LIST OF PRODUCTS

- ✶ Digital Multimeter
- ✶ Digital AC & AC/DC Clampmeter
- ✶ AC Clamp Adaptor
- ✶ AC/DC Current Adaptor
- ✶ Thermo Anemometer
- ✶ Thermo Hygrometer
- ✶ Distance Meter
- ✶ Digital Lux Meter
- ✶ Network Cable Tester
- ✶ Power Factor Regulator
- ✶ Earth Resistance Tester
- ✶ Digital Panel Meters
- ✶ DC Power Supplies
- ✶ High Voltage Detector
- ✶ Calibrators
- ✶ Gas Analysers
- ✶ Frequency Counter
- ✶ Function Generator
- ✶ Phasing Sticks
- ✶ Battery Tester
- ✶ Waterproof Pen Testers
- ✶ Solar Power Meter
- ✶ EMF Detector
- ✶ Wood, Paper & Grain Moisture Meter
- ✶ Transistorised Electronic Analog & Digital Insulation Resistance Testers(upto 10 KV)
- ✶ Digital Sound Level Meter & Sound Level Calibrator
- ✶ Digital contact & Non-contact Type Tachometer
- ✶ Digital Non-contact (infrared) Thermometer
- ✶ Maximum Demand Controller/Digital Power Meter
- ✶ Digital Hand Held Temperature Indicators

KUSAM-MECO®

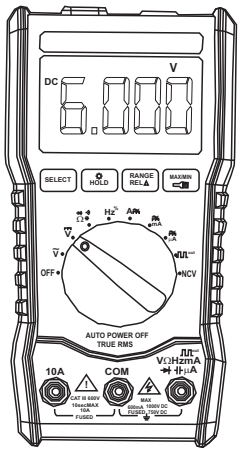
Email : sales@kusam-meco.co.in

Website : www.kusamelectrical.com

KUSAM-MECO®

AN ISO 9001:2015 COMPANY

TRUE RMS AUTORANGING DIGITAL MULTIMETER



MODEL - KM 60-T

OPERATION MANUAL

KUSAM-MECO®

TRMS DIGITAL MULTIMETER
MODEL - KM 60-T

KUSAM-MECO®

TABLE OF CONTENTS

I. **Overview :**The 6000 counts is a pocket-sized 3-5/6 bit automatic digital instrument. Is a stable performance, high precision, high reliability clear readings, and overload protection. With AAA 1.5V battery-driven. The instrument uses a large screen LCD display, boost power supply, even in the 2.3V low battery edge, it can guarantee the backlight high brightness, the table is easy to carry, is a vast number of users extremely like the instrument, the back-light can be bright can be automatically turned off after 15seconds. This series of instruments can be used to measure the DC Voltage and AC Voltage DC Current & AC Current, Resistance, Capacitance diode, Continuity Test, Square-wave output, Frequency measurement & True RMS measurement & other parameters. Is a ideal tool for the laboratory, factory, radio enthusiasts & families.

I. SAFETY :

This series of instruments is designed to comply with IEC1010 (International Electro-technical Commission promulgated safety standards), before use, please read the safety precautions.

1. When measuring the voltage, please input the limit voltage of DC 1000V or AC 750V rms.
2. The voltage below 36V is safe voltage. When measuring above 36V DC & 25V AC voltage, check whether test pen is reliable contact or right connected or good insulation properly, whether insulation is good & so on, in order to avoid electric shock.
3. When Change function & range, test pen should leave the test point;
4. Select the correct function & range, guard against accidental operation, the series of instruments although there is full-range protection, but for safety reasons, you still pay more attention.
5. When measuring current, do not input batteries more than 10A.
6. Safety symbol description, "⚠" Exist dangerous voltage, " ⏚ " Ground, " ⧈ " Double insulation, "⚠" Operator must refer to the instruction manual, "⊟" Low voltage symbol.

