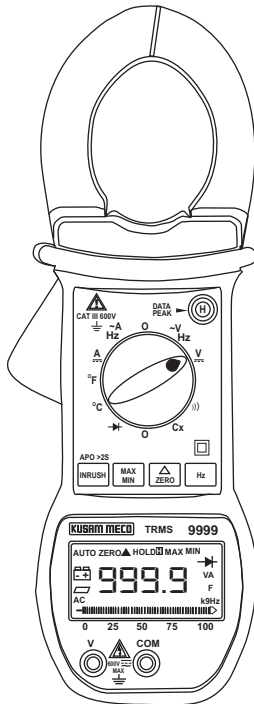


KUSAM-MECO

TRUE RMS AC/DC DIGITAL CLAMP METER

MODEL - 9999



KUSAM-MECO

**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 accident 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 - 9999 (hereafter referred to as “the Meter”) is a 4 digits True RMS Clampmeter with steady operations, and highly reliable hand-held measuring instrument having different measurement functions. The Clampmeter not only can measure AC Current, AC/DC Voltage, Frequency, Resistance, it can also test DC Current, "INRUSH" Current, Capacitance, Temperature, Diode Test. It 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
3	K-Type Thermocouple	1 piece
4	Thermocouple Adaptor	1 piece

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


FEATURES :

-  INRUSH Current measuring function.
-  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
-  Relative zero function.

GENERAL SPECIFICATIONS

Jaw size : Maximum Conductor 46.5 mm .
Display : 4 digit liquid crystal display (LCD) with a maximum reading of 9999.

Overrange : "OL" mark indication.

Low battery indication: The " " is displayed when the battery voltage drops below the operating level.

Measurement rate : 2 times per second, nominal.
Operating environment : 0°C to 50°C at <70%R.H.
Storage Temperature : -20°C to 60°C at <80%R.H. with battery removed from meter.

Accuracy stated at ambient temperature 18°C to 28°C(65°F to 82°F), <70% R.H.

Temperature Coefficient : 10% of applicable accuracy per °C(5% per °F) out side the range of 18 to 28°C (65 °F to 82°F)

Indoor use.

Altitude up to 2000m.

Safety Conformance : All input are protected to EN61010-1, 600V CAT III. Pollution degree II. EMC-instrument unspecified for use in EMC field.

Power : Single standard 9V battery.

Dimensions : 250mm(H)X100mm(W)X46mm(D).

Weight : Approx. 425gms.. including battery.

ELECTRICAL SPECIFICATION :

AC CURRENT TRMS (accuracy : at the center of CT)

Range	Resolution	Accuracy
0 to 999.9A	0.1 A	± (2% rdg + 5dgts) on 20 to 100Hz
		± (6% rdg + 5dgts) on 100 to 400Hz

Crest Factor : <3@ 0 to 500A
 <2.5 @ 500 to 600A
 <1.42 @ 600 to 1000A

Overload Protection : 1000A AC max for 1 minute

DC CURRENT (accuracy: at the center of CT)

Range	Resolution	Accuracy
0 to 999.9A	0.1 A	± (2% rdg + 5dgts)

Overload Protection : 1200A DC max for 1 minute.

DC VOLTS

Range	Resolution	Accuracy
0 to 600.0V	0.1 V	± (1% rdg + 5dgts)

Input Impedance : 1 M

Overload Protection : 600V DC/AC rms.

AC VOLTS TRMS

Range	Resolution	Accuracy
0 to 600.0V	0.1 V	± (1% rdg + 5dgts) on 20 to 100Hz
		± (6% rdg + 5dgts) on 100 to 400Hz

Input Impedance : 1 M

Overload Protection : 600V DC/AC rms.

RESISTANCE (Autorange)

Range	Resolution	Accuracy
0 to 999.9	0.1	± (1.5%rdg + 5dgts)
1000 to 9999	1	

Overload Protection : 600V DC / AC rms

CAPACITANCE

Range	Resolution	Accuracy
0 to 999.9 F	0.1 F	± (5%rdg + 10dgts)

Overload Protection : 600V DC / AC rms.

