Table 1-1
ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirement	Supplemental Information
INPUT (all functions)		
Impedance	100k ohms, ±2%, each side to ground	Full differential. Each side ac coupled through 1 uF and shunted to ground by approximately equal to 200 pF. Dual banana jack connectors at 0.750 inch spacing with ground connector additionally provided.
Input ranges	200 uV to 200 V in 10 steps (2-6 sequence from 200 mV to 200 V)	Range selection is manual or automatic. Auto-ranging time is typically < 1 second. Separate increase range and decrease range indicators illuminate whenever input level does not fall within optimum window for selected range. For specified instrument performance both indicators must be extinguished.
Maximum input voltage		300 V peak, 200 V rms either input to ground or differentially. Will recover without damage from continuous overloads of 120 V rms or 200 V rms for 30 minutes on all ranges. For linear response, peak input voltage must not exceed 3 times INPUT RANGE setting.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement		Supplemental Information
Common mode rejection (Inputs shorted)	≥ 50 dB at 50 or 60 Hz for common mode signals up to one-half of selected input range or 50 mV, whichever is greater.		Typically ≥ 40 dB to 300 kHz.
LEVEL FUNCTION			
Modes			Volts, dBm (600 ohms), or dB ratio with push to set 0 dB reference. Input range determines display range. Single effective range in dB modes with 0.1 dB resolution. Stored 0 dB reference is unaffected by subsequent changes in mode or function.
Accuracy (level ranging indicators extinguished)	Volts	dB modes	
20 Hz to 20 kHz	Within ±2% ±1 count	±0.3 dB[1] ±0.5% of reading	
10 Hz to 100 kHz	Within ±4% ±2 counts	±0.5 dB[1] ±0.5% of reading	

[1] ±0.2 dB at 1 kHz only. Flatness is ±0.1 dB, 20 Hz to 20 kHz, and ±0.3 dB, 10 Hz to 100 kHz.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
Bandwidth (no filters selected)	At least 300 kHz.	
Residual noise (Inputs shorted, T≤+40 degrees C)	≤ 3.0 uV (-108 dBm) with 80 kHz, 400 Hz filters. ≤ 1.5 uV (-114 dBm) with A weighting filter. (Standard instrument only). ≤ 5.0 uV (-104 dBm) with CCIR weighting and quasi-peak response. (Option 2 only).	
TOTAL HARMONIC DISTORTION PLUS NOISE FUNCTION		
Operation		Fully automatic notch filter tuning and nulling for valid test signals with 10% or less THD + N. Midband signal THD + N can degrade to 30% without loss of lock following initial tuning for SINAD testing. Typical or average measurement settling time is 2.5 seconds above 100 Hz increasing by approximately 1 sec/octave below 100 Hz.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
Fundamental frequency range	10 Hz to 100 kHz	
Minimum input level	60 mV (-22 dBm)	
Accuracy		Autoranging % or dB modes only. 100% reference level is total input signal amplitude including distortion and noise components. Accuracy may also be limited by the effects of residual THD + N and filter selection.
20 Hz to 20 kHz	Within ±10% (±1 dB) for harmonics ≤ 100 kHz.	
10 Hz to 100 kHz	Within ±20% (±2 dB) for harmonics ≤ 300 kHz.	
Residual THD+N (Vin ≥ 250 mV, T≤+40 degrees C)		System specification with any SG 5010 or SG 505 oscillator, all distortion, noise, and nulling error sources combined.
20 Hz to 20 kHz with 80 kHz noise limiting filter	≤ 0.0032% (-90 dB)	
10 Hz to 100 kHz, no filter	≤ 0.010% (-80 dB)	

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
Typical fundamental rejection		At least 10 dB below specified residual THD+N or the actual signal THD, whichever is greater.
INTERMODULATION DISTORTION FUNCTION		
Operation		Fully automatic SMPTE/DIN or CCIF difference tone test selection depending upon actual input signal whenever respective IMD ≤ 20%. Typical or average measurement settling time is 2 sec or less.
SMPTE and DIN tests		
Frequency range (upper tone)		Useable from 3 kHz to beyond 100 kHz
IM frequency range (lower tone)		50 Hz to 250 Hz
Level ratio range		1:1 to 4:1 (lower:upper)
Residual IMD (Vin ≥ 250 mV, T≤+40 degrees C.)	≤ .0032% (-90 dB) with 60 Hz and 7 kHz or 250 Hz and 8 kHz test tones.	System specification with any SG 5010 oscillator or passively summed SG 505 oscillator pair.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
CCIF difference tone test		
Frequency range		Useable from 4 kHz to beyond 100 kHz
Difference frequency range		80 Hz to 1 kHz
Residual IMD (Vin ≥ 250 mV, T≤+40 degrees C.)	≤0.0018% (-95 dB) with 14 kHz and 15 kHz test tones.	System specification with any SG 5010 oscillator or passively summed SG 505 oscillator pair.
Minimum input level	60 mV (-22 dBm)	
Accuracy	Within ±10% (±1 dB) for IM components ≤ 1 kHz	Autoranging % or dB modes only. Accuracy may also be limited by the effects of residual IMD and filter selection.
FILTERS		
400 Hz high pass	-3 dB at 400 Hz, ±5%; at least -40 dB rejection at 60 Hz	3 pole Butterworth response
80 kHz low pass	-3 dB at 80 kHz, ±5%	3 pole Butterworth response

