Ω))) " position.
2. Connect the black test lead to the "COM" terminal and red lead to the " V-Ω" terminal.
3. Verify that the power to the circuit under test is off. Connect test leads to the circuit to make the measurement.
4. Pushing the Ω /))) switch to select Resistance mode or Continuity mode.
5. At))) mode, Built - in buzzer sounds if the resistance of the circuit under test is less than 50Ω.

MAINTENANCE

⚠ **WARNING :** TO AVOID ELECTRICAL SHOCKS REMOVE TEST LEADS FROM INSTRUMENT BEFORE OPENING THE COVER.

4-1 General Maintenance

1. Repairs or servicing not covered in this manual should only be performed by qualified personal.
2. Periodically wipe the case with a dry cloth and detergent do not use abrasives or solvents.

4-2 Battery Installation or Replacement

The meter is powered by two 1.5V alkaline battery. Refer to Fig. 4 and use the following procedure to replace the battery.

1. Disconnect the test leads and turn the meter off. Remove the test leads from the front terminals.
2. Remove the battery cover of case bottom from the instrument by removing the screw and then lifting off battery cover.
3. Lift the battery from the battery box.
4. Reinsert the battery into the battery box.
5. Replace the battery cover and reinstall the screw.

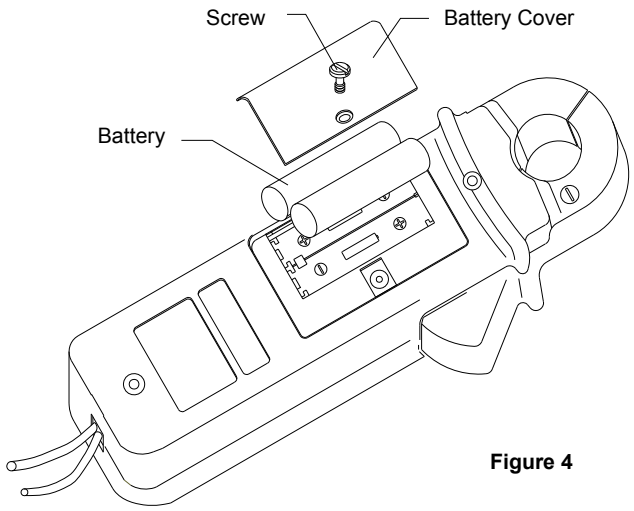


Figure 4

APPA TECHNOLOGY CORP.
9F.119-1 Pao-Zong Rd., Shin-Tien,
Taipai, 23115, Taiwan, R.O.C.
P.O.Box. 12-24 Shin-Tien, Taiwan.
Tel : 886-2-9178820 Fax : 886-2-9170848
E-MAIL:info @appatech.com
http://www.appatech.com

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