



SWEEP OSCILLATORS

8620 Family: broadband plug-ins

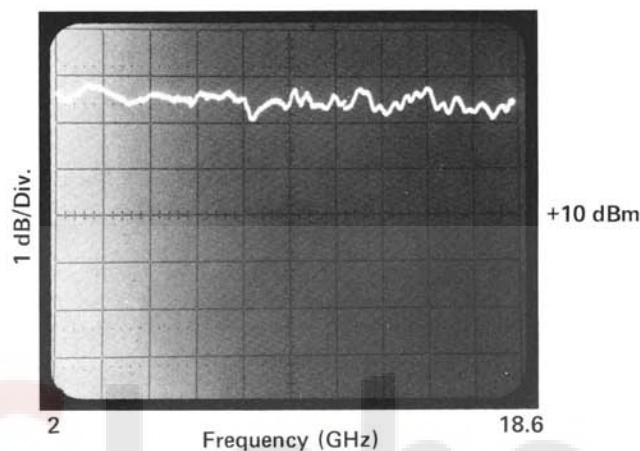
Models 86290A and 86290B

- +10 dBm 2 to 18.6 GHz with 86290B
- +7 dBm 2 to 18 GHz with 86290A
- Advanced technology provides outstanding performance
- 2 to 22GHz with Option H08



86290B

HP 86290B Typical Levelled Power Output



The 86290A and 86290B broadband plug-ins set new standards in wideband sweeper value with versatile frequency coverage and excellent performance characteristics at an attractive size and price. For broadband testing, a continuous sweep from 2 to 18.6 GHz (18 GHz with the 86290A) is provided. In addition, higher frequency resolution is achieved by covering the 2 to 18.6 GHz range in three individual bands of 2 to 6.2 GHz, 6 to 12.4 GHz, and 12 to 18.6 GHz (or 18 GHz). Continuous 2 to 22 GHz sweep operation is available via Option H08 with frequency bands of 2 to 6.2, 6 to 12.4, 12 to 22, and 2 to 22 GHz. Individual bands and corresponding dial scales are selected using the band select lever on the 8620C mainframe. Front panel lights indicate the frequency range selected. In each frequency band, all sweeper mainframe controls are operable.

The 86290A/B plug-ins offer outstanding electrical performance along with small size and simplicity of operation. The key microelectronic elements of the 86290B are a 2 to 6.2 GHz fundamental oscillator, 250 mW GaAs FET amplifier, and high-efficiency multiplier integrated with a tracking YIG filter, which combine to produce > 10 mW swept output over the 2 to 18.6 GHz range. This output is low in harmonic and spurious content and has excellent frequency linearity. On wideband sweeps, the 6.2 GHz and 12.4 GHz switch points can be Z-axis blanked as well as RF blanked, resulting in a spurious-free, clean continuous trace on any display.

The 86290A/B plug-ins have unique advantages as the source for network measurements. For 2 to 18 GHz scalar measurements, the 86290 accepts 27.8 kHz square wave AM modulation directly from the HP 8755 Frequency Response Test Set. Thus the need for an external modulator is eliminated providing convenience and cost savings, and more important, making full sweeper power available at the test device. Phase/amplitude network analysis over the continuous 2 to 18 GHz range becomes a reality using the 86290 and the HP 8410B Network Analyzer. Interfacing between the 8410B and the sweeper permits the 8410B to automatically phase-lock over multi-octave sweeps. Together, the 86290 and the 8410B make possible phase and amplitude measurements from 2 to 18 GHz in one continuous sweep.

As a stand-alone sweeper, the 8620C and 86290 plug-in provide still more features for ease in swept testing. Even at 18 GHz, frequency can be set with ± 30 MHz accuracy. Sweep linearity is 0.05% which means frequencies in the swept mode can be identified to accuracies comparable with wavemeters. Internal leveling is standard. External crystal and power meter leveling circuitry is also provided. A SLOPE control permits the frequency-dependent losses of a test setup to be compensated. The 2 to 6.2 GHz fundamental oscillator signal is always available through a rear output connector. Phase-locking from 2 to 18.6 GHz is accomplished using only 6.2 GHz hardware via this output. Accurate frequency readout is possible by connecting a DVM to the calibrated 1 Volt/GHz output located on the rear panel.

With the plug-in flexibility and these exceptional features, the 8620C/86290 sweeper is the ideal source for broadband sweep testing of components, transmission lines, antenna systems and ECM equipment.

General Specifications

Switch points: broadband switch points are at 6.2 and 12.4 GHz. Frequency overlap is typically 0 to 20 MHz at switch points.

Auxiliary output: rear panel 2 to 6.2 GHz fundamental oscillator output, nominally -10 dBm.

Slope control: front panel control allowing compensation for frequency dependent losses of a test setup by attenuating power at lower frequencies.

Peak control: front panel control for peaking power over desired frequency range.