TEMPERATURE (K-Type Thermocouple)

Range	Accuracy
-40°C to 1200°C	± (0.5%rdg + 1°C)
-40°F to 2200°F	± (0.5%rdg + 2°F) (not including thermo couple error)

Resolution : 0.1°C on -40°C to 999.9°C
 1°C on 1000°C to 1200°C
 0.1°F on -40°F to 999.9°F
 1°F on 1000°F to 2200°F

Overload Protection : 600V DC / AC rms

NOTE : Supplied Thermocouple is suitable for measurement upto 250°C, for higher Temperature measurement use separate T. C. probe.

FREQUENCY

Range	Resolution	Accuracy
20 to 400.0Hz	0.1Hz	± (0.5%rdg + 5dgts)

Sensitivity : 5Vrms. TTL signal

5A@20 to 100Hz

10A@100 to 400Hz

Overload Protection : 600V DC / AC rms

DIODE TEST

Accuracy	± (3.0%rdg + 3dgts)
Resolution	1 mV
TEST CURRENT	0.2mA ± 0.1 mA
TEST VOLTAGE	<3.0V DC

Overload Protection : 600V DC / AC rms.

CONTINUITY

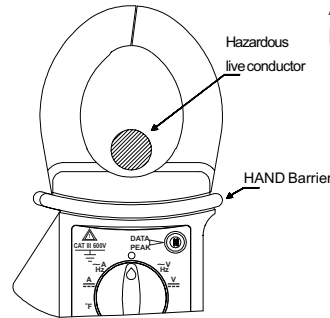
Audible indication	< 30
OL. PROTECTION	600V DC/AC rms.

SAFETY INFORMATION

The following safety information must be observed to ensure maximum personal safety during the operation of this meter.

1. Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.
2. This meter is not recommended for high voltage industrial use, for example, not for measurements of 440V AC or 600V AC industrial power mains. The unit is intended for use with low energy circuits to 600V AC/DC or high energy circuit to 250V AC or DC.
3. Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous.
4. Use caution when working above 60V DC or 30V AC rms. Such voltages pose a shock hazard.
5. When using the probes, keep your fingers behind the finger guards on the probes.
6. Measuring voltage which exceeds the limits of the Clampmeter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated on the front of the meter.

WARNING :- Typical meter applications are near exposed lethal voltages. Use caution when taking measurements. Before the meter is connected to any circuit, review the safety information.



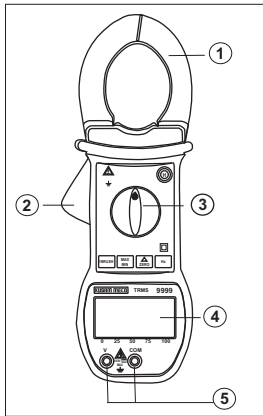
Always keep hands behind the meter **HAND Barrier**.

International Electrical Symbols

	Dangerous Voltage
	See Explanation in Manual
	AC Alternating Current.
	Double Insulation (Protection Class II)
	DC (Direct Current).
	Ground
	Both DC & AC
	Deficiency of Built in Battery.
	Continuity Test
	Diode
	Fuse

Warning :-
Not to be exposed to dripping or splashing environment.

The Clampmeter Structure



- 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, DCA, RESISTANCE, FREQUENCY, CAPACITANCE, TEMP., DIODE & CONTINUITY.
- 4) LCD DISPLAY :**
A 4 digit display (maximum reading 9999) indicates measured values, and features symbols indicating function, Data - Hold, Peak Hold, Max Hold, Low Battery, Continuity, Diode along with 40 Segment Analog Bar Graph.
- 5) INPUT JACKS (V +, and COM-) :**
Test leads are inserted into these jacks for Voltage, Resistance, Frequency, Capacitance, Temperature measurements and Continuity & Diode Checks.

FUNCTIONAL BUTTONS

POWER ON THE METER

Turn on the meter : To select power on option. Turn the rotaryswitch from "zero" position to any switch position.

Turn off the meter: Turn the range rotaryswitch into "zero" position to turn off the meter.

AUTOMATIC POWER OFF

The display blanks and the meter enters the APO mode if you have not changed the rotary switch position or pressed a button for 10 minutes.

In APO mode the "AUTO" is displayed. While in APO mode, change the rotary switch to turn the meter on.

INRUSH current & APO Function Button :

In "INRUSH" current function, the meter takes a large number of samples precisely at the beginning of the starting current for a 100-milli second period and then digitally filters and processes the samples to calculate the actual starting current. The "INRUSH" function is enabled at the ACA and DCA range.

