KUSAM-MECO®

An ISO 9001:2008 Company

# 400A AC DIGITAL CLAMPMETER
# MODEL-KM 1002

**KM 1002 Digital Clampmeter has been designed & tested according to IEC publication 61010:Safety requirements for electronic measuring Apparatus. User Manual contains warnings & safety rules which must be observed by the user to ensure safe operation of the instrument & retain it in safe condition. Therefore read through these operating instructions before using the instrument.**

NEW


Preliminary Data

## FEATURES :

- ✳ Safety design conforming to the IEC61010.
- ✳ Data hold switch for easy reading in dimly light or hard-to-read locations.
- ✳ Beeper permits easy continuity check.
- ✳ Provides a dynamic range of 4,000 counts full scale.
- ✳ Uses shrouded transformer jaws to further improve safety.
- ✳ Non-contact Voltage sensing.
- ✳ Data Hold & MAX Function.
- ✳ Auto Power Off.
- ✳ Diode & Continuity Test.

## GENERAL SPECIFICATIONS :

- **Display :** 3½ Digit 1999 counts Liquid crystal display.
- **Low Battery Warning shown on the display.**
- **Over range indication :** "OL" is shown on the display.
- Response time : Approx. 3 seconds.
- Sample Rate : **about 3 time per second**
- **Temperature & Humidity for guaranteed Accuracy :** 23 ± 5°C, relative humidity upto 85% without condensation.
- **Current consumption :** approx. 1mA max.
- **Standards :** IEC61010-1
- **Withstand Voltage :** 3700V AC (RMS 40~50Hz) for 1 minute between electrical circuit & housing case.
- **Insulation Resistance :** 10M or greater at 600V between electrical circuit & housing case.
- **Operating Temperature & Humidity :** 0°C ~ 40°C; 85% R.H. without condensation.
- **Storage Temperature & Humidity :** -20°C ~ 60°C; 85% R.H. without condensation.
- **Power Supply :** 2 AAA or DC 1.5V battery.
- **Dimension :** 186(L) x 65(W) x 28.5(D)mm
- **Weight :** approx. 166g. (including battery)
- **Accessories :** Test lead, User Manual, Battery & Carrying case.

## ELECTRICAL SPECIFICATIONS :KM 1002

### AC CURRENT (40 ~ 400Hz)

| Range | Resolution | Accuracy |
|---|---|---|
| 2 A | 1 mA | ±(2.5% rdg + 5 dgts) |
| 20 A | 10 mA | |
| 400 A | 100 mA | |

### AC VOLTAGE (40 ~ 400Hz)

| Range | Resolution | Accuracy |
|---|---|---|
| 2 V | 1 mV | ±(1.2% rdg + 3 dgts) |
| 20 V | 10 mV | |
| 200 V | 100 mV | |
| 600 V | 1 V | |

### DIODE & CONTINUITY TEST

| Range | Displaying Value |
|---|---|
| ⊣◁ | Forward voltage drop of diode |
| •)) | If the resistance is less than 50Ω, buzzer sounds |

### RESISTANCE

| Range | Resolution | Accuracy |
|---|---|---|
| 200 Ω | 0.1 Ω | ±(1.2% rdg + 3 dgts) |
| 2 kΩ | 1 Ω | |
| 20 kΩ | 10 Ω | |
| 200 kΩ | 100 Ω | |
| 2 MΩ | 1 kΩ | |
| 20 MΩ | 10 kΩ | |

### DC VOLTAGE

| Range | Resolution | Accuracy |
|---|---|---|
| 200 mV | 0.1 mV | ±(0.8% rdg + 3 dgts) |
| 2 V | 1 mV | |
| 20 V | 10 mV | |
| 200 V | 100 mV | |
| 600 V | 1 V | |

| Range | Test Condition |
|---|---|
| ⊣◁ | Forward DCA is approx. 1mA, backward voltage is approx. 3V |
| •)) | Open voltage is approx. 3V |

**All Specifications are subject to change without prior notice.**


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KUSAM-MECO®

# AC DIGITAL CLAMP METER

# KM 1002

## INSTRUCTION MANUAL

### 1. Features

- Safety design conforming to the following provisions of IEC61010.
  Overvoltage category IIII 300V, pollution degree 2
  Overvoltage category II 600V, pollution degree 2.
- Data hold switch for easy reading in dimly light of hard-to-read locations.
- Beeper permits easy continuity check.
- Provides a dynamic range of 4,000 counts full scale.
- Uses shrouded transformer jaws to further improve safety.

