KUSAM-MECO®

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 Detectors
* Calibrators
* Gas Detectors
* Frequency Counter
* Function Generator
* Phasing Sticks
* Battery Tester
* Waterproof Pen Testers
* Solar Power Meter
* EMF Detector
* 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®

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Dt. 17/June/2026

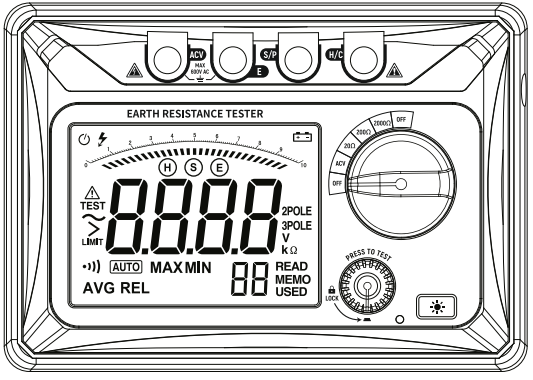
KUSAM-MECO®

KUSAM-MECO®

AN ISO 9001:2015 COMPANY

EARTH RESISTANCE TESTER

MODEL - KM 2030A



OPERATION MANUAL

KUSAM-MECO®

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KUSAM-MECO®

1. Declaration

In accordance with international copyright laws, no part of this manual may be reproduced in any form (including storage, retrieval, or translation into other languages) without prior permission and written consent. The content of this manual is subject to change in future versions without notice.

☞Caution ⚠

The "Caution" symbol indicates conditions or operations that may damage the instrument or equipment.

Exercise care when performing these operations. Failure to follow instructions may result in damage to the instrument or equipment. Do not proceed with any action marked by this symbol unless all conditions are met and fully understood.

☞Warning ⚠

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Read this manual carefully and heed all safety warnings before using the instrument.

2. Safety Information

This instrument must only be installed and operated by qualified personnel in compliance with the following safety precautions, technical specifications, and applicable laws and safety standards. Operating electrical equipment involves hazardous voltages. Failure to observe warnings may result in severe injury or equipment damage.

"Qualified personnel" refers to individuals with formal training and expertise in the setup, installation, commissioning, and operation of the instrument.

The instrument is designed and manufactured in accordance with IEC61016 safety standards and complies with GB4793.1-1995 (IEC-1010-1:1990) safety requirements for electronic measuring instruments.

⚠ Warning

- ⇨ Before measuring, ensure the rotary switch is set to the correct position and test leads are fully inserted.
- ⇨ Do not use the instrument in circuits with voltages exceeding 600V AC/DC to ground.
- ⇨ Avoid using the instrument near explosive gases, vapors, or dust.
- ⇨ Do not connect test leads or grounding rods when the instrument or hands are wet.

- ⇨ Do not touch test leads or grounding rods during measurement.
- ⇨ Do not open the battery cover during measurement.
- ⇨ Do not perform measurements under abnormal conditions (e.g., damaged casing, exposed metal parts).
- ⇨ Do not install replacement parts or modify the instrument. Return damaged units to an authorized dealer for repair.
- ⇨ Turn the rotary switch to "OFF" and remove test leads before opening the battery cover.

⚠ Caution

- ⇨ Remove batteries if the instrument will not be used for an extended period.
- ⇨ Avoid exposing the instrument to direct sunlight, high temperatures, humidity, or condensation.
- ⇨ Clean only with a neutral detergent or damp cloth. Do not use abrasives or solvents.
- ⇨ Ensure the instrument is dry before storage.

3. Key Features

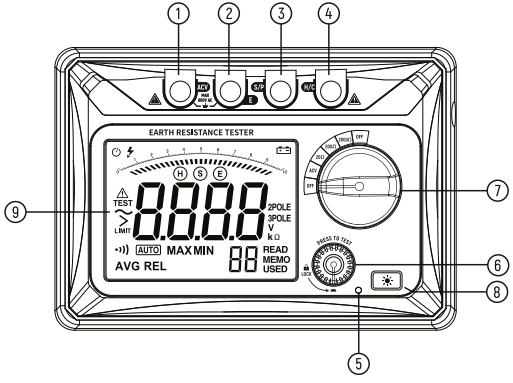
- Measures interference voltage.
- Measures grounding resistance for various equipment (e.g., high-voltage towers, buildings, electrical systems, mobile communication base stations, transmitters).
- Monitors and plans lightning protection systems.
- Measures resistance using auxiliary grounding electrodes.

4. Overview

This instrument features a smart microcontroller for high reliability and precision. It is suitable for grounding resistance tests in power distribution lines, indoor wiring, electrical equipment, and lightning protection systems, supporting both two-pole and three-pole measurement modes. It also measures ground voltage.

The instrument features a large-screen LCD digital display with backlight, ensuring easy readability for users.It includes data storage capability, allowing 20 sets of measurement data to be saved. The data is retained even during power loss, enabling convenient historical data review.Additionally, the device is equipped with an auto-shutdown function.

4.1 Panel Description



① **ACV Jack:** Ground voltage input.

② **E Jack:** Connects to the grounding electrode.

