

**KUSAM-MECO**

**KUSAM-MECO**

G-17, Bharat Industrial Estate,  
T. J. Road, Sewree (W), Mumbai-400 015. (INDIA)  
**Sales Direct** : 24156638  
**Tel.** : 91-22-2412 4540, 2418 1649.  
**Fax** : 91-22-24149659  
**Email** : kusam\_meco@vsnl.net  
**Website** : www.kusamelectrical.com,  
www.kusam-meco.co.in

**KUSAM-MECO**

## Digital Multimeter Plus LCR Meter Model - 306



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

Nearly every electrical engineer has a hand held Multimeter. We sometimes take them for granted, until we damage them or "burn them out" if you incorrectly connect your DMM to a circuit or have the DMM 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.

DMM 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 DMM becomes a lower impedance circuit element. If you accidentally connect this low impedance path across your circuit, you'll effectively short-circuit it. You can, therefore send high current through your meter and severely damage it. Unless the meter has a fused input, you can even get an explosion or fire.

Even if you correctly insert your DMM into the circuit, you can still damage your meter. Don't try to measure current in excess of your meter's capacity. Handheld DMMs usually have a maximum current rating of 10A or 20A.

If you are measuring current in industrial environment, you can easily exceed those ratings. The best way to avoid damage is to use a clamp meter or to connect a clamp attachment to your DMM.

To prevent excess current from flowing through your meter, always disconnect the test leads from the circuit under test whenever you change DMM functions, Set your meter to the correct function, say current and its highest range for the setting, say 10A. Next, connect the test leads before you apply power to the circuit. To be safe, start by setting your meter to its highest range first.

**TABLE OF CONTENTS**

<b>TITLE</b>	<b>PAGE</b>
Overview .....	1
Unpacking Inspection .....	2
Features .....	3
General Specifications .....	3
Electrical Specifications .....	4
DC Voltage	
AC Voltage	
DC current	
AC current	
Resistance	
Capacitance	
Inductance	
Frequency	
Transistor hFE Test	
Diode Test & Continuity	
Rules For Safe Operation .....	7
International Electrical Symbols .....	8
The Multimeter Structure .....	9
Functional Buttons .....	10
Display symbols .....	11
Measurement Operation .....	13
A. DC Voltage Measurement	
B. AC Voltage Measurement	
C. AC Current Measurement	
D. DC Current Measurement	
E. Measuring Resistance	
F. Measuring Capacitance	
G. Measuring Inductance	
H. Measuring Frequency	
I. Transistor hFE Test	
J. Diode Test & Continuity	
Maintenance .....	28
Replacing the Battery	
Fuse Replacement	
Cleanign	
Test Certificate .....	29
Warranty .....	31


## Overview


### **Warning**

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

Digital Multimeter Model - 306 (hereafter referred to as “the Meter”) is a 3½ digits Multimeter plus LCR Meter with steady operations, and highly reliable hand-held measuring instrument having different measurement positions. The Multimeter not only can measure AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency, Inductance, Transistor hFE Test, Diode Test, but also has 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 Multimeter. 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	9V battery (installed)	1 piece

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

## Features

- Professional Grade Rugged DMM+LCR Meter
- EN61010-1 Approval Protection Class II, Pollution Degree 2.
- Most rugged, Easy use hand held meter.
- MAX Hold facility
- Ohm, Diode, Continuity and Frequency Input protection.
- Auto range on frequency range and measurement


## GENERAL SPECIFICATIONS :

**Display :** 3½ digit LCD display (1999 Counts)

**Digit Size :** 18mm(H)

**Polarity :** Automatic, positive implied, negative polarity indication

**Zero :** Automatic.

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

**Measurement rate :** 2.5 times per second, nominal.

**Over range Indication :** 'OL' or '-OL' is displayed.

**Operating Temperature :** 0°C to 40°C  
Relative Humidity : < 70% non condensing

**Storage Temperature :** -20°C to 60°C  
Relative Humidity : < 80% non condensing

**Accuracy :** Stated accuracy at 23°C ±5°C, <75% relative humidity.

**Power :** Single, Standard 9V battery.

**Dimension :** 200mm(L) x 90mm(W) x 40mm(H)

**Weight :** Approx. 400g.

**Accessories :** Test Leads, Carrying Case, User Manual, Battery.

## ELECTRICAL SPECIFICATION :

### DC VOLTAGE

Range	Resolution	Accuracy
200 mV	100 μV	±(0.5% rdg + 1 dgt)
2 V	1 mV	
20 V	10 mV	
200 V	100 mV	
1000 V	1 V	

