

KUSAM-MECO

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KUSAM-MECO

CLAMP METER 999



**TAKE MEASUREMENT CAREFULLY AND YOU'LL
SPARE YOUR METER AND YOURSELF, SOME PAIN**

Nearly every electrical engineer has a hand held digital clamp meter (Tongtester). We sometimes take them for granted, until we damage them or “burn them out”. If you incorrectly connect your clamp meter to a circuit, or if you have the clamp meter on wrong setting, you damage the meter and possibly hurt yourself. You can also get into trouble if you try to measure the voltage across a charged capacitor.

Clamp meter users frequently burn their meters by trying to measure current the same way as they measure voltage. Remember, you measure voltage across a circuit, and current through a circuit. When you use the current input, your clamp meter becomes a low impedance circuit element.

Even if you correctly insert your clamp meter in to the circuit, you can still damage your meter. Don't try to measure current in excess of your meter's capacity. Check the current capacity of the Clamp meter.

If you are measuring current in industrial environment to prevent excess disconnect your test leads from the circuit under test whenever you change Clamp meter functions. Set your meter to the correct function, say current, and its highest range for the setting. If the reading is small, change the range to the next lower range till the reading can be read with the best possible accuracy. When measuring voltage, connect the test leads before your apply power to your circuit. To be safe, start by setting your meter to its highest range first.

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Overview



Warning

To avoid electric shock or personal injury, read the “Rules for Safe Operation” carefully before using the Meter.

Digital Clampmeter Model - 999 (hereafter referred to as “the Meter”) is a 3½ digits Clampmeter with steady operations, and highly reliable hand-held measuring instrument having different measurement positions. The Clampmeter not only can measure AC/DC Voltage, AC Current, Frequency, Resistance, Diode Test, but also has Data Hold, Peak Hold, Max Hold & Full Icon Display.

Terms in this manual



Warning : identifies conditions and actions that could result in serious injury or even death to the user.



Caution : identifies conditions and actions that could cause damage or malfunction in the instrument.







Unpacking Inspection

Open the package case and take out the Clampmeter. Check the following items carefully to see any missing or damaged part :


Item	Description	Qty.
1	English Operating Manual	1 piece
2	Test Lead	1 pair

In the event you find any Part missing or damaged, please contact your dealer immediately.

FEATURES :

-  High - Accuracy, Digital Reading.
-  Large LCD Of 21mm (h) for Easy Reading.
-  Instant Continuity Buzzer.
-  Overload Protection on all Ranges.
-  Recessed Safety Designed Input Jacks.
-  Data Hold, Peak Hold And Max Hold Functions

GENERAL SPECIFICATIONS :

- Display** : 3½ digit LCD. maximum reading 1999 with automatic sign and Function annunciators.
- Overrange indication** : MSB (highest) digit OL (1) or (-1) is displayed.
- Low battery** : “” is displayed when the battery voltage drops below the operating voltage.
- Measurement rate** : 3 measurements per second, nominal.
- Operating temperature** : 0°C to - 40°C, 0-70% RH
- Storage temperature** : -20°C to 60°C, 0-80% RH with battery removed.
- Accuracy** : Accuracy specifications at 23 ± 5°C less than 75% RH.
- Power** : One standard 9 V Battery.
- Dimension** : 250mm (L), 100mm(W), 96mm(H)
- Weight** : Approx (380 grams) including Battery.
- Accessories** : Test leads, Manual, Carrying Case.

ELECTRICAL SPECIFICATION :

AC CURRENT (50 ~ 60Hz)

Range	Resolution	Accuracy
20 A	0.01 A	± (1.5% rdg + 4 dgts)
200 A	0.1 A	
1000 A	1 A	± (2.0% rdg + 4 dgts)

OL. Protection : 1000A For 1 minute.

DC VOLTAGE

Range	Resolution	Accuracy
1000 V	1 V	± (0.5% rdg + 1 dgts)

OL. Protection : 600V DC/AC

Input Impedance : 10M

AC VOLTAGE (50Hz ~ 500Hz)

Range	Resolution	Accuracy
200 V	0.1 V	± (1.2% rdg + 4 dgts)
750 V	1 V	

OL. Protection : 600V DC or AC

Input Impedance : 10M

RESISTANCE

Range	Resolution	Accuracy
2 K	1	± (1.2% rdg + 1 dgts)
200 K	0.1 K	

Open Circuit Volt : 0.3V DC.

