## LIST OF PRODUCTS

* Digital Multimeter
* Digital AC & AC/DC Clampmeter
* AC Clamp Adaptor
* AC/DC Current Adaptor
* 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
* Thermo Hygrometer
* Thermo Anemometer
* Wood & Paper Moisture Meter
* Distance Meter
* Digital Hand Held Temperature Indicators
* Digital Lux Meter
* Network Cable Tester
* Power Factor Regulator
* Maximum Demand Controller/Digital Power Meter
* Earth Resistance Tester
* Gas Analysers
* Panel Meters
* Battery Testers
* DC Power Supply
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# DIGITAL INSULATION RESISTANCE TESTER KM 370 / KM 379

# OPERATION MANUAL

# DIGITAL INSULATION RESISTANCE TESTER & DIGITAL MULTIMETER

## MODEL
## KM 370 / KM 379



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## FOREWORD

Thank you for purchasing Insulation Resistance Tester of our company. To use the meter correctly, please read the operating instructions **thoroughly** and **carefully** before using it, especially the section of Safety information. Please keep the operating instructions in a safe place after reading it, putting it where the meter is or keeping it handy for future reference.

**Attention:**

**A test cable is provided for the meter. It is not allowed to perform insulation test by holding the test cable with your hands. Ensure that the to-be-tested object is securely clamped and keep your body away from the circuit before press the TEST key to output high voltage.**

## 1) OVERVIEW

Welcome to use the product!.

KM- 370 / 379 digital multimeter with auto range selection is a real digital Insulation resistance tester + digital multimeter. It has features of complete functions, high accuracy, reliability in operation, and convenience in use. Output test voltage can be switched among 250V/500V/1000V/2500V, depending on different models. An ordinary Insulation resistance meter can not measure the output high voltage of its own. When the output high voltage of the Insulation resistance meter doesn't conform to the rated value, it is not easy for the user to find the unconformity so that deviation of the measured result is very large sometimes and causing hidden troubles in safety. KM 370 / 379 can monitor the output high voltage in a real-time way. At any time, the user can observe actual measurement voltage that is output by the meter,



effectively avoiding misjudgment caused due to output voltage not confirming to the rated value. The measurement range of the meter can reach up to 40GΩ. The measurement time can be set up according to requirements. After a measurement is completed, the measured result can be kept automatically. Functions of the digital multimeter include AC/DC voltage, current, resistance, capacitance, frequency, diode and ON/OFF measurement. The functions of the digital multimeter are completely separated from those of the insulation resistance tester. When using the functions of the multimeter, you need not be worried that you would suffer electric shock due to high voltage generated by the Insulation resistance tester. The product is suitable for measurement of the insulation such as transformers, motors, cables, switches, and electric apparatuses. It is also applicable to maintenance, test, and inspection of various electric equipments. It is compact in structure, convenient to carry, and an ideal electrical and electronic testing meter of yours.

## 2) SAFETY INFORMATION

(1) Description of safety marks:

⚠ Warning: Important safety information the user must read !

⚠ Danger: high-voltage electric shock is present !

⧈ Double-insulated protection.

(2) Read the operating instructions carefully before using the meter.

Do not use the meter if the rear cover is not in its place.

(3) It is strictly prohibited to use the meter before its rear cover is put in place.
Otherwise, it might cause an electric shock.

(4) Check and make sure the Insulation layer of the test cable is in good condition without any breakage.

(5) To avoid electric shock, do not touch the test cable and the circuit under test when performing a test.

(6) Make sure one end of the test cable is securely inserted into the terminal.

(7) During test, any range must not exceed its specified maximum input value.

(8) During test, do not operate the switch knob for changing a range to avoid damaging the meter.

(9) DC voltage over 50V or AC voltage over 36V can cause danger of electric shock. Be careful when taking measurement.



(10) Before performing insulation test, make sure the range selection switch has been set within an appropriate voltage range.

(11) Do not perform Insulation resistance test in a combustible environment. Spark may cause explosion.

(12) Stop using the meter, if its case or test cable is broken during use and the metal is exposed.