**Input Impedance :** 10MΩ

**Overload Protection :** 500V DC or AC rms on 200mV range, 1000V DC or 750V AC rms on all other ranges

### AC VOLTAGE (50Hz~500Hz)

Range	Resolution	Accuracy
200 mV	100 μV	±(1.0% rdg + 4 dgts)
2 V	1 mV	
20 V	10 mV	
200 V	100 mV	
750 V	1 V	±(2.0% rdg + 4 dgts)

**Input Impedance :** 10MΩ

**Overload Protection :** 500V DC or AC rms on 200mV range, 1000V DC or 750V AC rms on all other range

### DC CURRENT

Range	Resolution	Accuracy
20 mA	10 μA	±(1.0% rdg + 1 dgt)
200 mA	100 μA	
10 A	10 mA	±(3.0% rdg + 1 dgt)

**Input Protection :** 0.5A/250V fast blow fuse 10A/600V fast blow ceramic fuse

## AC CURRENT(50Hz~500Hz)

Range	Resolution	Accuracy
20 mA	10 $\mu$ A	$\pm(1.5\% \text{ rdg} + 4 \text{ dgts})$
200 mA	100 $\mu$ A	
10 A	10 mA	$\pm(3.5\% \text{ rdg} + 4 \text{ dgts})$

**Input Protection** : 0.5A/250V fast blow fuse  
10A/600V fast blow ceramic fuse

## CAPACITANCE

Range	Resolution	Accuracy
2 nF	0.01 pF	$\pm(5.0\% \text{ rdg} + 10 \text{ dgts})$
20 nF	10 pF	
200 nF	100 pF	
2 $\mu$ F	1 nF	$\pm(8.0\% \text{ rdg} + 10 \text{ dgts})$ above 100 $\mu$ f
200 $\mu$ F	100 nF	

**Test Frequency** : 2nF, 20nF ranges 1KHz  
200nF, 2 $\mu$ F ranges 270Hz, 200 $\mu$ F range 27Hz

## INDUCTANCE

Range	Resolution	Accuracy
2 mH	1 $\mu$ H	$\pm(5.0\% \text{ rdg} + 20 \text{ dgts})$
20 mH	10 $\mu$ H	
200 mH	100 $\mu$ H	$\pm(5.0\% \text{ rdg} + 10 \text{ dgts})$
2 H	1 mH	
20 H	10 mH	

**Test Frequency** : 2mH, 20mH ranges 1KHz  
200mH, 2H ranges 270Hz, 20H range 27Hz

**Test Conditions** : quality factor > 5 in 270Hz

## DIODE TEST

Test Current	Test Voltage	Accuracy
1.0mA $\pm$ 0.6mA	3.0V MAX.	$\pm(3.0\% \text{ rdg} + 3 \text{ dgts})$

**Overload Protection** : 500V DC or AC rms

## DUTY CYCLE

Range	Accuracy	Resolution
10.0% - 90.0%	$\pm(1.0\% \text{ rdg} + 10 \text{ dgts})$	0.1%

**Pulse Width** : >10Hz. <20KHz TTL signal  
**Overload Protection** : 500V DC or AC rms

## RESISTANCE

Range	Resolution	Accuracy
200 $\Omega$	0.1 $\Omega$	$\pm(0.8\% \text{ rdg} + 4 \text{ dgts})$
2 K $\Omega$	1 $\Omega$	
20 K $\Omega$	10 $\Omega$	$\pm(0.8\% \text{ rdg} + 2 \text{ dgts})$
200 K $\Omega$	100 $\Omega$	
2000 K $\Omega$	1 K $\Omega$	
20 M $\Omega$	10 K $\Omega$	$+(3.0\% \text{ rdg} + 4 \text{ dgts})$
2000 M $\Omega$	1 M $\Omega$	$\pm[(5.0\% \text{ rdg}-10 \text{ dgts})+ 10 \text{ dgts}]$