OL. Protection : 600V DC or AC rms

DIODE TEST

TEST CURRENT	1.0 ± 0.6 mA
TEST VOLTAGE	3.2 V MAX.

OL. Protection : 500V DC/350 VAC

CONTINUITY

THRESHOLD	<30
RESPONSE TIME	<100mS
OL. PROTECTION	500 VDC/350VAC

FREQUENCY (Auto Ranging)

Range	Resolution	Accuracy
2 KHz	0.01 Hz	± (0.1% rdg + 3 dgts)
20 KHz	0.1 Hz	

Sensitivity : 80 V rms

OL. Protection : 600V DC or AC rms

Rules For Safe Operation (1)




Warning












To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules :

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors and Clamps.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for Continuity. Replace damaged test leads with identical electrical Specifications before using the Meter.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The rotary switch should be placed in the right position and no any changeover of range shall be made while measurement is conducted to prevent damage of the Meter.
- When measurement is taken at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after the meter is dampened.
- When using the test leads, keep your fingers behind the finger guards.

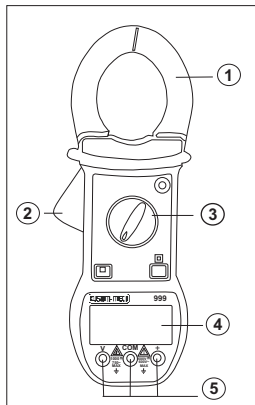
Rules For Safe Operation (2)

- Disconnect circuit power and discharge all high -voltage capacitors before testing resistance, continuity, diodes, or current.
- Replace the battery as soon as the battery indicator  appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time.
- Constantly check the battery as it may leak when it has not been used for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.

International Electrical Symbols

	AC (Alternating Current).
	DC (Direct Current).
	Both DC & AC.
	Grounding.
	Double Insulated.
	Deficiency of Built-In Battery.
	Continuity Test.
	Diode.
	Fuse.
	Warning ! Refer to the Operating Manual.
	Caution ! Risk of Electric Shock.

The Clampmeter Structure (see figure 1)



(Figure 1)

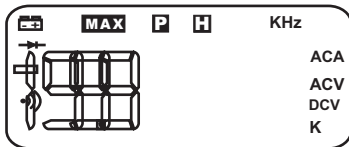
- 1) TRANSFORMER JAWS :**
Pick up the AC current flowing through the conductor.
- 2) TRIGGER :**
Press the lever to open the transformer jaws. When the lever is released, the jaws will close again.
- 3) FUNCTION SELECTOR :**
To Select ACV, ACA, DCV, RESISTANCE, FREQUENCY, DIODE & CONTINUITY.
- 4) LCD DISPLAY :**
A 3½ digit display (maximum reading 1999) indicates measured values, and features symbols indicating function, Data - Hold, Peak Hold, Max Hold, Low Battery, Continuity, Diode.
- 5) INPUT JACKS (V, Ω , and COM) :**
Test leads are inserted into these jacks for Voltage, Resistance, Frequency measurements and Continuity & Diode Checks.

Functional Buttons

Below table indicates the functional button operations

BUTTONS	OPERATION PERFORMED
POWER (Grey Switch)	Turn the Meter on and off. <ul style="list-style-type: none"> ● Rotate the SWITCH to turn ON the Meter. ● Rotate the SWITCH to turn OFF the Meter.
HOLD (Red Button)	<ul style="list-style-type: none"> ● Press HOLD button once to enter hold mode. ● Press HOLD button again to exit hold mode. ● In Hold mode, H is displayed and the present value is shown.
MAX (Grey Button)	<ul style="list-style-type: none"> ● Press MAX button once to enter maximum reading mode where the maximum value reached is displayed. ● Press MAX button again to exit maximum reading mode. ● In MAX mode, MAX is displayed and the maximum value is shown.
PEAK (Grey Button)	<ul style="list-style-type: none"> ● Press PEAK button once to hold peak reading in current range. ● Press PEAK button again to exit peak hold mode. ● In PEAK mode, P is displayed and the peak value is shown.