### 2. Safety Warnings

• This instrument has been designed and tested according to IEC Publication 61010: Safety Requirements for Electronic Measuring Apparatus. this instruction manual contains warnings and safety rules which must be observed by the user to ensure safe operation of the instrument and retain it in safe condition. Therefore read through these operating instructions before using the instrument.

**⚠ WARNING**

- **Read through and understand instructions contained in this manual before using the instrument.**
- **Save and keep the manual handy to enable quick reference whenever necessary**
- **Be sure to use the instrument only in its intended applications and to follow measurement procedures described in the manual.**
- **Be sure to understand and follow all safety instructions contained in the manual, failure to follow the above instructions may cause injury instrument damage and/or damage to equipment under test.**

The symbol ⚠ indicated on the instrument means that the user must refer to related parts in the manual for safe operation of the instrument, be sure to carefully read the instruction following each ⚠ symbol in this manual.

- **⚠ DANGER is reserved for conditions and actions that are likely to cause serious or fatal injury.**
- **⚠ WARNING is reserved for conditions and actions that can cause serious or fatal injury.**
- **⚠ CAUTION is reserved for conditions and action that can cause minor injury or instrument damage.**

**⚠ DANGER**

- **Never make measurement on a circuit with a voltage higher than 600V AC/DC.**
- **Do not attempt to make measurement in the presence of flammable gaffes, fumes, vapor or dust. Otherwise, the use of the instrument may cause sparking, which can lead to an explosion.**
- **Transformer jaws are made of metal and their tips are not insulated. Where equipment under test has exposed conductive parts, be especially careful to avoid the hazard of possible shorting.**
- **Never attempt to use the instrument if its surface or your hand is wet.**
- **Do not exceed the maximum allowable input of any measurement range.**
- **Never open the battery compartment cover when making measurement.**

**⚠ WARNING**

- **Never attempt to make any measurement if any abnormal conditions are noted, such as broken case, cracked test leads and exposed metal part.**
- **Do not turn the function selector switch with plugged in test leads connected to the circuit under test.**
- **Do not install substitute parts or make any modification to the instrument. Return the instrument to your distributor for repair or recalibration.**
- **Do not try to replace the Batteries if the surface of the instrument is wet.**
- **Always switch off the instrument before opening the battery compartment cover for battery replacement.**

**⚠ CAUTION**

- **Make sure that the function selector switch is set to appropriate position before making measurement.**
- **Always make sure to insert each plug of the test leads fully into the appropriate terminal on the instrument.**
- **Make sure to remove the test leads from the instrument before making current measurement.**
- **Do not expose the instrument to the direct sun, extreme temperatures or few fall.**
- **Be sure to set the function selector switch to the "OFF" position after use. When the instrument will not be in use for a long period of time, place it storage after removing the battery.**
- **Use a damp cloth and detergent for cleaning the instrument. Do not use abrasives or solvent.**

### 3. Specification

Measuring Ranges and Accuracy
(at 23±5°C, 45~75% relative humidity)

**DC Voltage**

| Range | Resolution | Accuracy |
|---|---|---|
| 200mV | 0.1mV | ±(0.8%rdg+3dgt) |
| 2V | 1mV | |
| 20V | 10mV | |
| 200V | 100mV | |
| 600V | 1V | |

**AC Voltage (40~400Hz)**

| Range | Resolution | Accuracy |
|---|---|---|
| 2V | 1mV | ±(1.2%rdg+3dgt) |
| 20V | 10mV | |
| 200V | 100mV | |
| 600V | 1V | |

**AC Current (40~400Hz)**

| Range | Resolution | Accuracy |
|---|---|---|
| 2A | 1mA | ±(2.5%rdg+5dgt) |
| 20A | 10mA | |
| 400A | 100mA | |

