

KUSAM-MECO®

**AUTO SCAN PEN
RC METER
MODEL KM 503**

**OPERATION
MANUAL**

KUSAM-MECO®

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AUTO SCAN PEN RC METER MODEL KM 503



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1. GENERAL INSTRUCTIONS


This pen R/C meter for SMD could fast precise measure small chip components.

To get the best service from this meter, please read this user's manual carefully and observe the detailed safety precautions strictly.

1.1 Precautions safety measures

* **When using this meter, the user must observe all normal safety rules concerning**

1.1.1 During use

- * Use the meter before must warm-up 30 seconds.
- * If the meter is used near noise generating equipment, be aware that display may become unstable or indicate large errors.
- * Do not use the meter if it looks damaged.
- * Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- * Do not operate the meter around explosive gas, vapor, or dust.
- * To avoid damages to the instrument, do not exceed the maximum limits of the input values.
- * **Caution : Avoid working with voltages above 50VDC or 36VAC rms. Such voltages pose a shock hazard and damage the meter**
- * When using this meter, keep your fingers away from the metal of the meter.
- * Before changing functions, disconnect the test clip from the circuit under test.
- * Replace the battery when the  symbol appears. With

a low battery, the meter might produce false display .

1.1.3 Symbols:

Symbols used in this manual and on the meter:



Caution: refer to the instruction manual.
Incorrect use may result in damage to the device or its components.



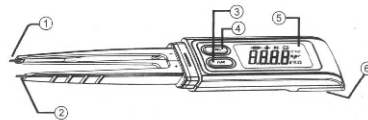
Conforms to IEC1010

1.1.4 Instructions

- * Before operating the meter, always disconnect from all sources of electric current and make sure you are not charged with static electricity, which may destroy internal components.
- * Any adjustment, maintenance or repair work carried out on the meter while it is live should be carried out only by appropriately qualified personnel, after having taken into account the instructions in this present manual.
- * If any faults or abnormalities are observed, take the instrument out of service and ensure that it can not be used until it has been checked out.
- * If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.
- * Never use the meter unless the back cover and battery cover are in place and fastened fully.

2. DESCRIPTION

2.1 Instrument Familiarization



- | | | |
|---------------|---------------|-----------------|
| 1. cathode | 2. anode | 3."REL" key |
| 4."FUNC." key | 5.LCD display | 6.Battery cover |

2.2 LCD Display



2.3 FUNC. key----Function key

This key is used to select the functions of the meter. Press this key once, the meter will turn on ad. Then press and hold this key for over 4 seconds, the meter will power off.

2.4 REL key----Relative measurement key

This key is used to select the Relative measurement mode. Press this key once to enter into the Relative measurement

mode, then press this key again, it will back to the normal mode.

2.5 Terminals

- + : Terminal receiving the anode
- - : Terminal receiving the cathode

Only for measuring the diode and the polar capacitance

3. TECHNICAL SPECIFICATIONS

3.1 General specifications

- Environment conditions
 - Pollution degree: 2
 - Altitude < 2000 m
 - Operating temperature:
 - 0~40 °C, (<80% RH, non-condensing)
 - Storage temperature:
 - 10~60 °C, (<70% RH, battery removed)
- Temperature Coefficient:
 - 0.1×(specified accuracy) / °C (<18 °C or >28 °C)
- MAX. Voltage between terminals and earth ground:
 - 50V DC or 36V AC rms
- Sample Rate: 3 times/sec for digital data
- Display: 3 3/4 digits LCD display with max. reading 3999
- Over Range indication: LCD will display "OL"
- Low battery indication:
 - The "⚡" is displayed when the battery is under the proper operation range
- Auto power off
 - If there is no key been operated for 15 minutes, the meter will auto power off to save battery energy.

- Power source: 3.0V battery
- Dimensions: 181(L)×35(W)×20(H) mm
- Weight: 65g. Approx. (battery included)

3.2 Measurement specifications

* Accuracy: ±(% of reading + number of digits) at 18°C to 28°C (64°F to 82°F) with relative humidity to 80%.

⚠ Caution when working with voltages above 50VDC or 36VAC rms.

3.2.1 Resistance

Range	Resolution	Accuracy
400Ω	0.1Ω	±(1.2% of rdg +3digits)
4kΩ	1Ω	
40kΩ	10Ω	
400kΩ	100Ω	
4MΩ	1kΩ	
40MΩ	10kΩ	±(2.0% of rdg +5 digits)

3.2.2 Capacitance

Range	Resolution	Accuracy
4nF	1pF	± (5.0% of rdg +5 digits)
40nF	10pF	± (3.0% of rdg +5 digits)
400nF	100pF	

4μF	1nF	± (3.0% of rdg +5 digits)
40μF	10nF	
200μF	100nF	

Keep two pins of the capacitance in short before measuring

3.2.3 Diode Test

Range	description	Test Condition
	Display read approx. forward voltage of diode	Forward DC Current: approx. 1mA Reversed DC Voltage: approx. 1.5V

4. OPERATING INSTRUCTION

4.1 Resistance measurement

⚠ To avoid electrical shock or damages to the meter under test, disconnect circuit power and discharge all high-voltage capacitors before measuring resistance.

- Select the function at mode.
- Connect the test clip to the object being measured and the measured value will show on the display.

NOTE:

- For measuring the high-resistance above 1MΩ, it may take a few seconds to stabilize the reading. This is normal for high resistance measuring.
- When the input is not connected, i.e. at open circuit, the

figure "OL" will be displayed for the overrange condition.

4.2 Capacitance measurement

⚠ To avoid electrical shock or damages to the meter under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Keep two pins of the capacitance in short before measuring.

- Select the function at mode.
- Connect the test clip to the capacitor being measured and read the displayed value.

NOTE:

- The meter may take a few seconds (200μF range, 30 seconds) to stabilize reading. This is normal for high capacitance measuring.
- To improve the accuracy of measurements less than 4nF, subtract the residual capacitance of the meter and clip. (Press the REL key to enter into the Relative measurement mode when it is in the open circuit state)

4.3 Diode measurement

⚠ To avoid electrical shock or damages to the meter under test, disconnect circuit power and discharge all high-voltage capacitors before testing diodes.

- Select the function at mode.
- Connect the + pin to the anode, the - pin to the cathode

of the diode under testing.


- The meter will show the approx. forward voltage of the diode. If the lead connection is reversed, only figure "OL" displayed.

5. MAINTENANCE


5.1 General Maintenance

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

5.2 Battery replacement

 **Before replacing the battery, disconnect test leads from any circuit under test, turn the meter off and remove test leads from the input terminals.**

Use the following procedure:

When the battery voltage drop below proper operation range the  symbol will appear on the LCD display and the battery need to be replaced.

- Press the battery cover and towards arrowhead direction to open the battery cover.
- Replace the battery with two new 1.5V batteries(AG13).
- Replace the battery cover.

TEST CERTIFICATE

This Test Certificate that warrants 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 503**

SERIAL NO. _____ **ISO 9001**

DATE: _____



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. All transaction are subject to Mumbai Jurisdiction.



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