FEATURES :

- ✷ Backlight Display
- ✷ Pulse Output
- ✷ Non-Contact Voltage Measurement (NCV)
- ✷ Flash Light
- ✷ Data Hold
- ✷ MAX / MIN & Rel Zero

GENERAL SPECIFICATIONS

- ✷ **Sensing :** True RMS
- ✷ **Display :** 3-5/6 digits 6000 counts liquid crystal LCD display
- ✷ **Maximum Display :** 5999 counts
- ✷ **Sampling Time :** about 3 times / second
- ✷ **Operating Temperature :** 0°C to 40°C, Relative Humidity <80%
- ✷ **Measurement :** Double integral A/D conversion.
- ✷ **Overrange Display :** 'OL'
- ✷ **Automatic Polarity display.**
- ✷ **Auto Power Off :** about 15 minutes when no signal.
- ✷ **Low Battery Indication :** Below 2.3V
- ✷ **Power Supply :** 1.5V AAA x 2 battery.
- ✷ **Dimension :** Approx.142(L)mm x 70(W)mm x 32(H)mm
- ✷ **Weight :** Approx. 205gm (including battery).
- ✷ **Accessories :** User Manual, Test leads & Battery.

- **SAFETY :**

  Complies with the safety requirements IEC1010 CAT III 600V.

ELECTRICAL SPECIFICATIONS :

Accuracy (reading data of % + least significant digits) accuracy storage temperature (23.5)°C, Relative Humidity <75%.

Performance (Note "▲" Indicates that the instrument has this function

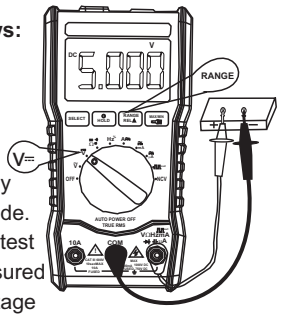
DC Voltage	▲
AC Voltage	▲
DC Current	▲
AC Current	▲
Resistance	▲
Diode\On-off	▲
Frequency	▲
Capacitance	▲
NCV	▲
Zero line /Fire Wire Test	▲
Full unit symbol	▲
Backlight manual / Auto off	▲
True RMS measurement.	▲

DC VOLTAGE

Range	Resolution	Accuracy
6 V	0.001 V	±(0.5%rdg + 3dgts)
60 V	0.01 V	
600 V	0.1 V	
1000 V	1 V	±(0.8%rdg + 10dgts)

Input Impedance : 10MΩ
Overload Protection : 6V range is 550V DC or AC peak;
The rest is 1000V DC or 750V AC Peak.
Maximum input voltage : 750V AC (RMS) or 1000V DC

The specific operation is as follows:



1. Insert the black test lead into the "COM" socket. The red test pen into the "V / Ω / Hz" jack.
2. Turn the range switch to the corresponding "⎓"range & display the DC Voltage measurement mode.
3. The test pen to reliably touch the test point, the screen shows the measured voltage value, display the DC voltage measured, the red pen is connected to the point of the polarity of the voltage.

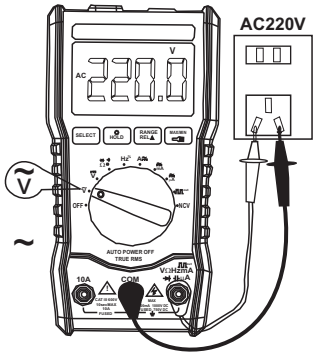
NOTE :

1. Do not input voltage exceed DC 1000V or AC 750V, if do, there will damage the instrument circuit.
2. When measuring high voltage circuit, pay special attention to avoid electric shock.
3. After completing all measuring operations, disconnect the test leads from the circuit under test.

AC VOLTAGE (ACV)

Range	Resolution	Accuracy
6 V	0.001 V	±(0.8%rdg + 3dgts)
60 V	0.01 V	
600 V	0.1 V	
750 V	1 V	±(1.2%rdg + 10dgts)

Input Impedance : 10MΩ
Standard sine wave & triangular wave frequency response is 40Hz ~ 1kHz.
Other waveforms are : 40Hz ~ 200Hz.



AC VOLTAGE (ACV)

The specific operation is as follows:

1. Insert the black test lead into the “COM” socket. The red test pen into the “V / Ω/ Hz” jack.
2. Turn the range switch to “ V ” to display the AC Voltage auto measurement mode.

