

3-5/6 DIGIT 6000 COUNTS TRMS DIGITAL MULTIMETER MODEL - KM 2257

THINK SAFETY

 THINK **KUSAM-MECO®**

SPECIAL FEATURES :

- AutoV (LoZ);
- BeepLit™ Continuity;
- Backlighted LCD;
- Display Hold;
- VFD;
- BeepJack™ on mA/mA / A terminals
- Auto-ranging MAX / MIN / AVG Record;
- Auto-ranging Relative Zero mode;
- EF-Detection (NCV);



GENERAL SPECIFICATIONS :

- **Sensing** : True RMS sensing
- **Display** : 3½ digits 6,000 counts
- **Update Rate** : 3½ digits: Max 5 per second nominal
60 Segment Bar-graph: 40 per second max
- **Operating Temperature** : -10°C to 50°C continuous operating
(except on A function, see Electrical Specifications below for more details)
- **Relative Humidity** : Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 50°C
- **Altitude** : Operating below 2000m
- **Ingress Protection** : Ip40
- **Storage Temperature** : -20°C ~ 60°C, < 80% R.H. (with battery removed)
- **Temperature Coefficient** : Nominal 0.15 x (specified accuracy) / °C @
(-10°C ~ 18°C or 28°C ~ 50°C), or otherwise specified
- **Low Battery** : Below approx. 2.5V
- **Power Supply** : 1.5V AAA Size battery X 2
- **Power Consumption (typical)** : 4.0mA
- **APO Consumption (typical)** : 20A
- **APO Timing** : Idle for approx. 30 minutes
- **Dimension** : Approx. 161(L) x 80(W) x 50(H)mm (With Holster)
- **Weight** : Approx. 334 gm (With Holster)
- **Accessories** : Test lead pair; Batteries installed; User's manual;
BKP60 banana plug type-K thermocouple
- **Optional purchase accessories** : BKB32 banana plug to type-K socket plug adaptor;
BMH-01 magnetic hanger; USB interface kit BRUA-20X



Preliminary Data

SAFETY :

- Certified per IEC/UL/EN/BSEN 61010-1 Ed. 3.1, IEC/UL/EN/BSEN 61010-2-033 Ed. 2.0, IEC/UL/EN/BSEN 61010-031 Ed. 2.0 and the corresponding CAN/CSA-C22.2 regulations to Measurement Categories : CAT II 1000V, CAT III 600V and CAT IV 300V AC & DC
- **Transient Protection** : 6.0kV (1.2/50ms surge)
- **Pollution Degree** : 2
- **E.M.C.**: Meets EN61326-1
In an RF field of 3V/m:
Temperature function is not specified
Ohm function: Total Accuracy = Specified Accuracy + 15 digits
Other functions: Total Accuracy = Specified Accuracy
Performance above 3V/m is not specified

• Overload Protection :

mA & mA: 0.63A/1000V DC/AC rms, IR 30kA, F fuse;
or better A: 11A/1000V DC/AC rms, IR 20kA, F fuse;
or better V & AutoV: 1100V DC/AC rms mV, Ohm &
others: 1000V DC/AC rms

Note: All Specification are Subject to change without prior notice.

ELECTRICAL SPECIFICATION

Accuracy is given as (% of reading digits + number of digits) or otherwise specified @ 23°C 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 at half scale, and with frequency components fall within the meter specified frequency bandwidth for non-sinusoidal waveforms

AC VOLTAGE

Range	Resolution	Accuracy
50Hz ~60Hz		
6.000V	0.001V	± (0.7%rdg + 3dgts)
60.00V	0.01V	
600.0V	0.1V	
1000V	1V	
45Hz ~500Hz		
6.000V	0.001V	± (1.0%rdg + 5dgts)
60.00V	0.01V	
600.0V	0.1V	
1000V	1V	

Input Impedance : 10MΩ, 54pF nominal

VFD_ACV (with Low Pass Filter)

Range	Resolution	Accuracy ¹⁾
10Hz ~ 100Hz (fundamental)		
600.0V	0.001V	± (1.0%rdg + 3dgts)
1000V	0.01V	
100Hz ~ 400Hz (fundamental)		
600.0V	0.001V	± (10%rdg + 3dgts) ²⁾
1000V	0.01V	

¹⁾ Not specified for fundamental frequency > 400Hz

²⁾ Accuracy linearly decreases from 1%+3d@100Hz to 10% + 3d@400Hz.

DC Voltage

Range	Resolution	Accuracy
60.00 mV	0.01mV	± (0.3%rdg + 4dgts)
600.0 mV	0.1mV	
6.000 V	0.001V	
60.00 V	0.01V	± (0.4%rdg + 3dgts)
600.0 V	0.1V	± (0.2%rdg + 3dgts)
1000 V	1V	± (0.4%rdg + 3dgts)

Input Impedance: 10MΩ, 54pF nominal

AutoV_DCV

Range	Resolution	Accuracy ¹⁾
6.000 V	0.001V	± (1.0%rdg + 4dgts)
60.00 V	0.01V	
600.0 V	0.1V	
1000 V	1V	

¹⁾Not specified at <1.5VDC

Threshold: > +1.5VDC or < -1.5VDC nominal

Input Impedance:

Initially approx. 2.1kΩ, 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:

12kΩ @100V
100kΩ @300V
240kΩ @600V
580kΩ @1000V

ACmV

Range	Resolution	Accuracy
40Hz ~500Hz		
60.00mV ²⁾	0.001V	± (1.0%rdg + 3dgts)
600.0mV ³⁾	0.01V	
500Hz ~1kHz		
60.00mV ²⁾	0.001V	± (2.0%rdg + 3dgts)
600.0mV ³⁾	0.01V	

