AC/DC CLAMP MULTIMETER

CE

INSTRUCTION MANUAL

APPA 36Ⅱ/36RⅡ

APPA®

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 Meter Safety

Terms as Marked on Equipment.

⚠ **ATTENTION** — Refer to manual.

⧈ **DOUBLE INSULATION** — Protection Class Ⅱ.

⚠ **DANGER** — Risk of electric shock.

Symbols in this Manual.

⚠ This symbol indicates where cautionary or other information is found in the manual.

Battery

1-3 Front Panel

Refer to Figure 1 and 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. **Function Switch** — This slide switch is used to select V~ , V⎓, A ~, A ⎓, Ω ,))) function.

4. HOLD/MAX(⎓) — This button has two modes one is data hold (A) and the other is maximum hold (B).

(A) Turning the rotary switch to power on, the button will work in data hold mode. Press to toggle data hold ON/OFF.

(B) Pressing and hold the HOLD/MAX (⎓) button then turn the rotary switch to power on, this button will work in maximum hold mode. Press to restart MAX recording. Press this switch more than 2 seconds to exit the maximum hold mode. Maximum hold mode doesn't work in continuity mode.

5. ZERO A⎓ / Ω/ 🔊 Button

Zero A⎓ Button — For DC current measurement, using the “ZERO A⎓“ button to zero the reading .

Ω / 🔊 Button — Pressing this button to measure resistor or continuity either.

Auto power off disable mode — Refer to 2-2 Electrical Specifications item (9) Auto Power Off Disable.

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

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

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

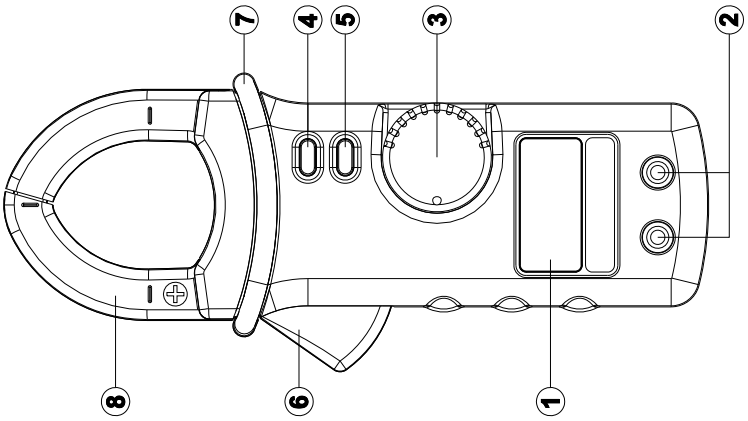

Figure 1

SPECIFICATIONS

2-1 General Specifications

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

Polarity : Automatic polarity indicated.

Over range Indication : "OL" indicated.

Low Battery Indication : "〜 " is displayed when the battery voltage drops below the 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 : Standard 9V battery, NEDA 1604, JIS 006P, IEC6F22.

Battery Life : Alkaline 150 hours.

Maximum Jaw Opening : 45mm.

Max/Conductor Size : 35 mm diameter.

Temperature Coefficient : 0.2 x (spec.Acc'y) / ℃ < 18℃, > 28℃.

Size : 82 mm (W) x 208 mm (L) x 41 mm (H) .

Weight : 360 grams (including battery)

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

2-2 Environmental Conditions

Indoor use.

Maximum Altitude : 2000 Meter.

Installation Category : IEC 1010-1 CAT. III 600V

Pollution Degree : 2

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

Storage Temperature : -20℃ to 60℃.

2-2 Electrical Specifications

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

(1) AC Voltage : Auto-ranging

Range	Resolution	Accuracy	Over voltage protection
400.0mV	100μV	Unspecified	600V rms
4.000V	1mV	±(1.5% reading + 5digits) 40Hz ~ 300Hz	
40.00V	10mV	±(1.5% reading + 5digits) 40Hz ~ 500Hz	
400.0V	100mV		
600V	1V		

Input Impedance : ≧ 9MΩ // less than 100pF.

AC Conversion Type : 36Ⅱ:

AC conversion are average sensing rms indication calibrated to the rms value of a sine wave input.

36RⅡ:

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 and non-sine wave below half scale. For non-sine wave 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	±(0.7% reading + 2 digits)	600V rms
4.000V	1mV		
40.00V	10mV		
400.0V	100mV		
600V	1V		

Input Impedance : ≧ 9MΩ.

(3) Resistance Auto-ranging

Range	Resolution	Accuracy	Overload Protection
400.0Ω	100mΩ	±(1.2% reading + 6 digits) *1	600V rms
4.000KΩ	1Ω	±(0.9% reading +3 digits) *2	
40.00KΩ	10Ω		
400.0KΩ	100Ω	±(1.2% reading + 3 digits) *2	
4.000MΩ	1KΩ		
40.00MΩ	10KΩ	±(2.5% reading + 5 digits) *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 turn the rotary function switch to resistor and continuity function maybe cause a buzzer sound.

(4) Continuity

Built-in buzzer sound when measured resistance is less than 50Ω and sound off when measured resistance is more than > 300Ω .
Between 50Ω to 300Ω the buzzer maybe sound or off either.

(5) DCA : Auto-ranging

Range	Resolution	Accuracy	Over voltage protection
0 ~ 40.0A	0.1A	±(1.5% reading + 10 digits)	600A rms
40.0A ~ 400.0A	0.1A	±(1.5% reading + 7 digits) *	
400A ~ 600A	1A	±(1.9% reading + 10 digits)	

1. * For 200.0A ~ 400.0A add 1% to accuracy.

