

SPECIAL FEATURES :

- Auto Hold
- VFD
- BeepLit™ Continuity
- Record MAX, MIN, & AVG readings
- Crest (Instantaneous Peak hold) MAX & MIN readings
- Relative Zero mode
- Data Hold
- Backlighted LCD display
- BeepJack™ audible & visible input warning
- %4-20mA loop
- current readings
- T1-T2 differential temperature readings
- dBm readings

GENERAL SPECIFICATIONS :

- * **Sensing:** AC and AC+DC True RMS
- * **Display :** 4-5/6 digits 60,000 counts.
- * **Polarity :** Automatic
- * **Update Rate:**
4-5/6 digits: Max 5 per second nominal
31 Segment Bar-graph: 50 per second max
- * **Operating Temperature:** -20°C to 55°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 55°C
- * **Storage Temperature:** -20°C to 60°C, < 80% R.H. (with battery removed)
- * **Altitude:** Operating below 2000m
- * **Temperature Coefficient:** nominal 0.10 x (specified accuracy)/ °C @
(-20°C ~ 18°C or 28°C ~ 55°C), or otherwise specified
- * **Power Consumption:** 10mA typical for AC & AC+DC Voltage/Current functions;
8mA typical for other functions
- * **Low Battery:** Below approx. 3.7V
- * **APO Timing:** Idle for 15 minutes
- * **APO Consumption:** 15µA typical.
- * **Power Supply:** 1.5V AAA Alkaline battery x 3
- * **Accessories:** Test lead pair, User's manual, Bkp60 banana plug K-type thermocouple x 1
- * **Optional Accessories:** BKB32 banana plug to type-K socket plug adaptor, BMH-02 magnetic hanger strap
- * **Dimension:** L193mm X W89mm X H51mm
- * **Weight:** Approx. 420 gm

SAFETY :

- **Safety:** Double insulation per IEC/UL/EN/BSEN 61010-1 Ed. 3.0, IEC/UL/EN/BSEN 61010-2-030 Ed. 1.0, IEC/UL/EN/BSEN 61010-2-033 Ed. 1.0, IEC/UL/EN/BSEN 61010-031 Ed. 2.0 and the corresponding CAN/CSA-C22.2 regulations to Measurement Categories III 1000V AC & DC and Category IV 600V AC & DC
- **E.M.C.:** Meets EN/BSEN 61326-1:2013
- **Overload Protections:**
µA & mA: 0.4A/1000V DC/AC, IR 30kA or better, F fuse
A: 11A/1000V DC/AC, IR 20kA or better, F fuse
V: 1100V DC/AC rms
mV, Ω & Others: 1000 V DC/AC rms
- **Pollution degree:** 2
- **Transient protection:** 8kV (1.2/50µs surge)



Preliminary Data

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

ELECTRICAL SPECIFICATIONS : KM 789

Accuracy is \pm (% reading digits + number of digits) or otherwise specified, at 23°C \pm 5°C & less than 75% relative humidity. Maximum Crest Factor <1.6:1 at full scale & < 3.2:1 at half scale, and with frequency components fall within the specified frequency bandwidth for non-sinusoidal waveforms.

DC VOLTAGE

Range	Accuracy
600.00 mV, 6.0000V, 60.000V	$\pm(0.03\% + 2\text{dgst})$
600.00 V	$\pm(0.05\% + 5\text{dgst})$
1000.0 V	$\pm(0.15\% + 5\text{dgst})$

Input Impedance : 10M Ω , 75pF nominal
(280pF nominal for 600mV range)

AC+DC VOLTAGE

Range	Accuracy
50Hz ~ 60Hz	
600.00mV ²⁾ , 6.0000V, 60.000V, 600.00V, 1000.0V	$\pm(0.7\%\text{rdg} + 40\text{dgts})$
0Hz, 40Hz ~ 1kHz	
600.00mV ²⁾ , 6.0000V, 60.000V, 600.00V, 1000.0V	$\pm(1.2\%\text{rdg} + 40\text{dgts})$
1kHz ~ 7kHz	
600.00mV ²⁾ , 6.0000V, 60.000V, 600.00V	$\pm(2.0\%\text{rdg} + 50\text{dgts})$
1000.0V	
7kHz ~ 20kHz	
600.00mV ²⁾ , 6.0000V, 60.000V, 600.00V ³⁾	$\pm(2.5\%\text{rdg} + 70\text{dgts})$
1000.0V	