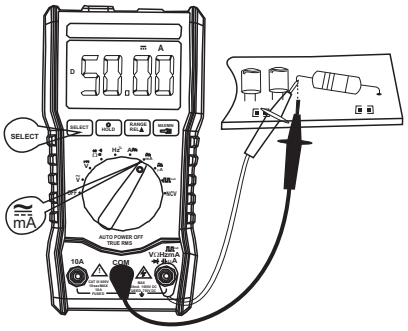
NOTE :

1. Before test there exits some residual numbers in the range, but does not affect the measurement accuracy.
2. Do not input voltage exceed 750Vrms, if do there will damage the instrument circuit.
3. When measuring high voltage circuit, pay special attention to avoid electric shock.
4. After completing all measuring operations, disconnect the test leads from the circuit under test.

DC CURRENT (DC mA)

Range	Resolution	Accuracy
60 mA	10 μA	±(1.2%rdg + 10dgts)
600 mA	100 μA	

The Maximum measured pressure drop : 600mV
Overload Protection : 60mA / 600mA : 600mA/250V Speed Glass Fuse.



The specific operation is as follows:

The right figure is DCmA schematic diagram.

1. Insert the black test lead into the “COM” socket. Insert the red test lead into the “mA / μA” jack.(max. 600mA), “SELECT” key to switch between AC & DC current.
2. Turn the range switch to the corresponding DCA position, then insert the instrument into the circuit pending to test. The current value of the measured current & the polarity of the red test point will also be displayed on the screen at the same time.

NOTE :

1.The instrument series connection to the circuit pending to test before the circuit should be the first power off.

2.If there is no concept of the measured current range in advance, the range switch should be transferred t o the highest range, & then according to the display value to the corresponding file; such as the screen display “0L” that has exceeded the range, needed to turn the range switch to the appropriate gear.

3.The maximum input current is 600mA (depending on the location of the red test pen inserted), excessive current will damage the mA file fuse.

4.When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.

5. After the completion of all the measurement operation, you should first turn off the power & then disconnect the test leads & the measured circuit connection, Especially to high current measurement.

6. It is for bidden to input more than 36V DC, 25V AC Voltage between the current jack & the “COM” jack.

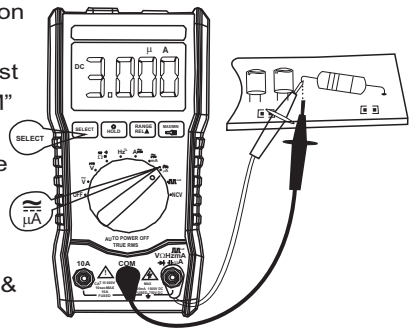
DC CURRENT (μA)

Range	Resolution	Accuracy
600 μA	0.1 μA	±(1.2%rdg + 10dgts)
6000 μA	1 μA	

The Maximum measured pressure drop : 600mV

Overload Protection : 600μA / 6000μA : 600mA/250V Speed Glass Fuse.

The specific operation is as follows:



1.Insert the black test lead into the “COM” socket. Insert the red test lead into the “mA / uA” jack. (max. 600mA), “SELECT” key to switch between AC & DC current.

2. Turn the range switch to the corresponding DC / AC uA position, then insert the instrument into the circuit pending to test. The current value of the measured current & the polarity of the red test point will also be displayed on the screen at the same time.

NOTE :

1. The instrument series connection to the circuit pending to test before the circuit should be the first power off.

2. If there is no concept of the measured current range in advance, the range switch should be transferred to the highest range, & then according to the display value to the corresponding file; such as the screen display “0L” that has exceeded the range, needed to turn the range switch to the appropriate gear.

3.The maximum input current is 6000uA (depending on the location of the red test pen inserted), excessive current will damage the mA file fuse.

