## LIST OF PRODUCTS

* Digital Multimeter
* AC Clamp Adaptor
* Thermo Anemometer
* Distance Meter
* Network Cable Tester
* Earth Resistance Tester
* DC Power Supplies
* Calibrators
* Frequency Counter
* Phasing Sticks
* Waterproof Pen Testers
* EMF Detector
* Digital AC & AC/DC Clampmeter
* AC/DC Current Adaptor
* Thermo Hygrometer
* Digital Lux Meter
* Power Factor Regulator
* Digital Panel Meters
* High Voltage Detectors
* Gas Detectors
* Function Generator
* Battery Tester
* Solar Power Meter
* Discharge Rods(400 KV)
* Wood, Paper & Grain Moisture Meter
* Transistorised Electronic Analog & Digital Insulation Resistance Testers(upto 15 KV)
* Digital Sound Level Meter & Sound Level Calibrator
* Digital contact & Non-contact Type Tachometer
* Digital Non-contact (infrared) Thermometer/ Thermal Imaging Camera
* Maximum Demand Controller/Digital Power Meter
* Digital Hand Held Temperature Indicators

KUSAM-MECO®


**OFFICE ADDRESS / SERVICE CENTER**

Shop no.18, 1st Floor, CIDCO Shopping Complex, Plot # 9, Sector-7,
Rajiv Gandhi Marg, Sanpada, Navi Mumbai - 400705.

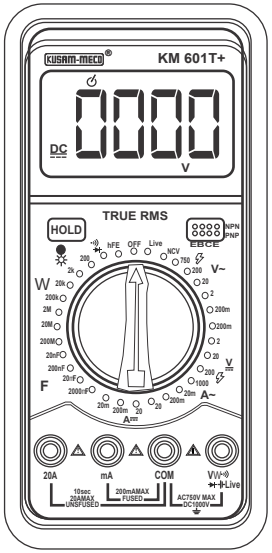
**Sales Direct :**+91-9867488006, 9867675093

**Email :** sales@kusam-meco.co.in **Website :** www.kusamelectrical.com


KUSAM-MECO®

**AN ISO 9001:2015 COMPANY**

# DIGITAL TRUE RMS MULTIMETER MODEL KM 601T+




# OPERATION MANUAL

TAKE MEASUREMENTS 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 I f 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 low 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 20A.

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.





## Safety Information

**⚠ WARNING**

Use this instrument with special attention, improper use may cause electric shock or damage to the instrument. In accordance with the usual safety procedures and full compliance with the safety regulations specified in the manual.

In order to make full use of the functions of the instrument & to ensure safe operation, please carefully read and follow the instructions of this manual.

The instrument performance is stable, the quality of reliability 3½ Digit 1999 Counts TRMS Digital Multimeter, using LCD display, clear reading, intuitive display, easy to operate, can be used to measure the DC Voltage, AC Voltage, DC Current, AC Current Resistance, Capacitance, Diode, Data hold, Auto power off.

The Multimeter uses a high-performance MCU processor; the instrument is fully functional, high accuracy, easy to use, in the laboratory, factories, radio enthusiasts and the ideal home tool.

**Follow the safe operating instructions to ensure safe use of the instrument.**

Appropriate use and protection, the instrument will give you a satisfactory service for long time.

**1. SAFETY RULES :**

- When using the instrument, the user must comply with the standard safety rules:
  - Universal anti-shock protection
  - Prevent misuse of instruments

- After receiving the instrument, check if it is damaged during transport.
- In the rough conditions of preservation, shipment, check and confirm whether the instrument is damaged.
- The Test Lead must be in good condition. Before use, check whether the insulation of the test leads is damaged and the wires of the Test Lead are exposed.
- Use the table provided to ensure safety, if necessary, must use the same or the same level of the Test Leads to replace.

**2 USE**

- When using, you must use the correct function and range.
- Do not exceed the protection range of each range to measure the value.
- Do not touch the top of the test leads (metal parts) when the meter is connected to the measuring circuit.
- In the measurement, if the measured voltage is higher than 60V DC or 30V AC (RMS)or 42V peak value, should pay attention to keep the fingers always on the test lead after the finger care device.
- Do not measure the voltage when the voltage between the measuring end and the earth exceeds AC 750V.
- Before turning the change switch to change the measuring function, remove the test leads from the circuit under test.