1)Accuracy specified from 10% to 100% of range
2)Signal peak absolute values, including DC bias, less than 1000mVpeak
3)Bandwidth specified to 10kHz only for 600V range
Input Impedance: 10M Ω , 75pF nominal (140pF nominal for 600mV range)
Residual reading less than 50 digits with test leads shorted.

RESISTANCE

Range	Accuracy ¹⁾
600.00 Ω	$\pm(0.085\%\text{rdg} + 10\text{dgts})$
6.0000k Ω , 60.000k Ω	$\pm(0.085\%\text{rdg} + 4\text{dgts})$
600.00k Ω	$\pm(0.15\%\text{rdg} + 4\text{dgts})$
6.0000M Ω ²⁾	$\pm(1.5\%\text{rdg} + 5\text{dgts})$
60.000Mk Ω ^{3,4)}	$\pm(2.0\%\text{rdg} + 5\text{dgts})$
99.99nS ⁵⁾	$\pm(1.1\%\text{rdg} + 10\text{dgts})$

Open Circuit Voltage: < 1.3VDC (< 1.5VDC for 600 Ω range)
1)Temperature Coefficient: 0.20 x (specified accuracy)/ °C @ (-20°C ~ 18°C or 28°C ~ 55°C)
2)Constant Test Current: 0.1 μ A Typical
3)Constant Test Current: 0.01 μ A Typical
4)Specified accuracy adds 0.5% @ >50M Ω
5)Specified accuracy adds 30d @ <10nS

CAPACITANCE

Range	Accuracy ¹⁾²⁾
10.00nF ²⁾	$\pm(1.0\%\text{rdg} + 10\text{dgts})$
100.0nF~1000nF	$\pm(1.0\%\text{rdg} + 2\text{dgts})$
10.00 μ F~1.000mF	$\pm(1.8\%\text{rdg} + 4\text{dgts})$
10.00mF	$\pm(2.0\%\text{rdg} + 4\text{dgts})$

1)Accuracies with film capacitor or better
2)Temperature Coefficient: 0.20 x (specified accuracy)/ °C @ (-20°C ~ 18°C or 28°C ~ 55°C)

Hz LOGIC LEVEL FREQUENCY

Range	Accuracy
5.000Hz ~ 1.0000MHz	0.002% + 4d

1)Sensitivity: >3.0Vp square wave
2)Specified with Pulse Width > 0.5 μ s

DC Loop Current %4~20mA

4mA = 0% (zero)
20mA = 100% (span)
Resolution: 0.01%
Accuracy: \pm 25d

AC VOLTAGE

Range	Accuracy
50Hz ~ 60Hz	
600.00mV 2), 6.0000V, 60.000V, 600.00V, 1000.0V	$\pm(0.5\%\text{rdg} + 30\text{dgts})$
40Hz ~ 1kHz	
600.00mV 2), 6.0000V, 60.000V, 600.00V, 1000.0V	$\pm(0.9\%\text{rdg} + 30\text{dgts})$
1kHz ~ 7kHz	
600.00mV 2), 6.0000V, 60.000V, 600.00V	$\pm(1.8\%\text{rdg} + 40\text{dgts})$
1000.0V	
7kHz ~ 20kHz	
600.00mV 2), 6.0000V, 60.000V, 600.00V	$\pm(2.0\%\text{rdg} + 60\text{dgts})$
1000.0V	
20kHz ~ 100kHz	
600.00mV 2), 6.0000V, 60.000V	$\pm(4.0\%\text{rdg} + 60\text{dgts})$
600.00V, 1000.0V	

