Data sheet

4 ½ Digit True RMS Bench Multimeter
2831E

TRUE RMS

USB (standard)

True RMS Bench Multimeter with Dual Display

The B&K Precision 2831E is a versatile and dependable bench multimeter suitable for applications in education, service & repair and manufacturing requiring basic and reliable measurements. Additionally, this meter enhances your productivity with built-in math functions and USB connectivity, features not found in other bench meters in this price category.

The 2831E takes typical multimeter measurements such as volts, ohms, and amps with great accuracy, stability and basic VDC accuracy of 0.03%. The meter is also capable of measuring frequency, period, continuity, and performing diode tests. Readings can be taken at a maximum rate of 25 readings/sec with measurement rates selectable between slow, medium, and fast.

The 2831E meter was designed for cost conscious users requiring a basic and dependable meter with a broad range of features offered at a value price.

Features & benefits

- 4 ½ digit (20,000 count) resolution
- 0.03% basic VDC accuracy
- VFD dual display to indicate two measurements simultaneously
- AC + DC True RMS
- Up to 25 readings per second measurement rate
- AC volt & amp measurement over wide frequency range (ACV 100 kHz/ACI 20 kHz)
- Limit mode for Pass/Fail testing
- Built-in math functions: Rel, Max/Min, dBm, dB, %, Hold, Compare
- CATI (1000 V)/CATII (300 V) protection
- USB interface (Virtual Com)
- SCPI compatible

www.bkprecision.com
Tel.: 714.921.9095

B&K PRECISION
ELECTRONIC TEST INSTRUMENTS

▲ Versatile tools

Dual Display

The 2831E offers a dual display allowing multiple measurements to be conveniently displayed at once. The display values could be two different measurements or one measurement expressed in different units. For example, you can simultaneously read an AC voltage and a frequency value or a DC voltage value expressed in volts and in dB.

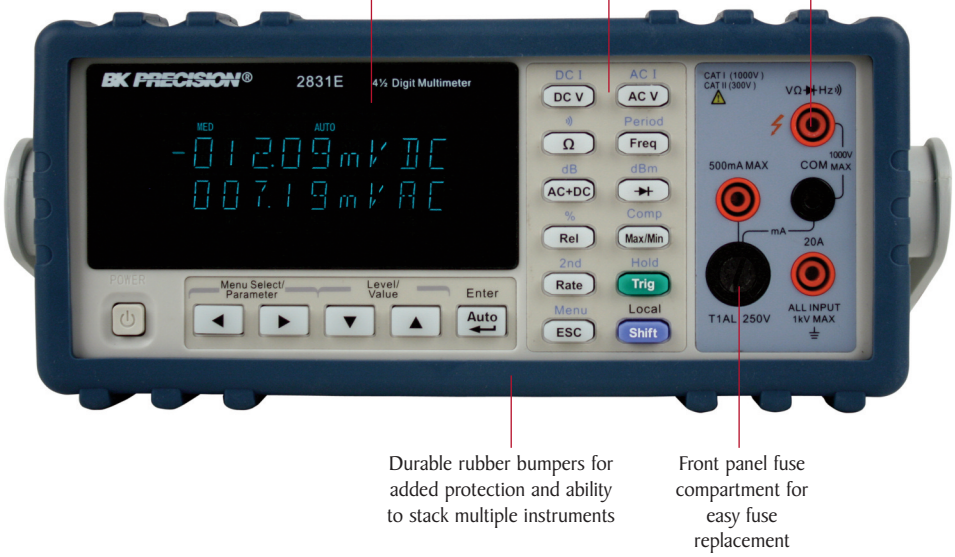
Increase Productivity with PC Connectivity and Math Functions

The built-in math operations Rel, Max/Min, dBm, dB, %, and Hold enhance your productivity and provide educators with a convenient tool to teach basic math concepts.
The 2831E is programmable via USB interface using industry standard SCPI commands. Users can control and configure the instrument from a remote PC and retrieve measurement results for further analysis.