③ **S/P Jack:** Connects to the auxiliary grounding electrode.

④ **H/C Jack:** Connects to the auxiliary grounding electrode.

⑤ Measurement indicator light.

⑥ **Measurement button:** Press or rotate 90° to start measurement.

⑦ Range selector knob.

⑧ Backlight and data recording read button

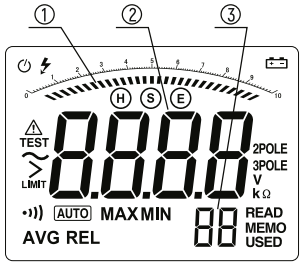
⑨ **LCD screen:** Displays measurements, units, and prompts.

4.2 Display Symbols

① Analog Bar

② Measurement Data Display Area

③ Data Storage Location Indicator



Display Symbols Legend:

TEST : Measurement indicator

>LIMIT : Overrange.

MAX : Maximum values

MIN : Minimum values

AVG : Average value

REL : Relative measurement

READ : Data reading

MEMO : Data storage.

USED : Stored data

2POLE : Two-Pole resistance measurement mode

3POLE : Three-Pole resistance measurement mode

V : Volts (voltage)

KΩ : Kilo-ohms (resistance)

~ : AC symbol

: Low battery indicator

⚠ : Warning symbol

Ⓗ Ⓢ Ⓔ : Socket identifier

5. Operating Instructions

Warning ⚠

Do not apply voltages exceeding 600V during ground voltage measurement.

High voltage is output during grounding resistance measurement (E, S/P, or H/C ports). Avoid electric shock.

Before using the instrument for measurements, check the battery voltage by turning on the power switch. Observe whether the low battery indicator "" appears. If displayed, replace the batteries following the procedures in the "Battery Replacement" section.

5.1 Ground Voltage Measurement

Rotate the selector switch to the "ACV" position. Insert the test leads into the E and ACV jacks. Connect the other ends of the test leads in parallel to the voltage source or load for measurement. The voltage value will be displayed on the LCD screen.

5.2 Two-Pole Ground Resistance Measurement (Simplified)

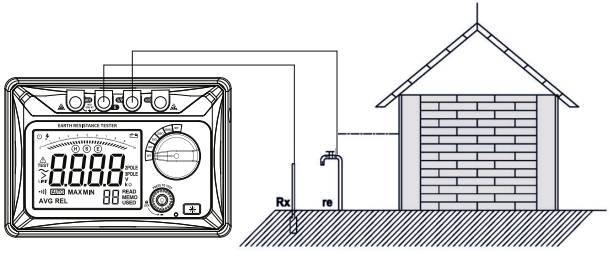
This method does not use a measurement method with auxiliary grounding rods. Instead, it uses existing grounding electrodes with known minimum grounding resistance as auxiliary

grounding electrodes, such as metal water pipes and other metal objects buried underground, commercial power supply common grounding, or building lightning rods as auxiliary grounding electrodes.

The measurement procedure is as follows:

(1) Detect the grounding voltage first

Measure the voltage to ground before the grounding resistance measurement, according to the “grounding voltage measurement” method to detect the measured device whether there is a grounding voltage exists. If the grounding voltage is present and exceeds 10V, the measurement of the grounding resistance will result in a large error. Disconnect the power supply to the object to be measured and wait until the ground voltage drops before measuring.



(2) Measurement of grounding resistance

Turn the rotary switch to “20Ω-2000Ω” any position, S/P, H/C need to be shorted, as shown in the figure above will be connected to the instrument and the device to be measured, press the “Measurement knob” key to start the measurement, the measurement indicator lamp lights and flashes, the measurement is automatically stopped, the measurement indicator lamp off, the measured value is automatically maintained on the display, read the measurement results. After the measurement stops automatically, the indicator will turn off and the measured value will be kept on the display automatically to read the result.

Note: If the measured value is out of range, > LIMIT 2000Ω will be displayed, which indicates that the value of auxiliary grounding resistance of the auxiliary grounding rod is too large, resulting in a warning that the current can not flow through the meter, please check whether the test wire is loose and the grounding resistance of the auxiliary grounding rod.

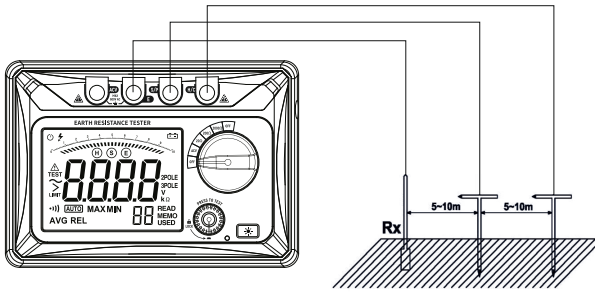
(3) Calculate the grounding resistance value

The measured value Re is the sum of the grounding resistance of the auxiliary grounding pole re and the real grounding resistance Rx, so the measured value Re minus re is the real grounding resistance Rx.

Rx (grounding resistance value) = Re (measured value) - re (auxiliary grounding electrode grounding resistance value).

