

**Specifications**

The standard specification interval is 1 year.

All specifications apply from +18 °C to +28 °C unless stated otherwise.

*Note*

*“Counts” refers to the number of increments or decrements of the least significant digit.*

All specifications assume a 5-minute warm-up period.

**DC Volts Measurement**

Range (V dc)	Resolution	Accuracy, ±(% of Reading + Counts)
4.000	0.001 V	0.1 % + 1
40.00	0.01 V	0.1 % + 1
400.0	0.1 V	0.1 % + 1
1000	1 V	0.1 % + 1

*Input impedance: 10 MΩ (nominal), < 100 pF*  
*Normal mode rejection ratio: > 60 dB at 50 Hz or 60 Hz*  
*Common mode rejection ratio: > 120 dB at dc, 50 Hz, or 60 Hz*  
*Overvoltage protection: 1000 V*

**DC Millivolts Measurement**

Range (mV dc)	Resolution	Accuracy, ±(% of Reading + Counts)
400.0	0.1 mV	0.1 % + 2

**AC Volts Measurement**

Range (ac)	Resolution	Accuracy, ±(% of Reading + Counts)		
		50 Hz to 60 Hz	45 Hz to 200 Hz	200 Hz to 500 Hz
400.0 mV	0.1 mV	0.7 % + 4	1.2 % + 4	7.0 % + 4
4.000 V	0.001 V	0.7 % + 2	1.2 % + 4	7.0 % + 4
40.00 V	0.01 V	0.7 % + 2	1.2 % + 4	7.0 % + 4
400.0 V	0.1 V	0.7 % + 2	1.2 % + 4	7.0 % + 4
1000 V	1 V	0.7 % + 2	1.2 % + 4	7.0 % + 4

*Specifications are valid from 5 % to 100 % of amplitude range.*  
*AC conversion: true rms*  
*Maximum crest factor: 3 (between 50 and 60 Hz)*  
*For non-sinusoidal waveforms, add ±(2 % reading + 2 % f.s.) typical*  
*Input impedance: 10 MΩ (nominal), < 100 pF, ac-coupled*  
*Common mode rejection ratio: > 60 dB at dc, 50 Hz, or 60 Hz*

**AC Current Measurement**

Range 45 Hz to 2 kHz	Resolution	Accuracy, ±(% of Reading + Counts)	Typical Burden Voltage
1.000 A (Note)	0.001 A	1 % + 2	1.5 V/A

*Note: 440 mA continuous, 1 A 30 seconds maximum*

*Specifications are valid from 5 % to 100 % of amplitude range.*  
*AC conversion: true rms*  
*Maximum crest factor: 3 (between 50 and 60 Hz)*  
*For non-sinusoidal waveforms, add ± ( 2 % reading + 2 % f.s.) typical*  
*Overload protection 440 mA, 1000 V fast-blow fuse*

**DC Current Measurement**

Range	Resolution	Accuracy, $\pm$ (% of Reading + Counts)	Typical Burden Voltage
30.000 mA	0.001 mA	0.05 % + 2	14 mV/mA
1.000 A (Note)	0.001 A	0.2 % + 2	1.5 V/A

Note: 440 mA continuous, 1 A 30 seconds maximum

Overload protection: 440 mA, 1000 V fast-blow fuse

**Ohms Measurement**

Range	Resolution	Measurement Current	Accuracy, $\pm$ (% of Reading + Counts)
400.0 $\Omega$	0.1 $\Omega$	220 $\mu$ A	0.2 % + 2
4.000 k $\Omega$	0.001 k $\Omega$	60 $\mu$ A	0.2 % + 1
40.00 k $\Omega$	0.01 k $\Omega$	6.0 $\mu$ A	0.2 % + 1
400.0 k $\Omega$	0.1 k $\Omega$	600 nA	0.2 % + 1
4.000 M $\Omega$	0.001 M $\Omega$	220 nA	0.35 % + 3
40.00 M $\Omega$	0.01 M $\Omega$	22 nA	2.5 % + 3

