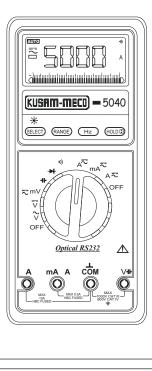
# (KUSAM-MECO) =

## DIGITAL MULTIMETER MODEL - 5040 / 5040-T



## (KUSAM-MECO)

#### TAKE MEASUREMENT CAREFULLY AND YOU'LL SPARE YOUR METER AND YOURSELF, SOME PAIN

Nearly every electrical engineer has a hand held digital multimeter (DMM). We sometimes take them for granted, until we damage them or "burn them out" if you incorrectly connect your DMM to a circuit or have the DMM on wrong setting, you damage the meter and possibly hurt yourself. You can also get into trouble if you try to measure the voltage across a charged capacitor.

DMM users frequently burn their meters by trying to measure current the same way as they measure voltage, Remember, you measure voltage across a circuit, and current through a circuit. When you use the current input, your DMM becomes a lower impedance circuit element. If you accidentally connect this low impedance path across your circuit, you'll effectively short-circuit it. You can, therefore send high current through your meter and severely damage it. Unless the meter has a fused input, you can even get an explosion or fire.

Even if you correctly insert your DMM into the circuit, you can still damage your meter. Don't try to measure current in excess of your meter's capacity. Handheld DMMs usually have a maximum current rating of 10A or 20A.

If you are measuring current in industrial environment, you can easily exceed those ratings. The best way to avoid damage is to use a clamp meter or to connect a clamp attachment to your DMM.

To prevent excess current from flowing through your meter, always disconnect the test leads from the circuit under test whenever you change DMM functions, Set your meter to the correct function, say current and its highest range for the setting, say 10A. Next, connect the test leads before you apply power to the circuit. To be safe, start by setting your meter to its highest range first.

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#### OVERVIEW

## 

To avoid electric shock or personal injury, read the "Safety Information" and "Rules for Safe Operation" carefully before using the Meter.

Digital Multimeter Model - 5040 / 5040-T (hereafter referred to as "the Meter") is a 3-4/5 digits Multimeter with steady operations, and highly reliable hand-held measuring instrument having high degree of protection. The Multimeter not only can measure AC / DC Voltage, AC / DC Current, Resistance, Capacitance, Frequency, Diode Test, but also has Data Hold, Full Icon Display, Backlight Display.

The above instrument comes with a windows software to record online data.

## TERMS IN THIS MANUAL

## 

Identifies conditions and actions that could result in serious injury or even death to the user.

# 

Identifies conditions and actions that could cause damage or malfunction in the instrument.



### **Unpacking Inspection**

Open the package case and take out the Multimeter. Check the following items carefully to see any missing or damaged part :

Item	Description	Qty.
1	English Operating Manual	1 piece
2	Test Lead	1 pair
3	Windows Software (Optional)	1 CD
4	Optical Cable (Optional)	1 no.

In the event you find any Part missing or damaged, please contact your dealer immediately.

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Item (3) & (4) are optional.

(KUSAM-MECO) = SPECIFICATIONS : GENERAL SPECIFICATIONS : **Display :**3-4/5 digits 5000 counts LCD display Update rate : 52 Segments Bargraph : 60 per second nominal Digital Data : 5 per second nominal; Low Battery : Below approx. 7V **Operating Temperature :** 0°C to 35°C, 0-80% R.H.; 35°C to 50°C, 0-70% R.H. Storage Temperature : -20°C to 60°C, 80% R.H. (with battery removed) Temperature Coefficient : normal 0.15 x (specified accuracy)/°C @ (0°C-18° or 28°C-50°C), or otherwise specified. **Power Supply** :Single standard Alkaline 9V battery **APO Timing :**Idle for 17 minutes Safetv : Double insulation per IEC61010-1 2nd Ed. EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No. 61010.1-0.92 to Category III 1000V AC & DC & Category IV 600V AC & DC. Terminals (to COM) measurement Category : V : Category III 1000V AC & DC & Category IV 600V AC & DC A/mA A: Category III & Category IV 600V AC & 300V DC. Transient Protection : 8kV (1.2/50 s surge) **E.M.C.**: Meets EN61326-1:2006 (EN55022, EN61000-3-2. EN61000-3-3. EN61000-4-2. EN61000-4-3. EN61000-4-4. EN61000-4-5. EN61000-4-6, EN61000-4-8, EN61000-4-11)

# (KUSAM-MECO) ==

In an RF field of 3V/m :

Capacitance function is not specified Other function range :

Total Accuracy = Specified Accuracy + 100 digits Performance above 3V/m is not specified.

