BESANTEK

BST-CM270

AC/DC DIGITAL CLAMP METER

INSTRUCTION MANUAL

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1. INTRODUCTION

NOTE

This meter has been designed and tested according to CE Safety Requirements for Electronic Measuring Apparatus, IEC/EN61010-1 and other safety standards. Follow all warnings to ensure safe operation.

⚠ WARNING

READ "SAFETY NOTES" (NEXT PAGE) BEFORE USING THE METER.

2. SAFETY NOTES

Read the following safety information carefully before attempting to operate or service the Meter.

- Use the meter only as specified in this manual, otherwise the protection provided by the meter may be impaired.
- Always keep hands behind the meter barrier.
- Use extreme caution when clamping around uninstalled conductors or bus bars.
- Never clamp around any conductor carrying a voltage above 600V R.M.S.
- Rated environmental conditions:

  1.Indoor use.
  2.IEC/EN 61010-1 CAT III 600V
  CAT II 1000V
  3.Pollution degree II.
  4.Altitude up to 2000 meter.
  5.Relative humidity 80% max.
  6.Ambient temperature 0~40°C.

- Observe the international Electrical Symbols listed below:


Meter protected throughout by double insulation or reinforced insulation.


Warning ! Risk of electric shock.


Caution ! Refer to this manual before using the meter.


Alternating current.


Earth (ground) terminal.

3. FEATURES

- 4000 - count LCD.
- Full automatic measurement.
  - ◎ Voltage measurement.
  - ◎ Current measurement.
  - ◎ Resistor measurement.
  - ◎ Capacitor measurement
  - ◎ Frequency counter.
- Range change function.
- Data Hold function freezes the reading.
- Continuity check.
- Diode measurement.
- Low battery indication.
- Auto Power Off (APO) function.
- Safety design throughout with no exposed metal parts, shielded banana plugs and recessed input terminals.

4. SPECIFICATIONS

Ranges:

AC Voltage: 400 mV/4 V/40 V/400 V/750 V
AC Current: 400 A /2000 A
DC Voltage: 400 mV/4 V/40 V/400 V/1000 V
DC Current: 400 A/2000 A
Resistance: 400 Ω/4 KΩ/40 KΩ/400 KΩ/4 MΩ/40 MΩ
Continuity Test: 400 Ω
Diode : 2 V at 1mA
Capacitor: 4 nF/40 nF/400 nF/4 μF/40 μF/400 μF/ 4mF
Frequency counter: 4K Hz/20K Hz

ACV

Range	Resolution	Accuracy (at 40-500Hz)
400 mV	0.1 mV	± (2.0% rdg+3dgt)
4 V	1 mV	± (1.5% rdg+3dgt)
40 V	10 mV	± (1.5% rdg+3dgt)
400 V	100 mV	± (1.5% rdg+3dgt)
750 V	1 V	± (1.5% rdg+3dgt)

*Overload protection : 750V AC RMS
*Frequency Response : 0~400mV at 40Hz~100Hz
4V~750V at 40Hz~500Hz

ACA

Range	Resolution	Accuracy
400 A	0.1 A	**0~1500A: ± (1.5% rdg+4dgt)** **1500~2000A: ± (2.5% rdg+4dgt)**
2000 A	1 A	

*Frequency Response 40Hz~500Hz

DCV

Range	Resolution	Accuracy
400 mV	0.1 mV	± (1.0% rdg+3dgt)
4 V	1 mV	± (1.0% rdg+3dgt)
40 V	10 mV	± (1.0% rdg+3dgt)
400 V	100 mV	± (1.0% rdg+3dgt)
1000 V	1 V	± (1.0% rdg+3dgt)

*Overload protection : 1000V DC

DCA

Range	Resolution	Accuracy
400 A	0.1 A	**0~1500A: ± (1.5% rdg+4dgt)** **1500~2000A: ± (2.5% rdg+4dgt)**
2000 A	1 A	

Resistance

Range	Resolution	Accuracy
400 Ω	0.1 Ω	± (1.5% rdg+3dgt)
4 KΩ	1 Ω	± (1.5% rdg+3dgt)
40 KΩ	10 Ω	± (1.5% rdg+3dgt)
400 KΩ	100 Ω	± (1.5% rdg+3dgt)
4 MΩ	1 KΩ	± (1.5% rdg+3dgt)
40 MΩ	10 KΩ	± (2.0% rdg+4dgt)