- Do not perform measurement of resistance, capacitance, diode and test circuit when live.
- In the current, resistance, capacitance, diode and line continuity test range, care should be taken to avoid connecting the meter to the voltage source.
- Do not measure the capacitance until the capacitor is fully discharged.
- Do not use this instrument near explosive gas, steam or dust.
- If you notice any abnormality or malfunction of the instrument, stop using it.
- Do not use the instrument unless the instrument case & battery cover are fully fastened in place.
- Do not store or use the instrument in direct sunlight, high temperature, high humidity.

**3. SYMBOLS :**

| | |
|---|---|
| ⚠ | Note (important safety information, see instruction manual) |
| ⚡ | Can be used on dangerous live conductors |
| ⧈ | Double Insulation Protection (Class II) |
| CAT III | In accordance with IEC-61010-1 standard over-voltage (installation) level III, pollution level 2 refers to the level of pulse withstands voltage protection provided. |
| CE | Meet the European Community (EU) standards |
| ⏚ | Grounded |

**GENERAL SPECIFICATIONS :**

| |
|---|
| Manual Ranging |
| Full ranges overload protection |
| **The maximum voltage allowed between the measuring end & the ground :** 1000V DC or AC 750V |
| **Display :** 3½ Digit 1999 counts LCD Display |
| **Fuse :** 20mA / 250V on mA & no fuse on 20A |
| **Over range display :** 'OL' or '-OL'. |
| **Sampling time :** about 3 times / sec |
| **Unit display :** with function, power unit display |
| **Automatic shutdown time :** no activity after about 15 minutes |
| **Static working current :** <2.0mA (no backlight) |
| **Operating Temperature :** 18°C ~ 28°C |
| **Storage Temperature :** -10°C ~ 50°C |
| Low battery display " " |
| **Power Supply :** 1.5V x 2 AAA batteries |
| **Dimension :** Approx. 192 x 90 x 35mm |
| **Weight :** Approx. 211 grams (including battery) |
| **Accessories :** Manual, Test lead pair, Battery & carrying case |





**ELECTRICAL SPECIFICATIONS:**

**Ambient Temperature 23 ± 5°C relative humidity <75%**

**DC VOLTAGE**

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 200 mV | 0.1mV | ±(0.8%rdg + 3dgts) |
| 2 V | 0.001V | ±(0.5%rdg + 3dgts) |
| 20 V | 0.01V | |
| 200 V | 0.1V | |
| 1000 V | 1V | ±(1.0%rdg + 3dgts) |

**Input impedance :** 10MW
**Maximum input Voltage :** 1000V DC
**NOTE :**
In the very Low voltage range, even if the test leads are not connected to the measured circuit; the meter may be showing some readings.
This is normal because of the high sensitivity of the meter, which does not affect the actual measurement results.

**AC VOLTAGE (TRMS) (5% to 100%)**

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 200 mV | 0.1mV | ±(1.2%rdg + 3dgts) |
| 2 V | 0.001V | ±(0.8%rdg + 3dgts) |
| 20 V | 0.01V | |
| 200 V | 0.1V | |
| 750 V | 1V | ±(1.2%rdg + 3dgts) |

**Input impedance :** 10MW
**Maximum input Voltage :** 750V AC (rms)
**Frequency range :** 40 ~ 1000Hz
In the very Low voltage range, even if the test leads are not connected to the measured circuit; the meter may be showing some the readings. This is normal because of the high sensitivity of the meter, which does not affect the actual measurement results.

### DC CURRENT

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 20 mA | 0.01mA | ±(0.8%rdg + 5dgts) |
| 200 mA | 0.1mA | ±(1.0%rdg + 5dgts) |
| 20 A | 0.01A | ±(2.5%rdg + 5dgts) |

**Minimum Input Current :** 2mA (FF200mA / 250V)
**Maximum input Current :** 20A (no fuse)
When the measured current is greater than 20A, the continuous measurement time is no longer than 10 seconds, after the measurement to stop the current measurement for more than 15 minute.