**Overload Protection** : 500V DC or AC rms

**Open Circuit Voltage** : 0.3V DC (3.0V DC on 200 $\Omega$  and 2000M $\Omega$  ranges)

## FREQUENCY (AUTO RANGING)

Range	Resolution	Accuracy
2 KHz	1 Hz	$\pm(0.1\% \text{ rdg} + 1 \text{ dgt})$
20 KHz	10 Hz	
200 KHz	100 Hz	
2000 KHz	1 KHz	
15 MHz	10 KHz	

**Sensitivity** : 1.0V rms min

**Overload Protection** : 500V DC or AC rms

**Effect Reading** : 20-1999

## TRANSISTOR hFE TEST

Range	Vce	Basic DC Current
0 to 1000	<3.0V DC	10 $\mu$ A approx.

## CONTINUITY TEST

**Audible Sound Buzzer** : Less than 40 $\Omega$   $\pm$  20 $\Omega$

**Overload Protection** : 500V DC or AC rms

## Rules For Safe Operation (1)



### Warning

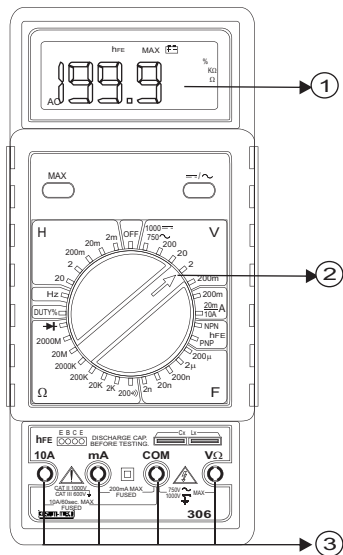
To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules :

- 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.
- 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.

## 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 Multimeter Structure** (see figure 1)



( Figure 1 )

**1) LCD DISPLAY :**

A 3½ digit display (maximum reading 1999) indicates measured values, and features symbols indicating function, Low Battery, Continuity, Diode.

**2) FUNCTION SELECTOR :**

To Select ACV, DCV, ACA, DCA, Resistance, Inductance, Capacitance, Frequency, Diode, Continuity & Transistor Test.

**3) INPUT JACKS (VΩ, mA, A and COM) :**

Test leads are inserted into these jacks for Voltage, Resistance, Capacitance, Inductance, Current measurements, Continuity & Diode Checks.

**4) A push button (ON/OFF) POWER switch will**

switch ON or switch OFF the multimeter.

**5) PROTECTIVE HOLSTER :**

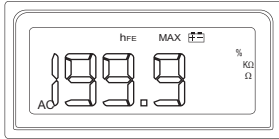
Prevents the instrument from damage

**Functional Buttons**

Below table indicates the functional button operations

BUTTONS	OPERATION PERFORMED
MAX. HOLD SWITCH	Press "MAX" to toggle in and out of the Maximum Hold mode. (holding the highest reading.) In the MAX mode, the MAX annunciator is displayed and maximum reading are stored in display register, If the new reading is higher than the reading being displayed, the higher reading is transferred to the display register. A "higher" reading is defined as the reading with the higher absolute value.  The MAX hold function is disable in the frequency count mode, but the MAX annunciator is still displayed.
⋯/~	This button allows user to select between AC & DC function of voltage and current.

**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 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	<b>mA, A</b>	A : Amperes (amps). The unit of current.
9	<b>mV, V</b>	V : Volts. The unit of voltage.
10	<b>Hz</b>	Hz : The unit of frequency.