## **Overload Protections :**

- A&mA : 1A/600V, IR 10kA or better, F fuse;
- A : 10A/600V, IR 100kA or better, F fuse
- V : 1050Vrms, 1450Vpeak;
- mV : 600VDC/VAC rms

& Others: 600VDC/VAC rms

Power Consumption : 4.3 mA typical

Dimension :(L)186mm X (W) 87mm X (H) 35.5mm;

(L)198mm X (W) 97mm X (H) 55mm with holster

Weight: 340gm; 430gm with holster

## **Special Feature :**

Data Hold; Range Hold, Backlighted display; Audible & visible input warning.

Accessories : Test leads pair, Holster, Battery installed, User's manual, PC interface kit (RS232 Optical adapter cable + RS232 software CD Optional).

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## ELECTRICAL SPECIFICATION

Accuracy is  $\pm$  (% reading digits + number of digits) or otherwise specified, at 23°C  $\pm$  5°C and less than 75% R.H

## AC VOLTAGE (50Hz - 60Hz)

Range	Resolution		Accuracy
50 mV	10	V	
500 mV	100	V	
5 V	1	mV	$\pm(0.5\%$ rdg+3dgts)
50 V	10	mV	±(0.5 /810g · 50g(5)
500 V	100	mV	]
1000 V	1	V	

**CMRR**: >60dB @ DC to 60Hz, Rs =1k **Input Impedance**: 10M , 16pF nominal (44pF nominal for 50mV & 500mV ranges)

## AC VOLTAGE (40Hz - 500Hz)

Range	Resolution		Accuracy
50 mV	10	V	±(0.8%rdg+3dgts)
500 mV	100	V	±(0.0 %iug · 50gis)
5 V	1	mV	
50 V	10	mV	±(1.0%rdg+4dgts)
500 V	100	mV	
1000 V	1	V	±(1.2%rdg+4dgts)

**CMRR**: >60dB @ DC to 60Hz, Rs =1k **Input Impedance**: 10M , 16pF nominal (44pF nominal for 50mV & 500mV ranges)



## AC VOLTAGE (Upto 20kHz)

Range	Resolution		Accuracy
50 mV	10	V	0.5 db*
500 mV	100	V	0.5 00
5 V	1	mV	
50 V	10	mV	3 db*
500 V	100	mV	
1000 V	1	V	Unspec'd

\*Specified from 30% to 100% of range **CMRR** : >60dB @ DC to 60Hz, Rs=1k **Input Impedance** : 10M , 16pF nominal (44pF nominal for 50mV & 500mV ranges)

#### DC VOLTAGE

Range	Resolution		Accuracy
50 mV	10	V	±(0.12%rdg+2dgts)
500 mV	100	V	±(0.06%rdg+2dgts)
5 V	1	mV	
50 V	10	mV	$\pm(0.08\%$ rdg+2dgts)
500 V	100	mV	
1000 V	1	V	]

### NMRR : >60dB @ 50/60Hz

CMRR : >120dB @ DC, 50/60Hz, Rs =1k Input Impedance : 10M , 16pF nominal (44pF nominal for 50mV & 500mV ranges)



#### AC CURRENT (50Hz - 60Hz)

Range		Resolution		Accuracy
500 A	4	100	nA	
5000 A	4	1	А	±(0.6%rdg+3dgts)
50 m/	4	10	А	
500 m/	4	100	А	±(1.0%rdg+3dgts)
5 A	A	1	mA	±(0.6%rdg+3dgts)
10 A	<b>4</b> *	10	mA	±(0.0 %)ug · 5ug(3)

Burden Voltage: 0.15mV/ A for 500 A, 5000 A. 3.3mV/mA for 50mA, 500mA & 45mV/A for 5A,10A. \* 10A continuous, >10A to 15A for 30 seconds max with 5 minutes cool down interval.