### AC CURRENT (TRMS) (5% to 100%)

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 20 mA | 0.01mA | ±(0.8%rdg + 10dgts) |
| 200 mA | 0.1mA | ±(1.0%rdg + 10dgts) |
| 20 A | 0.01A | ±(2.5%rdg + 10dgts) |

**Frequency Response :** 40Hz ~ 1000Hz True RMS
**Minimum Input Current :** 2mA (FF200mA / 250V)
**Maximum input Current :** 20A (no fuse)
When the measured current is greater than 20A, the continuous measurement time is no longer than 10 seconds, after the measurement to stop the current measurement for more than 15 minute.





### RESISTANCE

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 200 W | 0.1W | ±(1.0%rdg + 5dgts) |
| 2 kW | 0.001kW | ±(0.8%rdg + 5dgts) |
| 20 kW | 0.01kW | |
| 200 kW | 0.1kW | |
| 2 MW | 0.001MW | ±(1.2%rdg + 5dgts) |
| 20 MW | 0.01MW | ±(2.0%rdg + 5dgts) |
| 200 MW | 0.1MW | ±(5.0%rdg + 10dgts) |

**Open Circute Voltage :** Around 1.0V
**Overloading Protection :** 250V DC & AC (RMS)

### CAPACITANCE

| RANGE | RESOLUTION | ACCURACY |
|---|---|---|
| 20 nF | 0.01nF | ±(4.0%rdg + 10dgts) |
| 200 nF | 0.1nF | |
| 2 mF | 0.001mF | |
| 20 mF | 0.01mF | ±(5.0%rdg + 10dgts) |

Overloading Protection : 250V DC & AC (RMS)

### CONTINUITY TEST

| RANGE | RESOLUTION | FUNCTION |
|---|---|---|
|  | 0.1W | If the measured resistance is less than 50W, the buzzer inside the instrument may sound or may not sound. |

Overloading Protection : 250V DC & AC (RMS)

**DIODE TEST**

| RANGE | RESOLUTION | FUNCTION |
|---|---|---|
| ⊣▶ | 0.001V | Displays the approximate diode forward voltage. |

Forward DC Current of about 1mA
Reverse DC Voltage of about 2.65V
Overload protection : 250V DC or AC (rms)

**TRANSISTOR TEST**

| RANGE | DESCRIPTION | TEST CONDITIONS |
|---|---|---|
| **hFE** | The display reads the hFE approximation (0 ~ 1000) | Base Current approx. 10mA : Vee Approx 2.8V |





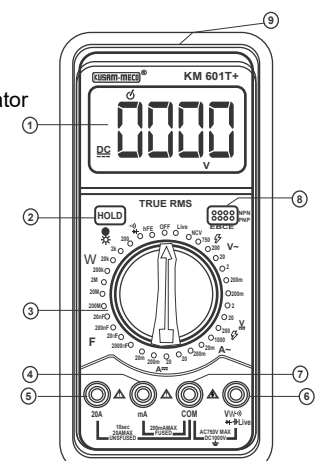
**4. DESCRIPTION**

Instrument for the portable, professional measuring instrument, with LCD digital display with a backlight for easy to read. The range switch is easy to measure with one hand operation, with overload protection and low battery indication. Whether professional, factory, school, enthusiast or personal use, it is ideal instrument.

- Instrument for AC current, DC current, AC voltage sine wave true RMS, DC voltage, resistance, capacitance measurement & line off measurement.
- The meter has a reading hold function.
- The instrument has an automatic shutdown function.

**5. PRODUCT DESCRIPTION**

1. LCD Monitor
2. NCV Firing line & Buzzer indicator
3. Switch
4. mA current input jack
5. 20A High current input jack
6. Resistor, Capacitor, Voltage, Frequency, diode & ON/OFF input jacks
7. COM jack
8. Transistor test socket
9. NCV



**OPERATION :**

**AUTOMATIC POWER OFF**

1. If there is no operation for 15 minutes after power on, the instrument will go to sleep automatically to save power. 1minute before the shutdown, the buzzer has 5 prompts, shut down before a long sound into the off state.
2. When auto power off, press power button, meter will be ready to use.

