

HP 8901A and HP 8901B Specifications

RF Input

Frequency range: 150 kHz to 1300 MHz

Operating level:

12 mVrms to 7 Vrms, 150 kHz to 650 MHz.

22 mVrms to 7 Vrms, 650 MHz to 1300 MHz.

Input impedance: 50Ω nominal.

Tuning: manual frequency entry, automatic, or track (frequencies > 10 MHz only).

Acquisition time (automatic operation): ~1.5 seconds.

Maximum safe input level (typical): 35 Vrms (25W for source SWR < 4), ac; 40V, dc.

Frequency Modulation

Rates:

20 Hz to 10 kHz, 150 MHz to 10 MHz.

20 Hz to 200 kHz, 10 MHz to 1300 MHz.

20 Hz to 20 kHz with 750 μs filter, 10 MHz to 1300 MHz.

Deviations:

40 kHz peak maximum, 150 kHz to 10 MHz.

400 kHz peak maximum, 10 MHz to 1300 MHz.

40 kHz peak maximum with 750 μs filter, 10 MHz to 1300 MHz.

Accuracy^{1,2}:

±2% of reading ±1 digit, 20 Hz to 10 kHz rates, 250 kHz to 10 MHz.

±1% of reading ±1 digit, 50 Hz to 100 kHz rates; ±5% of reading ±1 digit, 20 Hz to 200 kHz rates, 10 MHz to 1300 MHz.

Demodulated output distortion³:

<0.1% THD, deviations <10 kHz, 400 kHz to 10 MHz.

<0.1% THD, rates and deviations <100 kHz, 10 MHz to 1300 MHz.

AM rejection (for 50% AM at 400 Hz and 1 kHz rates)¹: <20 Hz peak deviation measured in a 50 Hz to 3 kHz BW.

Residual FM (50 Hz to 3 kHz BW): <8 Hz rms @ 1300 MHz, decreasing linearly with frequency to <1 Hz rms for 100 MHz and below.

Maximum deviation resolution:

0.1 Hz (rms detector on HP 8901B only), <4 kHz peak deviation.

1 Hz, <4 kHz peak deviation.

10 Hz, 4 kHz to 40 kHz peak deviation.

100 Hz, 40 kHz to 400 kHz peak deviation.

Resolution is increased one digit with 750 μs de-emphasis and pre-display "on" and with rms detector.

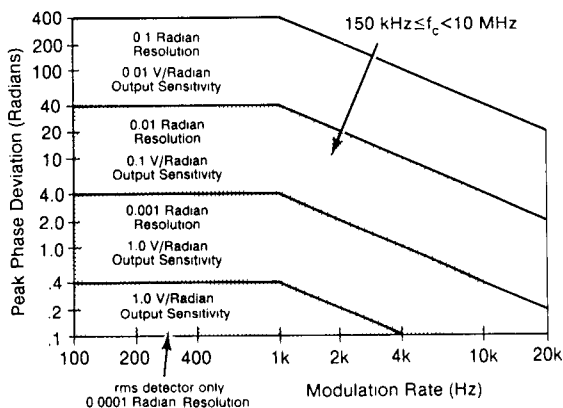
Stereo separation (50 Hz to 15 kHz): >47 dB typical.

Phase Modulation

Carrier frequency: 10 MHz to 1300 MHz.

Rates: 200 Hz to 20 kHz; typically usable from 20 Hz to 100 kHz with degraded performance.

Deviation and maximum resolution:



Accuracy¹: ±3% of reading ±1 digit.

Demodulated output distortion: <0.1% THD.

AM rejection (for 50% AM at 1 kHz rate)¹: <0.03 radian peak deviation (50 Hz to 3 kHz BW).

Amplitude Modulation

Rates:

20 Hz to 10 kHz, 150 kHz to 10 MHz.

20 Hz to 100 kHz, 10 MHz to 1300 MHz.

Depth: to 99%.

Accuracy^{1,2,4}:

±2% of reading ±1 digit, 50 Hz to 10 kHz rates, >5% depth; ±3% of reading ±1 digit, 20 Hz to 10 kHz rates, 150 kHz to 10 MHz.

±1% of reading ±1 digit, 50 Hz to 50 kHz rates, >5% depth; ±3% of reading ±1 digit, 20 Hz to 100 kHz rates, 10 MHz to 1300 MHz.

Flatness (variation in indicated AM depth for constant depth on input signal): ±0.3% of reading ±1 digit, 90 Hz to 10 kHz rates, 20% to 80% depth, 10 MHz to 1300 MHz.

Demodulated output distortion: <0.3% THD for ≤50% depth; <0.6% THD for ≤95% depth.

FM Rejection (at 400 Hz and 1 kHz rates, 50 Hz to 3 kHz BW)¹:

<0.2% AM for <5 kHz peak deviation, 250 kHz to 10 MHz.

<0.2% AM for <50 kHz peak deviation, 10 MHz to 1300 MHz.

Residual AM (50 Hz to 3 kHz BW): <0.01% rms.

Maximum Depth Resolution:

0.01% for depths ≤39.99%; 0.1% for depths ≥40%. Resolution increases 1 digit with rms detector (HP 8901B only).

Frequency Counter

Range: 150 kHz-1300 MHz.

Accuracy: ±3 counts of least significant digit ± reference accuracy.

Internal Reference:

Frequency: 10 MHz.

Aging rate: <1x10⁻⁶/month (optional⁵: 1x10⁻⁹/day).

Maximum resolution:

HP 8901A: 10 Hz for frequencies <1 GHz; 100 Hz for frequencies ≥1 GHz.

HP 8901B: 1 Hz.

HP 8901A RF Level (Peak Voltage Responding, RMS Sine Wave Power Calibrated)

Range: 1 mW to 1W.

Instrumentation accuracy: ±1.5 dB (150 kHz to 1300 MHz); 0.7 dB typical.

SWR: ≤1.3, 150kHz to 650 MHz; ≤1.5, 650 MHz to 1300 MHz.

Resolution: 0.1 mW for levels 0.1W to 1W; 0.01 mW for levels 0.01W to 0.1W; 0.001 mW for levels <0.01W.

HP 8901B RF Level (True RMS)

Frequency range with HP 11722A: 100 kHz to 2.6 GHz.

Power range: -20 dBm to +30 dBm.

RF range linearity (using recorder output):

±0.02 dB, RF ranges 2 - 5.

±0.03 dB, RF range 1.

Using front-panel display, add ±1 count of least-significant digit.

RF range-to-range change error:

±0.02 dB/RF range change from reference range.

Input SWR: <1.15, using HP 11722A Sensor Module.

Zero set (digital settability of zero):

±0.07% of full scale on lowest range.

Decrease by a factor of 10 for each high range.

RF power resolution:

0.1% of full scale in watts or volts mode.

0.01 in dBm or dB relative mode.

¹ Peak residuals must be accounted for in peak readings.

² But not to exceed: 50 Hz to 40 kHz rates for stated accuracy with rms detector (HP 8901B only).

³ With 750 μs de-emphasis and pre-display "off", distortion is not specified for modulation outputs >4V peak. This can occur near maximum deviation for a measurement range at rates <2 kHz.

⁴ For peak measurements only, AM accuracy may be affected by distortion generated by the Modulation Analyzer. In the worst case, this can decrease accuracy by 0.1% of reading for each 0.1% of distortion.

⁵ After 30 day warm-up.