1. Press the "INRUSH" button before the inrush current measurement and display shows "----".
2. Press the trigger to open transformer jaws and clamp on to one conductor only, and turn on the motor.
3. Read the INRUSH current directly from display.
Press and hold down the "INRUSH" button for more than 2 seconds to disable/enable the APO mode, and the "AUTO" turn off.

MAX/MIN Function Button

Press the "MAX/MIN" button to enter the MAX, MIN recording mode. (Displays the Maximum reading, Minimum reading).

To pause max/min function without erasing stored values, press **H**. The "HOLD" is displayed. Press "MAX/MIN" button and hold down the "MAX/MIN" button for more than 2 seconds or turn the rotary switch to exit the MAX/MIN function.

ZERO Δ Function Button

Press "ZERO Δ " button to enter the relative mode and zero the display, and store the displayed as a reference value. In relative mode, the " Δ " is displayed.

Press and hold down the "ZERO Δ " button for more than 2 seconds to exit the relative mode.

Display HOLD & PEAK Function Button

In display HOLD mode, the meter holds the reading on the display.

In PEAK mode, the meter displays the PEAK value of measured value, PEAK function is enabled at ACV, DCV, ACA and DCA range.

Press **H** button to activate display HOLD. The "HOLD" is displayed.

Press **H** button again to activate PEAK function.

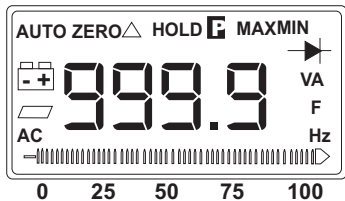
The "**F**" is displayed.

Press **H** button again to resume normal operation.

Hz Function Button

Select the function by rotary switch whose frequency is to be checked i.e. "A" or "V". Then press the 'Hz' button to measure the frequency of that function (A or V).

Display Symbols



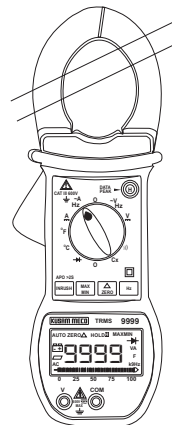
No.	Symbol	Meaning
1		Dangerous Voltages.
2		The battery is low ⚠ Warning : To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator appears.
3	AC	Indicator for AC voltage or current, The displayed value is the TRMS value.
4	—	Indicates negative reading.
5		Test of diode.
6	HOLD	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	f	f : Unit of Capacitance.
12	, k ,	: Ohm. The unit of resistance. K : kilo-ohm. 1×10^3 or 1000 ohms.
13		Peak reading in current range
14	MAX/MIN	Max/Min reading in the function/range measured

OPERATION

Before taking any measurements, read the safety Information section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements.

A) AC CURRENT MEASUREMENT

1. Set the range rotary switch to "A".
2. Press the trigger to open transformer jaws and clamp onto one conductor only. Read the current directly on the display. It is recommended that the conductor be placed at the center of the closed jaws for maximum accuracy.

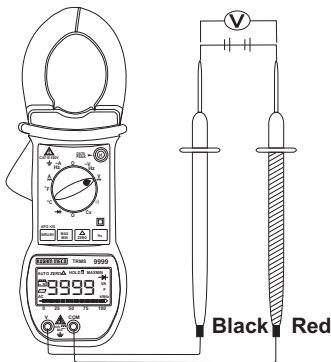


B) DC CURRENT MEASUREMENT

1. Set the range rotary switch to "**A**".
2. Press "ZERO Δ " button to off set the residual magnetic of jaws. The " Δ " is displayed.
3. Press the trigger to open transformer jaws and clamp on to one conductor only. Read the current directly on the display. It is recommended that the conductor be placed at the center of the closed jaws for maximum accuracy.