Frequency reference output: nom. 1 V/GHz (2-18.6 volts) rear panel BNC output, CW frequency accuracy typically ± 35 MHz.

Mainframe compatibility: the 86290B will operate properly only with the 8620C mainframe. The 86290A will operate directly with 8620A mainframes with serial number prefixes of 1332A and above and with all 8620C mainframes. To use the 86290A with other 8620A mainframes order 86290A Option 060 which includes a mainframe modification kit.

Weight: net, 4.4 kg (9.6 lb). Shipping, 5.9 kg (13 lb).



86290A and 86290B Broadband Plug-ins

Specifications with plug-in installed in an 8620C mainframe	BAND 1	BAND 2	BAND 3	BAND 4
Frequency range: (GHz)* 86290A 86290B	2-6.2 2-6.2	6-12.4 6-12.4	12-18 12-18.6	2-18 2-18.6
Frequency accuracy (25 °C) CW mode (or >100 ms sweep time with FM switch in FM/PL): (MHz) Remote programming: typically (MHz) All sweep modes: (MHz) Marker: (MHz) Frequency linearity (correlation between frequency and sweep out voltage) typically: (MHz)	±20 ±2.5 ±30 ±30 ±8	±30 ±3.5 ±40 ±40 ±8	±30 ±3.5 ±40 ±40 ±8	±100 — ±100 ±100 ±30
Frequency stability With temperature: (MHz/°C) With 10% line voltage change: (kHz) With 10 dB power level change: (kHz) With 3:1 load SWR, all phases: (kHz) Frequency drift (in 10 minute period after 30 minute warm-up): typically (kHz) Residual FM (10 kHz bandwidth; FM switch in NORM) CW mode: (kHz peak)	±0.5 ±100 ±600 ±100 ±300 <10	±1.0 ±100 ±1200 ±200 ±600 <20	±1.5 ±100 ±1800 ±300 ±900 <30	±2.0 ±100 ±1800 ±300 ±900 <30
Maximum leveled power (25 °C): (dBm) 86290A 86290B Power level control range: (dB)	>+7 >+10 >+10	>+7 >+10 >+10	>+7 >+10 >+10	>+7 >+10 >+10
Power variation Internally leveled: (dB) Externally leveled (excluding coupler and detector variation) Crystal detector: (dB) Power meter: (dB) With temperature (typically): (dB/°C)	±0.7 ±0.15 ±0.15 ±0.1	±0.7 ±0.15 ±0.15 ±0.1	±0.8 ±0.15 ±0.15 ±0.1	±0.9 ±0.15 ±0.15 ±0.1
Spurious signals (below fundamental at specified maximum power) Harmonic related signals: (dB) Nonharmonics: (dB)	>25 >50	>25 >50	>25 >50	>25 >50
Residual AM in 100 kHz bandwidth (below fundamental at specified maximum power): (dB)	>55	>55	>55	>55
Source VSWR internally leveled, 50Ω nominal impedance	<1.9	<1.9	<1.9	<1.9
External FM Maximum deviations for modulation frequencies DC to 100 Hz: (MHz) 100 Hz to 2 MHz: (MHz) Sensitivity (typically) FM mode: (MHz/volt) Phase-lock mode: (MHz/volt)	±75 ±5 -20 -6	±75 ±5 -20 -6	±75 ±5 -20 -6	±75 ±5 -20 -6
AM (At specified maximum power) Specified requirements guaranteeing HP 8755 operation with ±6V, 27.8 kHz square wave MOD DRIVE connected to EXT AM input. On/Off ratio: (dB) Symmetry: Attenuation for +5 volt input: (dB) Internal 1 kHz square wave On/Off ratio: (dB) RF blanking (selected by mainframe switch) On/Off ratio: (dB)	>30 40/60 >30 >25 >30	>30 40/60 >30 >25 >30	>30 40/60 >30 >25 >30	>30 40/60 >30 >25 >30
Minimum sweep time typically: (ms)	10	10	10	60
CW remote programming setting time typical time to settle into CW frequency accuracy specification, 8620C Opt. 001 or 011; FM switch in FM/PL: (ms)	5	5	5	10

*The 2-22 GHz option (H08) differs in some performance areas. Please consult your local HP Field Engineer for complete information.

Ordering Information

86290A 2 to 18 GHz +7 dBm (5mW) plug-in (internal leveling standard) \$13,250
86290B 2 to 18.6 GHz +10 dBm (10 mW) plug-in (internal leveling standard) \$15,250
Opt 004: rear panel RF output: add \$80
(See Data Sheet for specifications)

Price

Opt 005: APC-7 RF output connector: add \$40
Opt 060: 86290A only, kit included for modifying 8620A mainframes with serial prefix 1332A and below. (86290B can only be used with the 8620C): add \$300
Opt H08: 2 to 22 GHz operation, 86290A/B add \$3000