

DIGITAL CLAMP-ON-MULTIMETER WITH VFD FUNCTION

16 FUNCTION 39 RANGES

Model - KM 181

Large size Motors use Modern Technology for their operation. Instead of conventional Star Delta starters they use adjustable (variable frequency) drivers. This gives high starting torque for the motors. But VFD's also generate High Frequency Voltage & High Frequency Signals. These signals if measured by an ordinary TRUE RMS Multimeter will give incorrect readings. For correct measurements, it is necessary to have a DMM which filters the High Voltage & High Frequency (carrier frequency) Signals & display the fundamental Voltage & fundamental Hz correctly. This Clampmeter displays this readings correctly. Hence it is very essential for installation of VFD's properly.

SPECIAL FEATURES :

- VFD-V & VFD-Hz function
- 5ms CREST-MAX capture mode (Peak Hold)
- Autoranging Relative -Zero mode
- Data Hold function
- EF-Detection (NCV)
- PC Interface (Optional)
- AutoCheck™ Voltage & Ohms
- Hz Line Level Frequency
- Manual / Autoranging range selection.
- Auto Power Off
- Diode Test & Continuity Test

GENERAL SPECIFICATIONS :

- * Sensing : Average sensing
- * Jaws Opening size : 26 mm 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
- * Altitude : Operating below 2000m
- * Storage Temperature : -20°C to 60°C, < 80% R.H. (With battery removed)
- * 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 : 5.2mA typical
- * APO Timing : Idle for 34 minutes
- * APO Consumption : 10 A typical
- * Dimension : 190(L) x 63(W) x 32(H) mm
- * Weight : Approx. 179gm.

SAFETY :

- 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 600V & CAT IV 300V AC & DC.
- Transient Protection : 6 kV (1.2/50 s surge)
- 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 + 100 dgts
Performance above 3V/m is not specified.
- Overload Protection :
ACA Clamp-on jaws : AC 600A rms continuous
" + " & COM Terminals (all other functions) : 660V DC / V AC rms.

ACCESSORIES :

Test lead pair, Batteries installed, User's manual & Carrying case



Preliminary Data

ELECTRICAL SPECIFICATIONS : KM 181

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

ACA CURRENT(Clamp on)

Range	Resolution	Accuracy ¹⁾⁽²⁾⁽³⁾
50Hz – 400Hz		
60.00 A	10 mA	$\pm(1.8\%rdg + 3dgt)$
600.0 A	100 mA	

¹⁾Add 12d to specified accuracy while reading is at 1% to 10% of range.

²⁾Induced error from adjacent current carrying conductor : <0.5A/A

³⁾Specified accuracy is from 1% to 100% of range and for measurements made at the jaw center. When the conductor is not positioned at the jaw center, position errors introduced are: Add 1% to specified accuracy for measurements made WITHIN jaw marking lines (away from jaw opening)
Add 4% to specified accuracy for measurements made beyond jaw marking lines (toward jaws opening)

AUTOCHECK™ DCV

Range	Resolution	Accuracy
6.000 V	1 mV	$\pm(1.3\%rdg + 5dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ¹⁾	1 V	

¹⁾ Added range to indicate instantaneous over-range voltage values.

AutoCheck™ Lo-Z DCV Threshold : >+1.0VDC & <-1.0VDC nominal.

AutoCheck™ Lo-Z DCV input impedance :

Initially approx. 2.5k Ω , 200pF 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 :
15 k Ω @ 100V
100k Ω @ 300V
250k Ω @ 600V

AUDIBLE CONTINUITY TESTER

Audible Threshold	Response Time
Between 10 and 200	32ms approx.