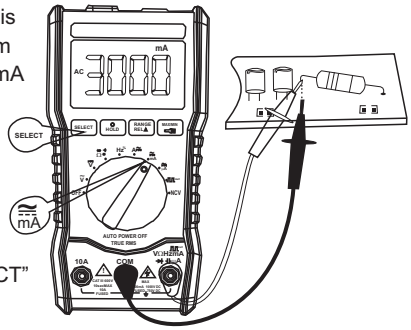
4. When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.
5. After the completion of all the measurement operation, you should first turn off the power & then disconnect the test leads & the measured circuit connection, Especially to high current measurement.
6. It is forbidden to input more than 36V DC, 25V AC Voltage between the current jack & the “COM” jack.

AC CURRENT(AC mA)

Range	Resolution	Accuracy
60 mA	10 μA	±(1.2%rdg + 10dgts)
600 mA	100 μA	

The Maximum measured pressure drop : 600mV
Overload Protection : 60mA / 600mA : 600mA/250V Speed Glass Fuse.

The specific operation is as follows: The diagram on the right is the DC mA schematic diagram.
1. Insert the black test lead into the “COM” socket. Insert the red test lead into the “mA / mA” jack. (max. 600mA), “SELECT” key to switch between AC & DC current.



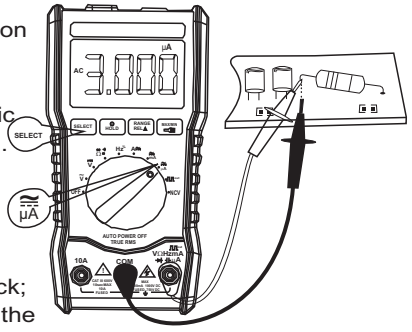
2.Turn the range switch to the corresponding DC/AC mA gear, trigger “ SELECT” to select AC m A and then put the meter into the circuit under test. The measured current value and the current polarity of the red test point will also be displayed at the same time. on the screen.

NOTE :
1.The instrument series connection to the circuit pending to test before the circuit should be the first power off.
2. If there is no concept of the measured current range in advance, the range switch should be transferred to the highest range, & then according to the display value to the corresponding file; such as the screen display“0L” that has exceeded the range, needed to turn the range switch to the appropriate gear.
3. The maximum input current is 600mA (depending on the location of the red test pen inserted), excessive current will damage the mA file fuse.
4.When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.
5.After the completion of all the measurement operation, you should first turn off the power & then disconnect the test leads & the measured circuit connection, Especially to high current measurement.
6. It is for bidden to input more than 36V DC, 25V AC Voltage between the current jack & the “COM” jack.

AC CURRENT (μA)

Range	Resolution	Accuracy
600 μA	0.1 μA	±(1.2%rdg + 10dgts)
6000 μA	1 μA	

The Maximum measured pressure drop : 600mV
Overload Protection :
600μA / 6000μA : 600mA/250V Speed Glass Fuse.



The specific operation is as follows: The figure on the right shows the schematic diagram of DC mA .
1. Insert the black meter pen into the "COM" jack and the red meter pen into the "V/Ω/Hz" jack; the default value of the current is DC, trigger the "SELECT" key to switch between AC & DC current.
2.Turn the range switch to the corresponding DC/AC m A gear, trigger " SELECT" to select AC m A and then put the meter into the circuit to be measured. The measured current value and the current polarity of the red test point will also be displayed at the same time. on the screen.
NOTE :
1.The instrument series connection to the circuit pending to test before the circuit should be the first power off.
2.If there is no concept of the measured current range in advance, the range switch should be transferred to the

highest range, & then according to the display value to the corresponding file; such as the screen display "0L" that has exceeded the range, needed to turn the range switch to the appropriate gear.
3. The maximum input current is 600mA (depending on the location of the red test pen inserted), excessive current will damage the mA file fuse.
4.When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.
5.After the completion of all the measurement operation, you should first turn off the power & then disconnect the test leads & the measured circuit connection, Especially to high current measurement.
6. It is forbidden to input more than 36V DC, 25V AC Voltage between the current jack & the "COM" jack.