(13) When opening the rear cover for changing battery, make sure the test cable has been removed out of the test terminal and the range switch to OFF position.

(14) Take the battery out when the meter will not be used for a long time.

(15) When 🔋 is displayed in the meter , it is necessary to change the battery in time to ensure measurement accuracy.

## 3) GENERAL SPECIFICATIONS:

- **Auto range :** OL will be displayed for overload.
- **Display mode :** Liquid crystal display ; maximum display: 4000.
- **Sampling rate:** 2 times per second.
- The meter can display actual insulation test voltage. LED light is used to indicate high voltage output status.
- **Operating environment :** 0°C ~ 40°C, less than 75% RH.
- **Storage environment :** -10°C~ 60°C, less than 80% RH
- **Maximum power consumption:** 4.5W; minimum power consumption 18mW.
- **Indication for insufficient battery capacity :** is displayed.
- **Power supply :** 6 pieces of AA 1.5V battery.
- **Auto power off :** The multimeter is turned off automatically in approx. 15 minutes after it is turned ON if no key is pressed or the knob is not turned.
- **External dimension :** 170(L) x156(W) x 64(H)mm
- **Weight :** Approx. 650gs (including the battery).



## 4) TECHNICAL CHARACTERISTICS AND OPERATING DESCRIPTION OF THE INSULATION TESTER

**Accuracy :** ±% reading ± number, one-year warranty

**Environment to guarantee the accuracy:** 23°C ± 5°C, less than 75%RH

**Rated Measurement Voltage, Valid Measurement Range And Precision**

| Rated Voltage | Measurement range | Accuracy |
|---|---|---|
| 250V | 0.25M ~ 400MΩ | 0.2M~200MΩ: ±3% rdg±5, 200M~4GΩ : ±5% rdg±5, 4G~40GΩ :±10% rdg±5 |
| 500V | 0.5MΩ ~ 4GΩ | |
| 1000V | 1.5M ~ 40G | |
| 2500V | 5M ~ 40GΩ | |

**Display Range**

| Rated Voltage | Display (Auto Range) | Resolution |
|---|---|---|
| 250V | 4M/40M/400MΩ | 1k/10k/100kΩ |
| 500V | 4M/40M/400M/4GΩ | 1k/10k/100k/1MΩ |
| 1000V | 40M/400M/4G/40G | 10k/100k/1M/10MΩ |
| 2500V | 40M/400M/4G/40GΩ | 10k/100k/1M/10MΩ |

**Characteristics Of The Measurement Terminal**

| Rated Voltage | The measurement resistance value that can maintain lower limit of the rated voltage |
|---|---|
| 250V | 250KΩ (ERR is displayed when it is less than 200KΩ) |
| 500V | 500KΩ (ERR is displayed when it is less than 400KΩ) |
| 1000V | 1.5MΩ (ERR is displayed when it is less than 1MΩ) |
| 2500V | 5MΩ (ERR is displayed when it is less than 2MΩ) |

**Allowed range of open circuit voltage :**
90% - 110% of the rated Voltage
**short circuit current :** Not less than 1.5mA



## 5) Technical Characteristics And Operating Description Of The Multimeter.

**Accuracy :**
± % reading ± number, one-year warranty
**Environment to guarantee the accuracy :**
23°C±5°C, less than 75%RH

**DC VOLTAGE (DCV)**

| Range | Resolution | Accuracy |
|---|---|---|
| 400mV | 0.1mV | ± (0.5%+5d) |
| 4V | 1mV | |
| 40V | 10mV | |
| 400V | 100mV | |
| 1000V | 1V | ± (0.8%+5d) |

**Input impedance :** 400mV>1000MΩ; 10MΩ for other ranges. Maximum input voltage:
DC or AC peak value 1000V.

**AC VOLTAGE (ACV)**

| Range | Resolution | Accuracy |
|---|---|---|
| 4V | 1mV | ± (0.8%+5d) |
| 40V | 10mV | |
| 400V | 100mV | |
| 700V | 1V | ± (1%+5d) |

