

**KUSAM-MECO**®

An ISO 9001:2008 Company

# HIGH VOLTAGE 5 KV DIGITAL INSULATION RESISTANCE TESTER

## SPECIAL FEATURES :

- Microprocessor controlled with advanced safety features.
- 2 lines X 16 Characters large LCD display.
- Bar-graph indicates test voltage-rise & decay can be observed during tests.
- Display and sound warning if external voltage is present.
- Continuous battery monitoring.
- Auto-ranging / Auto Power-off.
- Battery life is extended by "Energsave™" feature.
- Built-in carrying case. Test leads in separate pouch.
- Large LCD Show test time duration (up to 99.9s) for Easy Comparison.
- IEC 1010-1 CAT III 300V.

## Model- KM - 2803IN - 5KV DC

**LCD DISPLAY**

## ELECTRICAL SPECIFICATIONS: KM 2803IN

Test Voltage (DCV)	0.5 KV	1 KV	2.5 KV	5 KV
Measuring Ranges (Auto-Range)	0-25G	0-50G	0-125G	0-250G
Accuracy	0-50G : ± 3% of reading 50-250G : ± 5% of reading			
Pollution Degree	2			
Altitude	upto 2000 meter			
Operating Temperature & Humidity	0 ~ 40°C; 80% max. R.H.			
Storage Temperature & Humidity	-10°C ~ 65°C; 80% R.H.			
Power Source	1.5V (AA) x 8 Alkaline Batteries			
Weight (battery included)	930g Approx.			
Dimensions	170(L)x120(W)x95(D) mm.			
Accessories	Test leads-AL-50 (3 meter), AL-30 (1.25 meter), AL-30C (1.25 meter), Shoulder belt (BET-2800), Instruction Manual, Batteries			

**AL-50 TestLead standard****AL-30 TestLead**

All Specifications are subject to change without prior notice

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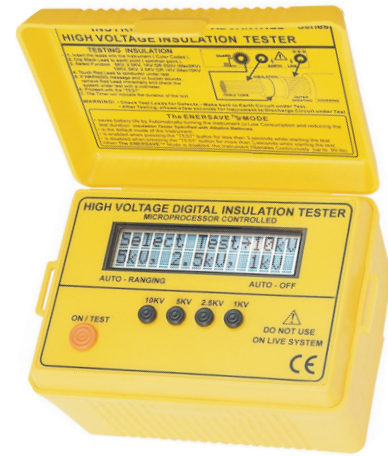
**HIGH VOLTAGE 10KV  
DIGITAL INSULATION RESISTANCE TESTER****Model- KM 2804IN - 10KV DC****SAFETY :**

CE marking according to the Low Voltage Directive (2006/95/EC) and EMC Directive (2004/108/EC, 92/31/EEC, & 93/68/EEC) and found to comply with the essential requirement of the directives.

IEC/EN 61010-1: 2001. EN 61326-1, EN 55011+A1+A2, EN 61000-3-2+A2, EN 61000-3-3+A1+A2, EN 61000-4-2+A1+A2, EN 61000-4-3+A1, EN 61000-4-4, EN 61000-4-5+A1, EN 61000-4-6+A1, EN 61000-4-8+A1, EN 61000-4-11, EN61000-4-6+A1, EN61000-4-11.

**ELECTRICAL SPECIFICATIONS: KM 2804IN**

Test Voltage (DCV)	1 KV	2.5 KV	5 KV	10 KV
Measuring Ranges (Auto-Range)	0-50G	0-125G	0-250G	0-500G
Accuracy	0-50G : ± 3% of reading 50-500G : ± 5% of reading			
Pollution Degree	2			
Altitude	upto 2000 meter			
Operating Temperature & Humidity	0 ~ 40°C; 80% max. R.H.			
Storage Temperature & Humidity	-10°C ~ 65°C; 80% R.H.			
Power Source	1.5V (AA) x 8 Alkaline Batteries			
Weight (battery included)	930g Approx.			
Dimensions	170(L)x120(W)x95(D) mm.			
Accessories	Test leads-AL-50 (3 meter), AL-30 (1.25 meter), AL-30C (1.25 meter), Shoulder belt (BET-2800), Instruction Manual, Batteries			