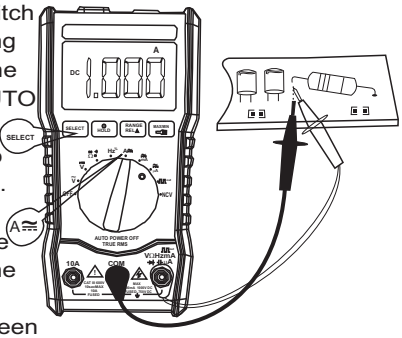
STRAIGHT 10A CURRENT (DC/ACA)

Range	Resolution	Accuracy
6 A	0.01 A	±(2.0%rdg + 30dgts)
10 A	0.01 A	

The Maximum measured pressure drop : 600mV
Overload Protection : 60mA / 600mA : 600mA/250V Speed Glass Fuse.

The specific operation is as follows: The figure on the right shows AC and DC 6A/10A
1.Insert the black meter pen into the "COM" jack and the red meter pen into the "V/Ω/Hz" jack; the default value is DC, triggering the "RANG" key to switch between automatic / manual 6A &10A currents:

2.Turn the range switch to the corresponding DC/ACA position. The default value is AUTO DC6A/10A. Then connect the meter to the circuit under test. The measured current value and the current polarity of the red test point will be displayed on the screen at the same time. trigger “SELECT” key to select AC current AC6A/10A:



NOTE :

1.The instrument series connection to the circuit pending to test before the circuit should be the first power off.

2. The maximum input current is 10A (depending on the insertion position of the red meter pens), not more than 10 seconds, excessive current will cause the circuit to heat, or even damage the instrument;

3. When the test leads are plugged into the current input terminals, do not connect the test leads to any circuit in parallel or it will damages the fuses and the instrument.

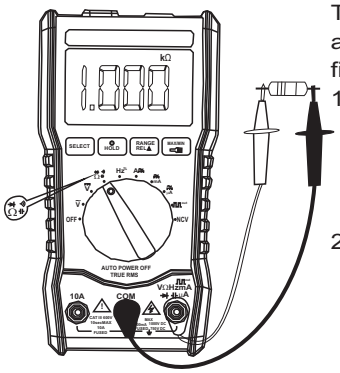
5. After the completion of all the measurement operation, you should first turn off the power & then disconnect the test leads & the measured circuit connection, Especially to high current measurement.

6. It is forbidden to input more than 36V DC, 25V AC Voltage between the current jack & the “COM” jack.

RESISTANCE (Ω)

Range	Resolution	Accuracy
600 Ω	0.1 Ω	±(0.8%rdg + 5dgts)
6 kΩ	1 Ω	±(0.8%rdg + 3dgts)
60 kΩ	10 Ω	
600 kΩ	100 Ω	
6 MΩ	1 kΩ	
40 MΩ	10 kΩ	±(2.5%rdg + 3dgts)

Open Circuit Voltage : Less than 3V
Overload Protection : 550V DC or AC Peak



The specific operation is as shown in the right figure;

1. Insert the black meter pen into the “COM” socket while the red meter pen into the “V/Ω/Hz” jack;
2. Rotate the dial to the “ Ω ”position, trigger the “SELECT” key and select the resistance grade for automatic measurement.

NOTE :

1.When measuring low resistance, the table will bring the internal resistance, in order to obtain accurate readings, you can firstly record the short-circuit value of the table pen, by testing value minus the short-circuit value.

2.When measuring the on-line resistance, pls make sure that all the circuits under test must be turned off and a ll capacitors fully discharged in order to ensure the measured value accurately.

3. Do not enter the voltage in the resistance range, which is absolutely prohibited, although the instrument in the gear on the gear on the voltage protection.

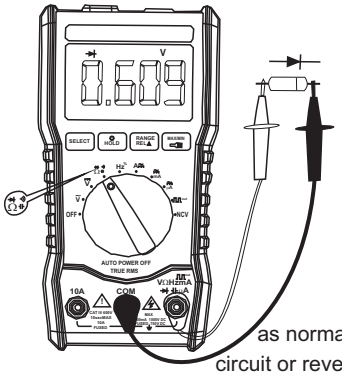
DIODE & CONTINUITY TEST

Range	Display Value	Test condition
Ω ⊣⊢	Diode forward voltage drop	Positive DC Current of about 1mA, open circuit voltage of about 3V.
	The buzzer buzzes for a long time, & the test resistance is less than (50 ± 20)Ω.	Open circuit voltage is about 3V press “SELECT” to switch between two functions.