**Frequency range:** 40Hz ~ 400Hz
(400V and 700V range is 40Hz ~100Hz).
**Maximum input voltage:** DC or AC peak value1000V.
**Display:** Average (Sine wave virtual value calibration)

**DC CURRENT (DCA)**

| Range | Resolution | Accuracy |
|---|---|---|
| 40mA | 10mA | ± (0.8%+5d) |
| 400mA | 100mA | |

**AC CURRENT (ACA)**

| Range | Resolution | Accuracy |
|---|---|---|
| 40mA | 10mA | ± (1%+5d) |
| 400mA | 100mA | |

**Overload protection:** 0.5A/250V fuse.

**RESISTANCE**

| Range | Resolution | Accuracy |
|---|---|---|
| 400Ω | 0.1Ω | ±(0.8%+5d) |
| 4kΩ | 1Ω | |
| 40kΩ | 10Ω | |
| 400kΩ | 100Ω | |
| 4MΩ | 1kΩ | ±(1%+3d) |
| 40MΩ | 10kΩ | ±(2%+3d) |

**Overload protection:** 250V RMS.

**CAPACITANCE**

| Range | Resolution | Accuracy |
|---|---|---|
| 40nF | 10pF | ±(3%+5d) |
| 400nF | 100pF | |
| 4μF | 1nF | |
| 40μF | 10nF | |

**Overload protection:** 250V RMS.

**FREQUENCY (FREQ)**

| Range | Resolution | Accuracy |
|---|---|---|
| 40Hz | 0.01Hz | ±(0.5%+3d) |
| 400Hz | 0.1Hz | |
| 4KHz | 1Hz | |
| 40KHz | 10Hz | |
| 400KHz | 100Hz | |
| 4MHz | 1KHz | |

**Overload protection:** 250V RMS.
**Input Sensitivity :** 2V RMS.





**Attention:**

If the frequency amplitude under test is larger than 50V, please press SELECT key of ACV function to enter frequency function, and then make the measurement.

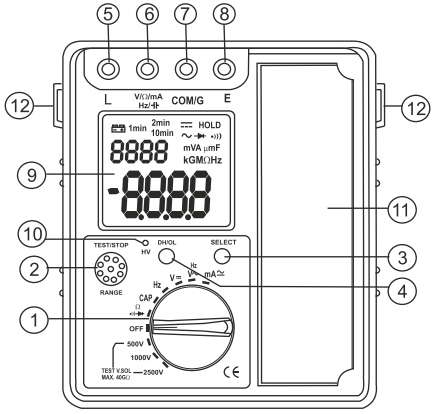
**FORWARD VOLTAGE OF THE DIODE →+**

Display approximate forward voltage value of the diode. Test condition: Forward DC current of approx. 0.5mA, reverse DC voltage of approx. 1.5V.

**CONTINUITY TEST •))**

When the ON resistance is less than 50 ± 20Ω, the buzzer in the meter buzzes. Test condition: open circuit voltage of approx. 0.5V

**NAME AND FUNCTION OF PARTS**
**(see the figure)**




**1.FUNCTION SWITCH KNOB**

Switch among power ON/OFF, measurement voltage of the Insulation resistance, and various functions of the multimeter.

**2.TEST/STOP key:**

It is used to measure the Insulation resistance RANGE key: it is used to switch between hand-operated and auto range mode as the meter is used as the multimeter. The function is not available when the meter is used as the Insulation resistance tester. On startup, the meter is preset to auto range mode. Press the key to switch to hand-operated range mode. In hand-operated range mode, every time press the key, the range goes up one level until to the maximum level. After the maximum level is reached, every time press the key, the range



goes to the minimum level. The process is repeated. If press and hold the key over 2 seconds, the meter is switched to auto range mode.

**3.SELECT key:**

It is used to set the measurement time of the Insulation resistance as well as various function switch of the same position.

**4.DH/BL key**

Data hold / backlight function: press the key to lock the displayed result. Press it again to restore normal measurement (when OL is displayed in the meter, Hold function is not available). Press and hold the key for 2 seconds to switch between backlight ON / OFF (in adjustment mode, backlight is not available)

**5. L (LINE)**

Input terminal (connected to line terminal of the to-be-tested object).