## AC CURRENT (40Hz - 1kHz)

Ran	ge	Resolution		Accuracy
500	А	100	nA	
500	D A C	1	А	±(0.8%rdg+4dgts)
50	mA	10	А	]
500	mA	100	Α	±(1.0%rdg+4dgts)
5	A	1	mA	±(0.8%rdg+4dgts)
10	A*	10	mA	±(0.0 /010g + 40g(3)

**Burden Voltage :** 0.15mV/ A for 500 A, 5000 A 3.3mV/mA for 50mA, 500mA & 45mV/A for 5A,10A. \* 10A continuous, >10A to 15A for 30 seconds max with 5 minutes cool down interval.

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## DC CURRENT

Ran	ge	Resolution		Accuracy
500	А	100	nA	
500	D A C	1	А	
50	mA	10	А	±(0.2%rdg+4dgts)
500	mA	100	Α	±(0.2 /010g+40gts)
5	А	1	mA	
10	A*	10	mA	

Burden Voltage : 0.15mV/ A for 500 A, 5000 A 3.3mV/mA for 50mA, 500mA & 45mV/A for 5A,10A. \* 10A continuous, >10A to 15A for 30 seconds max with 5 minutes cool down interval

### RESISTANCE

Range	Resolution	Accuracy
50	0.01	<u>+(0.3%rdg+6dgts)</u>
500	0.1	<u>+(0.1%rdg+3dgts)</u>
5 K	1	
50 K	10	<u>+(</u> 0.1%rdg+2dgts)
500 K	100	
5 M	1 K	<u>+(0.4%rdg+3dgts)</u>
50 M	10 K	<u>+(1.5%rdg+5dgts)</u>

### **Open Circuit Voltage :**

#### AUDIBLE CONTINUITY TESTER

Audible threshold	between 20	and 200
Response time	<100 s	

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## CAPACITANCE

Rang	e	Resolution		Accuracy*
50	nF	0.01	nF	+(0.8%rdg+3dgts)
500	nF	0.1	nF	<u>-(0.0 /010g · 50g(s)</u>
5	F	0.001	F	<u>+(</u> 1.5%rdg+3dgts)
50	F	0.01	F	<u>+(2.5%rdg+3dgts)</u>
500	F**	0.1	F	<u>+(3.5%rdg+5dgts)</u>
9999	F**	1	F	<u>+(5.0%rdg+5dgts)</u>

\* Accuracies with film capacitor or better.

\*\*In manual-ranging mode, measurements not specified below 45.0 F and 450 F for 500.0 F & 9999 F ranges respectively.

## FREQUENCY

Functi	on	Sensitivity (Sine RMS)		Range	
m۱	V	300	mV	10Hz - 125 kHz	
5 V	V	2	V		
50	V	20	V	10Hz - 20 kl	Ηz
500	V	80	V	10Hz - 1 kHz	
1000	V	300	V		
, Cx, D	iode	300	mV	10Hz - 125 kl	1-
A, mA,	A	10%	F.S.	10HZ - 125 KI	

Accuracy : 0.01% rdg + 2 dgts

## DIODE TEST

Range	Test Current	Accuracy
2.000 V	0.4mA	±(1.0%rdg+1dgt)

Open Circuit Voltage : <3.5V DC Overload Protection : 600V DC or AC rms

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## **RULES FOR SAFE OPERATION (1)**

## Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules :

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for Continuity. Replace damaged test leads with identical electrical specifications before using the Meter.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The rotary switch should be placed in the right position and no any change over of range shall bemade while measurement is conducted to prevent damage of the Meter.
- When measurement is taken at an effective Voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.
- Do not measure any circuit that draws more than the current rating of the protection fuse.
- Do not attempt a current measurement where the open circuit voltage is above the protection fuse voltage rating.

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- Never attempt a voltage measurement with the test lead inserted into the A/mA or A input jack.
- Replace the blown fuse with the proper rating as specified in the manual.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after the meter is dampened.
- When using the test leads, keep your fingers behind the finger guards.