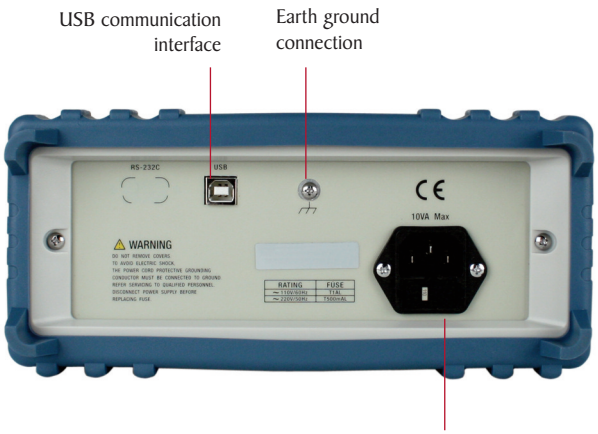
Limit Operation

The 2831E's limit operation lets you set and control the values that determine a HI / IN / LO status of subsequent measurements. The meter can be configured to emit an audible alarm when readings are outside of the configured limit.

▲ Easy operation



Rear panel



Specifications

DC Voltage

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range	Resolution	Full Scale Reading	Accuracy (1 year)	Typical Input Impedance
Slow	200.00 mV	10 µV	210.00	0.03%+0.04% (1)	>10 MΩ
	2.0000 V	100 µV	2.1000	0.03%+0.02% (1)	>11.1 MΩ
	20.000 V	1 mV	21.000	0.03%+0.02%	>10.1 MΩ
	200.00 V	10 mV	210.00	0.03%+0.02%	10 MΩ
	1000.0 V	100 mV	1010.0 (2)	0.03%+0.02%	10 MΩ

(1) under REL status

(2) 1% over-range (1010 V) is readable at 1000 V range

AC Voltage

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range	Resolution	Full Scale Reading	Accuracy(1 year)(1) 23 °C ± 5 °C			
				20~50 Hz	50~20 kHz	20~50 kHz	50~100 kHz
Slow	200.00 mV	10 µV	210.00	1.0%+0.2%)	0.5%+0.15%	1.8% + 0.25%	3.0% + 0.75%
	2.0000 V	100 µV	2.1000	1.0%+0.2%)	0.4%+0.05%	1.5% + 0.1%	3.0% + 0.25%
	20.000 V	1 mV	21.000	1.0%+0.2%	0.4%+0.05%	1.5% + 0.1%	3.0% + 0.25%
	200.00 V	10 mV	210.00	----	0.8%+0.075%	1.5% + 0.1%	3.0% + 0.25%
	750.0 V	100 mV	757.5(3)	----	0.8%+0.075%	1.5% + 0.1% (2)	3.0% + 0.25% (2)

Max. crest factor: 3.0 at full scale

(1) Specifications are for sine wave inputs >5% of range.

(2) Limit at 40 kHz or ≤ 3×107 Volt-Hz for 750 V range

(3) 1% over-range (757.50V) is readable at 750V range

DC Current

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range	Resolution	Full Scale Reading	Accuracy (1 year)	Burden Voltage(1) & Shunt Resistor
Slow	2.0000 mA	0.1 µA	2.1000	0.08%+0.025% (2)	<0.3 V / 100 Ω
	20.000 mA	1 µA	21.000	0.08%+0.02% (2)	<0.04 V / 1 Ω
	200.00 mA	10 µA	210.00	0.08%+0.02%	<0.3 V / 1 Ω
	2.0000 A	100 A	2.1000	0.3%+0.025%	<0.05 V / 10 mΩ
	20.000 A	1 mA	21.000 (3)	0.3%+0.025%	<0.6 V / 10 mΩ

(1) Typical voltage across the input terminals at full scale reading.