LCD DISPLAY



AL-50 TestLead standard



AL-30 TestLead



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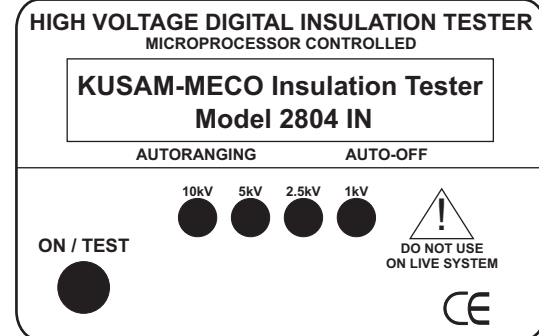
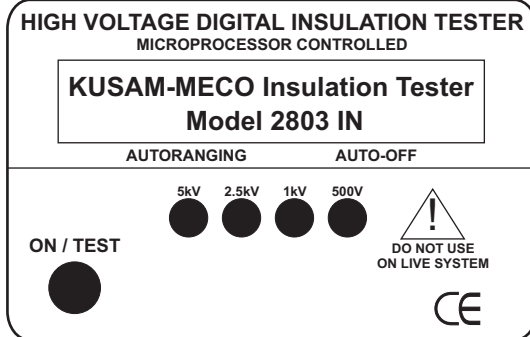
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**KUSAM-MECO**

# HIGH VOLTAGE INSULATION RESISTANCE TESTER

## OPERATION MANUAL



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## IMPORTANT!

### 1. Safety Precautions.

Electricity can cause severe injuries even with low voltages or currents. Therefore it is extremely important that you read the following information before using your Digital Insulation Tester.


- 1.1 This Instrument must only be used and operated by a competent trained person and in strict accordance with the instructions. **KUSAM-MECO** will not accept liability for any damage or injury caused by misuse or non compliance with instructions and safety procedures.
- 1.2 This instrument must not be used on live circuits. Ensure all circuits are de-energised before testing See paragraph 1.8 for details of built-in warning features should your Digital Insulation tester be connected to a live system.
- 1.3 Never open Digital Insulation Tester except for battery replacement. (See Battery replacement section).
- 1.4 Always inspect your Digital Insulation tester and test leads before use for any sign of abnormality or damage. If any abnormal conditions exist (broken test leads, cracked case, display faulty etc...). Do not attempt to take any measurement or use the tester, Return your digital Insulation tester to **KUSAM-MECO** or your nearest distributor for service.
- 1.5 Never replace the protective fuse with any other than the specified or approved equivalent.
- 1.6 Your Digital Insulation tester has been designed with your safety in mind. However, no design can completely protect against incorrect use. Electrical circuits can be dangerous and /or lethal when a lack of caution or poor safety practice is used. Use caution in the presence of voltage above 24V as these pose a shock hazard.
- 1.7 Pay attention to cautions and warnings which will inform you of potentially dangerous procedures.
- 1.8 Your Digital Insulation Tester has a live circuit warning beeper if it is connected to a live circuit, a rapid pulsating beep will be heard. **DO NOT** proceed to test and immediately disconnect the instrument from the circuit. In addition your tester will display the warning message.

### 1.9 Rated environmental conditions:

- 1.9.1 Indoor use.
- 1.9.2 Pollution Degree 2.
- 1.9.3 Altitude up to 2000 Meter.
- 19. 4 Relative Humidity 80% Max.
- 1.9.5 Ambient Temperature 0~40°C.

### 2.0 Observe the International Electrical Symbol listed below.

 Warning! Risk of electric shock.

 Caution ! Refer to this manual before using the meter.

## 2. Models

### 2.1 **2803 IN**

The 2803 IN is a four voltage(500V,1KV, 2.5 KV and 5 KV) Digital Insulation Tester. Auto Ranging and Menu Driven. The 2803 IN has a Bar-Graph which displays the voltage decay during the discharge of the tested circuit and the voltage stressing the insulation while the test is in progress.

The 2803 IN has a Timer which shows the elapsed time for which the test was"ON" and also shows the total time of the test.

The 2803 IN displays a Voltage warning and sounds when AC or DC is present before injecting the Test voltage. The 2803 IN will buzz intermittently when high voltage is generated and this remains until the circuit under test is fully discharged.