## RULES FOR SAFE OPERATION (2)

- Disconnect circuit power and discharge all highvoltage capacitors before testing resistance, continuity, diodes, or current.
- Replace the battery as soon as the battery Indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Turn the Meter power off when it is not in use & take out the battery when not using for a long time.
- Constantly check the battery as it may leak when it has not been used for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.
- Disconnect the test leads from the test points before changing functions. Always set the instrument to the highest range and work down ward for an unknown value if you are using manual ranging mode.



### Safety

This manual contains information and warnings that must be followed for operating the instrument safely and maintaining the instrument in a safe operating condition. If the instrument is used in a manner not specified by the manufacture, the protection provided by the instruement may be impaired.

The meter protection rating, against the users, is Double insulation per IEC61010-1 2nd Ed., EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No. 61010.1-0.92 to Category III 1000V AC & DC & Category IV 600V AC & DC.

## Terminals (to COM) measurement Category :

- V : Category III 1000V AC & DC & Category IV 600V AC & DC
- A/mA A : Category III & Category IV 600V AC & 300V DC.

## Per IEC1010 Overvoltage Installation Category

## **OVERVOLTAGE CATEGORY I**

Equipment of OVERVOLTAGE CATEGORY I is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level. **Note** - Examples include protected electronic circuits.

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## **OVERVOLTAGE CATEGORY II**

Equipment of OVERVOLTAGE CATEGORY II is energy consuming equipment to be supplied from the fixed installation.

## OVERVOLTAGE CATEGORY III

Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.

**Note -** Examples include switches in the fixed installations and some equipment for industrial use with permanent connection to the fixed installation.

## OVERVOLTAGE CATEGORY IV

Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation. **Note -** Examples include electricity meters and primary over-current protection equipment.

## Electromagnetic Compatibility (EMC)

The instrument Meets EN61326-1:2006 (EN55022, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11).

	(Kusam-meco)
Internat	ional Electrical Symbols
	Grounding.
	Double Insulated.
	Fuse.
$\bigtriangleup$	Warning ! Refer to the Operating Manual.
Æ	Caution ! Risk of Electric Shock.
	/14

<ul> <li>MULTIMETER STRUCTURE</li> <li>Panel Illustration.</li> <li>Image: International internatio</li></ul>	(KUSAM-MECO)
<ul> <li>additional and the second se</li></ul>	
<ol> <li>Push-buttons for special functions &amp; features.</li> <li>Selector to turn the Power On or Off and Select a function</li> <li>Input Jack for 10A (&gt;10A to 15A for 30sec) current function.</li> <li>Input Jack for all functions EXCEPT current ( A, mA, A) functions.</li> <li>Common (Ground reference) Input Jack for all functions</li> <li>Input Jack for milli-amp &amp; micro-amp current Functions.</li> <li>Optical cable to connect DMM 5040 /</li> </ol>	(1)
	<ol> <li>3-4/5 digits 5000 counts LCD display.</li> <li>Push-buttons for special functions &amp; features.</li> <li>Selector to turn the Power On or Off and Select a function</li> <li>Input Jack for 10A (&gt;10A to 15A for 30sec) current function.</li> <li>Input Jack for all functions EXCEPT current ( A, mA, A) functions.</li> <li>Common (Ground reference) Input Jack for all functions</li> <li>Input Jack for milli-amp &amp; micro-amp current Functions.</li> <li>Optical cable to connect DMM 5040 /</li> </ol>



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#### Analog bar-graph

The analog bar graph provides a visual indication of measurement like a traditional analog meter needle. It is excellent in detecting faulty contacts, identifying potentiometer clicks, and indicating signal spikes during adjustments.

#### Average sensing RMS Calibrated

RMS (Root-Mean-Square) is the term used to describe the effective or equivalent DC value of an AC signal. Most digital multimeters use average sensing RMS calibrated technique to measure RMS values of AC signals. The technique is to obtain the average value by rectifying and filtering the AC signal. The average value is then scaled upward (calibrated) to read the RMS value of a sine wave. In measuring pure sinusoidal waveform, this technique is fast, accurate, and cost effective. In measuring pure sinusoidal waveforms, however, significant errors can be introduced because of different scaling factors relating average to RMS values.