**INSTRUCTIONS FOR MEASUREMENT**

1. Turn On The Power. If The Battery Voltage Is Low (about <1.5V), The Display displays " " symbol, then you should replace the battery.
2. "⚠" sign indicates that the input voltage or current should not exceed the indicated value, which is no protect the internal wiring from damage.
3. Place the range selection, switch in the desired measurement function & range.
4. When wiring, connect the common test leads & connect the live test leads. Remove the live test leads when removing the wiring.

**AC & DC VOLTAGE MEASUREMENT**

> ⚠ **WARNING**
>
> **AC** rms to prevent electrical shock or damage to the instrument.
>
> Do not apply more than 1000V DC or 750V AC rms voltage between the common & the earth to prevent electrical shock or damage to the instrument.





1. Place the range selector switch to DC voltage or to AC Voltage
2. Connect the Red Test lead to V/W & Black Test lead to COM jack.
3. Connect the other ends of the test lead to the voltage source or load.
4. Read the measured voltage value from the LCD monitor. When measuring the DC voltage, the display will be the same time.

**NOTE :**

1. In the small voltage range, such as DC 6V or AC 6V range, even if the test lead is not connected to the measured electrical circuit the LCD will have a random reading, which is normal, this is because the instrument has high sensitivity, when the instrument connected to the circuit under test, you will get a real measurement.
2. " ⚠" indicates that the maximum input voltage is 750V AC or 1000V DC.
3. If the meter detects a reading greater than 1000V DC or 750Vrms AC, a "beep" alarm sounds.

**AC & DC CURRENT MEASUREMENT**

> ⚠ **WARNING**
>
> Risk of electric shock
>
> Do not attempt to perform current measurement on the circuit when the voltage between the open circuit & ground exceeds 250V. if the fuse is blown during measurement, it may damage the instrument or damage yourself.

In order to avoid damage to the instrument or equipment under test, before the current measurement, please check the instrument fuse. When measuring, use the correct input socket, function & range. Do not connect the other end of the test leads in parallel to any circuit when the test leads are inserted in the current input receptacle.

1. Turn the rotary switch to the appropriate range. Select AC or DC Current function as needed.
2. Connect the black test lead to the COM input socket. If the measured current is less than 200mA, connect the red test lead to the mA mA input socket. If the measured current is bigger than 200mA, connect the red test lead to the 20A input socket.
3. Disconnect the circuit to be tested. Connect the black test lead to one end of the disconnected circuit (the lower voltage) & connect the red tet lead to the other end of the circuit that is broken (its voltage is high).
4. Connect the power to the circuit & read out the displayed readings. If the display only displays **"OL",** this means that the input exceeds the selected range & the rotary switch should be placed in a higher range.

**RESISTANCE MEASUREMENT**

⚠ **WARNING**

Risk of electric shock.

To avoid damage to the instrument or equipment under test, all power supplies of the circuit under test & all high voltage capacitors should be fully discharged before measuring the resistance.





1. Turn the rotary switch to the resistance range.
2. Insert the black test lead into the COM jack & the red test lead into V/Wjack.
3. Measure the resistance of the circuit under test with the other ends of the test lead.
4. Read the measured resistance value from the LCD monitor.

Note:

1. The measured resistance value on the circuit is usually different from the resistance rating.
2. In the measurement of low resistance, in order to measure the accuracy of the two short-circuit test leads, read the leads short-circuit, resistance, measured in the measured resistance to be subtracted after the resistance value.
3. In the 1MWrange, the instrument may take several seconds to stabilize the reading, which is normal for high resistance measurements.
4. When the meter is open, the display will show **"OL",** indicating the measured value over range.

**DIODE TEST**

⚠ **WARNING**

Risk of electric shock.

To order to avoid damage to the instrument or equipment under test, before measuring the diode, all the power supply of the circuit under test should be cut off & all high voltage capacitors should be fully discharged.

**Test a diode outside the circuit.**

1. Turn the rotary switch to ⯈| test state.
2. Insert the black test lead into the COM jack & the red test lead V/Wjack.
3. Connect the diode anode at the other end of the red test lead, & connect the diode to the other end to test the diode cathode.
4. The meter will show the approximate value of the forward voltage drop of the diode under test. If the polarity of the test lead is reversed, the meter will display **"OL".**

In the circuit, the normal diode should produce a forward voltage drop of 0.5V to 0.8V; however, the reverse bias reading will depend on the resistance change of the other channels between the two test leads.