5.3 Three-pole method ground resistance measurement (precise measurement)

This instrument uses the potential difference method to measure the grounding resistance value. The potential difference method refers to the method of flowing AC rated current I between the measured object E (grounding electrode) and H/C (current electrode), measuring the potential difference V between E and S/P (voltage electrode), and then finding out the grounding resistance value Rx.



(1) First, check the ground voltage.

Before measuring the ground resistance, measure the voltage to ground and check whether there is any ground voltage in the device being measured using the “ground voltage measurement” method. If there is a voltage to ground and it

exceeds 10V, it will cause a relatively large error in the ground resistance measurement. Please disconnect the power supply of the device being measured and wait for the ground voltage to drop before measuring.

(2) Measurement of grounding resistance

As shown in the figure above, starting from the device under test, drive the P auxiliary grounding rod and C auxiliary grounding rod into the ground in a straight line at intervals of 5 to 10 meters. Connect the test lines (black, red, green) from the E, S/P, and H/C ports of the instrument in the order of the device under test, auxiliary grounding rod P, and auxiliary grounding rod C.

Turn the rotary switch to any position between “20Ω-2000Ω,” as shown in the figure above. Connect the meter to the device to be measured, press the “Measurement Knob” button to start the measurement, the measurement indicator light will illuminate and flash. After the measurement automatically stops, the measurement indicator light will turn off, and the measurement value will be automatically retained on the display screen. Read the measurement result.

Note: Please insert the auxiliary grounding rod into moist soil as much as possible. If you must insert it into dry soil, gravel, or sand, wet the part of the auxiliary grounding rod that is inserted to keep the soil moist. When measuring on concrete, lay the auxiliary grounding rod flat and pour water on it, or place a wet towel on top of it.

Note: If the measured value exceeds the range, the display will show >LIMIT 2000Ω, indicating that the auxiliary grounding resistance value of auxiliary grounding rod C is too high, preventing current from flowing through the instrument. Please check if the test leads are loose and verify the grounding resistance of the auxiliary grounding rod. If the test leads are tangled or in contact, this may also cause measurement errors. Therefore, please ensure that the test leads are separated before measurement. When the auxiliary grounding resistance value is too high, the indicated value may have significant errors. In areas with high moisture content, please bury auxiliary grounding rods P and C deeply and ensure that all connection points are securely connected.

5.4 Reading Measurement Data

The data reading function of this instrument allows you to view stored historical measurement data.

(1) In standby mode, press and hold the “Record” key to enter the data reading interface. The “READ” indicator will appear. Press the “Record” key again to exit the data storage interface.

(2) Press the “Record” key briefly to view the data storage.

5.5 Backlight

Press the backlight button to turn the backlight on or off. The backlight must be turned on or off manually.

6. General Specifications

- **Measurement Method:**

Ground resistance is measured using the constant current conversion method, employing a test current with a frequency of approximately 800 Hz and an amplitude of approximately 3 mA.Ground voltage is measured using the average value rectification method.

- **Operating Temperature and Humidity:**
  0~40°C, relative humidity below 85%
- **Storage Temperature and Humidity:**
  -10~50°C, relative humidity below 85%
- **Power Supply:**
  6x1.5V AA batteries
- **Dimensions:**
  173x123x60 mm
- **Weight:**
  Approximately 448g (excluding batteries)
- **Accessories:** Three test leads
  (red-15m, green-10m, black - 5m), two grounding rods

7. Technical Specifications

Accuracy: ± (a% of reading + digits), with a one-year warranty period.

Reference Conditions: Ambient temperature 18°C - 28°C, relative humidity not exceeding 80%.

	Measurement range	Accuracy	Resolution
Ground Resistance	0 ~ 20Ω	±(3% +3 digits)	0.01Ω
	20 ~ 200Ω	±(3% +3 digits)	0.1Ω
	200Ω~2kΩ	±(3% +3 digits)	0.001KΩ
Ground Voltage	0V~600V (50/60HZ)	±(1% +5 digits)	1V

8.Battery Replacement

⚠ Warning

Do not replace batteries when the instrument is wet.

Do not replace batteries during measurement. To avoid electric shock, switch the rotary switch to the “off” position and remove the test leads before replacing the batteries.

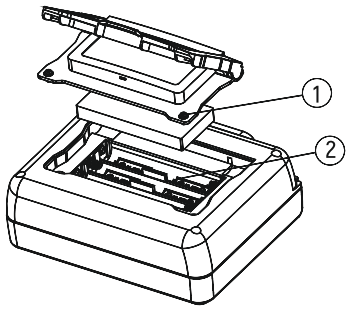
⚠ Caution

Do not mix new and old batteries. When installing, pay attention to the direction of the positive and negative poles of the battery and do not install them backwards.

① Unscrew the fastening screw on the battery cover of the instrument and remove it.

② Replace the old battery, paying attention to the direction of the battery electrodes marked on the bottom of the battery case.

③ Cover the battery cover and tighten the screw.



TEST CERTIFICATE

EARTH RESISTANCE TESTER

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 2030A**

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED

QC
KUSAM-MECO
PASS

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.