

Table 1-3. 8050A Specifications

**ELECTRICAL:** The electrical specifications given apply for an operating temperature of 18°C to 28°C (64.4°F to 82.4°F), relative humidity up to 90%, and a 1-year calibration cycle.

**FUNCTIONS:** DC volts, AC volts (linear and dB), DC current, AC current, resistance, diode test, conductance, relative.

**DC VOLTS\*:**

RANGE	RESOLUTION	ACCURACY for 1-Year
±200 mV	10 $\mu$ V	±(0.03% of reading +2 digits).
±2V	100 $\mu$ V	
±20V	1 mV	
±200V	10 mV	
±1000V	100 mV	

**INPUT IMPEDANCE:** 10 M $\Omega$  in parallel with <100 pF, all ranges

**NORMAL MODE REJECTION RATIO:** >60 dB at 60 Hz or 50 Hz

**COMMON MODE REJECTION RATIO:** >90 dB at dc, 50 Hz or 60 Hz (1 k $\Omega$  unbalanced)  
(>120 dB available on request)

**COMMON MODE VOLTAGE (MAXIMUM):** 500V dc or peak ac

**RESPONSE TIME TO RATED ACCURACY:** 1 second maximum

**MAXIMUM INPUT:** 1000V dc or peak ac continuous (less than 10 seconds duration on both the 200 mV and 2V ranges).

\*DC Volts can also be measured using the dB mode with .01 dB resolution between 5% of range and full range.

**AC VOLTS (TRUE RMS RESPONDING, AC COUPLED):**

**VOLTAGE READOUT ACCURACY:** ± (% of reading + no. of digits), between 5% of range and full range.

INPUT VOLTAGE	RESOLUTION	RANGE	20 Hz**	45 Hz	1 kHz	10 kHz	20 kHz	50 kHz
10 mV - 200 mV	10 $\mu$ V	200 mV						
0.1V - 2V	100 $\mu$ V	2V						
1V - 20V	1 mV	20V	1%+10		.5%+10	1%+10	5%+30	
10V - 200V	10 mV	200V						
100V - 750V	100 mV	750V				NOT SPECIFIED		

\*\*Typically 3 to 5 digits of rattle will be observed at full scale at 20 Hz.

Table 1-3. 8050A Specifications (cont)

**dB RANGES:**

INPUT VOLTAGE	dBm (600 Ω REF)	ACCURACY: from 5% of range to full scale, 1-year					
		RANGE	20 Hz	45 Hz	1kHz	10 kHz	20 kHz
0.77 mV - 2 mV	-60 to -52	200 mV*	0.5 dBm				
2 mV - 2V	-52 to +8	200 mV*	±0.25 dBm	±0.15 dBm	±0.25 dBm	±0.75 dBm	
0.1V - 2V	-18 to +8	2V					
1V - 20V	+2 to +28	20V					
10V - 200V	+22 to +48	200V					
100V - 750V	+42 to +60	750V	NOT SPECIFIED				

\*When 200 mV range is selected the 8050A autoranges for best accuracy for 2V inputs and less.

**RESOLUTION:** 0.01 dB from 5% of scale to full scale; 0.1 dB from 1-5% of scale, 1 dB below 1% of scale.

**VOLT · Hz PRODUCT:**  $10^7$  max (200V max @ 50 kHz)

**EXTENDED dB RESPONSE:** Typically -72 dB (600 $\Omega$  Ref)  $\pm 1$  dB to 10 kHz

**EXTENDED FREQUENCY RESPONSE:** Typically -3 dB at 200 kHz

**COMMON MODE REJECTION RATIO (1 k $\Omega$  unbalance):** >60 dB at 50 Hz or 60 Hz

**CREST FACTOR RANGE:** Waveforms with a Peak/RMS ratio of 1:1 to 3:1 at full scale, increasing down range

**INPUT IMPEDANCE:** 10 M $\Omega$  in parallel with <100 pF

**MAXIMUM INPUT VOLTAGE:** 750V rms or 1000V peak continuous (less than 10 seconds duration on both the 200 mV and 2V ranges), not to exceed the volt-hertz product of  $10^7$ .