**Resistance**

| Range | Resolution | Accuracy |
|---|---|---|
| 200Ω | 1.0Ω | ±(1.2%rdg+3dgt) |
| 2kΩ | 1Ω | |
| 20kΩ | 10Ω | |
| 200kΩ | 100Ω | |
| 2MΩ | 1kΩ | |
| 20MΩ | 10kΩ | |

**Diode And Continuity Test**

| Range | Displaying value | Test Condition |
|---|---|---|
| ▶\| | Forward voltage drop of diode | Forward DCA is approx 1mA, backward voltage is approx. 3V |
| ))) | If the resistance is less than 50Ω, buzzer sounds. | Open voltage is approx 3V |

- Display: Liquid crystal display (maximum count: 1999)
- Low Battery Warning: "⊟" is shown on the display
- Overrange Indication: "OL" is shown on the display
- Response Time: Approx. 3 seconds
- Sample Rate: About 3 time per second
- Temperature and Humidity for guaranteed Accuracy: 23±5°C, relative humidity up to 85% without condensation.
- Operating Temperature and humidity: 0~40°C, relative humidity up to 85% without condensation.
- Storage Temperature and humidity: -20~60°C, relative and humidity up to 85% without condensation.
- Power Source: Two AAA or equivalent (DC 1.5V) batteries.
- Current Consumption: Approx. 1mA max.
- Standards: IEC61010-1
  CAT III 300V, pollution degree 2
  CAT II 600V, pollution degree 2
- Withstand Voltage: 3700V AC (RMS 40-60Hz) for 1 minute between electrical circuit and housing case.
- Insulation Resistance: 10M or greater at 600V between electrical circuit and housing case.
- Dimensions: 186(L) x 65(W) x 28.5(D) mm.
- Weight: Approx. 166g (including batteries)
- Accessories: Test leads
  Two AAA batteries
  Instruction manual

### 4. Preparation for Measurement

#### 4-1. Checking battery Voltage

Set the function selector switch to any position other than "OFF". When the display is clear without "⊟" showing proceed to measurement. When the display blank or "⊟" is indicated, replaces the batteries according to the instructions described in section 8. Battery Replacement.

**NOTE**

**The sleep feature automatically turns the instrument off in a certain period of time after the last switch operation. Therefore, the display may be blank with the function selector switch set to a position other than "OFF". To operate the instrument in this case. Set the Switch back to the "OFF" position, then to the desired position, or press any switch. If the display still blanks, the batteries are exhausted. Replace the batteries.**

#### 4-2 Checking Switch Setting and Operation

Make sure that the function selector switch is set to the correct position and the data hold switch is deactivated. Otherwise, desired measurement cannot be made.

### 5. Measurement

#### 5-1. Current Measurement

**⚠ WARNING**

- **Do not make measurement on a circuit with a voltage higher than 600V AC. Otherwise, shock hazard or damage to the Instrument or equipment under test may result.**
- **Transformer jaw tips are designed to minimize the possibility of shorting conductors in the circuit under test If equipment under test has exposed conductive part, however, extra precaution should be taken to avoid possible shorting.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function switch at "2/20A~" or "400A~" range and press the trigger to open the transformer jaws and clamp them around a conductor.
(2) Jaws should be completely closed before taking a reading.
(3) The most accurate reading will be obtained by keeping the conductor across center of the transformer jaws.
(4) The reading will be indicated on the display.

- **During current measurement, keep the transformer jaws fully closed. Otherwise accurate measurement cannot be made. The maximum conductor size 30mm in diameter.**
- **When measuring a larger current, the transformer jaws may buzz. This does not affect the instrument's accuracy.**

#### 5-2. AC Voltage Measurement

**⚠ DANGER**

- **Never use the instrument on a circuit with a voltage higher that 600V AC. Otherwise, electric shock hazard or damage to the instrument or the circuit under test may result.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function Selector switch to the "V~" position.
(2) Plug the red test lead into the V/Ω terminal and the black test lead into the COM terminal.
(3) Connect the test lead prods to the circuit under test and take the reading on the display.