**6. V/Ω/mA/Hz/CAP**

Input terminal: common positive input terminal of the digital multimeter;

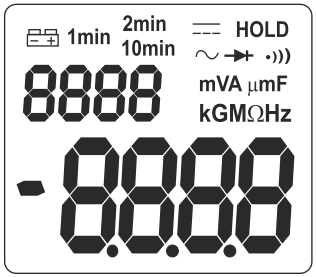
**7.COM/G**

Input terminal (COM is common EARTH of the multimeter /G is shielded terminal of the Insulation resistance).

**8.E (EARTH)**

Input terminal (connected to EARTH terminal of the to-be-tested object)

**9. Liquid crystal display**




**Small 8888 :** measured value of high voltage of the Insulation resistance -8888: measured value of various functions.

**Min:** measurement time of the Insulation resistance (minute)

**OL:** overflow display, indicating that the measured value exceeds the maximum display value.

**ERR:** indicating that serious current leakage or short circuit occurs to the equipment.

**:** Battery capacity is insufficient

**10.** Indicator light of high voltage

**11.** Holding box of the test cables

**12.** Ring used to fasten the hanging strip.





## USAGE FOR INSULATION RESISTANCE MEASUREMENT

**⚠ DANGER :**

If there is any measurement error, it may cause personal injury and meter failure. Operate it only after reading the operating instructions carefully and thoroughly.

**OPERATING DESCRIPTION :**

**1. SAFETY INFORMATION**

1) Watch out for high Voltage electric shock. When completing the Insulation resistance test, remove the test cable only after making sure high voltage across the tested object is less than 50V.

2) During measurement, do not touch the object under test and watch out for high - voltage electric shock.

3) When testing the Insulation resistance, the object should not be electrified. Make sure the to be tested object is securely earthed. Before test, it is necessary to short circuit and discharge two test terminals of the to be tested object.

4) When testing the Insulation resistance, make sure no external voltage is applied to the test circuit.

5) Before starting test, make sure position of the range switch knob is correct and the test cable is securely connected.

6) After press the high voltage key, high voltage from 250V to 2500V will be output between L terminal and E terminal ( depending on different models and positions.) Here, be sure not to touch the meter and exposed part of the object under test. Otherwise, danger of electric shock would occur.

**2. INSULATION RESISTANCE TEST :**

1) Connection of the test lead with a high voltage test bar into L terminal socket of the meter. Insert one end of the test cable with clamp into E terminal socket of the meter. Insert one end of the test cable with black test lead ( the lead with a clamp ) G terminal socket of the meter. Make a good connection respectively.

2) Test connecting cable Connecting cable of E terminal socket of the meter is earthing cable; Connecting cable of L terminal socket of the meter (with a high voltage test bar) is circuit cable; Connecting cable of G terminal socket of the meter (the lead with a clamp) is shielding cable and connected to surface of the to-be-tested object to prevent surface leakage and affect Impedance test.

3) Rated voltage selection Select a rated voltage you need in the Insulation resistance test. Turn the range switch knob to a corresponding voltage position, and press SELECT to make selection among 1min/2min/10min according to test time requirement.



4) Connect lead of the test bar to another terminal of the to-be-tested object. Press high voltage switch (TEST/STOP). Here, the red indicator light turns on, indicating high voltage output for test is connected. Actual high, voltage value can be displayed in the meter.

After the test is started, numerical value is displayed in the meter. The displayed value is the Insulation resistance value of the object under test. For convenience of use, when the set test time comes, the meter cuts high voltage off automatically, and locks and saves the measured result. When the measured result is less than the set minimum resistance value under the measurement voltage, ERR is displayed in the meter. If there is a need to remeasure, press any key to release the lock status and start the measurement over again.

**Attention:**

Do not short-circuit the two test lead with high voltage output or take measurement of Insulation resistance after high voltage is output. The improper operation is very easy to generate spark, cause fire disaster, and damage the meter.

While measuring the Insulation resistance, this meter can discharge automatically; only when the voltage of the measured meter discharges under 30V, could the high voltage be started to measure.