1)Accuracy specified from 10% to 100% of range
2)Signal peak absolute values, including DC bias, less than 1000mVpeak
3)Accuracy adds 1% @ >5kHz ~ 7kHz
4)Bandwidth specified to 10kHz only for 600V range
5)Accuracy specified from 30% to 100% of range
Input Impedance: 10M Ω , 75pF nominal (140pF nominal for 600mV range)
Residual reading less than 50 digits with test leads shorted

LoZ Auto-DCV

Range	Accuracy
6.000V, 60.000V, 600.00V, 1000.0V	$\pm(0.5\%\text{rdg} + 30\text{dgts})$

LoZ Auto-DCV Threshold: > +1.0VDC or < -1.0VDC nominal
LoZ Auto-DCV Input Impedance:
Initially approx. 2.1k Ω , 140pF 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, 90k Ω @ 300V, 300k Ω @ 600V, 670k Ω @ 1000V

LoZ Auto-ACV

Range	Accuracy
50Hz ~ 60Hz	
6.000V, 60.000V, 600.00V, 1000.0V	$\pm(1.0\%\text{rdg} + 40\text{dgts})$

1)Accuracy specified from 10% to 100% of range
LoZ Auto-ACV Threshold: > 1.0VAC (50/60Hz) nominal
LoZ Auto-ACV Input Impedance:
Initially approx. 2.1k Ω , 140pF 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, 90k Ω @ 300V, 300k Ω @ 600V, 670k Ω @ 1000V

BEEPLIT™ CONTINUITY TESTER

Audible threshold: between 100 Ω and 420 Ω
Response time < 100 μ s
Audible Indication: Beep Sound
Visible Response: LCD Backlight

BEEPLIT™ DIODE TESTER

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
3.0000V	$\pm(1\%\text{rdg} + 20\text{dgts})$	0.35mA	<3.1VDC

Short-Beep-Alert Threshold: Drop Across 0.850V
BeepLit™ continuous ON Threshold: < 0.100V
Audible Indication: Beep Sound
Visible Indication: LCD Backlight

CREST mode (Instantaneous Peak Hold)

Accuracy: Specified accuracy \pm 100 digits for changes > 0.35ms in duration
Availability: Voltage and Current functions
Resolution: 6000 counts

AutoHold Real-Read™

Accuracy: Specified accuracy \pm 50 digits
Availability: Resistance, Continuity, LoZ AutoV, VFD Volts, Voltage and Current functions

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ELECTRICAL SPECIFICATIONS : KM 789

AC+DC CURRENT

Range	Accuracy ¹⁾	Burden Voltage
0Hz, 40Hz – 3kHz		
600.00μA, 6000.0μA	±(1.0%rdg + 30dgts)	0.2mV/μA
60.000mA, 600.00mA	±(1.2%rdg + 40dgts)	2.0mV/mA
6.0000A, 10.000A ¹⁾		30mV/A

1) Accuracy unspecified @ <10% of range

2) 10A continuous up to ambient 40°C only, and is <3 mins on per >15 mins off @ 40°C ~55°C; >10A to 20A for <30 seconds on per >15 mins off

% DUTY CYCLE

5V Logic Frequency	Range Specified	Accuracy
5Hz ~ 1kHz	0.10% ~ 99.99%	3d/kHz+2d
1kHz ~ 10kHz	1.00% ~ 99.00%	
10kHz ~ 500kHz	20.00% ~ 80.00%	

Sensitivity: >3.0Vp square wave

VFD AC VOLTAGE

Range	Accuracy ¹⁾
10Hz ~ 200Hz	
600.00V, 1000.0V	±(4%rdg + 50dgts)
200Hz ~ 440Hz	
600.00V, 1000.0V	±(10%rdg + 50dgts)

1) Signal fundamental frequency > 440Hz is unspecified

2) Accuracy linearly decreases from 2% + 50d @ 200Hz to 10% + 50d @ 440Hz

Non-Contact EF-Detection (NCV)

Bar-Graph Indication	EF-H (Hi Sensitivity)	EF-L (Lo Sensitivity)
	Typical Voltage (Tolerance)	
-	25V (18V~45V)	60V (50V~140V)
--	50V (30V~80V)	120V (100V~260V)
---	80V (70V~160V)	230V (180V~400V)
----	120V (110V~250V)	400V (330V~490V)
-----	350V (>270V)	600V (>500V)

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 (Single-pole): For more precise indication of live wires, such as distinguishing between live and ground connections, use one single test probe to test via terminal COM for direct metal contact probing to achieve the most distinctive indications.