Overload Protection : 550V DC or AC peak.

Warning: For safety, disable the input voltage value in this range!

1. Insert the black test lead into the “COM” socket while the red meter pen into the “V/Ω/Hz” jack; (note the polarity of the red test pen is “+”);



2. Set the range switch to “ Ω ⊣⊢ ” grade, trigger the “SELECT” key, select the diode measurement, and connect the test leads to the diode was not tested. The reading is an approximation of forward voltage drop of the diode. For silicon PN junction, 500niV~800niV confirmed as normal;if the measured diode open circuit or reverse polarity, then display“0L”;

3.Trigger “ SELECT” key to select the buzzer measurement and connect the test leads to two points of the circuit pending test. If the built-in buzzer sounds and the on-off alarm indicator is on, the resistance between the two points is below(50 20)Q.

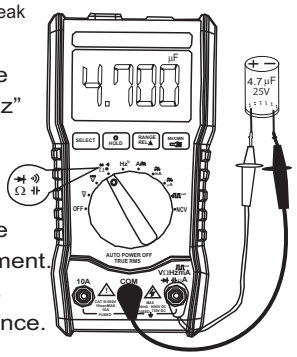
NOTE :

Do not input “ Ω ⊣⊢ ” voltage symbol, so as not to damage the instrument.

CAPACITANCE

Range	Resolution	Accuracy
60 nF	10 pF	±(3.5%rdg + 20dgts)
600 nF	100 pF	
6 μF	1 nF	
60 μF	10 nF	
600 μF	100 nF	
6 mF	11 μF	±(5.0%rdg + 3dgts)
30 mF	10 mF	

Overload Protection : 550V DC or AC peak



1.Insert the black meter pen into the “COM”socket while the red meter pen into the “V/Ω/Hz” jack;

2. Rotate the dial to the “ ” position, trigger the “SELECT” key and select the capacitance profile for automatic measurement.

3. Then connect the test leads across the measured capacitance.

NOTE :

1. When measuring the capacitance with 10nF range, there maybe residual reading on the screen display value. which is the distributed capacitance of the test pen. For an accurate reading, which can be subtracted after measurement.

2.When large capacitance stalls is measuring serious or breakdown capacitor, it will show some unstable values; it is normal that be measuring large capacitors, the reading takes a few seconds to stabilize.

3.Please test the capacitor, capacity before the capacitor should be fully disharged to prevent damage to the fuse and instrumentation.

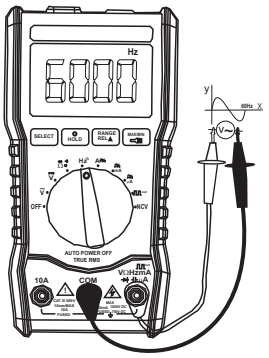
4.Unit: IF=1000mF 1mF=1000..F 1uF=1000nf 1nF=1000p

FREQUENCY

Range	Resolution	Accuracy
10 Hz	0.01 Hz	±(0.1%rdg + 3dgts)
100 Hz	0.1 Hz	
1 kHz	1 Hz	
10 kHz	10 Hz	
100 kHz	100 Hz	
1 MHz	1 kHz	
10 MHz	10 kHz	

Overload Protection : 550V DC or AC peak (less than 10 seconds)

Input Voltage Range : 1V rms

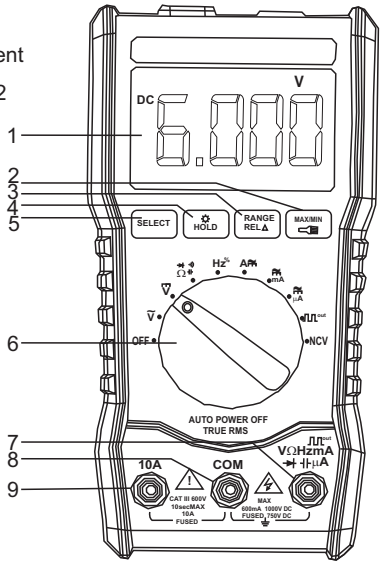


1. Insert the test leads or shielded cables into the “COM” and “V/Ω/Hz” jacks;
2. Turn the range switch to “Hz” and connect the test leads or cables to the signal source or load under test.