~Hz LINE LEVEL FREQUENCY

Function	Sensitivity (Sine RMS)	Range
6 V	1 V	10Hz ~ 1999Hz
60 V	6 V	10Hz ~ 1999Hz
600 V	60 V	10Hz ~ 1999Hz
VFD 6 V ¹⁾	1 V ~ 2 V	10Hz ~ 420Hz
VFD 60 V ¹⁾	6 ~20 V	10Hz ~ 420Hz
VFD 600 V ¹⁾	60 V ~ 200 V	10Hz ~ 420Hz
VFD 60 A ¹⁾	6 A ~ 20 A	20Hz ~ 420Hz
VFD 600 A ¹⁾	60 A ~ 200 A	20Hz ~ 420Hz

Accuracy : 0.03% + 4d

¹⁾VFD sensitivity linearly decreases from 10% F.S. @ 200Hz to 40% F.S. @ 420Hz

AC VOLTAGE

Range	Resolution	Accuracy
50Hz ~ 400Hz		
6.000 V	1 mV	$\pm(1.2\%rdg + 5dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ¹⁾	1 V	

¹⁾Added range to indicate instantaneous over-range voltage values.

Input Impedance : 10M Ω , 50pF nominal

AUTOCHECK™ ACV (with Low Pass Filter)

Range	Resolution	Accuracy ¹⁾
5Hz ~ 20Hz		
6.000 V	1 mV	$\pm(3.0\%rdg + 80dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ²⁾	1 V	
20Hz ~ 200Hz		
6.000 V	1 mV	$\pm(2.0\%rdg + 50dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ²⁾	1 V	
200Hz~420Hz³⁾		
6.000 V	1 mV	$\pm(6\%rdg + 80dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ²⁾	1 V	

¹⁾ Not specified for fundamental frequency > 420Hz

²⁾ Added range to indicate instantaneous over-range voltage values

³⁾ Accuracy linearly decreases from 2% + 50d @ 200Hz to 6% + 80d @ 420Hz

AutoCheck™ Lo-Z ACV Threshold : >1V (50/60Hz) nominal.

AutoCheck™ Lo-Z ACV input impedance :

Initially approx. 2.5k Ω , 200pF 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 :
15 k Ω @ 100V
100k Ω @ 300V
250k Ω @ 600V

DIODE TESTER

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

Accuracy : 1.0% + 3d

CREST-MAX CAPTURE MODE

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

DC VOLTAGE

Range	Resolution	Accuracy
6.000 V	1 mV	$\pm(0.5\%rdg + 5dgt)$
60.00 V	10 mV	
600.0 V	100 mV	
600 V ¹⁾	1 V	

¹⁾Added range to indicate instantaneous over-range voltage values.

Input Impedance : 10M Ω , 50pF nominal

AUTOCHECK™ OHM

Range ¹⁾	Resolution	Accuracy
600.0	0.1	$\pm(0.5\%rdg + 5dgt)$
6.000 K	1	
60.00 K	10	$\pm(0.8\%rdg + 5dgt)$
600.0 K	100	
6.000 M	1 K	$\pm(1.2\%rdg + 5dgt)$
60.00 M	10 K	$\pm(2.2\%rdg + 5dgt)$

Open Circuit Voltage : 0.45VDC typical.

¹⁾AutoCheck™ OhmThreshold : <10.00M Ω nominal.

CAPACITANCE

Range	Resolution	Accuracy ¹⁾
60.00 nF	10 pF	$\pm(2.0\%rdg + 5dgt)$
600.0 nF	100 pF	
6.000 F	1 nF	$\pm(3.5\%rdg + 5dgt)$ ²⁾
60.00 F	10 nF	
600.0 F	100 nF	$\pm(4.0\%rdg + 5dgt)$ ²⁾
2000 F	1 F	

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)

NON-CONTACT EF-DETECTION

Typical Voltage	Bar-Graph Indication
20V (tolerance : 10V ~ 36V)	-
55V (tolerance : 23V ~ 83V)	--
110V (tolerance : 59V ~ 165V)	---
220V (tolerance : 124V ~ 330V)	----
440V (tolerance : 250V ~ 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.

All Specifications are subject to change without prior notice.