(2) Use REL function

(3) In 20 A range, >10~20 ADC is readable for 20 seconds maximum

AC Current (True RMS, AC Coupling)

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range	Resolution	Full Scale Reading	Accuracy(1 year)(1) 23 °C ± 5 °C		
				20~50 Hz	50~2 kHz	2~20 kHz
Slow	2.0000 mA	0.1 µA	2.1000	1.5%+0.5%	0.5%+0.3%	2%+0.5%
	20.000 mA	10 µA	21.000	1.5%+0.5%	0.5%+0.3%	2%+0.38%
	200.00 m A	100 µA	210.00	1.5%+0.5%	0.5%+0.3%	2%+0.38%
	2.0000 A	1 mA	2.1000	2.0%+0.5%	0.5%+0.3%	----
	20.000 A	10 mA	21.000 (2)	2.0%+0.5%	0.5%+0.3%	----

Max. crest factor: 3.0 at full scale

(1) Specifications are for sine wave inputs >5% of range.

(2) In 20 A range,>10~20 A AC is readable for 20 seconds maximum

Specifications (cont.)

Resistance

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range (1)	Resolution	Full Scale Reading	Test current	Accuracy (1 year)
Slow	200.00 Ω	10 mΩ	210.00	0.5 mA	0.10%+0.05% (2)
	2.0000 kΩ	100 mΩ	2.1000	0.45 mA	0.10%+0.025% (2)
	20.000 kΩ	1 Ω	21.000	45 μA	0.10%+0.025% (2)
	200.00 kΩ	10 Ω	210.00	4.5 μA	0.10%+0.025%
	2.0000 MΩ	100 Ω	2.1000	450 nA	0.15%+0.025%
	20.000 MΩ	1 kΩ	21.000	45 nA	0.3%+0.05%

(1) In order to eliminate the noise interference, which might be induced to the test leads, it is recommended to use a shielded test cable for measuring resistance above 100 kΩ.

(2) Using REL function

Continuity

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Range	Resolution	Full Scale Reading	Test current	Accuracy (1 year) 23 °C ± 5°C
200 Ω	100 mΩ	999.9	0.5 mA	0.1%+0.1%

Diode

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

Rate	Range	Resolution	Full Scale Reading	Test current
Med	2.0000 V	100 μV	2.3000 V	0.5 mA (Approx.)

Frequency

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

ACV Range	Frequency Range	Best Resolution	Full Scale Reading	Accuracy	Input Sensitivity (Sine Wave)
200 mV to 750V	10 Hz	100 μHz	9.9999	0.05%+0.02%	200 mV rms
	10~100 Hz	1 mHz	99.999	0.01%+0.02%	300 mV rms
	100~100 kHz	10 mHz	999.99	0.01%+0.008%	300 mV rms
	100k~1 MHz	10 Hz	999.99	0.01%+0.008%	500 mV rms

Period

Resolution, Full Scale Reading and Accuracy ± (% of reading + % of range), 23 °C ± 5 °C

ACV Range	Frequency Range	Best Resolution	Full Scale Reading	Accuracy	Input Sensitivity (Sine Wave)
200 mV to 750V	1~10 μs	0.1 ns	9.9999	0.01%+0.008%	500 mV rms
	10 μs~10 ms	1 ns	9.9999	0.01%+0.008%	300 mV rms
	10 ms~100 ms	1 μs	99.999	0.01%+0.02%	300 mV rms
	100 ms	10 μs	199.99	0.05%+0.02%	200 mV rms

General

Power Supply	Power Consumption	Operating Environment	Storage Environment	Warm-up	Dimensions (W×H×D)	Net Weight
110/220 V ± 10%, 50/60 Hz ± 5%	≤ 10VA	0 °C to 40 °C, ≤ 90 %RH	-40 °C to 70 °C	at least 30 minutes	225 mm×100 mm×355 mm 8.85" x 3.93 " x 13.97"	2.5 kg 5.51 lbs

One Year Warranty

Accessories Included: Test leads, Power cord, Spare fuse, Operation Manual , Calibration certificate and test report

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