NOTE :

1. When the input exceeds 10Vrms, it can be read, but it may be out of tolerance.
2. In the noise environment, it is better to use shielded cables when measuring small signals.
3. When measuring high voltage circuits, special attention must be paid to avoid electric shocks;
4. Do not input more than 250V DC or AC peak voltage to avoid damage to the instrument.

INSTRUMENT LAYOUT :



1. LCD Display.

2. MAX / MIN measurement key, press & hold for 2 seconds to turn the flashlight on & off.

3. RANGE is a manual range conversion key, which is a REL relative measurement function when tested in the capacitance file;

4. HOLD is the data retention key. Press & hold for 3 seconds for the backlight to turn on. Press & hold for 2 seconds for the backlight to turn On & Off (the backlight will automatically turn off after 15 seconds) :

5. Function selection keys.

6. Gear function selection keys.

7. Voltage, resistance, Diode, Capacitance, Frequency, Square wave output, Current input port.

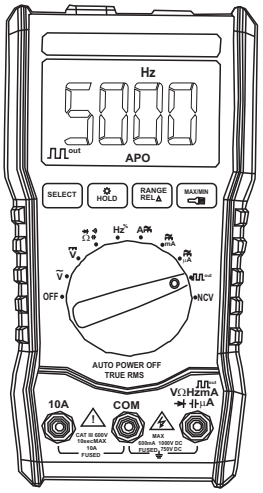
8. COM input, Negative input, insert black pen.

9.10A input port.

SQUARE-WAVE OUTPUT (⎍⎍OUT)

The operation is as followers: (above right figure)

1. Rotate the dial to "⎍⎍dUT" position; (default start output is 50Hz);
2. Insert the two input terminals of the device under test into the red meter pen and insert "V/Ω/Hz" and "COM" terminals respectively.
3. Trigger "SELECT" key, the output of "V/Ω/Hz" and "COM"of the table is 50Hz-100Hz-200Hz-300Hz-400Hz-500Hz-600Hz-700Hz 800Hz-900Hz-1000Hz- 2000Hz -3000Hz-4000Hz-5000Hz. At the same time, the LCD screen displays the current output value.

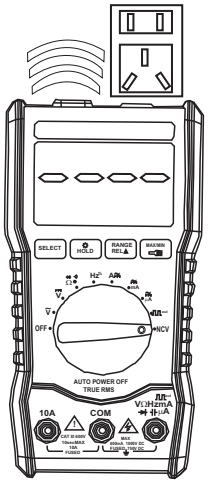


NCV MEASUREMENT

The operation is as follows: (lower right figure)

1. Rotate the dial to the “NCV” position (LCD displays “EF” in the absence of measurement);

2. The instruments has the NCV test point at its front end. As long as the point is close to the AC voltage, the buzzer will emit different continuous sounds according to the signal’s different intensity. At the same time, the LCD will display according to the strength of the signal. Different segments.



AUTOMATIC STARTUP & SHUTDOWN

When the instrument stops using for about 15 minutes, the meter will automatically power off to enter the sleep state; To restart the power, dial to the OFF position, turn the knob to the automatic shutdown function.

TROUBLESHOOTING

If your instrument does not work, the following method can help you solve the general problem, if the fault still can not be excluded, please contact the service center or dealer.

Failure Phenomenon	Check the location and methods
Not Shutdown	Battery not connected
	Replace the battery
Low battery symbol	Replace the battery
Current is not input	Replace fuse
Resistance display error	The test pen is not in contact

KUSAM-MECO®

MUMBAI

TEST CERTIFICATE

TRUE RMS AUTORANGING DIGITAL MULTIMETER

This Test Certificate warrantees 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 60-T**

SERIAL NO. _____

DATE: _____

ISO 9001:2015
REGISTERED

QC
KUSAM-MECO
PASS

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.

THIS WARRANTY IS BUYER’S SOLE AND EXCLUSIVE REMEDY & 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.