Display Symbols (see figure 2)



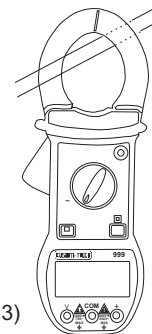
(Figure 2)

No.	Symbol	Meaning
1	⚡	Dangerous Voltages.
2	🔋	The battery is low ⚠️ Warning : To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator appears.
3		Indicator for AC voltage or current, The displayed value is the mean value.
4	—	Indicates negative reading.
5	➔	Test of diode.
6	⏸	Data hold is active.
7	•)))	The continuity buzzer is on.
8	A	A : Amperes (amps) The unit of current.
9	V	V : Volts. The unit of voltage.
10	Hz	Hz : frequency.
11	, k ,	: Ohm. The unit of resistance. K : kilo-ohm. 1×10^3 or 1000 ohms.
12	P	Peak reading in current range
13	MAX	Max reading in the function/range measured

Measurement Operation

- Make sure the Low Battery display is not on, otherwise false readings may be provided.
- Pay extra attention to the symbol which is located besides the input terminals of the Meter before carrying out measurement.

A. AC Current Measurement (see figure 3)



(figure 3)

⚠️ Warning

Never attempt an in-circuit current measurement where the voltage between terminals and ground is greater than 60V.

Use proper function, and range for the current measurement.

The AC Current measurement has 3 measurement positions on the rotary Switch : 20A, 200A and 1000A

To measure AC CURRENT

- 1) Set the function switch to ACA range.
- 2) Make sure that the switch is not pressed.
- 3) Open the transformer jaws by pressing the trigger.

- 4) Enclose one conductor in transformer jaws and release trigger. Jaws should be completely closed before taking the reading.
- 5) If peak current reading is required, press the Peak button.

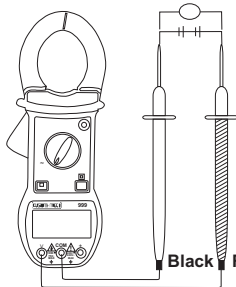
The measured value is shown on the display.



Caution :

- Place the switch in the 1000A range position if the measured current is unknown. Rotate the switch to lower positions to get more accurate readings.
- The LCD displays “ 1 ” indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- When AC Current measurement has been completed, open the jaw to remove the conductor & then Switch off the meter.

B. DC voltage measurement (see figure 4)



(Figure 4)



Warning

To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V or 750V rms although readings may be obtained.

The DC Voltage range is : 1000V. To measure DC voltage, connect the Meter as follows :

- 1) Insert the red test lead into the **V** input terminal and the black test lead into the **COM** input terminal
- 2) Set the rotary switch in the DC voltage measurement position in **V $\overline{\text{---}}$** range.
- 3) Connect the test leads across with the object being measured.

The measured value is shown on the display.



Caution :

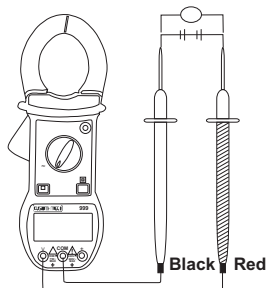
- The LCD displays “1” indicating the existing selected range is overloaded, it is required to switch off the meter after disconnecting the meter from the circuit.
- In DC voltage range, the Meter has an input impedance of approx. 10M . This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k , the error is negligible (0.1% or less).
- When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

C. AC Voltage Measurement (see figure 5)



Warning :

To avoid harm to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V or 750V rms although readings may be obtained.



(figure 5)

The AC Voltage measurement has 2 measurement positions on the rotary switch : 200V and 750V

To measure AC Voltage, connect the Meter as follows :

- 1) Insert the red test lead into the V terminal and the black test lead into the **COM** terminal.
- 2) Set the rotary switch to an appropriate measurement position in V ~ range.
- 3) Connect the test leads across with the object being measured.

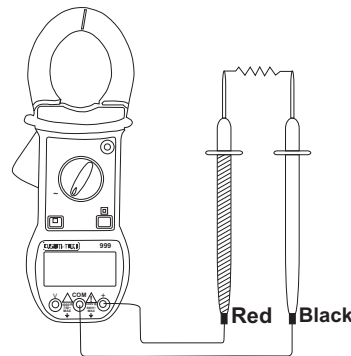
The measured value is shown on the display, which is effective value of sine wave (mean value response).

⚠ Caution :

- If the value of voltage to be measured is unknown, use the maximum measurement position (750V) and reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays " 1 " indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.