Overload protection: 1000 V

Open circuit voltage: < 3.9 V

**Frequency Counter Accuracy**

Range	Resolution	Accuracy, $\pm$ (% of Reading + Counts)
199.99 Hz	0.01 Hz	0.005 % + 1
1999.9 Hz	0.1 Hz	0.005 % + 1
19.999 kHz	0.001 kHz	0.005 % + 1

Display updates 3 times/second at > 10 Hz

**Frequency Counter Sensitivity**

Input Range	Minimum Sensitivity (rms Sinewave) 5 Hz to 5 kHz*	
	AC	DC (approximate trigger level 5 % of full scale)
400 mV	150 mV (50 Hz to 5 kHz)	150 mV
4 V	1 V	1 V
40 V	3 V	3 V
400 V	30 V	30 V
1000 V	300 V	300 V

\* Usable 0.5 Hz to 20 kHz with reduced sensitivity.  
10<sup>6</sup> VHz max

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### **Diode Test and Continuity Test**

**Diode test indication:** Displays voltage drop across device, 2.0 V full scale. Nominal test current 0.2 mA at 0.6 V. Accuracy  $\pm(2\% + 1 \text{ count})$ .

**Continuity test indication:** continuous audible tone for test resistance  $< 100 \Omega$

**Open circuit voltage:**  $< 2.9 \text{ V}$

**Short circuit current:** 220  $\mu\text{A}$  typical

**Overload protection:** 1000 V rms

### **Loop Power Supply**

**Loop Power Supply:** Minimum 24 V@ 24 mA into 1200  $\Omega$  load

### **DC Current Output**

#### **Source Mode:**

Span: 0 mA or 4 mA to 20 mA, with overrange to 24 mA

Accuracy: 0.05 % of span<sup>1</sup>

Compliance voltage: 28 V with battery voltage  $> -4.5 \text{ V}$

#### **Simulate Mode:**

Span: 0 mA or 4 mA to 20 mA, with overrange to 24 mA

Accuracy: 0.05 % of span<sup>1</sup>

Loop voltage: 24 V nominal, 48 V maximum, 15 V minimum

Compliance voltage: 21 V for 24 V supply

Burden voltage:  $< 3 \text{ V}$

### **General Specifications**

**Maximum voltage applied between any jack and earth ground:** 1000 V

**Storage temperature:**  $-40 \text{ }^\circ\text{C}$  to  $60 \text{ }^\circ\text{C}$

**Operating temperature:**  $-20 \text{ }^\circ\text{C}$  to  $55 \text{ }^\circ\text{C}$

**Operating altitude:** 2000 meters maximum

**Temperature coefficient:** 0.05 x specified accuracy per  $^\circ\text{C}$  for temperatures  $< 18 \text{ }^\circ\text{C}$  or  $> 28 \text{ }^\circ\text{C}$   
<sup>1</sup>0.1 x specified accuracy per  $^\circ\text{C}$  for temperatures  $< 18 \text{ }^\circ\text{C}$  or  $> 28 \text{ }^\circ\text{C}$

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**Accuracy adders for use in RF Fields:** In an RF field of 3 V/m, change the accuracy specifications as follows:

For AC Volts Measurement, add 0.25 % of range

For DC Current Measurement, 30.000 mA range, add 0.14 % of range

For DC Current Output, add 0.32 % of span

Accuracy for all meter functions is not specified in RF fields  $> 3 \text{ V/m}$ .

**Relative humidity:** 95 % up to  $30 \text{ }^\circ\text{C}$ , 75 % up to  $40 \text{ }^\circ\text{C}$ , 45 % up to  $50 \text{ }^\circ\text{C}$ , and 35 % up to  $55 \text{ }^\circ\text{C}$

**Vibration:** Random 2g, 5 to 500 Hz

**Shock:** 1 meter drop test

**Safety:** Complies with EN61010, ANSI/ISA S82.01-1994 and CAN/CSA C22.2 No. 1010.1-92 Overvoltage Category III.

**Certifications:**  ,  ,  , 

**Power requirements:** Four AA batteries (alkaline recommended)

**Size:** 10.0 cm X 20.3 cm X 5.0 cm (3.94 in X 8.00 in X 1.97 in)

**Weight:** 610 g (1.6 lbs)