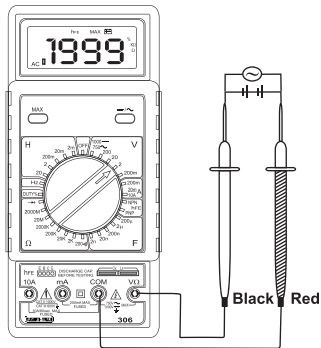
**Display Symbols** (see figure 2)

No.	Symbol	Meaning
11	Ω, kΩ, MΩ	Ω : Ohm. The unit of resistance. KΩ : kilohm. 1 x 10 <sup>3</sup> or 1000 ohms. * mΩ :mega Ohm 1x1 <sup>6</sup> ohms.
12	nF, μF	nF, μF : The unit of Capacitance
13	μH, mH, H	The unit of inductance



**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. DC Voltage Measurement** (see figure 3)

( figure 3)

**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 1000V rms although readings may be obtained.**

The DC Voltage measurement has 5 measurement positions on the rotary switch : 200mV, 2V, 20V, 200V and 1000V

**To measure DC Voltage, connect the Meter as follows :**

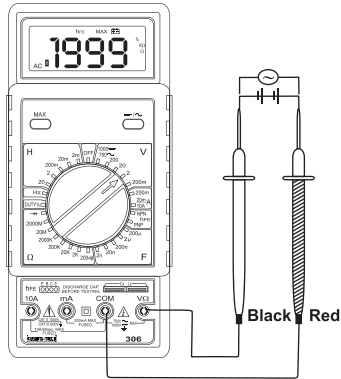
- 1) Insert the red test lead into the V $\Omega$  terminal and the black test lead into the COM terminal.
- 2) Set the rotary switch to an appropriate measurement position in V  $\text{---}$  range.
- 3) Connect the test leads across with the object being measured.

The measured value is shown on the display,

** Caution :**

- If the value of voltage to be measured is unknown, use the maximum measurement position (1000V) 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.
- In each range, the Meter has an input impedance of approx. 10M $\Omega$ . This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10k $\Omega$ , 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.

**B. AC 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 1000V rms although readings may be obtained.

The AC Voltage ranges are : 200mV, 2V, 20V, 200V, 750V. To measure AC voltage, connect the Meter as follows:

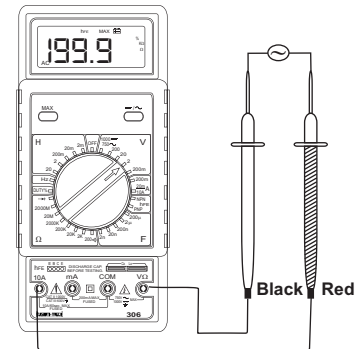
- 1) Insert the red test lead into the VΩ input terminal and the black test lead into the COM input terminal
- 2) Set the rotary switch to an appropriate measurement position in V~ range.
- 3) Connect the test leads across with the object being measured.

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

**Caution :**

- ✎ If the value of voltage to be measured is unknown, use the maximum measurement position (750) 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.
- ✎ In each range, the Meter has an input impedance of approx. 10MΩ. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10kΩ, the error is negligible (0.1% or less).
- ✎ When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

**C. AC Current Measurement** (see figure 5)



(Figure 5)

**⚠ Warning :**

Never attempt an in-circuit current measurement where the open circuit voltage between terminals and ground is greater than 60V DC or 30V rms. If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. Use proper terminals, function, and range for the measurement. When the testing leads are connected to the current terminals, do not parallel them across any circuit.

The AC current measurement has 3 measurement positions on the rotary switch : 20mA, 200mA, 10A.

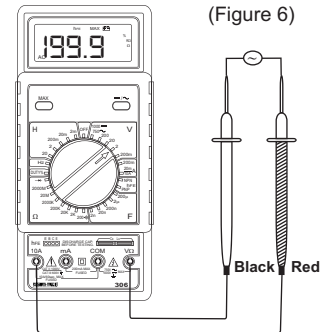
To measure AC Current, connect the meter as follows :

- 1) Turn off power to the circuit. Discharge all High - Voltage capacitors.
- 2) Insert the red test lead into the mA or 10A terminal and the black test lead into the COM terminal
- 3) Set the rotary switch to an appropriate measurement position in Current range.
- 4) Break the current path to be tested. Connect the red test lead to the positive side of the path and the black test lead to the negative side of the path.
- 5) Turn on power to the circuit.

