



An ISO 9001:2008 Company

DIGITAL EARTH RESISTANCE Model KM 2030

GENERAL SPECIFICATIONS :

- Display : 3½ Digit LCD display.
- Ground resistance measurements from 0 ~ 01Ω to 2000Ω with 0.01Ω resolution.
- **Earth Resistance** : 20Ω / 200Ω / 2000Ω
- **Accuracy** : 20Ω : ± (2% + 0.1Ω);
200Ω / 2000Ω : ± (2% + 3)
- **Earth Voltage** : 0 ~ 30V
- **Accuracy** : ± (3% + 5)
- **Resolution** : 0.01Ω
- Working LED Indicator.
- Data Hold Function.
- **Response Time** :
Measure earth resistance, about 5 seconds.
Measure Earth Voltage, about 2 seconds.
- **Withstand Voltage** : AC 1500V
- Low battery indication.
- **Power** : AA 1.5V X 6 & 12V x 1 Battery.
- **Weight** : approx. 680g.
- **Dimension** : 150(L) x 100(W) x 70(D) mm.
- **Standard Accessories** : Test Wires, Earth wire, Auxiliary Earth Bars, Instruction Manual, Battery & Carrying Case.



Preliminary Data

All Specifications are subject to change without prior notice



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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
- * 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
- * Digital AC & AC/DC Clampmeter
- * AC/DC Current Adaptor
- * Thermo Hygrometer
- * Digital Lux Meter
- * Power Factor Regulator
- * Digital Panel Meters
- * High Voltage Detector
- * Gas Analysers
- * Function Generator
- * Battery Tester
- * Solar Power Meter



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Digital Earth Resistance Tester

MODEL - KM 2030

OPERATION MANUAL

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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.

MUMBAI

TEST CERTIFICATE

Digital Earth Resistance Tester

This Test Certificate warrants 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-2030**

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED




A General Introduction


Digital Earth Resistance Tester is a new generation tester for electrician practice which is developed by our company in recent years. The circuit, structure and technique of traditional earth resistance tester have been improved and the new design is both fine-looking and practical. This one has more complete functions, higher accuracy, more convenient and reliable for operation and more suitable for outdoor use with dust and wet proof structure. It can test earth resistance of various earth systems including power systems, electric equipments, lightning conductors as well as resistance value of low resistance conductor and AC voltage test.

B Safety Rules

1. Please read this manual carefully before use.
2. It should not be used before placing the back cover back to avoid risk of electric shock.
3. Please do not touch lead terminal and circuit under test to avoid electric shock.
4. Please make sure the range select switch setting within the proper range before test.
5. Make sure the coupler plug of lead inserted in the terminal tightly.
6. When the tester is wet, do not use it or replace battery.
7. Please do not turn the switch during test.
8. Please do not test in flammable places since sparkles may cause explosion.

9. Please stop use when metal is exposed due to breakage of casing or testing wire. Make sure the isolation skin of testing wire is intact before use.
10. Please make sure the testing wire has been removed from testing terminal and the range select switch is on off position before replacing battery.
11. Please make sure the range select switch is on off position after use.
12. Replace battery when  shown on tester or the battery indicator light is off to ensure testing accuracy. Please remove the battery if not use it for long time.

C. Performance Features

1. Measuring range of earth resistance : 0-2000 Ω
2. Measuring range of earth voltage : 0-30V。
3. LED green light indicates normal operating mode 。
4. 3 digit LCD display for more direct and convenient reading 。
5.  on LCD indicates deficiency of 12V battery. LED red light off indicates deficiency of 1.5V battery.
6. Response time : measure earth resistance, about 5 seconds. Measure earth voltage, about 2 seconds.
7. Withstand voltage : AC 1500V, 1minute between circuit and outer casing.
8. Overload protection: on earth voltage, can withstand 300V AC (1 minute). on earth resistance, can withstand 200V AC (10 seconds)
9. Power supply, 1.5V 6 AA batteries, 12V 1 battery (23A)
10. Dimensions : 150 x 100 x 70mm.
11. Weight: about 680g (including battery).
12. Working environment :
Working temperature : 0°C 40°C relative humidity <80%
Storage temperature : -10°C 50°C relative humidity <85%
Ensure accurate temperature : 23°C ±5°C relative humidity <75%

re: earth resistance of common earth electrode of commercial electric power system, etc. Re: reading value of instrument earth resistance.

G. Replacing Battery

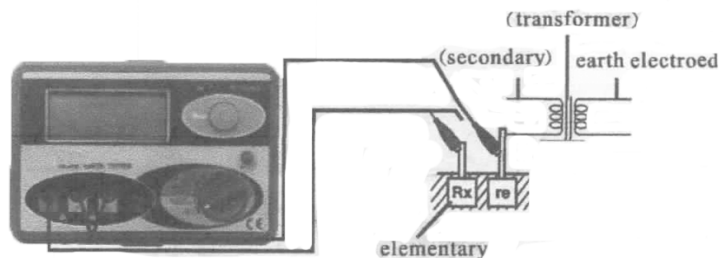
- 1) Do not open the battery cover if the outer casing is wet.
- 2) Please do not replace the battery during test. Please turn the range switch to off and remove testing leads, control bar, etc before replacing the battery to avoid electric shock. Undo the screw on battery cover at the bottom of the unit and open the battery cover. Put into a new battery, put battery cover back and tighten the screw

H. Accessorie

- 1) assistant earth bar: 2 bars
- 2) testing wire: 1 set
(including red testing wire 15 meters each, yellow testing wire 10 meters each and green testing wire 5 meters each)
- 3) simple testing wire 1 set (including: red testing wire 1.6 meters each and green testing wire 1.6 meters each)
- 4) 1.5V(R6AA) battery 6pcs
- 5) 12V(23A) battery 1pcs
- 6) instruction manual 1 pcs

7-3 Simple measuring method of earth resistance The method is designed for places where assistance earth bar cannot be punched. Use a earth electrode with quite small earth resistance like metal water pipe, common earth electrode of commercial electric power system, earth end of building, etc to substitute assistant earth bar P and C.

