

## Section 1

# SPECIFICATION

### Instrument Description

The DA 4084 is a fully automatic programmable distortion analyzer in a dedicated power supply. This instrument offers true rms voltage measurement capabilities. Volts, dBm or dB ratio display modes are provided. The DA 4084 features a 0 dB set reference memory in the dB ratio mode. A 3 1/2 digit readout and an analog display for nulling and peaking indications are included.

Level setting, tuning and nulling are fully automatic. Input level range and distortion measurement range selections are fully automatic or manual. A selection of predetection filters, functional in all modes, is included. These filters provide conditioning to minimize the effects of extraneous signals. A position for an auxiliary filter is also provided.

**CAUTION**

*This power supply is not compatible with Tektronix TM 500 or TM 5000 plug-ins.*

### Performance Conditions

The electrical characteristics in this specification are valid only if the DA 4084 has been adjusted at an ambient temperature between +20°C and +30°C. The instrument must be in a noncondensing environment whose limits are described under environmental. Allow twenty minutes warm-up time for operation to specified accuracy; sixty minutes after exposure to or storage in a high humidity (condensing) environment. Any conditions that are unique to a particular characteristic are expressly stated as part of that characteristic.

Unless specifically noted, all performance specifications are valid using only rms response.

The electrical and environmental performance limits, together with their related validation procedures, comprise a complete statement of the electrical and environmental performance of a calibrated instrument.

Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in this manual.

**Table 1-1 (cont.)  
ELECTRICAL CHARACTERISTICS**

Characteristics	Performance Requirement	Supplemental Information
Fundamental frequency 10 Hz to 20 kHz  20 kHz to 50 kHz  50 kHz to 100 kHz	$\pm 1$ dB (0.1%–50%)  $\pm 2$ dB (0.1%–50% )  +3 dB, –4 dB (0.1%–50%)	
Residual THD+N ( $V_{in} \geq 250$ mV, all distortion, noise, and nulling error sources combined, $T \leq 40^\circ\text{C}$ )  20 Hz to 20 kHz with 80 kHz noise limiting filter  10 Hz to 20 Hz 20 kHz to 100 kHz	Measured with a low-distortion sinewave oscillator.  $\leq 0.005\%$ (–86 dB)  $\leq 0.015\%$ (–76.5 dB)	
Typical fundamental rejection		At least 10 dB below specified residual THD+N or the actual signal THD, whichever is greater.
<b>FILTERS</b>		
400 Hz high pass	–3 dB at 400 Hz $\pm 5\%$ ; at least –40 dB rejection at 60 Hz.	Three pole Butterworth response
80 kHz low pass	–3 dB at 80 kHz $\pm 5\%$	Three pole Butterworth response
30 kHz low Pass	–3 dB at 30 kHz $\pm 5\%$	Three pole Butterworth response
A weighting		Within specifications for type 1 sound level meters listed in ANSI S 1.4 1971 (revised 1976) and IEC Recommendation 179.
External filter		Selects front panel AUXILIARY INPUT allowing connection of external filter between it and FUNCTION OUTPUT.

**Table 1-1 (cont.)  
ELECTRICAL CHARACTERISTICS**

Characteristics	Performance Requirement	Supplemental Information
<b>FRONT PANEL SIGNALS</b>		
INPUT MONITOR Vin ≥ 50 mV	1 Vrms ± 10%	10 Hz to 100 kHz Constant amplitude (average response) version of differential input signal. THD is typically ≤ 0.0010% (− 100 dB) from 20 Hz to 20 kHz.
Vin ≤ 50 mV		Approximately 20 times input signal
Impedance	1 kΩ ± 5%	
<b>FUNCTION OUTPUT</b>		
Signal	1 V ± 3% for 1000 count volts or % display	Selected and filtered ac signal actually measured
Impedance	600 Ω ± 5%	
<b>AUXILIARY INPUT</b>		
Sensitivity	1 V ± 3% for 1000 count volts or % display	Loop through accuracy from FUNCTION OUTPUT is ± 3%
Maximum input voltage		15 V peak, 6 V peak for linear response
Impedance	100 kΩ ± 5%	Ac coupled
<b>DISTORTION ANALYZER REAR INTERFACE SIGNALS</b>		
Rear interface input		Pins 28B (+), 28A (−), 27B and 27A (common) are front panel selectable and independent of main front panel input. All characteristics are the same as main INPUT except maximum input voltage is limited to 42 V peak, 30 V rms. Due to potential crosstalk at the rear interface, noise and distortion performance may be degraded.
Input monitor		Pins 24A and 23A (gnd) same as front panel INPUT MONITOR