**RESPONSE TIME:** 2 seconds maximum within a range

**REFERENCE IMPEDANCES:** Fifteen user selectable impedance reference levels are provided to reference a 0 dBm, 1 mW level (50 $\Omega$ , 75 $\Omega$ , 93 $\Omega$ , 110 $\Omega$ , 125 $\Omega$ , 135 $\Omega$ , 150 $\Omega$ , 250 $\Omega$ , 300 $\Omega$ , 500 $\Omega$ , 600 $\Omega$ , 800 $\Omega$ , 900 $\Omega$ , 1000 $\Omega$ , 1200 $\Omega$ ), and an 8 $\Omega$  impedance reference level is provided to reference a 0 dBW level.

**DC CURRENT:**

RANGE	RESOLUTION	ACCURACY for 1-Year	BURDEN VOLTAGE
200 $\mu$ A	0.01 $\mu$ A	$\pm (0.3\% \text{ of reading} + 2 \text{ digits})$	0.3V max
2 mA	0.1 $\mu$ A		
20 mA	1 $\mu$ A		
200 mA	10 $\mu$ A		
2000 mA	100 $\mu$ A		0.9V max

**OVERLOAD PROTECTION:** 2A/250V fuse in series with 3A/600V fuse (for high energy sources).

Table 1-3. 8050A Specifications (cont)

**AC CURRENT (TRUE RMS RESPONDING, AC COUPLED):**

INPUT CURRENT	RESOLUTION	RANGE 20 Hz** 45 Hz 2 kHz 10 kHz 20 kHz					BURDEN VOLTAGE
10 $\mu$ A - 200 $\mu$ A	0.01 $\mu$ A	200 $\mu$ A					
100 $\mu$ A - 2 mA	0.1 $\mu$ A	2 mA					
1 mA - 20 mA	1 $\mu$ A	20 mA	2%+10		1%+10	2%+10	0.3V rms max
10 mA - 200 mA	10 $\mu$ A	200 mA					
100 mA - 2000 mA	100 $\mu$ A	2000 mA				Not specified	0.9V rms max

\*\*Typically 3 to 5 digits of rattle will be observed at full scale at 20 Hz.

**CREST FACTOR RANGE:** Waveforms with a Peak/RMS ratio of 1:1 to 3:1 at full scale.

**RESISTANCE:**

RANGE	RESOLUTION	ACCURACY for 1-Year	FULL SCALE VOLTAGE ACROSS UNKNOWN RESISTANCE
200 $\Omega$	0.01 $\Omega$	$\pm(0.1\% \text{ reading} + 2 \text{ digits} + .02\Omega)$	.19V
2 k $\Omega$	0.1 $\Omega$		1.2V
20 k $\Omega$	1 $\Omega$	$\pm(.05\% \text{ of reading} + 2 \text{ digits})$	.2V
200 k $\Omega$	10 $\Omega$		2V
2000 k $\Omega$	100 $\Omega$	$\pm(0.25\% \text{ reading} + 3 \text{ digits})$	.2V
20 M $\Omega$	1 k $\Omega$		2V

**OVERLOAD PROTECTION:** 500V dc/ac rms on all ranges

**OPEN CIRCUIT VOLTAGE:** Less than 3.5V on all ranges

**RESPONSE TIME (TO RATED ACCURACY):** 10 seconds maximum on 20 M $\Omega$  range  
2 seconds maximum on all other ranges

**DIODE TEST:** These three ranges have enough voltage to turn on silicon junctions to check for proper forward-to-back resistance. The 2 k $\Omega$  range is preferred and is marked with a larger diode symbol on the front panel of the instrument. The three non-diode test ranges will not turn on silicon junctions so in-circuit resistance measurements can be made with these three ranges.

**CONDUCTANCE:**

RANGE	RESOLUTION	ACCURACY for 1-Year
2 mS	.1 $\mu$ S (10 M $\Omega$ )	$\pm(0.1\% \text{ of reading} + 5 \text{ digits})$
200 nS	.01 nS (100,000 M $\Omega$ )	$\pm(0.5\% \text{ of reading} + 20 \text{ digits})$

**MAXIMUM OPEN CIRCUIT VOLTAGE:** <3.5V

**OVERLOAD PROTECTION:** 500V dc/ac rms on all ranges

**CONDUCTANCE UNITS:** We use the international unit of conductance, the siemen = S = 1/ $\Omega$ . Another unit of conductance is the mho.