Performing the test can find connection error and defective equipment, guarantee high quality installation, and prevent fire disaster or explosion.

### 3. TEST IN MAINTENANCE

Another important reason of the insulation test is to protect and lengthen service life of electric system and motor. Electric system is affected by such factors as dust, grease, temperature, stress, and vibration for a long time. These conditions may cause Insulation deterioration. Loss in production, and even fire disaster. Regular maintenance and test can provide very valuable information of system wear and tear status and help forecast system failure possibility. Solving problems in time can guarantee that a system operates without any fault and effectively lengthen service life of various equipments.

To obtain meaningful Insulation resistance result, an electrician should check the to-be-tested system carefully before taking measurement. When the following conditions are satisfied, the best results will be obtained:

1) Shut down the system or equipment and disconnect it from other circuits, electric switches, capacitors, electric brushes, lightning rods, and circuit breakers. Ensure the test is not affected by leakage current that flows through switches and over-current protection components.
2) The temperature should be higher than dew point of the environmental air. If the condition is not satisfied, a layer of water smoke will be formed in the Insulation surface. In some cases, it would be absorbed by Insulation material.
3) In surface of the conductor there should be no carbon and other impurity that are easy to form on a conductor.



4) The applied voltage should not be too high. When low voltage system is tested, too high voltage would cause overload or damage a insulator.
5) The to-be-tested system should be fully discharged to the earth. The earthing discharge time should be approx. fivefold of the charge time.
6) Temperature influence is worth attention. As Insulation resistance is in inverse ratio with Insulation material temperature (the higher the temperature is, the lower the impedance is). The recorded impedance reading would be changed by Insulation material temperature. It is suggested to perform measurement in a standard temperature of 20°C (68°F). Compare a reading with a result at a temperature of 20°C according to conventional practice. With a temperature over 20°C, the impedance value at 20°C will be twofold of its reading every time the temperature goes up for at 10°C (18°F ); with a temperature under 20°C, the impedance value at 20°C will be one half of its reading every time the temperature goes down for 10°C (18°F). For example, when 10MΩ impedance at 40°C is converted into the impedance at 20°C, its value is 40MΩ. The conductor temperature can be measured with a non - contact infrared temperature tester.

### 4. ⚠ WORK SAFETY

To guarantee safety is responsibility of everybody. However, your safety is at your own hands. No tool can guarantee your safety. Only safe equipment and safe work habit can provide you with the safest protection. The followings are some safety tips you hould obey:

**SPECIAL ATTENTION IN OPERATION:**

Before test, make sure the to-be-tested circuit is not electrified.

Do not take measurement of any electrified equipment or electrified circuit.

During test, dangerous voltage output exists in the meter. Be sure to operate it carefully. Ensure the to-be-tested object is securely clamped and keep your hands away from the test clamp before press TEST key to output high voltage.

**Attention in operation:**

When use 500V measurement voltage to measure resistance less than 2MΩ, 1000V to measure resistance less than 5MΩ, and 2500V to measure resistance less than 10MΩ, measurement time must not exceed 10 seconds.

**5) POWER OFF**

After the test is completed, release lock status of the meter and observe voltage display value of the Insulation resistance tester. When it is less than 50V, turn the range switch knob to OFF position, and then remove the test cable. The test is over.

**Attention: The meter can not be turned OFF automatically when it is used as an Insulation resistance tester. Please turn range switch knob to OFF position after the test is over.**



**NOTES FOR USE OF THE INSULATION RESISTANCE TESTER**

**1. BRIEF INTRODUCTION**

The Insulation resistance tester can be used to verify completeness of motor, transformer, switching equipment, and coil and cable of electric equipment. For example, when electric cable or switching equipment (low capacitance equipment) is tested, time-related capacitive leakage current is not noticeable and would quickly drop to zero. Within a short time (one minute or less), it will reach a stable conductive leakage current quantity of, providing a good condition for spot-check of reading / short-time impedance test.