**Table 1-1 (cont.)  
ELECTRICAL CHARACTERISTICS**

<b>Characteristics</b>	<b>Performance Requirement</b>	<b>Supplemental Information</b>
Function output		Pins 23B and 24B (gnd) same as front panel FUNCTION OUTPUT.
Auxiliary input		Pins 25B and 26B (gnd) same as front panel AUXILIARY INPUT. Maximum input voltage is 15 V peak, 6 V peak for linear operation.
Ac/dc converter output		Pins 20A and 19A (gnd). Dc output of the selected ac to dc converter. 1 V $\pm 5\%$ for 1000 count display with 500 $\Omega \pm 5\%$ source resistance.
dB converter output		Pins 19B and 20B (gnd). Dc output of the logarithmic dB converter. 10 mV $\pm 5\%$ equals 1 dB of display with 1 k $\Omega \pm 5\%$ source resistance. Changes in level or distortion range will cause brief ac transients.
<b>DETECTORS AND DISPLAYS</b>		
Detectors (Response)		
RMS		True rms detection
AVG		Average detection, rms calibrated for sinewaves. Typically reads 1 to 2 dB lower than true rms detection for noise, and THD+N measurements.
Displays		
Digital		3 1/2 digit, 2000 count LED. Overrange indication is 1, blank, blank, blank.
Analog bar graph		10 segment LED intensity modulated bar graph display of digital readout. Segments are logarithmically activated with approximately 2.5 dB/segment.

**Table 1-1 (cont.)  
ELECTRICAL CHARACTERISTICS**

<b>Characteristics</b>	<b>Performance Requirement</b>	<b>Supplemental Information</b>
<b>SOURCE POWER REQUIREMENTS</b>		
Voltage ranges	Selectable 100 V, 120 V, 220 V, and 240 V nominal line $\pm 10\%$	
Line frequency	48 Hz to 440 Hz	
Fuse data		
100 V, 120 V ranges	3 AG, 0.6A, 250 V, slow blow	
220 V, 240 V ranges	3 AG, 0.3A, 250 V, medium blow	
Power consumption	Approximately equal to 36 watts	
<b>MISCELLANEOUS</b>		
Internal power supplies		
+15		Nominally +15.1 V $\pm 3\%$
-15		Nominally -15.1 V $\pm 5\%$
+5		Nominally +5.25 V $\pm 5\%$
Fuse data		
F4060		3 AG, 1 A, 250 V, fast blow
F4061		3 AG, 1 A, 250 V, fast blow
F4062		3 AG, 1.5 A, 250 V, fast blow
Recommended adjustment interval		2000 hours or 12 months, whichever occurs first.
Warm-up time		20 minutes; 60 minutes after storage in high humidity environment.

**Table 1-2  
ENVIRONMENTAL CHARACTERISTICS**

<b>Characteristics</b>	<b>Description</b>	
Temperature Operating Nonoperating	0°C to +50°C -40°C to +75°C	
Humidity	95% RH, 0° C to 30° C 75% RH, to 40° C 45% RH, to 50° C	Meets MIL-T-28800C, class 5.
Altitude Operating Nonoperating	4.6 km (15,000 ft) 15 km (50,000 ft)	Exceeds MIL-T-28800C, class 5.
Vibration	0.38 mm (0.015") peak to peak, 5 Hz to 55 Hz, 75 minutes.	Meets MIL-T-28800C, class 5.
Shock	30 g's (1/2 sine), 6 shocks in each direction along 3 major axes, 18 total shocks.	Meets MIL-T-28800C, class 5.
Bench Handling (plug-in only)	12 drops from 45°, 4" or equilibrium, whichever occurs first.	Meets MIL-T-28800C, class 5.
Packaged Product Vibration and Shock	Qualified under National Safe Transit Association Preshipment Test Procedures 1A-B-1 and 1A-B-2.	
Electromagnetic Interference	Within limits of F.C.C. Regulations, Part 15, Subpart J, Class A; VDE 0871 category B, VDE 0875; and MIL-STD-461B (April 1, 1980) Class B, CE02, CE04, CS02, CS06, RE02, RE02.1.	
Electromagnetic Susceptibility	Within limits of MIL-STD-461B (April 1, 1980) Class B, RS03.	
Electrostatic Immunity	At least 15 kV discharge from 500 pF in series with 100 Ω to instrument case or any front panel connector without damage or permanent performance degradation.	

**Table 1-3**  
**PHYSICAL CHARACTERISTICS**

<b>Characteristics</b>	<b>Description</b>
Finish	Laminated polycarbonate front panel with anodized aluminum chassis.
Net Weight	Approximately equal to 16 lbs. (7.2 kg)
Overall Dimensions	Height 193.8 mm (7.63 inches) Width 229.84 mm (9.049 inches) Length 476 mm (18.74 inches)