#### True RMS

True RMS is a term which identifies a DMM that responds accurately to the effective RMS value regardless of the waveforms such as : square, sawtooth, triangle, pulse trains, spikes, as well as distorted waveforms with the presences of harmonics.

Harmonics may cause :

- 1) Overheated transformers, generators and motors to burn out faster than normal.
- 2) Circuit breakers to trip prematurely.
- 3) Fuses to blow
- 4) Neutrals to overheat due to the triplen harmonics present on the neutral.
- 5) Bus bars and electrical panels to vibrate.

## **Crest Factor**

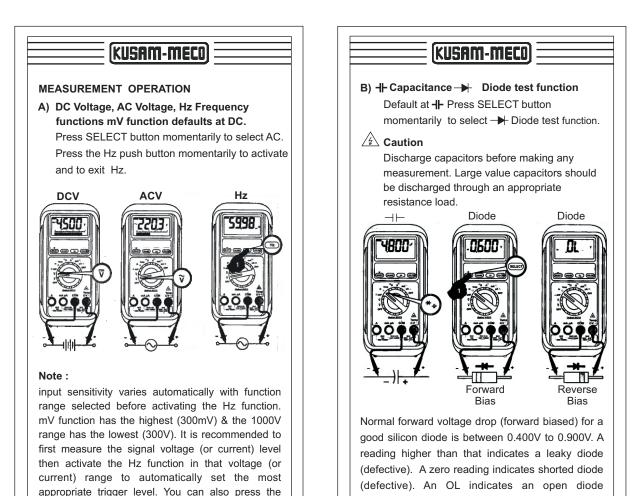
Crest Factor is the ratio of the Crest (instantaneous peak) value to the True RMS value, and is commonly used to define the dynamic range of a true RMS DMM. A pure sinusodial waveform has a Crest Factor of 1.4. A badly distorted sinusoidal waveform normally has a much higher Crest Factor.

## NMRR (Normal Mode Rejection Ratio)

NMRR is the DMM's ability to reject unwanted AC noise effect which can cause inaccurate DC measurements. NMRR is typically specified in terms of dB (decibel). DMM 5040 / 5040-T has a NMRR specification of >60dB at 50 and 60Hz which means a good ability to reject the effect of AC noise in DC measurements.

## CMRR (Common Mode Rejection Ratio)

Common mode voltage is voltage present on both the COM and VOLTAGE input terminals of a DMM with respect to ground. CMRR is the DMM's ability to reject common mode voltage effect which can cause digit rattle or offset in voltage measurements. DMM 5040 / 5040-T has a CMRR specifications of >60dB at DC 60Hz in ACV function; and >120dB at DC, 50 and 60Hz in DCV function. If neither NMRR nor CMRR specification is specified, a DMM's performance will be uncertain.



RANGE button momentarily to select another trigger

level manually. If the Hz reading becomes unstable, select lower sensitivity to avoid electrical noise. If

(defective). Reverse the test leads connections

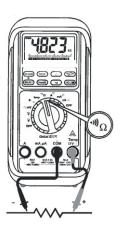
(reverse biased) across the diode. The display

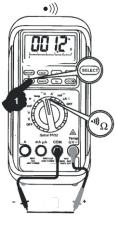
shows OL if the diode is good. Any other readings



## C) Resistance, Continuity functions

Default at Press SELECT button momentarily to select •))) Continuity function which is convenient for checking wiring connections and operation of switches. A continuous beep tone indicates a complete wire.





## 🖄 Caution

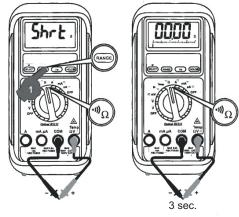
Using resistance and continuity function in a live circuit will produce false results and may damage the instrument. In many cases the suspected component must be disconnected from the circuit to obtain an accurate reading.