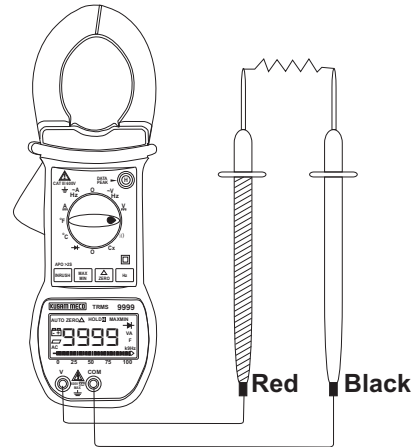


C) VOLTAGE MEASUREMENTS



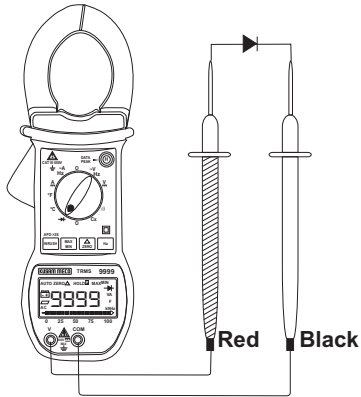
1. Connect the red test lead to the "V " jack and the black test lead to the "COM" jack.
2. Set the range rotary switch to the desired voltage range.
3. Connect the test leads to the device or circuit being measured.
4. For DC, a (-) sign is displayed for negative polarity, positive polarity is implied.

D) RESISTANCE MEASUREMENTS



1. Set the range rotary switch to position.
2. Remove power from the equipment under test.
3. Connect the red test lead to the "V " jack and the black test lead to the "COM" jack.
4. Touch the probes to the test points. The value indicated in the display is the measured value of resistance in ohms.

E) MEASURING DIODES & CONTINUITY



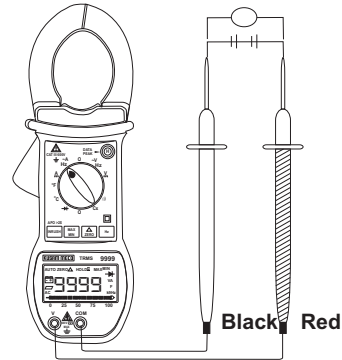
Diode Tests

1. Set the range rotary switch to $\rightarrow|$ position.
2. Remove power from the equipment under test.
3. Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
4. Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, "0.000" or another number is displayed.
5. If the diode is open, "OL" is displayed, in both directions.
6. If the junction is measured in a circuit and a low reading is obtained with both lead connections, the junction may be shunted by a resistance of less than 1k . In this case the diode must be disconnected from the circuit for accurate testing.

CONTINUITY MEASUREMENTS

1. Set the range rotary to $\rightarrow))$ position. The " $\rightarrow|$ " is displayed.
2. Turn off power to the circuit under test. External voltage across the components causes invalid readings.
3. Connect the test leads to the two points at which continuity is to be tested. The buzzer will sound if the resistance is less than approximately 30 .

F) FREQUENCY MEASUREMENT



1. Set the range rotary switch to the \sim AHz or \sim VHz position, and press "Hz" button, the Hz is displayed.
2. In ACV range, connect the red test lead to the "V" jack and the black test lead to the "COM" jack.
3. Connect the test leads to the point of measurement and read the frequency from the display.
4. In ACA range, refer to AC Current Measurement. Press 'Hz' button.
5. Read the frequency from the display.

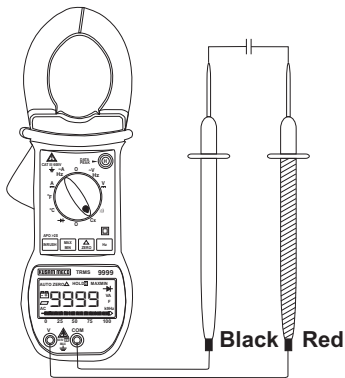
G) Temperature Measurements (K-type)

1. Set the range rotary switch to the °C or °F position.
2. Use the socket to connect the thermocouple and V, COM jack.
3. Read the temperature from the display.

NOTE : Supplied Thermocouple is suitable for measurement upto 250°C, for higher Temperature measurement use separate T. C. probe.

H) Capacitance Measurements

1. Set the range rotary switch to the "Cx" position. The " F" is displayed. Press (ZERO) to zero the display.
2. Discharge capacitors before trying to measure it.
3. Connect the "+" lead to the "V " jack and the "-" lead to the "COM" jack.
4. Read the capacitance directly from the display.




MAINTENANCE

Warning

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt battery. The "+" appears on the LCD display when replacement is needed. To replace the battery, remove the two screws from the back of the meter and lift off the battery case. Remove the battery from battery contacts.

Install new battery in the battery contacts. Close the battery case and fix the two screws on the back of the meter.

Cleaning

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

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MUMBAI
TEST CERTIFICATE
DIGITAL CLAMPMETER

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. 9999

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED



KUSAM-MECO

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 warranty 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.

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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 transaction are subject to Mumbai Jurisdiction.

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