The measured value is shown on the display.

**⚠ Caution**

- If the value of current to be measured is unknown, use the maximum measurement position (10A) and 10A terminal, and reduce the range step by step until a satisfactory reading is obtained.
- When AC Current measurement has been Completed, switch off power in the circuit, disconnect the connection between the testing leads and the circuit undetected

**D. DC Current Measurement (see figure 6)**

(Figure 6)

**⚠ Warning :**

Never attempt an in - circuit current measurement where the open circuit voltage between terminals and ground is greater than 60V DC or 30V rms. If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. Use proper terminals, function, and range for the measurement. When the testing leads are connected to the current terminals, do not parallel them across any circuit.

The DC current measurement has 3 measurement positions on the rotary switch : 20mA, 200mA, 10A.

**To measure DC Current, connect the meter as follows :**

- 1) Turn off power to the circuit. Discharge all High - Voltage capacitors.
- 2) Insert the red test lead into the mA or 10A terminal and the black test lead into the COM terminal

- 3) Set the rotary switch to an appropriate measurement position in Current range.
- 4) Break the current path to be tested. Connect the red test lead to the positive side of the path and the black test lead to the negative side of the path.
- 5) Turn on power to the circuit.  
The measured value is shown on the display.

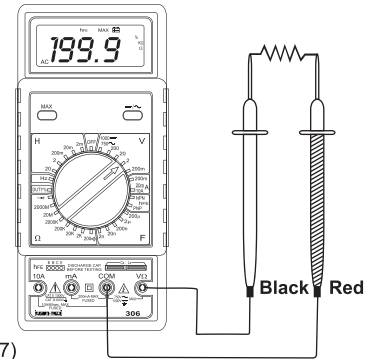
### Caution

- If the value of current to be measured is unknown, use the maximum measurement position (10A) and 10A terminal, 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 current measurement has been completed, switch off the power in the circuit disconnect the connection between the testing leads and the circuit under test.

## E. Resistance Measurement (see figure 7)

### 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.



(Figure 7)

The resistance range has 7 measurement positions on the rotary switch : 200Ω, 2KΩ, 20KΩ, 200KΩ, 2000KΩ, 20MΩ, 2000MΩ.

### To measure resistance, connect the meter as follows

- 1) Insert the red test lead into the VΩ terminal and the black test lead into the COM terminal.
- 2) Set the rotary switch to an appropriate measurement position in Ω 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 0.1Ω to 0.3Ω of error to the Resistance measurement. To obtain precision readings in low-resistance, that is the range of 200Ω, 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  
 Reading 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 :**

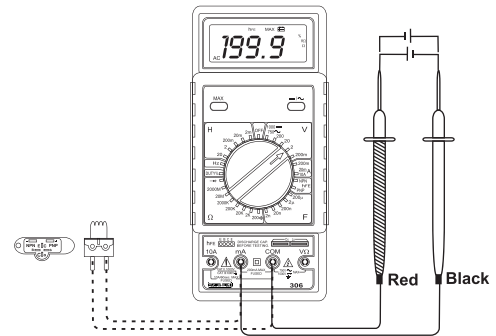
- Never connect high voltage to the input sockets with the switch in Resistance range.
- Using Resistance measurement function in a Live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from

**F. Capacitance Measurement** (see figure 8)



**Warning**

To avoid damages to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is discharged. Never attempt to input over 60V in DC or 30V rms in AC to avoid personal injury.



(Figure 8)

Capacitance measurement has 5 measurement positions on the rotary switch : 2nF, 20nF, 200nF, 2μF and 200μF.

To measure capacitance, connect the Meter as follows :


- 1) Set the function/range switch on the range position needed.
- 2) Insert the capacitor into the CX LX socket.
- 3) Never apply an external voltage to the CX LX sockets. Damage to the meter may result.