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
Audio bandpass	-3 dB at 22.4 Hz, ±5% and 22.4 kHz, ±5%	Within specifications of CCIR Recommendation 468-2 and DIN 45405 for unweighted measurement response.
A weighting (standard instrument only)		Within specifications for type 1 sound level meters listed in ANSI S 1.4 1971 (revised 1976) and IEC Recommendation 179.
CCIR WTG (Option 2 only)		Within specifications of CCIR recommendation 468-2 and DIN 45405 for noise measurements with quasi-peak detector. Rms detector calibration shifted for 0 dB at 2.00 kHz instead of 1.00 kHz.
External Filter		Selects front panel AUXILIARY INPUT allowing connection of external filter between it and FUNCTION OUTPUT.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
FRONT PANEL SIGNALS		
INPUT MONITOR		
Vin ≥ 50 mV	1 V rms, ±10%	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	1k ohms, ±5%	
FUNCTION OUTPUT		
Signal	1 V, ±3%, for 1000 count volts or % display.	Selected and filtered ac signal actually measured.
Impedance	1k ohms, ±5%	
AUXILIARY INPUT		
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	100k ohms, ±5%	Ac coupled.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
REAR INTERFACE SIGNALS		
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 FUNCTION OUTPUT.
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 ±5% for 1000 count display with 500 ohms ±5% source resistance.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
dB converter output		Pins 19B and 20B (gnd). Dc output of the logarithmic dB converter. 10 mV ±5% equals 1 dB of display with 1k ohms ±5% source resistance. Changes in level or distortion range will cause brief ac transients.
DETECTORS AND DISPLAYS		
Detectors (Response)		
RMS		True rms detection.
AVG (standard instrument only)		Average detection, rms calibrated for sinewaves. Typically reads 1 to 2 dB lower than true rms detection for noise, THD+N, and IMD measurements.

Table 1-1
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
Quasi-peak (Option 02 only)		Quasi-peak detection, rms calibrated for sinewaves. Within specifications of CCIR Recommendation 468-2 and DIN 45405. Due to the peak hold nature of its response readings, considerably higher than rms response will occur with large crest factor signals (such as noise). The input range indicators should be ignored and auto-ranging avoided with these types of signals.
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
ELECTRICAL CHARACTERISTICS
(cont)

Characteristics	Performance Requirement	Supplemental Information
MISCELLANEOUS		
Power consumption		Approximately 24 watts
Internal Power Supplies		
+15		Nominally +15.1 V, ±3%
-15		Nominally -15.1 V, ±5%
+5		Nominally +5.25 V, ±2%
Fuse Data		
F1610		3 AG, 1 A, 250 V, fast blow
F1620		3 AG, 1 A, 250 V, fast blow
F1621		3 AG, 1 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
[1]ENVIRONMENTAL CHARACTERISTICS

Characteristics	Description	
Temperature		Meets MIL-T-28800B, class 5.
Operating	0 to +50 degrees C	
Nonoperating	-40 to +75 degrees C	
Humidity	95% RH, 0 to +30 degrees C 75% RH, to +40 degrees C 45% RH, to +50 degrees C	Meets MIL-T-28800B, class 5.
Altitude		Exceeds MIL-T-28800B, class 5.
Operating	4.6 km (15,000 ft)	
Nonoperating	15 km (50,000 ft)	
Vibration	0.38 mm (0.015") peak to peak, 5 Hz to 55 Hz, 75 minutes.	Meets MIL-T-28800B, class 5, when installed in qualified power modules.[2]
Shock	30 g's (1/2 sine), 11 ms duration, 3 shocks in each direction along 3 major axes, 18 total shocks.	Meets MIL-T-28800B, class 5, when installed in qualified power modules.[2,3]

[1]With TM 5000-Series power module. System performance subject to exceptions of power module or other individual plug-ins.

[2]Refer to power module specifications.

[3]Requires power module retainer bar or clip.

Table 1-2
[1]ENVIRONMENTAL CHARACTERISTICS

(cont)

Characteristics	Description
Bench Handling[3]	12 drops from 45 degrees, 4" or equilibrium, whichever occurs first. Meets MIL-T-28800B, class 5.
Package Product Vibration and Shock (Plug-in only)	Qualified under National Safe Transit Association Preshipment Test Procedure1A-B-1 and 1A-B-2.
Electromagnetic Interference	Within limits of F.C.C. Regulations, Part 15, Subpart J, Class A; and MIL-STD-461B (April 1, 1980) Class B.
Electrostatic Immunity	At least 15 kV discharge from 500 pF in series with 100 ohms to instrument case or any front panel connector without damage or permanent performance degradation (Input terminals limited to 10 kV).

[1]With TM 5000-Series power module. System performance subject to exceptions of power module or other individual plug-ins.

[3]Requires power module retainer bar or clip.

Table 1-3
PHYSICAL CHARACTERISTICS

Characteristics	Description
Maximum Overall Dimensions	
Height	126.0 mm (4.96 inches)
Width	131.2 mm (5.16 inches)
Length	285.5 mm (11.24 inches)
Net Weight	Approximately equal to 2.04 kg (4.5 lbs.)
Finish	
Front Panel	Plastic-aluminum laminate
Chassis	Anodized aluminum