#### 5-3. DC Voltage Measurement

**⚠ DANGER**

- **Never use the instrument on a circuit with a voltage higher that 600V DC. Otherwise, electric shock hazard or damage to the instrument or the circuit under test may result.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function Selector switch to the "V⎓" position.
(2) Plug the red test lead into the V/Ω terminal and the black test lead into the COM terminal.
(3) Connect the test lead prods to the circuit under test and take the reading on the display.

take the reading on the display.

### 5-4. Resistance Measurement

**⚠ DANGER**
- **Always make sure that the circuit under test is powered off.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function selector switch to the "200Ω" position.
(2) Plug the red test lead into the V/ terminal and the black test lead into the COM terminal.
(3) Connect the test lead prods to the circuit under test and take the reading on the display.

**NOTE**
- **When shorting the test lead prods together, the display may show a very small resistance instead of "0". This is the resistance of the test leads.**
- **If one of the test leads has an open, the display reads "OL".**

### 5-5. Continuity Test

**⚠ DANGER**
- **Always make sure that the circuit under test is powered off.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function selector switch to the "⊣◀ / ◀)) " position.
(2) Plug the red test lead into the V/Ω terminal and the black test lead into the COM terminal.
(3) Press the FUNC key and set the instrument to continuity check mode.
(4) Connect the red test lead across the resistance to be measured. The buzzer if the resistance of the circuit measured is lower than approximately 50Ω

**NOTE**
- **When shorting the test lead prods together, the display may show a very small resistance instead of "0". This is the resistance of the test leads.**
- **If one of the test leads has an open, the display reads "OL".**

### 5-6. Diode Test

**⚠ DANGER**
- **Always make sure that the circuit under test is powered off.**
- **Do not make measurement with the battery compartment cover removed.**

(1) Set the function selector switch to the " ⊣◀/ ◀)) " position.
(2) Plug the red test lead into the V/Ω terminal and the black test lead into the COM terminal.
(3) Press the FUNC key and set the instrument to diode test mode.
(4) Connect the red test lead anode, the black lead to cathode of the diode under the testing.
(5) You can get reading from LCD.

**NOTE**
- **When shorting the test lead prods together, the display may show a very small resistance instead of "0". This is the resistance of the test leads.**
- **If one of the test leads has an open, the display reads "OL".**

### 5-7. NCV (Non-contact voltage)

(1) Set the function selector switch to "NCV" position.
(2) Test leads are not used for the NCV test, the display goes blank and the LED will flash a bright red light.
(3) Hold the top center of the clamp meter close to the conductor circuit in question.
(4) If a voltage in the range of 150 to 600V AC is present, the LED will continuously flash a bright red light.
(5) After stop working for 3 minutes, the meter will be into sleep mode (set the function selector switch to "NCV" position again to restart the power).

### 6. Data Hold Function

This is a function used to freeze the measured value on the display. Press the data hold switch to freeze the reading. The reading will be hold regardless of subsequent changes in input. "H" is show on the down left corner of the display while the instrument is the date hold mode. To exit the data hold mode, press the data hold switch again.

### 7. MAX function

Max is the maximum value hold key that acts with trigger. After pressing the key, A/D will keep working, and the display value are always updated and kept the maximum value. (The actual gained value is not the peak value, but maximum value.)

### 8. Battery Replacement

**⚠WARNING**
**To avoid electric shock hazard, make sure to set the function selector switch to "OFF" and remove the test leads from the instrument before trying to replace the batteries.**

**⚠ CAUTION**
- **Do not mix new and old batteries.**
- **Make sure to install battery in correct polarity bas indicated inside the battery compartment.**

When "🔋" is shown on the display, replace the batteries. Note that when the battery is completely exhausted, the display blanks without "🔋" show.
(1) Set the function selector switch to the "OFF" position
(2) Unscrew and remove the battery compartment on the bottom of the instrument.
(3) Replace the batteries observing correct polarity. Use two new AAA or equivalent batteries.
(4) Mount and screw the battery compartment cover.

**MUMBAI**

# TEST CERTIFICATE

## DIGITAL CLAMPMETER

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 1002**

SERIAL NO. _____

DATE: _____

QC KUSAM-MECO PASS

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, 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.

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