RECORD mode (MAX MIN AVG)

Function Mode Where Available	Added Uncertainty 1) to Specified Accuracy	Min. Volts/Amps Signal Duration	REC Nominal Update Rate per Second
DC	±30d	300ms	10
AC	±300d (±80d ²⁾³⁾	460ms	5 (10 ²⁾)
VFD	±180d	800ms	5
DC+AC	±300d ²⁾	2s	1
nS	-	-	1
Cx	-	-	Subject to Cx Values
Hz, T1-T2	-	-	2
Ω, T1, T2, Others	-	-	5

1) Specified at Range Locked (Manual-ranging)

2) Specified at AC Inputs >15% of Range

DC CURRENT

Range	Accuracy ¹⁾	Burden Voltage
600.0μA ¹⁾²⁾	±(0.075%rdg + 20dgts)	0.2mV/μA
6000μA	±(0.075%rdg + 20dgts)	0.2mV/μA
60.000mA ²⁾	±(0.075%rdg + 20dgts)	2.0mV/mA
600.0mA	±(0.15%rdg + 20dgts)	2.0mV/mA
6.0000A	±(0.3%rdg + 20dgts)	30mV/A
10.00A ³⁾	±(0.3%rdg + 30dgts)	30mV/A

1) Specified with Open-circuit-voltage (OCV) of Current-loop-under-test at >100μV.

2) The meter shows a few negative residue counts when the input is short-circuited, with OCV at zero volt. It is the nature of the internal protection circuitry design, and will not affect measurement readings at nominal OCVs greater than 100μV in significant measurements.

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

AC CURRENT

Range	Accuracy ¹⁾	Burden Voltage
40Hz – 3kHz		
600.00μA, 6000.0μA	±(0.9%rdg + 20dgts)	0.2mV/μA
60.000mA, 600.00mA		2.0mV/mA
6.0000A, 10.000A ¹⁾	±(1.0%rdg + 30dgts)	30mV/A

1) Accuracy unspecified @ <10% of range

2) 10A continuous up to ambient 40°C only, and is <3 mins on per >15 mins off @ 40°C ~ 55°C; >10A to 20A for <30 seconds on per >15 mins off

TEMPERATURE

Range	Accuracy ¹⁾²⁾
-200.0°C to 1090°C	1.0% + 1.0°C
-328.0°F to 1994°F	1.0% + 1.8°F

1) Accuracies assume meter interior has the same temperature (isothermal stage) of the ambient for a correct junction voltage compensation. Allow the meter and the type-K probe set to reach isothermal stage 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

~Hz LINE LEVEL FREQUENCY

Function Range	Sensitivity (Sine RMS)	Range
6 V	0.4 V	10Hz ~ 50kHz
60 V	4 V	10Hz ~ 50kHz
600 V	40 V	10Hz ~ 30kHz
1000 V	400 V	10Hz ~ 5kHz
VFD 600 V	40 V	10Hz ~ 400Hz
VFD 1000V	400 V	10Hz ~ 400Hz
600 μA	40 μA	10Hz ~ 5kHz
6000 μA	400 μA	10Hz ~ 5kHz
60 mA	4 mA	10Hz ~ 5kHz
600 mA	40 mA	10Hz ~ 5kHz
6 A	0.6 A	10Hz ~ 3kHz
10 A	6 A	10Hz ~ 3kHz

dBm

Range and accuracy are subject to ACmV, ACV and reference impedance selected.

Typical 600Ω reference impedance ranges:

In ACmV: -42.22 dBm to -2.22 dBm; In ACV: -17.78 dBm to 62.22 dBm

Input Impedance: 10MΩ, 140pF nominal

Selectable reference impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000 and 1200Ω

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



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