

KUSAM-MECO

An ISO 9001:2015 Company

TRMS DIGITAL MULTIMETER WITH VFD, EF-DETECTION

3PHASE ROTATION-R & 3PHASE ROTATION-M

Model KM 237R

THINK SAFETY
THINK **KUSAM-MECO**

19 FUNCTIONS 39 RANGES**SPECIAL FEATURES :**

- Auto V(LoZ), VFD V & Hz Function
- EF-Detection (NCV)
- Paper White Backlight Display
- Auto Power Off
- Auto-ranging MAX/MIN/AVG record
- Diode & Continuity Test
- Beep/Lit Continuity, Features Audible Beep & Visible Backlight Effects
- Beep-Jack Input warning against improper A-terminal plug in
- Auto-ranging Relative Zero Mode
- 3phase rotation-R(Regular-sensitivity mode) for supply systems(probe-contact)
- 3phase rotation-M (Hi-sensitivity mode) for Motors (probe-contact)
- Rugged Fire retarded casing.
- Display Hold
- Low Battery Indication

**CAT II 1000V
CAT III 600V
CAT IV 300V
UL
APPROVED**

GENERAL SPECIFICATIONS :

- * Sensing : TRUE RMS AC conversion
- * Display : 3-5/6 digits 6000 counts LCD display
- * Update Rate : 5 per second nominal
- * Operating Temperature : -10°C to 45°C
- * Relative Humidity : Maximum relative humidity 80% for temperature upto 31°C decreasing linearly to 50% relative humidity at 45°C
- * Altitude : Operating Below 2000m.
- * Storage Temperature: -20°C to 60°C, <80% R.H. With battery removed from meter.
- * Pollution Degree : 2
- * Temperature Coefficient : nominal 0.15 x (specified accuracy) /°C @ (-10°C~18°C or 28°C~45°C), or otherwise specified.
- * Low battery : Below approx. 2.5V
- * Power Consumption : Typical 3.2mA
- * APO Consumption : Typical 10µA
- * APO Timing : Idle for 30 minutes
- * Power Supply : 1.5V AAA battery x 2
- * Dimension : 161(L) X 80(W) X 50(H) mm (with Holster)
- * Weight : Approx. 334 gm (with Holster)

SAFETY :

- **Safety** : Double insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/UL/EN61010-2-030 Ed. 1.0, IEC/UL/EN61010-2-033 Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 & the corresponding CAN/CSA-C22.2 regulations to measurement CAT II 1000V, CAT III 600V and CAT IV 300V AC & DC.
- **E. M. C. :** Meets EN61326-1:2013
 - In an RF field of 3V/m :
 - Ohm function :
 - Total Accuracy = Specified Accuracy + 15 digits
 - Other function ranges :
 - Total Accuracy = Specified Accuracy
 - Performance above 3V/m is not specified.
- **Transient Protection** : 6.0kV lightning surge (1.2/50µs)
- **Terminals (to COM) Measurement Category :**
 - V/ mAµA / A / L3 : CAT II 1000 Volts, CAT III 600V and CAT IV 300 Volts AC & DC.
- **Overload Protections :**
 - A : 11A/ 1000V DC/AC rms, IR 20kA, F fuse or better
 - V, Auto V & L3 : 1100V DC/AC rms
 - mV, Ω & Others : 1000V DC/AC rms

**Magnetic Hanger****ACCESSORIES :** Test leads pair, Alligator clip set, Batteries installed, User's Manual.**OPTIONAL ACCESSORIES :** Magnetic Hanger, Carrying case.

Current Clamp CA300, Current Clamp Adaptor CA500, CA1000, CA2000, High Voltage Probe PD-28.

All Specifications are subject to change without prior notice.

ELECTRICAL SPECIFICATIONS - KM 237R

Accuracy is \pm (% reading digits + number of digits) or otherwise specified, at 23°C \pm 5°C

ACV & ACA accuracies are specified from 1% to 100% of range or otherwise specified. Maximum Crest Factor <2:1 at full scale & <4:1 half scale, and with frequency components fall within the meter specified frequency bandwidth for non-sinusoidal waveforms.

DC VOLTAGE

Range	Resolution	Accuracy
60.00 mV	10 μ V	$\pm(0.3\%rdg + 2dgts)$
600.0 mV	100 μ V	
6.000 V	1 mV	
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

Input Impedance : 10M Ω , 54pF nominal

AC VOLTAGE

Range	Resolution	Accuracy
50Hz -- 60Hz		
6.000 V	1 mV	$\pm(0.7\%rdg + 3dgts)$
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	
45Hz -- 440Hz		
6.000 V	1 mV	$\pm(2.0\%rdg + 3dgts)$
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	
10Hz -- 500Hz		
60.00 mV	10 μ V	$\pm(1.0\%rdg + 3dgts)$
600.0 mV	100 μ V	
500Hz -- 800Hz		
60.00 mV	10 μ V	$\pm(2.0\%rdg + 3dgts)$
600.0 mV	100 μ V	

Input Impedance : 10M Ω , 54pF nominal

LINE FREQUENCY

Function	Sensitivity (Sine RMS)	Range
60 mV	50 mV	10Hz - 50kHz
600 mV	50 mV	10Hz - 50kHz
6 V	3 V	10Hz - 50kHz
60 V	5 V	10Hz - 50kHz
600 V	50 V	10Hz - 1kHz
1000 V	500 V	10Hz - 1kHz
VFD 600 V	50 V	10Hz - 1kHz
VFD 1000V	500 V	10Hz - 1kHz
6 A	8 A	50Hz - 1kHz
10 A	8 A	50Hz - 1kHz

Accuracy : 0.03%+2d

BEEPLIT CONTINUITY TESTER

Continuity Threshold :	Between 30 Ω and 480 Ω
Response time :	64ms
Latch time :	128ms
Audible Response :	Beep sound
Visible Response :	LCD Backlight

DIODE TESTER

Range	Resolution	Accuracy
3.000 V	100mV	$\pm(0.9\%rdg + 2dgts)$

Test Current : 0.3mA typical.