### 2.2 **2804 IN**

The 2804 IN is a four voltage(1KV, 2.5KV, 5KV and 10KV) Digital Insulation Tester. Auto Ranging and Menu Driven. The 2804 IN has a Bar-Graph which displays the voltage decay during the discharge of the tested circuit and the voltage stressing the insulation while the test is in progress.

The 2804 IN has a Timer which shows the elapsed time for which the test was"ON" and also shows the total time of the test.

The 2804 IN displays a Voltage Warning and sounds . when AC or DC is present before injecting the Test Voltage.

The 2804 IN will buzz intermittently when high voltage is generated and this remain until the circuit under test is fully discharged.

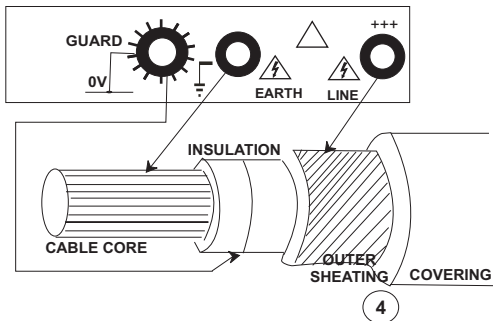
**3. FEATURES**

- 2 Lines X 16 Characters large L.C.D.
- Four Insulation Test Voltage

2803 IN	2804 IN
500VDC - 25000M	1000VDC - 50000M
1000VDC - 50000M	2500VDC - 125000M
2500VDC - 125000M	5000VDC - 250000M
5000VDC - 250000M	10000VDC - 500000M

- Insulation Resistance Autoranging on all range.
- ENERSAVE™.
- Bar-graph indicates test voltage-rise and decay can be observed during tests
- Warning and display of external voltage presence.
- Over load protected.
- Low battery indicator.
- Measure Insulation Timer Test.
- Very Low Battery Consumption.
- Smart Microprocessor controlled.
- One years Warranty.
- Better than 5% accuracy.
- Auto- Off.
- Compact and Light weight.

**4. CONNECTIONS**



**5. SPECIFICATIONS**

**2803 IN**

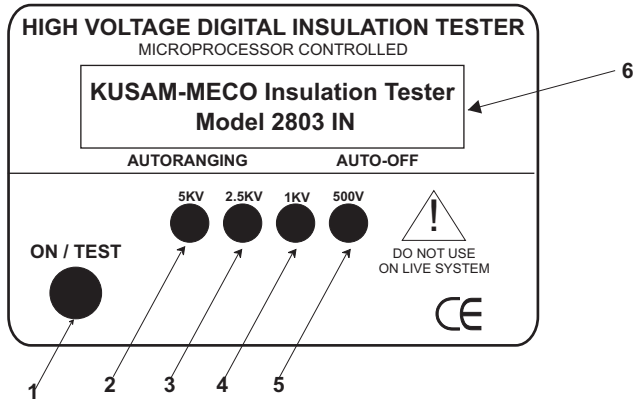
Test Voltage	500VDC	1KV DC	2.5KV DC	5KV DC
<b>Measuring Range Auto Ranging</b>	<b>25G</b>	<b>50G</b>	<b>125G</b>	<b>250G</b>
<b>Accuracy</b>	$\pm 5\% \pm 2$ Digits			
<b>Power</b>	8 x 1.5V Alkaline Battery			

**2804 IN**

Test Voltage	1kVDC	2.5kVDC	5kV DC	10kV DC
<b>Measuring Range Auto Ranging</b>	<b>50G</b>	<b>125G</b>	<b>250G</b>	<b>500G</b>
<b>Accuracy</b>	$\pm 5\% \pm 2$ Digits			
<b>Power</b>	8 x 1.5V Alkaline Battery			

**KUSAM-MECO**

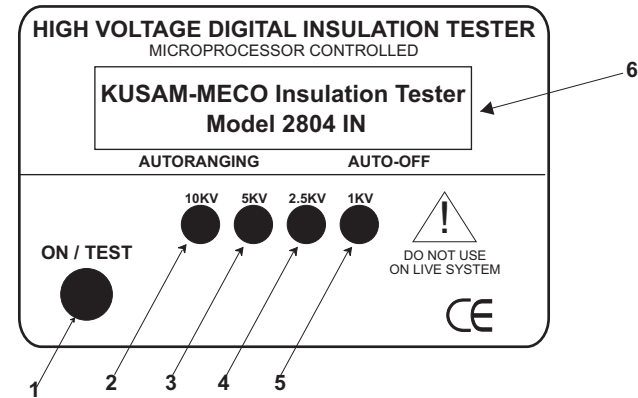
**INSTRUMENT LAYOUT : MODEL-2803**



- 1. On Switch. Test Button Switch
- ENERSAVE TM**
- 2.- 5000V Test Selection Button
- 3- 2500V Test Selection Button
- 4- 1000V Test Selection Button
- 5- 500V Test Selection Button
- 6- ENERSAVE TM .Interlligent L.C.D.

