

AC / DC TRMS Clamp-On Multimeter with VFD, EF-Detection, PC Interface & Extended 1500V DC Range

MODEL KM 2778

SPECIAL FEATURES :

- Extended >1000 ~ 1500V DC range suitable for solar
- AutoCheck™ Voltage & Ohms
- VFD-V & VFD-Hz function
- 5ms CREST-MAX capture mode (Peak Hold)
- Autoranging Relative -Zero mode
- Display Hold function
- EF-Detection (NCV)
- Backlight LCD Display
- Auto Power Off
- Diode Test & Continuity Test
- PC Interface (Optional)

GENERAL SPECIFICATIONS :

- * Sensing : TRMS sensing
- * Jaw Opening : 55mm max.
- * Display : 3-5/6 digits 6000 counts & 3½ digits 1,999 counts for Hz.
- * Update Rate : 5 per second nominal
- * Polarity : Automatic
- * Low Battery : Below approx 2.4V
- * Operating Temperature : 0°C to 40°C
- * Relative Humidity : Maximum 80% R. H. for temperature upto 31°C decreasing linearly to 50% Relative Humidity at 40°C
- * Storage Temperature : -20°C to 60°C, < 80% R.H. (With battery removed)
- * Altitude : Operating below 2000m
- * Temperature Coefficient : nominal 0.15 x (specified accuracy) / °C @ (0°C--18°C or 28°C--40°C), or otherwise specified
- * Power supply : Standard 1.5V AAA Battery x 2.
- * Power Consumption : Typical 14mA for Current function, & 5.2mA for others.
- * APO Timing : Idle for 34 minutes
- * APO Consumption : 10µA typical
- * Dimension : 264(L) x 97(W) x 43(H) mm
- * Weight : Approx. 608gm.
- * Accessories : Test leads (pair), user's manual, Bkp60 banana plug K-type Thermocouple x 1 & carrying case.
- * Optional Accessories : USB interface kit BRUA-19X, BKB32 banana plug to type-K socket plug adaptor

SAFETY :

- Double insulation per IEC/EN61010-1 2nd Ed., UL61010-1 2nd Ed., & CAN/CSA C22.2 No.61010.1-0.92 to Category CAT IV 1000V AC & DC.
- Transient Protection : 12 kV (1.2/50µs surge)
- Overload Protection : Clamp-on jaws : 2000A rms continuous " + " & COM Terminals (all other functions) : 1000V rms.
- Pollution degree : 2
- EMC : 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) In an RF field of 3V/m : Capacitance function is not specified Other function ranges : Total Accuracy = Specified Accuracy + 200 digits Performance above 3V/m is not specified.



ELECTRICAL SPECIFICATIONS : KM 2778

Accuracy is ± (% readings digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% R.H.

True RMS voltage accuracies are specified from 5% to 100% of range or otherwise specified.

Maximum Crest Factor <1.4:1 at full scale & <2.8:1 at half scale, & with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

ACA CURRENT(Clamp on)

Range	Resolution	Accuracy ¹⁾
50Hz – 60Hz		
200.0 A	100 mA	±(2.0%rdg + 5dgts)
0 ~ 500 A	1 A	±(2.5%rdg + 5dgts)
500~2000 A	1 A	±(3.0%rdg + 5dgts)
40Hz~50Hz & 60Hz~400Hz		
200.0 A	100 mA	±(2.5%rdg + 5dgts)
0 ~ 500 A	1 A	±(3.0%rdg + 5dgts)
500~1000 A	1 A	±(3.5%rdg + 5dgts)
1000~2000 A	1 A	Unspecified

True RMS Crest Factor :

< 1.4:1 at full scale & <2.8:1 at half scale

¹⁾Induced error from adjacent current carrying conductor :

<0.1A/A

DCA CURRENT(Clamp on)

Range	Resolution	Accuracy ¹⁾²⁾
200.0 A	100 mA	±(2.0%rdg + 5dgts)
0 ~ 500 A	1 A	±(2.0%rdg + 5dgts)
500~2000 A	1 A	±(2.5%rdg + 5dgts)

¹⁾Induced error from adjacent current carrying conductor : <0.1A/A

²⁾Specified with Relative Zero Δ mode applied to offset the non-zero residual readings, if any.

DC + ACA CURRENT(Clamp on)

Range	Resolution	Accuracy ¹⁾²⁾
DC, 50Hz ~ 60Hz		
200.0 A	100 mA	±(3.0%rdg + 8dgts)
2000 A	1 A	
40Hz ~ 50Hz & 60Hz ~ 400Hz		
200.0 A	100 mA	±(3.5%rdg + 8dgts)
0 ~ 1000 A	1 A	
1000~2000 A	1 A	Unspecified

True RMS Crest Factor :

< 1.4:1 at full scale & <2.8:1 at half scale

¹⁾Induced error from adjacent current carrying conductor :

<0.1A/A

²⁾Specified with Relative Zero Δ mode applied to offset the non-zero residual readings, if any.