*Overload protection : 500V AC RMS or 500V

Continuity Test

Range	Audible threshold
400 Ω	Less than 25Ω

Diode Test

Range	Resolution	Accuracy
2 V	1 mV	± (1.5% rdg+3dgt)

Capacitor

Range	Resolution	Accuracy
4 nF **(30p~4nF)**	1 pF	± (3.0% rdg+5dgt)
40 nF	10 pF	
400 nF	100 pF	
4 µF	1 nF	
40 µF	10 nF	
400 µF	100 nF	
4 mF	1 µF	± (15% rdg+5dgt)

*Overload protection : 500V AC RMS or 500V DC

Frequency counter

Range	Resolution	Accuracy
4K Hz	1 Hz	± (0.5% rdg+2dgt)
20K Hz	10 Hz	± (0.5% rdg+2dgt)

*Overload protection : 500V AC RMS or 500V DC
*Trigger level : 0.2V

- **Overload protection**

ACV	750V rms
DCV	1000V
Frequency & Ohm	500V rms

- **Conductor Size**
  Approx. 55mm max
- **Dimensions**
  255mm(L) x 100mm(W) x 42mm(D)
- **Weight**
  Approx. 515g (battery included)
- **Power source**
  One type PP3, 6F22, 006P(or equivalent), 9V battery.
- **Operating Principle**
  Dual slope integration.
- **Over rage indication**
  " O.L " indicated.
- **Low Battery Indication**
  "⊟" sign appears on the display when the battery voltage drops below accurate operating level.
- **Response Time**
  Approx. 1 second.
- **Sample Rate**
  Approx. 2 times per second.

- **Temperature & Humidity for Guaranteed**

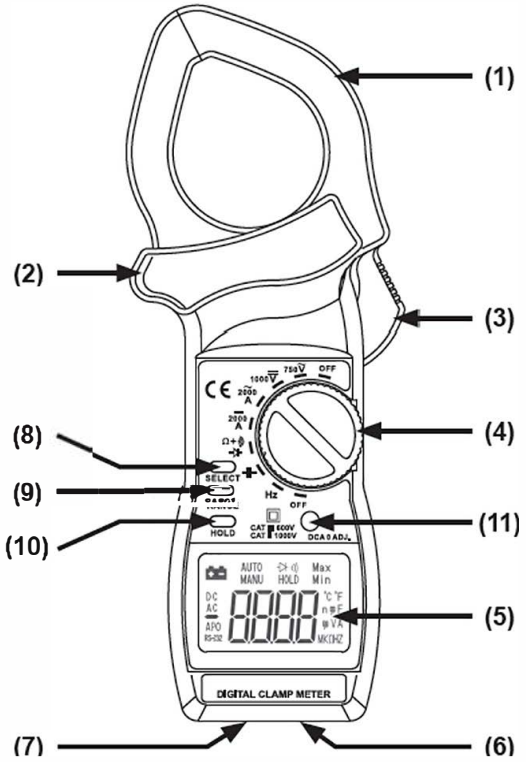
  Operaing Temperature & Humidity
  0°C to 40°C at< 80% max. relative humidity.

  Storage Temperature & Humidity
  -10°C to 50°C at< 80% max. relative humidity.

- **Battery Life**
  Approx. 50 hours on continuous use.

- **Accessories**
  Test leads
  Soft pouch
  Instruction Manual
  Battery (one 006P 9V).

5. INSTRUMENT LAYOUT



(1) Transformer Jaws
Pick up the AC current or DC current flowing through the conductor. The "+" marking on the jaw indicates direction of DC current existing on the conductor being tested which follows forward and vertically with jaws, the reading shown on display is positive.

(2) Barrier
Provide a protective distance from hands to conductor.

(3) Jaw Trigger
Press the lever to open the transformer jaws. When the lever is released, the jaws will close again.

(4) Function selector rotary switch
The rotary switch selects the function.

(5) LCD Display
The LCD display indicates the function mode, bar graph, annunciator, and measured value of a signal. Field effects 3 ¾ digit LCD with maximum reading of 3999.

(6) Volt/Ohm/Frequency Terminal
This is positive input terminal for voltage / ohm / frequency measurement. Use the RED test lead to connect.

(7) COM Terminal
This is the ground input terminal. Use the BLACK test lead to connect.

(8) Select Button
In the resistance + continuity + diode function, press the Select button to selects resistance, Continuity or diode function.

(9) Range Button

Press the Range button to selects the manual range mode and turns off the AUTO annunciator and turns on the manual annunciator and changes the full scale range. In manual range mode, each time press Range button (less than one second), the range increments and a new value is displayed. To exit the manual range mode and return to auto mode, press the RANGE button (More than one second).