- When AC Voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

D. Resistance Measurement (see figure 6)



(figure 6)

⚠ Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

The resistance range has 2 measurement positions on the rotary switch : 2K

To measure resistance, connect the meter as follows

- 1) Insert the red test lead into the "+" terminal and the black test lead into the **COM** terminal.
- 2) Set the rotary switch to an appropriate measurement position in range.
- 3) Connect the test leads across with the object being measured.

The measured value is shown on the display,

Note :

- The test leads can add 0.1 to 0.3 of error to the Resistance measurement. To obtain precision readings in low-resistance range of 200 , short-circuit the input terminals beforehand and record the reading obtained (call this reading as X). (X) is the additional resistance from the test lead.

Then use the equation :

Measured resistance value (Y) - (X) = precision readings of resistance.

- When there is no input, for example in open circuit condition, the Meter displays “ 1 “. When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

⚠ Caution :

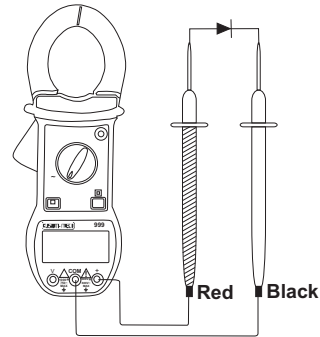
- Never connect high voltage. to the input sockets with the switch in Resistance range.
- Using Resistance measurement function in a live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from the circuit to obtain an accurate reading.

E. Measuring Diodes & Continuity

(See figure 7)

⚠ Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring diodes and continuity.



(figure 7)

Testing Diodes

Use the diode test function to check diodes, The diode test sends a current through the Semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test a diode out of a circuit, connect the Meter as follows :


- 1) Insert the red test lead into the “+” terminal and the black test lead into the COM terminal.
- 2) Set the rotary switch to \rightarrow position.
- 3) For forward voltage drop reading on any Semiconductor component, place the red test lead on the component’s anode and place the black test lead on the component’s cathode. The measured value shows on the display.

⚠ Caution :

- In a circuit, a good diode will produce a forward voltage drop reading of 0.5V to 0.8V; however ; the reverse voltage drop reading can vary depending on the resistance of other pathways between the probe tips.

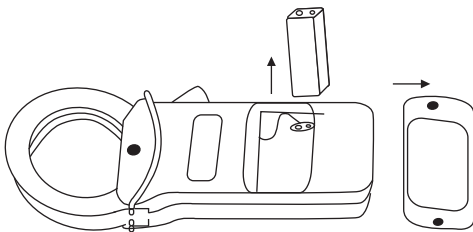
Maintenance

△ Warning

To avoid false reading, replace the battery as soon as the battery indicator  appears.

To replace battery (see figure 9)

- Disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.
- Turn the Meter OFF.
- Remove the screws from the battery compartment, and separate the battery compartment from the case bottom
- Remove the battery from the battery compartment.
- Replace the battery with a new Standard 9V Battery.
- Rejoin the battery compartment and the case bottom, and install the screw.



(figure 9)

MUMBAI

TEST CERTIFICATE

DIGITAL AC CLAMP METER

This Test Certificate warrants that the product has been inspected and tested in accordance with the published specifications.

The instrument has been calibrated by using equipment which has already been calibrated to standards traceable to national standards.

MODEL NO. KM 999

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED



WARRANTY

Each "KUSAM-MECO" product is warranted to be free from defects in material and workmanship under normal use & service. The warranty period is one year (12 months) and begins from the date of despatch of goods. In case any defect occurs in functioning of the instrument, under proper use, within the guarantee period, the same will be rectified by us free of charges, provided the to and fro freight charges are borne by you.

This warranty extends only to the original buyer or end-user customer of a "KUSAM-MECO" authorized dealer.

This warranty does not apply for damaged Ic's, fuses, burnt PCB's, disposable batteries, carrying case, test leads, or to any product which in "KUSAM-MECO's" opinion, has been misused, altered, neglected, contaminated or damaged by accident or abnormal conditions of operation or handling.

"KUSAM-MECO" authorized dealer shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of "KUSAM-MECO".

"KUSAM-MECO's" warranty obligation is limited, at option, free of charge repair, or replacement of a defective product which is returned to a "KUSAM-MECO" authorized service center within the warranty period.

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. "KUSAM-MECO" SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE WHATSOEVER.

All transactions are subject to Mumbai Jurisdiction.

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