The measured value shows on the display.



**Caution :**

- Never connect high voltage to the input sockets with the switch in Capacitance range.
- Using Capacitance 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.

- 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.
- 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.

## G. INDUCTANCE MEASUREMENT

Set the Function/Range switch to the desired H (Inductance) range. Never apply an external voltage to the Cx Lx sockets. Damage to the meter may result.

Insert the inductor leads directly into the Cx Lx socket.

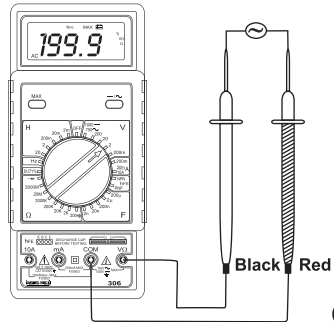
Read the inductor value directly from the display.

## H. Frequency Measurement (see figure 10)

### Warning :

**To avoid harm to you or damages to the Meter, do not attempt to measure voltages higher than 60V in DC or 30V rms in AC although reading may be obtained.**

When the frequency signal to be tested is higher than 30V rms, the Meter cannot guarantee accuracy of the measurement.



(Figure 10)

The frequency measurement range is 2kHz, 20kHz, 200kHz, 2000kHz, 15MHz

To measure frequency, connect the Meter as follows :

- 1) Insert the red test lead into the VΩ terminal and the black test lead into the COM Terminal.
- 2) Set the rotary switch in the kHz range.
- 3) Connect the test leads across with the object being measured.

The measured value is shown on the display.

**⚠ Caution**

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

**I. Measuring Diodes & Continuity**

**⚠ Warning**

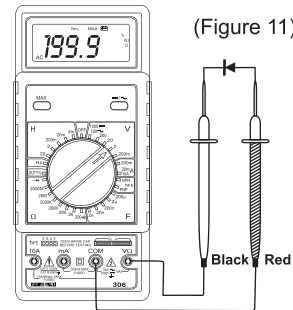
(See figure 11)

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.

**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 :**



(Figure 11)

- 1) Insert the red test lead into the VΩ terminal and the black test lead into the COM terminal.
- 2) Set the rotary switch to 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.

**⚠ 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.

The measured value is shown on the display.

- Connect the test leads to the proper terminals as said above, to avoid error display. The LCD will display "1" indicating open-circuit for wrong connection. The unit of diode is Volt (V), displaying the positive connection voltage-drop value.
- When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test.

### Testing for Continuity

To test for continuity, connect the Meter as below :

1. Insert the red test lead into V $\Omega$  terminal and the black test lead into the COM terminal.
2. Set the rotary switch to  $\rightarrow$ ))) position
3. Connect the test leads across with the object being measured.

The buzzer sounds if the resistance of a circuit under test is less than 40 $\Omega$ .

The LCD displays the resistance value of a circuit under test.

### **Caution :**

- The LCD displays "1" indicating the circuit being tested is open.
- When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test.

### J. Transistor Testing

To test the Transistors, connect the Meter as below :


1. Insert the transistor in the transistor (nfe) sockets provided in the meter.
2. The measured value is shown on 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 "transistor" 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.

### **Fuse Replacement**

If not current measurements are possible, check for a blown overload protection fuse. There are two fuses; F1 for the "mA" jack and F2 for the "10A" jack. For access to fuses, remove the two screws from the back of the meter and lift off the battery case. Replace F1 only with the original type 0.5A/250V, fast acting fuse. Replace F2 only with the original type 10A/600V, fast acting ceramic fuse.

### **Cleaning**

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



MUMBAI

**TEST CERTIFICATE****DIGITAL MULTIMETER**

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. 306

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 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.

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.

G 17, Bharat Industrial Estate, T. J. Road,  
Sewree (W), Mumbai - 400 015. INDIA.

**Sales Direct :** (022) 24156638

**Tel. :** (022) 24124540, 24181649.

**Fax :** (022) 24149659

**Email :** kusam\_meco@vsnl.net

**Website :** www.kusamelectrical.com

www.kusam-meco.co.in