(10) HOLD Button

Press the HOLD button (HOLD annunciator turns on) makes the meter stop updating the LCD display. This mode can be nested in most of the special modes. Enabling HOLD function in automatic mode makes the meter switch to manual mode, but the full scale range remains the same. HOLD function can be cancelled by changing the measurement mode, pressing Range, or push HOLD again.

(11) DCA zero adjust shaft

(12) Auto Power Off (APO)

The meter has a default auto power off function (APO annunciator turns on). If the meter idles for more than 10 minutes, the meter automatically turns the power off. When this happens, the state of the meter is saved. In order to disable auto power off function, power on the meter when any of the push function, except for HOLD, is pressed down.

6. MEASUREMENT

Before proceeding with measurement, read the safety notes.

(1) AC Voltage measurement

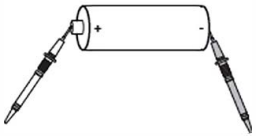
- Insert the BLACK test lead to COM and the RED one to the other terminal.
- Set the function switch to ACV.
- Connect the test leads to the object to be measured. when measuring AC voltage, the polarity of the leads can be ignored.
- Read the display.

※ If the readings exceed AC 600V(DC 600V), maybe the reading value is wrong and it is dangerous. (Refer to the safety notes)

(2) DC Voltage measurement

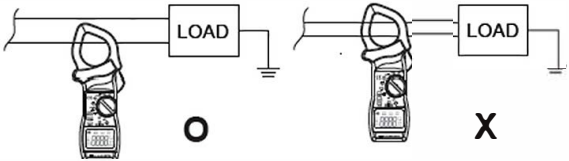
- Insert the BLACK test lead to COM and the RED one to the other terminal.
- Set the function switch to DCV.
- Connect the test leads to the object to be measured.
- Read the display.

※ Reversing the polarity of the test leads displays a negative value.



(3) AC Current measurement

- Set the function switch to ACA.
- Press the jaw trigger to open the transfomer jaw and clamp onto one conductor only.
- Read the display.



(4) DC Current measurement

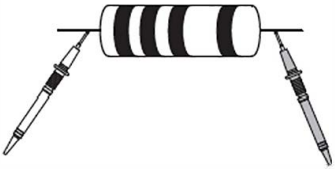
- Set the function switch to DCA.
  ※ If the inital reading of DCA is not zero, adjust the "DCA zero adjustment shaft" until the display shows zero.
- Press the jaw trigger to open the transfomer jaw and clamp onto one conductor only.
- Read the display.

(5) Diode measurement

CAUTION!

Make sure that there is no voltage in the circuit or components being measured.

Diode measurement mode shares the same configuration with 4.000V manual voltage measurement mode.
If the test circuit is open or the voltage drop between the two ports of the device (diode) under test are larger than 2V, the LCD panel will show "OL"..
The buzzer generates a 2KHz sound whenever the digit number is less than 0.25V. Because the cycle time of measurement is only 50ms, the least significant digit will not display.



(6) Capacitance measurement

Switch to capacitance measurement mode. Insert the BLACK test lead to COM and the RED one to the other terminal. Connect the test leads to the capacitance test and read the display directly. In order to obtain an accurate reading, a capacitor must be discharged before measurement begins. The chip has a built-in discharge mode to automatically discharge the capacitor.
In discharge mode, the LCD displays DS.C discharging through the chip is quite slow.
We recommend the user to discharge the capacitor with some other apparatus.

(7) Frequency measurement

Switch to frequency measurement mode. Insert the BLACK test lead to COM and the RED one to the other terminal. Apply the test leads to the points across which the frequency is to be measured, and read the result directly from the display.

7. MAINTENANCE

Battery Replacement:

When the low battery warning sign appears, replace with a new battery as follows:

(1) Disconnect the test leads from the clamp meter and turn off the power.

(2) Unscrew the battery cover and replace with a new Battery.

Cleaning and Storage:

> **⚠ WARNING**
> To avoid electrical shock or damage to the meter, do not get water inside the case.

Periodically wipe the case with a damp cloth and detergent. Do not use abrasives or solvents.

If the meter is not to be used for a long time over 60 days, please remove the battery for storage.

CAT IV - Is for measurements performed at the source of the low voltage installation.

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

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

CAT I - Is for measurements performed on circuits not directly Connected to Mains.

Due to our policy of constant improvement and development, we reserve the right to change specifications without notice.