On the other hand, time-related current will last for several hours when the equipment under test is long cable, large-sized motor or generator (high capacitance equipment). The current would cause ceaseless change of the reading of the Insulation resistance tester. It is impossible to obtain an accurate reading. If trend analysis among readings can be made, for example, step voltage or medium absorption test, the situation can be overcome. The analysis doesn't rely on a single reading, but on a large quantity of related readings. As time-related current drops quickly when low capacitance equipment is tested, results from multiply tests are the same. Therefore, use of the multiply test method will waste time.

**2.TEST IN ASSEMBLY**

The most important reason of the insulation test is to ensure the public and individual safety. Through high voltage DC test among live wire, earthing and earthing wire, you can eliminate short circuit or earthing phenomenon that is dangerous to the human life. Usually, the test is performed after preliminary equipment installation is completed.

★ In any time, put the circuit in power - off status as possible as can. Take appropriate cut-off / turn steps. If the ON / OFF status is undetermined, assume the circuit is electrified. You can use AC/DC voltage measurement function of the meter to determine if the circuit is in power-on status.

★ Use protection device for the power-on circuit: Use Insulation tools. Put up wear fireproof suit, google, and Insulation gloves. Take off watch or other adorn-ment. Stand on an Insulation pad.

★ Draw lesson from experienced electricians: Keep one hand away from other objects. This way will reduce the possibility that closed-loop current goes through your thorax and heart.

★ When perform Insulation resistance test:

※ Do not connect the insulation tester to an electrified conductor equipment. Follow manu-facturer's suggestions to perform the test.

※ Cut off fuse, electric switch, and circuit breaker. Turn off the to-be-tested equipment.

※ Disconnect branch circuit wire, earthed wire and other equipment from the to-be-tested equipment.

※ Before and after the test, discharge capacitors of the to-be-tested object. Some equipment may have automatic discharge function.

※ Check if there is leakage current going through fuse, electric switch, and discharge circuit breaker. Leakage current would cause incorrect test result.

※ When the insulation is in bad condition, equipment would generate electric arc. Therefore, do not use the insulation tester in a dangerous environment with combustible and explosive gas.

※ When connect test cable, use a pair of Insulation rubber gloves.



## 5. IMPORTANT TIPS.

What the Insulation resistance tester measures is surface-to-surface resistance value of the object under test, but not point-to-point one. Therefore, the wire should not be connected to surface of a non-conductive object (such as cable rubber and plastic case). It is necessary to use a conductive material (such as silver paper) to cover surface of the to-be-tested object, and next, connect a wire to the Conductive surface, and then, you can perform the measurement.

## OPERATING DESCRIPTION OF THE DIGITAL MULTIMETER

### AC/DC VOLTAGE MEASUREMENT

Turn the switch knob to V⎓ or V~ range. Insert one end of the black lead into the jack of COM. Insert one end of the red lead in the jack of V/ Ω/mA/Hz/CAP. Connect the other end of the two leads in parallel to two terminals of the to-be-tested circuit. The value on the LCD screen can be directly read;

**Attention:**

1) Input voltage should not exceed the limited value. If does, there is danger of damaging the meter circuit. When the displayed value is larger than DC1100VHU or AC770V, OL is displayed in the meter, indicating the input voltage has exceeded maximum limit value of the meter.

2) When perform measurement of high voltage circuit, be sure that human body will not contact the high voltage.

## AC/DC CURRENT MEASUREMENT

Turn the switch knob to mA range. Here, the meter is preset to DC current measurement mode. Insert one end of the black lead into the jack of COM and one end of the red lead into the jack of V/ Ω/mA/Hz/CAP. If take measurement of DC current, connect the other end of the two leads in series to the to-be-tested circuit. The value on LCD screen can be directly read. If take measurement of AC current, press SELECT key to switch to AC current range. Connect the other end of the two leads in series to the to-be-tested circuit and read the displayed value.

**Attention:**

1) Input current must not exceed the limited value. If does, there is danger of damaging the meter circuit.