**CONTINUITY TEST**

⚠ **WARNING**
Risk of electric shock.
To avoid damage to the instrument or equipment under test, disconnect all power from the circuit under test & discharge all high voltage capacitors fully before the beep off test.

1. Turn the rotary switch to the •)) test mode. (Default buzzer mode)
2. Insert the black test lead into the COM jack, the red test lead into V/Wjack.
3. Measure the resistance of the circuit under test with the other ends of the test leads, when the resistance is less than 50W. The buzzer inside the meter will probably sound & the light will be on at the same time, when the test resistance is 40W~ 60W. The buzzer inside the meter will probable sound, when the test resistance is less than 10W, the buzzer inside the meter will probably sound & the light will be on at same time.

**NOTE :**
When the meter is open, the display will show **"OL",** indicating the measured value over 200W.





**TRANSISTOR MEASUREMENT**

⚠ **WARNING**
Risk of electric shock.
In order to avoid damage to the instrument or equipment under test, before measuring the diode, all the power supply of the circuit under test should be cut off & all high voltage capacitors should be fully discharged.

1. Turn the rotary switch hFE position.
2. Connect the diode anode at the other end of the red test lead, & connect the diode to the other end to test the diode cathode.
3. Checking that the transistor is identified as NPN or PNP type, & then the three legs e, B, C of the transistor are inserted into the corresponding hole of hFE test seat.
4. Reading the value of hFE.

**CAPACITANCE MEASUREMENT**

⚠ Risk of electric shock.
To avoid damage to the instrument or equipment under test, all power supplies of the circuit under test & all high voltage capacitors should be fully discharged before measuring the capacitance. Use the DC voltage function to determine that the capacitors have been discharged.

1. Turn the rotary switch to the ⊣⊢ position.
2. Insert the black test lead into the COM jack & the red test lead into V/Wjack.
3. After the capacitor is completely discharged, the other end of the black test lead is connected to the measured capacitance. And the measured capacitance value will be displayed.

**NOTE :**

1. To improve the accuracy of the measured value below 10nF, the distributed capacitance of the meter & conductor should be subtracted.

2. When measuring large capacitance, it takes some time to stabilize the reading.
3. Measure the polarity of the capacitor, pay attention to the corresponding polarity, to avoid damage to the instrument.

**FIRE WIRE LIVE**

1. Rotate the switch to Live position, LCD display **"Liv".**
2. Red test lead input V/Wjacket, other link the tester.
3. LCD display **"LHv"** & have the buzzer sound. Then the red test lead link the fire wire line. If have no change, then it is null line.

NOTE :

1. This function only for AC Voltage (AC 110V ~ 380V)
2. Please strictly observe the safety rules & standards for this range test.

**REPLACEMENT BATTERY**

⚠ In order to avoid the wrong reading caused by electric shock or personal injury, instrument display appears " 🔋 " symbol, you should replace the battery immediately.

To avoid electrical shock or personal injury, turn off the battery cover before replacing the battery & check that the test leads have been disconnected from the measuring circuit.

Follow the steps below to replace the battery.

1. Turn off the instrument power supply.
2. Remove all test leads from the input socket.
3. Unscrew the captive screws of the battery cover & remove it.
4. Remove the battery cover.
5. Replace the new battery.
6. Install the battery cover as it is, tighten the screws.

NOTE :

The polarity of the battery should not be changed.





**REPLACE TEST LEAD**

⚠ **WARNING**

When changing the test leads, you must replace the same or the same grade of the test leads. Test leads must be intact, level:1000V 10A.

If the Test lead insulation is damaged, such as wire exposed, you must replace the test lead.

- The contents of this manual are subject to change without notice.
- The contents of this manual are considered correct, if the user found errors, omissions, etc., please contact the manufacturer.
- The company does not assume any accidents & hazards caused by incorrect operation of the user.
- The functions described in this manual do not serve as a reason for the use of the product for special purpose.

KUSAM-MECO®

**MUMBAI**

# TEST CERTIFICATE

## TRMS DIGITAL MULTIMETER

This Test Certificate warranties 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 601T+**

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, 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.