Input Impedance : 10MΩ, 54pF nominal

²⁾ Signal peak absolute values, including DC bias, less than 130mVpeak

³⁾ Signal peak absolute values, including DC bias, less than 1300mVpeak

AutoV_ACV

Range	Resolution	Accuracy ¹⁾
50Hz ~ 60Hz		
6.000V	0.001V	± (1.0%rdg + 5dgts)
60.00V	0.01V	
600.0V	0.001V	
1000V	0.01V	

¹⁾ Not specified at <1.5VAC

Threshold : >1.5V AC nominal

Input Impedance: Initially approx. 2.1kΩ, 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:

12kΩ @100V
100kΩ @300V
240kΩ @600V
580kΩ @1000V

DC Current

Range	Resolution	Accuracy	Burden Voltage
600.0 μA	0.1 μA	± (0.5%rdg + 5dgts)	0.1mV / μA
6000 μA	1 μA		1.9mV / mA
60.00 mA	0.01 mA		
600.0 mA	0.1 mA	± (1.0%rdg + 5dgts)	0.04V / A
6.000 A	0.001 A		
10.00 A ¹⁾	0.01 A		

¹⁾ 10A continuous up to ambient 40°C only, and is <3 mins on per >15mins off @ 40°C ~ 55°C;

>10A to 20A for <30 seconds on per >15 mins off

Logic Level Hz (DCmV Function)

Range	Sensitivity (Square wave)
10.00Hz ~ 200.0kHz	3V peak

Accuracy : 0.03% + 3d

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AC Current

Range	Resolution	Accuracy	Burden Voltage
50Hz ~ 400Hz			
600.0 μ A	0.1 μ A	$\pm (1.0\% \text{rdg} + 5 \text{dgts})$	0.1mV / μ A
6000 μ A	1 μ A		
60.00 mA	0.01 mA		1.9mV / mA
600.0 mA	0.1 mA		
6.000 A	0.001 A		0.04V / A
10.00 A ¹⁾	0.01 A		

¹⁾ 10A continuous up to ambient 40°C only, and is
<3 mins on per >15mins off @ 40°C ~ 55°C;
>10A to 20A for <30 seconds on per >15 mins off

CREST mode (Instantaneous Peak Hold)

Accuracy : Specified accuracy ± 250 digits

for changes > 5ms in duration

Availability : Voltage & Current functions

Resolution : 6000 counts

CAPACITANCE

Range	Resolution	Accuracy
20.00nF	0.01nF	$\pm (1.5\% \text{rdg} + 8 \text{dgts})$
200.0nF	0.1nF	
2000nF	1nF	$\pm (1.5\% \text{rdg} + 2 \text{dgts})$
20.00 μ F	0.01 μ F	
200.0 μ F	0.1 μ F	
2000 μ F	1 μ F	
10.00mF	0.01mF	$\pm (4.5\% \text{rdg} + 10 \text{dgts})$

Accuracies with film capacitor or better

Diode Tester

RANGE	Accuracy
3.000V	1.0% + 3d

Test Current: 0.3mA typical

Open Circuit Voltage: < 3.2VDC typical

BeepLit™ Continuity Tester

Continuity Threshold: Between 30 Ω and 480 Ω

Continuity ON Response Time: <15ms

Audible Indication: Beep sound

Visible Indication: LCD Backlight

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 the input terminal COM or V. The COM terminal (Black) has the best sensitivity.

RESISTANCE (OHMS)

Range ¹⁾	Resolution	Accuracy
600.0 Ω	0.1 Ω	$\pm (0.5\% \text{rdg} + 4 \text{dgts})$
6.000 k Ω	0.001k Ω	
60.00 k Ω	0.01 k Ω	
600.0 k Ω	0.1 k Ω	
6.000 M Ω ²⁾	0.001 M Ω	$\pm (0.7\% \text{rdg} + 4 \text{dgts})$
60.00 M Ω ³⁾	0.01 M Ω	$\pm (2.0\% \text{rdg} + 4 \text{dgts})$ ³⁾

¹⁾ Open Circuit Voltage : 1.6V DC typical

²⁾ Constant Test Current : 0.2 μ A typical

³⁾ Constant Test Current : 0.02 μ A typical

⁴⁾ 5% + 20d @ >30M Ω

TEMPERATURE

Range	Resolution	Accuracy ^{1) 2)}
-40.0°C ~ 99.9°C	0.1 °C	$\pm (1.0\% \text{rdg} + 1 °C)$
100°C ~ 1000°C	1 °C	$\pm (0.3\% \text{rdg} + 3 °C)$
-40.0°F ~ 99.9°F	0.1 °F	$\pm (1.0\% \text{rdg} + 2 °F)$
100°F ~ 1832°F	1 °F	$\pm (0.3\% \text{rdg} + 6 °F)$

¹⁾ Accuracies assume meter interior & the ambient have reached the same temperature (isothermal stage)

for a correct function voltage compensation. Allow enough settling time for a significant change of ambient temperature. It can take up to an hour for changes > 5°C.

²⁾ Type-K Thermocouple range & accuracy not included.

Line Frequency

Function	Sensitivity (Sine RMS)	Range
6V	0.4V	10Hz - 50kHz
60V	4V	
600V	40V	10Hz - 1kHz
1000V	400V	
VFD 600V	50V	
VFD 1000V	500V	
600 μ A	40 μ A	10Hz - 5kHz
6000 μ A	400 μ A	
60mA	40mA	
600mA	400mA	
6A	0.6A	50Hz - 1kHz
10A	6A	

Accuracy: 0.03% + 3d

AutoHold Real-Read™

Accuracy: Specified accuracy ± 50 digits

Availability: Resistance, Continuity, LoZ AutoV,
VFD Volts, Voltage and Current functions

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