Open Circuit Voltage : <3.2VDC typical.

DC CURRENT

Range	Resolution	Accuracy	Burden Voltage
6.000 A	1 mA	$\pm(0.7\%rdg + 3dgts)$	0.04 V / A
10.00 A ¹⁾	10 mA		0.04 V / A

¹⁾ 10A continuous, >10A to 20A for 30 Sec. Max with 5 minutes cool down interval
Overload Protection type : HBC fuse

AC CURRENT

Range	Resolution	Accuracy	Burden Voltage
50Hz -- 400Hz			
6.000 A	1 mA	$\pm(1.0\%rdg + 3dgts)$	0.04 V / A
10.00 A ¹⁾	10 mA		0.04 V / A

¹⁾ 10A continuous, >10A to 20A for 30 Sec. Max with 5 minutes cool down interval
Overload Protection type : HBC fuse

VFD AC VOLTAGE (with Low Pass Filter)

Range	Resolution	Accuracy ¹⁾
10Hz -- 440Hz (fundamental)		
600.0 V	100 mV	$\pm(1.0\%rdg + 3dgts)$
1000 V	1 V	

¹⁾ Not specified for fundamental frequency >440Hz

AUTOV_ AC VOLTAGE

Range	Resolution	Accuracy ¹⁾
45Hz -- 440Hz		
600.0 V	100 mV	$\pm(2.0\%rdg + 3dgts)$
1000 V	1 V	

¹⁾ Not specified at <1VAC

Threshold : >1VAC nominal

Input Impedance : Initially approx. 2.1k Ω , 164pF nominal;
Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical).

Ended up impedances vs display voltages typically are:

12k Ω @100V

100k Ω @300V

240k Ω @600V

580k Ω @1000V

AUTOV_ DC VOLTAGE

Range	Resolution	Accuracy ¹⁾
600.0 V	100 mV	$\pm(2.0\%rdg + 3dgts)$
1000 V	1 V	

¹⁾ Not specified at <1VAC

Threshold : > + 1.0VDC or < -1.0VDC nominal

Input Impedance : Initially approx. 2.1k Ω , 164pF nominal;
Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical).

Ended up impedances vs display voltages typically are:

12k Ω @100V

100k Ω @300V

240k Ω @600V

580k Ω @1000V

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ELECTRICAL SPECIFICATIONS - KM 237R

CAPACITANCE

Range	Resolution	Accuracy
2000 nF	1 nF	±(1.5%rdg + 2dgts)
20.00 μF	10 nF	
200.0 μF	100 nF	
2000 μF	1 μF	
10.00 mF	10 μF	±(4.5%rdg + 10dgts)

Accuracies with film apacitor or better

NON-CONTACT EF-DETECTION

Bar-Graph Indication	EF-H (Hi Sensitivity)	EF-L (Lo Sensitivity)
	Typical Voltage (Tolerance)	
-	10V (3V ~ 19V)	40V (16V ~ 71V)
--	20V (10V ~ 38V)	80V (32V ~ 142V)
---	40V (21V ~ 79V)	160V (63V ~ 285V)
----	80V (40V ~ 156V)	300V (105V ~ 608V)
-----	160V (>80V)	500V (>300V)

Indication : Bar-graph segments & audible beep tones proportional to the field strength

Detection Frequency : 50/60Hz

Detection Antenna : Top left end of the meter

Probe-Contact EF-Detection : For more precise indication of live wires, such as distinguishing between live and ground connections, use direct contact testing with one single test-probe via an input terminal COM or V. The COM terminal (Black) has the test sensitivity.

OHMS

Range ¹⁾	Resolution	Accuracy
600.0 Ω	100 mΩ	±(0.3%rdg + 3dgts)
6.000 kΩ	1 Ω	
60.00 kΩ	10 Ω	±(0.5%rdg + 3dgts)
600.0 kΩ	100 Ω	
6.000 MΩ ²⁾	1 kΩ	±(0.9%rdg + 2dgts) ⁴⁾
60.00 MΩ ³⁾	10 kΩ	

¹⁾ Open Circuit Voltage : 1.6VDC typical.

²⁾ Constant Test Current : 0.2μA Typical

³⁾ Constant Test Current : 0.02μA Typical

⁴⁾ 5% + 20d @ > 30MΩ.

Ⓜ 3-PHASE ROTATION FUNCTION

Hi-sensitivity mode Ⓜ	
Voltage Range	0.4V ~ 1000V
Frequency Range	3Hz ~ 400Hz

Ⓡ 3-PHASE ROTATION FUNCTION

Regular sensitivity mode Ⓡ	
Voltage Range	65V ~ 1000V
Frequency Range	35Hz ~ 400Hz

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