SIGNAL ANALYZERS

Audio Analyzer 20 Hz to 100 kHz

Model 8903A (cont.)

8903A Specifications

Source

Frequency range: 20 Hz to 100 kHz.
Frequency resolution: 0.3%
Frequency accuracy: 0.3% of setting.
Output level range: 0.6 mV to 6V open circuit.
Output level resolution: 0.3% or better.
Output level accuracy (open circuit): 2% of setting, 60 mV to 6V, 20 Hz to 50 kHz; 3% of setting, 6 mV to 6V, 20 Hz to 100 kHz; 5% of setting, 0.6 mV to 6 mV, 20 Hz to 100 kHz.
Flatness (1 kHz reference): ±0.7%, 20 Hz to 20 kHz; ±2.5%, 20 Hz to 100 kHz.
Distortion & noise: the higher of: −80 dB or 30 μV, 20 Hz to 20 kHz, 80 kHz BW; −70 dB or 95 μV, 20 kHz to 50 kHz, 500 kHz BW; −65 dB or 169 μV, 50 kHz to 100 kHz, 500 kHz BW.
Impedance: 600Ω ±1%.
Sweep mode: logarithmic sweep with up to 500 points/decade or 255 points between entered start and stop frequencies, whichever is smaller.

AC Level

Full range display: 300.0V, 30.00V, 3.000V, 0.3000V, 30.00mV, 3.000 mV, 0.3000mV.
Overrange: 33% except on 300V range.
Accuracy: ±2% of reading, 30V to 300V, 20 Hz to 1 kHz; ±2% of reading, 50 mV to 30V, 20 Hz to 20 kHz; ±4% of reading, 0.3 mV to 30V, 20 Hz to 100 kHz.
AC Converter: true-rms responding for signals with crest factor≤3 and harmonics up to 80 kHz typical. 3 dB measurement BW: >500 kHz typical. Average detection selectable by internal jumpers.

DC Level

Full range display: 300.0V, 48.00 V, 16.00V, 4.00V.
Overrange: 33% except on 300V range.
Accuracy: ±0.75% of reading, 400 mV to 300V; ±3 mV, <400 mV.

Distortion

Fundamental frequency range: 20 Hz to 100 kHz.
Display range: 0.001% to 100%,−99.99 dB to 0 dB.
Accuracy: ±1 dB, 20 Hz to 20 kHz; ±2 dB, 20 kHz to 100 kHz.
Input voltage range: 50 mV to 300V.
Residual noise and distortion: the higher of: 0.01%, −80 dB, or 30 μV, 20 Hz to 20 kHz, 80 kHz BW; 0.032%, −70 dB, or 95 μV, 20 kHz to 50 kHz, 500 kHz BW; 0.056%, −65 dB, or 169 μV, 50 kHz to 100 kHz, 500 kHz BW.
Displayed resolution: 0.0001%, <0.1% distortion; 0.001%, 0.1% to 3% distortion; .01%, 3% to 30% distortion; 0.1%, >30% distortion.
Detection: true rms (average detection selectable by internal jumpers).

SINAD[1,2]

Fundamental frequency range: 20 Hz to 100 kHz.
Display range: 0 dB to 99.99 dB.
Accuracy: ±1 dB, 20 Hz to 20 kHz; ±2 dB, 20 kHz to 100 kHz.
Input voltage range: 50 mV to 300V.
Detection: true rms (average detection selectable by internal jumpers).
Resolution: 0.01 dB for SINAD ratios >25. For ratios <25 the display is rounded to the nearest half dB to reduce digit flickering of noise signals. (Full resolution is available by defeating this feature using special function 16.1.)
Analog meter: active in SINAD only and for SINAD ratios <18 dB (or 24 dB using special function 7.1.)
Tuning: notch filter is tuned to analyzer source frequency.