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

ELECTRICAL SPECIFICATIONS : KM 2778

DC VOLTAGE

Range	Resolution	Accuracy
6.000 V	1 mV	±(0.5%rdg + 5dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	
1000 ~ 1500V	1 V	

Input Impedance : 10MΩ, 50pF nominal

AC VOLTAGE

Range	Resolution	Accuracy
50Hz ~ 400Hz		
6.000 V	1 mV	±(1.2%rdg + 5dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

Input Impedance : 10MΩ, 50pF nominal

AC + DC VOLTAGE

Range	Resolution	Accuracy
DC, 50Hz ~400Hz		
6.000 V	1 mV	±(1.4%rdg + 7dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

Input Impedance : 10MΩ, 50pF nominal

VFD_ACV (with Low Pass Filter)

Range	Resolution	Accuracy ¹⁾
10Hz ~ 20Hz		
6.000 V	1 mV	±(4%rdg + 80dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	
20Hz ~ 200Hz		
6.000 V	1 mV	±(2%rdg + 60dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	
200Hz~420Hz²⁾		
6.000 V	1 mV	±(7%rdg + 80dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

¹⁾ Not specified for fundamental frequency > 400Hz²⁾ Accuracy linearly decreases from 2% + 50d @ 200Hz to 7% + 80d @ 400Hz

AUTOCHECK™_ACV

Range	Resolution	Accuracy ¹⁾
50Hz ~ 60Hz		
6.000 V	1 mV	±(1.5%rdg + 5dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

AutoCheck™ Lo-Z ACV Threshold : >1.5V (50/60Hz) nominal.

AutoCheck™ Lo-Z ACV input impedance :

Initially approx. 2.5kΩ, 600pF 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 :

10 kΩ @ 100V
 60 kΩ @ 300V
 200kΩ @ 600V
 420kΩ @ 1000V

AUTOCHECK™_DCV

Range	Resolution	Accuracy
6.000 V	1 mV	±(1.3%rdg + 5dgts)
60.00 V	10 mV	
600.0 V	100 mV	
1000 V	1 V	

AutoCheck™ Lo-Z DCV Threshold : >+1.5VDC & <-1.5VDC nominal.

AutoCheck™ Lo-Z DCV input impedance :

Initially approx. 2.5kΩ, 600pF 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 :
 10 kΩ @ 100V
 60 kΩ @ 300V
 200kΩ @ 600V
 420kΩ @ 1000V

CAPACITANCE

Range	Resolution	Accuracy ¹⁾
60.00 nF	10 pF	±(2.0%rdg + 5dgts)
600.0 nF	100 pF	
6.000 μF	1 nF	±(3.5%rdg + 5dgts) ²⁾
60.00 μF	10 nF	
600.0 μF	100 nF	±(4.0%rdg + 5dgts) ²⁾
2000 μF	1 μF	

¹⁾ Accuracies with film capacitor or better²⁾ Temperature Coefficient : 0.25 x (specified accuracy) / °C @ (0°C ~ 18°C or 28°C ~ 40°C)

OHM & AUTOCHECK™_OHM¹⁾

Range	Resolution	Accuracy
600.0 Ω	0.1 Ω	±(0.5%rdg + 5dgts)
6.000 KΩ	1 Ω	
60.00 KΩ	10 Ω	±(0.8%rdg + 5dgts)
600.0 KΩ	100 Ω	
6.000 MΩ	1 KΩ	±(1.2%rdg + 5dgts)
40.00 MΩ	10 KΩ	±(2.3%rdg + 5dgts)

Open Circuit Voltage : 0.45VDC typical.

¹⁾AutoCheck™ OhmThreshold : <10.00MΩ nominal.

~Hz LINE LEVEL FREQUENCY

Function	Sensitivity (Sine RMS)	Range
6 V	2 V	40Hz ~ 1999Hz
60 V	20 V	40Hz ~ 1999Hz
600 V	100 V	40Hz ~ 1999Hz
1000 V	600 V	40Hz ~ 1999Hz
200 A	10 A	20Hz ~ 400Hz
2000 A	40 A	20Hz ~ 400Hz
VFD 6 V ¹⁾	1 V ~ 2 V	10Hz ~ 400Hz
VFD 60 V ¹⁾	6 V ~ 20 V	10Hz ~ 400Hz
VFD 600 V ¹⁾	60 V ~ 200 V	10Hz ~ 400Hz

Accuracy : 0.1% + 4d

¹⁾VFD sensitivity linearly decreases from 10% F.S. @ 200Hz to 40% F.S. @ 400Hz

NON-CONTACT EF-DETECTION

Typical Voltage	Bar-Graph Indication
20V (tolerance : 10V ~ 36V)	-
55V (tolerance : 23V ~ 85V)	- - -
110V (tolerance : 59V ~ 600V)	- - - - -

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

Detection Frequency : 50/60Hz

Detection Antenna : Top side of the stationary jaw
 Probe-Contact EF-Detection: For more precise indication of live wires, such as distinguishing between live and ground connections, use the Red (+) test probe for direct contact measurement.

TEMPERATURE

Range	Resolution	Accuracy
-50°C ~ 1000°C	1°C	±(0.3%rdg + 4dgts)
-58°F ~ 1832°F	1°F	±(0.3%rdg + 6dgts)

K-type Thermocouple range & accuracy not included

CREST-MAX CAPTURE MODE

Accuracy : Specified accuracy plus 250 digits for changes > 5ms in duration

AUDIBLE CONTINUITY TESTER

Audible Threshold	Response Time
between 10Ω and 200Ω	32ms approx.

DIODE TESTER

Range	Test Current (Typical)	Open Circuit Voltage
1.000V	0.56mA	<1.8V DC typical

Accuracy : 1.0% + 3d

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