## RESISTANCE AND CONTINUITY MEASUREMENT

⚠ Warning! When perform resistance and continuity measurement, it is necessary to guarantee that no voltage is applied across the to-be-tested circuit or component

Set the switch knob to Ω •))) position. Here, the meter is preset to resistance range. Insert one end of the red lead into the jack of V/ Ω/mA/Hz/CAP, and one end of the black one into the jack of COM. Connect the other end of the two leads in parallel to two terminals of the to-be-tested circuit or component and read the resistance value.



Press SELECT key to switch to •))) range. When the tested resistance value is less than approx. 50 ± 20Ω, the buzzer would buzz. This is continuity test. When the leads are open-circuited or input is overloaded, OL will be displayed on the screen.

## FORWARD VOLTAGE MEASURMENT OF THE DIODE

Turn the switch knob to Ω →|– position. Press SELECT key to switch to →|– range. Insert one end of the red lead into the jack of V/W/mA/Hz/CAP and one end of the black lead into the jack of COM (polarity of the red lead is +). Connect the other end of the two leads in parallel to two terminals of the to-be-tested diode and read the forward voltage value. When the diode is reversely connected or the input terminal is open-circuit, OL will be displayed on the screen.

## CAPACITANCE MEASUREMENT

⚠ **Warning!** When perform capacitance measurement, it is necessary to guarantee the to-be-tested capacitor is completely discharged.

Turn the switch knob to Ω CAP position. Press **SELECT** key to switch to CAP range. Insert one end of the red lead into the jack of V / Ω / Hz / CAP / mA and one end of the black lead into the jack of COM. Connect the other end of the two leads in parallel to two terminals of the to-be-tested capacitor and read the capacitance value.

When capacitance value is relatively large, it may take over 10 minutes to take the measurement.

## FREQUENCY MEASUREMENT

Turn the switch knob to Hz range. Insert one end of the red lead into the jack of V/ Ω/mA/Hz/CAP and one end of the black lead into the jack of COM. Connect the other end of the two leads in parallel to the to-be-tested circuit and read the frequency value. Sensitivity of the frequency range is approx. 2V RMS.

**Attention:**

1. In an environment with strong noise, it is better to use shielded cable when perform small single measurement.

2. When the frequency amplitude under test is larger than 50V, please press SELECT key in the ACV range to enter frequency function, and then make the measurement. When high voltage frequency is measured in this method, the meter can bear voltage with a peak value up to 1000V. which can prevent the meter from being damaged when attenuate the voltage amplitude is too high. The meter can automatically attenuate the voltage under test to an optimal amplitude value that ICs can handle and has good antijamming ability.

## AUTO POWER OFF

the meter is turned off automatically in approx. 15 minutes. After it is turned on if no key is pressed and the range switch knob is not operated.

**Attention:** To lengthen service life of the battery, please turn the power off after use it.



## MAINTENANCE OF THE METER

⚠**Warning!** It is necessary to turn the power off and disconnect test leads before open the case of the meter or battery cover to prevent danger of electric shock.

1. When the sign  is displayed in the meter , the battery needs to be changed. Open the battery cover, and replace the old battery with a new one of the same type to ensure the meter works normally.

2. To protect internal circuit of the meter, it is necessary to replace the fuse with one of the same specifications when the fuse in current range is burned. Specifications of the fuse used in the series meters is: F 500mA/250V(fast). Be sure to turn the switch knob to OFF position before open the bottom cover to prevent high-voltage electric shock.

3. Keep the meter and the test lead clean, dry, and undamaged. Use a clean cloth or eradicator to clean the case of the meter. Do not use abrasive or organic solvent.

4. Avoid mechanical damage, shock and impact; avoid exposure to high temperature and strong magnetic field.

## ACCESSORIES

1. Test Cable : One Set, Including One Red High Voltage Test Lead, Two Black Leads, Two Black Test Clamps), And One Red Test Clamp.

2. Operating instructions: one copy

3.Conformity certificate/Warranty card: one piece

MUMBAI

# TEST CERTIFICATE

## DIGITAL INSULATION RESISTANCE TESTER

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 370 / KM 379**

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED

QC
KUSAM-MECO
PASS



## *LIMITED 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, Burnt PCB 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 BUYERS 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.

KUSAM-MECO®

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