Signal to Noise

Frequency range: 20 Hz to 100 kHz.
Display range: 0 dB to 99.99 dB.
Accuracy: ±1 dB.
[1]SINAD is a sensitivity measurement computed from the ratio of signal plus noise and distortion to noise and distortion.
[2]Residual noise and distortion same as for distortion mode.

Input voltage range: 50 mV to 300V.
Residual noise: the higher of −80 dB or 30 μV, 80 kHz BW; −70 dB or 95 μV, 500 kHz BW.
Resolution: same as SINAD.
Operation: the analyzer displays the ratio of the input voltages as the internal source is automatically switched on and off.

Frequency Counter

Range: 20 Hz to 150 kHz[3].
Resolution: 5 digits[4].
Accuracy: 0.004% ±1 digit.
Input sensitivity: 50 mV in distortion and SINAD modes 5.0 mV in ac level and sig/noise modes.
Counting technique: reciprocal with 2 MHz timebase.

Audio Filters

400 Hz high pass filter: 3 dB cutoff frequency, 400 Hz ±40 Hz; 140 dB/decade rolloff.
Psophometric filter (CCITT recommendation P53) deviation from ideal response: ±0.2 dB at 800 Hz; ±1 dB, 300 Hz to 3 kHz; ±2 dB, 50 Hz to 3.5 kHz; ±3 dB, 3.5 kHz to 5 kHz.
30 kHz low pass filter: 3 dB cutoff frequency, 30 kHz ± 2 kHz; 60 dB/decade rolloff.
80 kHz low pass filter: 3 dB cutoff frequency, 80 kHz ± 4 kHz; 60 dB/decade rolloff.

Rear Panel Inputs/Outputs

Recorder output: X: 0-10 Vdc (typical) corresponding to log of oscillator frequency.
Y: 0-10 Vdc (typical) corresponding to displayed value and entered plot limits.
Recorder output resistance: 1 kΩ nominal.
Monitor output: in ac level mode provides scaled output of measured input signal. In SINAD, distortion, and distortion level modes provides scaled output of input signal with the fundamental removed.

General

Input impedance: 100kΩ ±1% shunted by <300 pF with low terminal grounded[5,6].
CMRR (@ 60 Hz): 60 dB for differential input <2V; 36 dB for differential input <48V; 30 dB for differential input >48V.
Remote operation: HP-IB, all functions except the line switch, low terminal ground switches, and the x10÷10 increment keys.
HP-IB compatibility, as defined in IEEE-488-1978 is: SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0.
Temperature: operating, 0° to 55°C; storage, −55°C to 75°C.
Power requirements: 100, 120, 220, or 240 volts (+5, -10%); 48-440 Hz; 100 VA maximum.
Weight: net, 12.3 kg (27 lb). Shipping, 16.4 kg (36 lb).
Size: 146 H x 425 W x 440 mm D (5.75 x 16.8 x 17.3 in.).
HP System II module size: 5¼ H x 1 MW x 17 D. See p. 658-661 for compatible accessories.
EMI: conducted and radiated interference is within the requirements of methods CE03 and RE02 of MIL STD 461A, VDE 0871, and CISPR publication 11. Conducted and radiated susceptibility meet the requirements of methods CS01, CS02, and RS03 (1 volt/meter) of MIL STD 461A dated 1968.

Ordering Information	Price
8903A Audio Analyzer	**$6620**
(**Note:** HP-IB cable not supplied. See page 38.)	
Option 001: Rear panel connections instead of front panel for source output and analyzer input.	add $50
Option 907: Front panel handle kit	add $43
Option 908: Rack mount flange kit	add $25
Option 909: Front panel handle plus rack mount flange kit	add $65
Option 910: Extra Operating & Service Manual	add $30

[3]20 Hz to 100 kHz in SINAD and distortion.
[4]Resolution is limited to 0.01 Hz for input frequencies <100 Hz.
[5]In dc level mode input resistance is 101kΩ ± 1%.
[6]Input capacitance is <330 pF for Option 001.