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#### Auto leads resistance calibration

When entering the 50 range manually by RANGE button for high precision low resistance measurement, this feature will prompt you to short the inputs for calibration. The display shows "Shrt". Simply short the leads for about 3 seconds until the display shows zero, then the resistance in the leads and in the internal protection circuitry of the meter is compensated automatically. The compensation value can be as much as 5

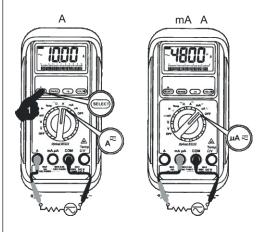


 A, mA and A Current function
 Default at DC. Press SELECT button momentarily to select AC.

\* **Note**: When measuring a 3-phase system, Sepecial attention should be taken to the phase to phase voltage which is significantly higher than the phase to earth voltage.

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To avoid exceeding the voltage rating of the protection fuse(s) accidently, always consider the phase to phase voltage as the working voltage for the protection fuse(s).



## E) RS232 PC computer interface capabilities

The instrument equips with an optical isolated interface port at the meter back for data communication. PC interface kit (RS232 optical adapter cable + RS232C software floppies) is required to connect the meter to the PC computer. The RS232 Data Recording System software equips with a digital meter, an analog meter, a comparator meter, and a Data Graphical recorder display. Refer to the README file in the interface kit for further Details.

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## FUNCTIONAL BUTTONS

### **Backlighted display**

Press the SELECT button for 1 second or more to turn on and off the display backlight function. The backlight will also be turned off automatically after 30 second to extend battery life.



## Hold 🔳

The Hold function freezes the display for later view. Press the HOLD button momentarily to activate and to exit the hold function.

HOLD 🛙





### Mannual or Auto-ranging

Press the RANGE button momentarily to select manual-ranging and the meter will remain in the range it was in, the LCD annunciators **AUTO** turns off. Press the button momentarily again to step through the ranges. Press and hold the button for 1 second or more to resume auto-ranging.

#### Note :

Manual ranging feature is not available in Hz function.



## Set Beeper Off

Press the Hz button while turning the meter on to disable the Beeper feature.

## Auto Power Off (APO)

The Auto Power Off (APO) mode turns the meter off automatically to extend battery life after approximately 17 minutes of no activities. Activites are speciafied as : 1) Rotary switch or push button operations and 2) Significant measuring data readings of around 10% of range. That is, the meter will intelligently avoid entering the APO mode when it is under normal measurements. To wake up the meter from APO, press the SELECT button momentarily or turn the rotary switch to the OFF position and then turn back on again. Always turn the rotary switch to the OFF position when the meter is not in use.

## Disabling Auto Power Off

Press the RANGE button while turning the meter on to disable the Auto Power Off (APO) feature.

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## MAINTENANCE

## 🕂 Warning

To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input jacks and turn OFF the meter before opening the case. Do not operate with open case. Install only the same type of fuse or equivalent.

## **Cleaning and storage**

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for periods of longer than 60 days, remove the battery and store it separately

## **Trouble Shooting**

If the instrument fails to operate, check battery, fuses, leads, etc., and replace as necessary. Double check operating procedure as described in this user's manual.

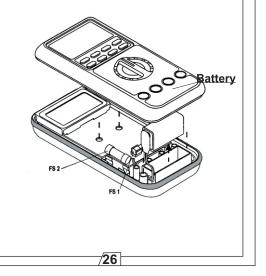
If the instrument voltage-resistance input terminal has been subjected to high voltage transient (caused by lighting or switching surge to the system) by accident or abnormal conditions of operation, the series fusible resistors will be blown off (become high impedance) like fuses to protect the user and the instrument. Most measuring functions through this terminal will then be open circuit. Refer to the warranty section for obtaining warranty and repairing service.

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### **Battery and Fuse replacement**

The meter uses a single standard 9V battery, a 600V/1A IR 10kA fast acting F fuse (FS 1) for A/mA current input, and a 600V/10A IR 100kA fast acting F fuse (FS-2) for A current input.

Loosen the screws form the case buttom. Lift the end of the case bottom nearest the input jacks until it unsnaps from the case top. Replace the battery and the blown fuse(s). Replace the case bottom, and ensure that all the gaskets are properly seated and the two snaps on the case top (near the LCD side) are engaged. Re-fasten the screws.



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# MUMBAI <u>TEST CERTIFICATE</u> DIGITAL MULTIMETER

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. 5040 / 5040-T

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 Two years (24 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.

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