KUSAM-MECO®
An ISO 9001:2015 Company

# AC / DC TRMS Clamp-On Multimeter with VFD, EF-Detection & PC Interface

THINK SAFETY
THINK KUSAM-MECO®

## Model KM 2777 - TRUE RMS SENSING

### SPECIAL FEATURES :

- 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)


**Preliminary Data**

### 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 2777

Accuracy is ± (% readings digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% R.H.
True RMS Model KM 2777 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.



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# ELECTRICAL SPECIFICATIONS : KM 2777

### 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 | |

**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~420Hz[2]** | | |
| 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 > 400Hz

[3] 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

### 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.

### CAPACITANCE

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

[1] Accuracies with film capacitor or better

[2] Temperature Coefficient : 0.25 x (specified accuracy) / °C @ (0°C ~ 18°C or 28°C ~ 40°C)

### ~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

### 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

### OHM & AUTOCHECK™ _OHM[1]

| Range | Resolution | Accuracy |
|---|---|---|
| 600.0 Ω | 0.1 Ω | ±(0.5%rdg + 5dgts) |
| 6.000 KΩ | 1 Ω | |
| 60.00 KΩ | 10 Ω | |
| 600.0 KΩ | 100 Ω | ±(0.8%rdg + 5dgts) |
| 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.

### 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

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

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