Table 1-3. 8050A Specifications (cont)

**RELATIVE:**

**RELATIVE REFERENCE:** An input applied when the RELATIVE button is depressed to the ON position is held as "0" reference point. Subsequent readings indicate the deviation ( $\pm$ ) from this point.  
(Note: REL annunciator indicates when this mode is enabled.)

**RELATIVE ACCURACY:** Error will not exceed the sum of the errors of the two measurements.

**ENVIRONMENTAL:**

**TEMPERATURE COEFFICIENT:**  $<0.1$  times the applicable accuracy specification per  $^{\circ}\text{C}$  for  $0^{\circ}\text{C}$  to  $18^{\circ}\text{C}$  and  $28^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $32^{\circ}\text{F}$  to  $64.4^{\circ}\text{F}$  and  $82.4^{\circ}\text{F}$  to  $122^{\circ}\text{F}$ ).

**OPERATING TEMPERATURE:**  $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $32^{\circ}\text{F}$  to  $122^{\circ}\text{F}$ ).

**STORAGE TEMPERATURE:** (without batteries):  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$ ).  
(with batteries):  $-40^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $+122^{\circ}\text{F}$ ).

**RELATIVE HUMIDITY:** Up to 90%,  $0^{\circ}\text{C}$  to  $35^{\circ}\text{C}$  ( $32$ - $95^{\circ}\text{F}$ ), up to 70%,  $35^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $95$ - $122^{\circ}\text{F}$ ), except on 2000 k $\Omega$ , 20 M $\Omega$ , and 200 nS ranges where it is up to 80%,  $0^{\circ}\text{C}$  to  $35^{\circ}\text{C}$  ( $32$ - $95^{\circ}\text{F}$ ).

**GENERAL:**

**MAXIMUM COMMON MODE VOLTAGE:** 500V dc, or peak ac (low terminal potential with respect to power line ground)

**SIZE:** 22 cm X 6 cm X 25 cm ( $8\frac{1}{2}$ " X  $2\frac{1}{2}$ " X 10") See Figure 1-8.

**WEIGHT:** 1.08 kg (2 lbs., 6 oz.)

**POWER REQUIREMENTS (LINE ONLY MODELS):**

**LINE VOLTAGE:** 90 to 110V ac 47 to 440 Hz      Factory configured for customerspecified  
105 to 132V ac, 47 to 440 Hz      voltage.  
200 to 264V ac, 47 to 440 Hz

**POWER CONSUMPTION:** 4W max.

**STANDARDS:** IEC 348 Protection Class 1

Table 1-4. 8050A Option Specifications

**-01 BATTERY OPTION:****BATTERIES:** TYPE: NiCAD

OPERATING TIME: 10 hours, typical

RECHARGE TIME: (with POWER switch in OFF position): 14 hours for full charge

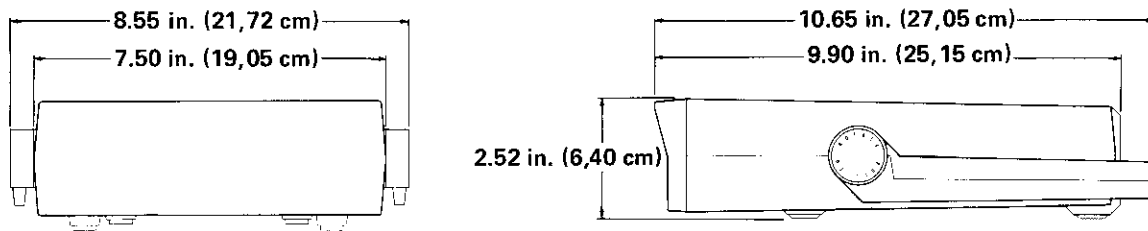
**POWER CONSUMPTION:** 6W max.**LINE VOLTAGE:** 90-264V, 47-440 Hz, field changeable**STANDARDS:** IEC 348: Protection Class 1 when operated from supply mains  
Protection Class 2 when operated from internal batteries

Figure 1-8. 8050A Dimensions