2. Temperature Coefficient : 0.2 x (Spec.Acc'y) /℃ < 21 ℃ or > 26℃.

3. Operating Temperature : 0℃ to 30℃ (≦ 80%RH) , 30℃ to 40℃ (≦ 75%RH)

(6) ACA : Auto-ranging

Range	Resolution	Accuracy	Frequency Response	Overload Protection
0 ~ 40.0A	0.1A	±(1.9% reading + 7 digits)	50Hz ~ 60Hz	600A r.m.s.
40.0A ~ 400.0A	0.1A	±(1.9% reading + 5 digits) **		
400A ~ 600A	1A	±(1.9% reading + 10 digits)		
0 ~ 40.0A	0.1A	±(2.5% reading + 7 digits)	61Hz ~ 400Hz	
40A ~ 400.0A	0.1A	±(2.5% reading + 5 digits) *		
400A ~ 600A	1A	±(2.5% reading + 10 digits)		

1. * For 200.0A ~ 400.0A add 1.1% to accuracy.
2. ** 200.0A ~ 400.0A add 1.6% to accuracy for 36RⅡ.

   200.0A ~ 400.0A add 1.1% to accuracy for 36Ⅱ.

3. Temperature Coefficient : 0.2 x (Spec.Acc'y) /℃ < 21 ℃ or > 26℃.

4. Operating Temperature : 0℃ to 30℃ (≦ 80%RH) , 30℃ to 40℃ (≦ 75%RH)

AC Conversion Type : 36Ⅱ:

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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. If 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 change steps of range 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 after power on.

(9) Auto Power Off Disable :

Pressing and hold the ZERO A⎓ Ω button then turn the rotary switch from power off to Ω/ position quickly (less than one second) that will disable the auto power off.

OPERATION

This instrument has been designed and tested in accordance with IEC Publication 1010, 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℃ ～ 50℃ and at less than 80% R.H. except current function is operated between 0℃ ～ 40℃.
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.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. Turning the rotary switch at "A~" or "A⎓" position.
2. Open 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 Figure 2.
5. **For accuracy measurement on DCA mode follow the procedure below**
   (i) Position clamp around wire or conductor and release clamp trigger smoothly, do not release quickly, make sure that the wire or conductor is at the center of the clamp.
   (ii) Remove the wire or conductor from the clamp.
   (iii) Press the ZERO A⎓ button to zero the reading, effective in DCA mode only.
   (iv) Repeat (i).
   (v) The positive reading measurement can get better accuracy in DCA mode.

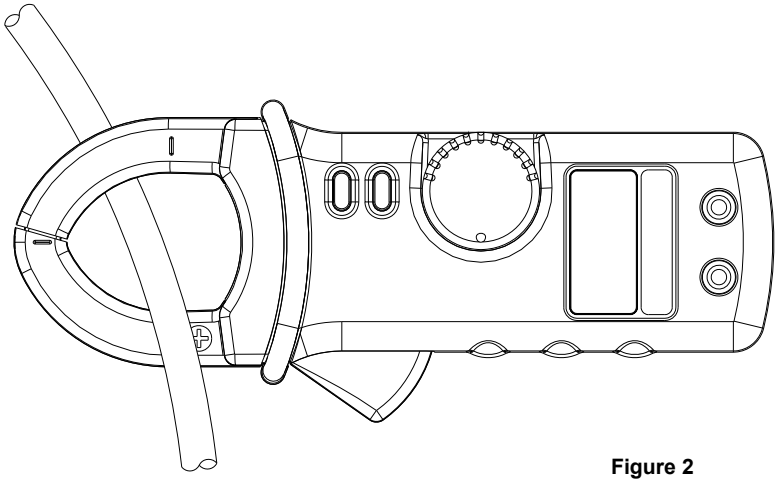

Figure 2

3-3 AC/DC Voltage Measurement

1. Turning the rotary switch at " V ∼ " or "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.

3-4 Resistance Measurement

1. Turning the rotary 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. Pressing the Ω / •)) button 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 between 50Ω to 300Ω the buzzer maybe sound or off either.

MAINTENANCE

⚠ **WARNING :** TO AVOID ELECTRICAL SHOCK OR DAMAGE REMOVE TEST LEADS 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 mild detergent do not use abrasives or solvents.

4-2 Battery Installation or Replacement

The meter is powered by single 9V standard 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 lower housing from the instrument by removing the screw and then lifting off battery cover.
3. Lift the battery from the battery snap.
4. Reinsert the battery into the battery snap.
5. Replace the battery cover and reinstall the screw.

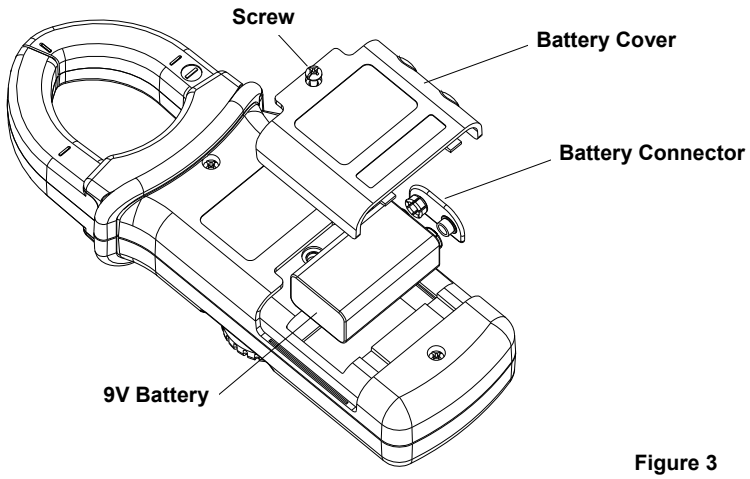

Figure 3

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