1) Connecting testing wires. Please connect simple testing wires according to picture below.



1 earth electrode 2 secondary 3 transformer 4 elementary

Risk: be careful of electric shock when using commercial electric system earth method for test. Please do not use this tester to measure supply voltage.

2) Measuring earth voltage Please turn the range select switch to earth voltage. Make sure the voltage value below 10V since error may occur to measuring value of earth voltage if the voltage value above 10V. At this point, one can break the power supply of tested earth electrode equipment to lower earth voltage and then measure the value.

3) Measuring earth resistance First please press "Test/Stop" beginning from 1000 Q. If the show value is too small, switch to 200n /20 Q and the show value here is namely the tested earth resistance value. Note: when measuring current is about 2mA, even the residual current circuit breaker cannot take effect. Calculate the real earth voltage value RX by equation below:

$$RX=RE-re$$

D Technical Indicators

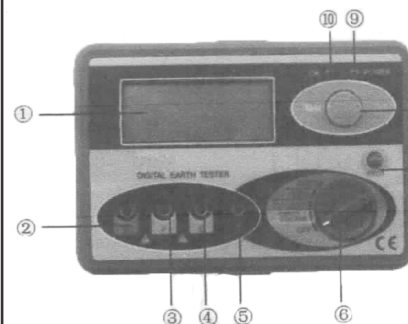
Earth resistance

Rang	Accuracy	Resolution
20 Ω	± 2% rdg+0.1 Ω	0.01Ω
200 Ω	± 2% rdg+3 dgt Ω	0.1Ω
2000 Ω		1Ω

Earth Voltage

Rang	Accuracy	Resolution
30V	± 10% rdg+15 dgt	0.1V

E. Operation Diagram



1. LCD display
2. "E" port (earth electrode)
3. "P" port (electric potential pole)
4. "C" port (current pole)
5. "V" port (voltage pole)
6. Function switch.
7. HOLD data holding switch
8. TEST testing button
9. POWER power indicator light (red)
10. OK operation indicator light (green)

F. Operation Instruction

a. Check battery voltage

No  symbol on LCD indicates sufficient 12V battery.

 symbol on LCD means you need replace 12V battery according to instruction.

B. Routine method for testing earth resistance Risk : Δ maximum 50V voltage may be generated between E-C or E-P terminals when testing earth resistance !

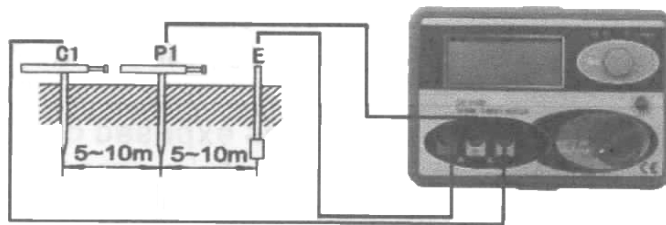
Please do not touch testing lead to avoid electric shock.

Please make sure testing wire plug insert in testing terminal thoroughly before testing since loose connection may cause error in testing result.

1. Connecting testing wire: As shown in picture below, punch assistant earth bar P1 and C1 in earth 5 to 10 meters distant from tested earth substance; connect green wire to terminal E, yellow wire to terminal P and red wire to terminal C.

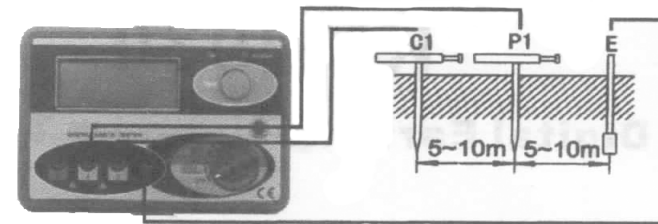
Note: please place assistant earth bar in land with high water content. You need add water in dry land, sand land or land containing crushed stones to maintain humidity of inserting position of earth bar.

Lie earth bar flat and add water when meeting cement ground and cover wet towel, ect on earth bar before testing,



In the picture, E connect earth electrode port
 P connect electric potential pole port
 C connects voltage pole port
 V connects voltage pole port

2. Working power and connecting wire testing Press "Test/Stop", "POWER" light off indicates insufficient 1.5V battery. Please replace it. "OK" light on indicates normal connecting of lead and P, C terminals and earth resistance of assistant earth within permitted range. If light is off, check the lead connecting P and C terminals or change the position of earth bar, or water the land to lower assistant earth resistance to a proper level. Check breakage by short circuit of spring clamps of red and yellow lead ends.
3. Measuring earth voltage: Please turn the range select switch to earth voltage. Make sure the voltage value below 10V since error may occur to measuring value of earth voltage if the voltage.



In the picture,

- E connects earth electrode port
- P connects electric potential pole port
- C connects current pole port
- V connects voltage pole port

value above 10V. At this point, one can break the power supply of tested earth electrode equipment to lower earth voltage and then measure the value.

4) Measuring earth resistance First please press "Test/Stop" beginning from 20000. If the show value is too small, switch to 2000 /20.Q and the show value here is namely the tested earth resistance value.

Note: make sure connecting wires separated during wire connecting since testing when testing leads wind about with each other may encounter mutual inductance to affect reading. The assistant earth resistance value may be too big and error may occur to show value. Make sure assistant earth bar P and C into wet land and complete contact of connecting parts