**KUSAM-MECO**

**INSTRUMENT LAYOUT : MODEL-2804**



- 1. On Switch. Test Button Switch
- ENERSAVE TM**
- 2.- 10000V Test Selection Button
- 3- 5000V Test Selection Button
- 4- 2500V Test Selection Button
- 5- 1000V Test Selection Button
- 6- ENERSAVE TM .Interlligent L.C.D.

## 7. FUNCTIONS.

### 7.1 Power-On

To switch your instrument "ON", press the on button(1). The L.C.D. will display the model, From then, Follow Interactive instructions on L.C.D.

**7.2 Insulation Resistance Measurement@ 10000Vdc.** To select 10KV DC Test voltage, press 10KV button(2) (only available on 2804 IN)

**7.3 Insulation Resistance Measurement@ 5KV DC.** To select 5KV DC Test voltage, press 5KV button(2) on model 2803 IN And(3) on model 2804 IN.

**7.4 Insulation Resistance Measurement@ 2.5KV DC.** To select 2.5KV DC Test voltage, press 2.5KV button(3) on model 2803 IN And(4) on model 2804 IN.

**7.5 Insulation Resistance Measurement@ 1KV DC.** To select 1KV DC Test voltage, press 1KV button(4) on model 2803 IN And(5) on model 2804 IN.

**7.6 Insulation Resistance Measurement@ 500V DC.** To select 500KV DC Test voltage, press 500V button(5) on model 2803 IN (only available on 2803 IN)

### 7.7 ENERSAVE™ Mode

The ENERSAVE™ Mode saves battery life by Automatically turning the instrument to low Consumption(Reducing the Test Duration).

The ENERSAVE™ Mode is default mode of the instrument The ENERSAVE™ Mode is enabled when pressing the TEST button (1)for less than 3 seconds.

The ENERSAVE™ Mode is disabled when pressing the TEST button (1)for more than 3 seconds.

When the ENERSAVE™ Mode is disabled, the instrument Operates in continuous mode.

### 7.8 Voltage Output Bar-Graph.

The Bar-Graph shows the voltage present on the leads It also shows the voltage charging a cable or capacitive system under test and shows the decay during the Automatic Capacitive discharge of the system under test.

### 7.9 Auto-Low Resistance Detect.

While in Insulation Test Mode, if the L.C.D. displays "LOW M stop test immediately. This could mean that the Insulation has breakdown and so you are now trying to inject very high voltage on a short circuit.

### 7.10 Timer

The duration of the test is shown on the L.C.D. This is particularly useful to verify that insulation does not break down within a certain time.

### 7.11 STOP Test

To stop the Test in progress, press the TEST button(1). The test will immediately stop and the Instrument will enable the ENERSAVE™ mode Automatically.

### 7.12 Auto- Stop

Should the operator leave the Instrument in the test mode with the ENERSAVE™ disabled, the Instrument will Automatically Stop the test after a duration of 99.9 Seconds. (Auto -off still applies)



**7.13 Auto Live / Voltage Warning.**

Should the leads be placed onto a live system before starting the test, a warning beeper will be automatically activated and,

Your instrument will display "Live Warning..... Circuit Live" Message.

Let the instrument discharge the circuit (in the case of capacitive system) or make sure that the circuit under test is not live.

**7.14 Auto-Discharge.**

At Auto-Stop or test completion, the Instrument Automatically discharge the system under Insulation test, so that the dangerous high voltage is discharged. The Auto-Discharge can be observed on the L.C.D so that the operator only removes for the leads when the discharge is complete. During discharge, beep occurs so that the user does wait for the complete discharge of the system under test. This is indicated by a one second long beep accompanied by the "HOLD" message on the display.

**DO NOT REMOVE LEADS UNTIL THE HOLD MESSAGE APPEARS ON THE DISPLAY.**

**7.15 "Replace Battery" Warning Indicator.**

If the battery energy is detected to be too low, the instrument will display the "Replace Battery" warning and Automatically shut-down. The instrument can't operate properly with a low battery. Use only Alkaline batteries.

**7.16 Auto-off**

The Auto-off is announced by a one second beep. The Auto-off timer is automatically enabled

**LIVE WARNING MESSAGE/BEEPER**  
To Clear Live Warning Message/Beeper  
Remove leads from circuit under test and push  
"TEST" button until display Clears

**8. Preparation for Measurement**

8.1 Before testing always check the following.

At Power "ON", read the display to make sure the "Replace Battery" message do not get displayed. There is no visual damage to the instrument or test leads.

**8.2 Test Leads continuity :**

Using a Ohm-meter, check the resistance/ continuity of the leads.

**9. Battery Replacement.****9.1 Battery Replacement**

Your Digital insulation Tester's battery is situated under the tester. Your ENERSAVE™ display will indicate you when battery need to be replaced.

Disconnect the test leads from the instrument, remove the battery cover and the batteries.

Replace with 8 alkaline 1.5V R6 or L6 batteries, taking care to observe correct polarity.

Replace battery Holder and the battery cover.

**10. Calibration & Servicing**

Both, calibration and servicing are performed at KUSAM-MECO facilities.

Before returning the Instrument , ensure that:

The leads have been checked for continuity and signs of damage.

The batteries are in good condition.

**11. CLEANING & STORAGE:****WARNING**

To avoid electrical shock or damage to the  
The meter, do not get water inside the case

Periodically wipe the case with a damp cloth and detergent ;  
do not use abrasives or solvents

**12. INSULATION RESISTANCE TESTING WITH 2803 IN**

Warning : Insulation test should be conducted on circuits that are de-energised.

Ensure circuits are not live before commencing testing

**2803 IN**

Turn instrument "ON" by pressing the "ON" button.  
The L.C.D. Display will come to the following screen.

Select Test → 5KV  
2.5KV, 1KV, or 500V

Select Insulation test voltage .For example, 500V  
The Following screen will confirm your selection.

500V 30000M  
Selected

Follow the Interactive Screen.

Connect Leads,.....  
Testing for Live.

If the system you are trying to Test is not voltage free,  
the beep will go on. the following warning screen will appears.  
Remove your leads immediately.

LIVE WARNING...  
Circuit Live !!!

If the system is not live, the test will start and the following  
screen will appear, indicating the test test ,duration and other  
factors

R=1253.0M 85.2s  
0 → ||||| ← 500V

If either the operator or the instrument stops the Test, the  
latest result is "HOLD" on the L.C.D.The instrument  
switches off after 45 to 60sec.

R=1253.0M 85.2s  
0 → HOLD ← 500V

**13. INSULATION RESISTANCE TESTING WITH 2804 IN**

Warning : Insulation test should be conducted on circuits that are de-energised.

Ensure circuits are not live before commencing testing

**2804 IN**

Turn instrument "ON" by pressing the "ON" button.  
The L.C.D. Display will come to the following screen.

Select Test → 10KV  
5KV, 2.5KV, or 1KV

Select Insulation test voltage .For example,10000V  
The Following screen will confirm your selection.

10KV 500000M  
Selected

Follow the Interactive Screen.

Connect Leads,.....  
Testing for Live.

If the system you are trying to Test is not voltage free,  
the beep will go on, the following warning screen will  
appears. Remove your leads immediately.

LIVE WARNING...  
Circuit Live !!!

If the system is not live, the test will start and the following  
screen will appear, indicating the test, duration and other  
factors

R=125340M 85.2s  
0 → ||||| ← 10KV

If either the operator or the instrument stops the Test, the  
latest result is "HOLD" on the L.C.D.The instrument  
switches off after 45 to 60sec.

R=125340M 85.2s  
0 → HOLD ← 10KV



MUMBAI  
**TEST CERTIFICATE**  
**HIGH VOLTAGE INSULATION  
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. \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

DATE: \_\_\_\_\_

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, 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 transactions are subject to Mumbai Jurisdiction.