

# Versatile seven model lineup includes a new DDS signal generator. Four models feature electronic attenuation.

**New** With DDS (Direct Digital Synthesizer) Signal Source

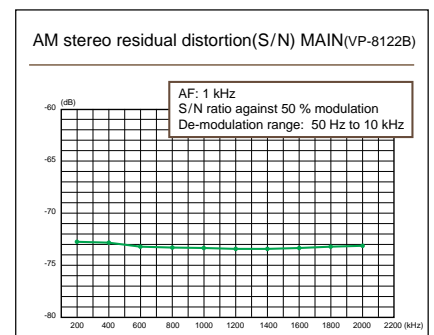
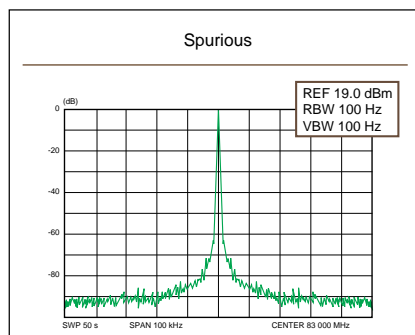
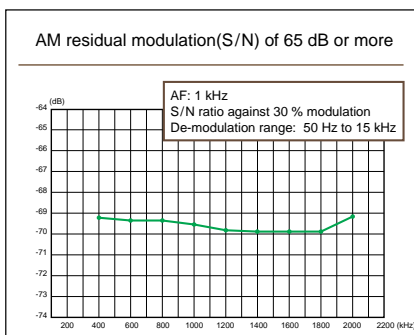
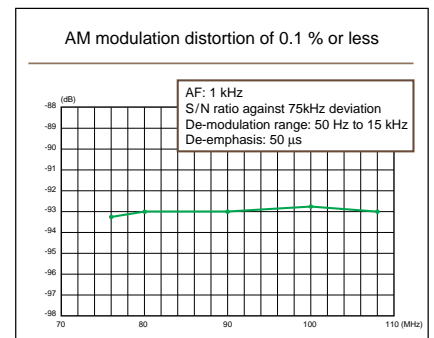
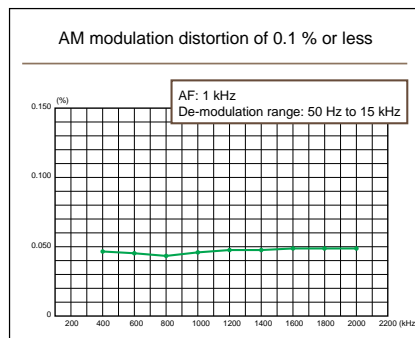
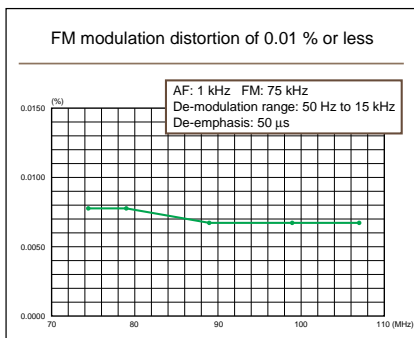


Direct digital synthesizer for enhanced frequency response measurements.

VP-8133A



## Typical data of performance



280 MHz Synthesized Signal Generator

## Multi-purpose standard model

High purity signal and 19 dBm output covers 0.01 to 280 MHz range (broadcast band), Basic Model.



VP-8130A



VP-8120B



## With FM stereo modulator

Additional FM stereo modulation with 60 dB or more stereo separation, based on VP-8130A/VP-8120B.



VP-8131A



VP-8121B



## With FM/AM stereo modulator

Additional High performance signal generator with FM and AM stereo (C-QUAM) modulation, based on VP-8130A/VP-8120B.



VP-8132A



VP-8122B



New

	Electronic ATT	F M	A M	FM stereo	AM stereo	DDS
VP-8130A	●	●	●			
VP-8131A	●	●	●	●		
VP-8132A	●	●	●	●	●	
VP-8133A	●	●	●	●		●
VP-8120B		●	●			
VP-8121B		●	●	●		
VP-8122B		●	●	●	●	

# VP-8120 Series • VP-8130 Series

## FEATURES

### 1

Low FM modulation distortion, low spurious, high purity source for all basic performance tests

- Covers wide range from LW to VHF.
- Supports hi-fi receiver tests with low  $-60$  dBc spurious and 90 dB or more S/N ratio.

#### FM/AM high purity signals

- Low FM (0.01% or less) and AM (0.1% or less) modulation distortion with  $-60$  dBc non-harmonic spurious for testing hi-fi receivers.
- Residual distortion of better than 90 dB (FM) and 65 dB (AM).

#### High 2 V output (19 dBm)

- High output from  $-133$  to  $+19$  dBm (50  $\Omega$ ).
- 0.1 dB attenuator setting resolution for all ranges.
- Results can be selected in 7 units.
- Built-in output level sweep function.

#### High 10 Hz RF resolution (10 kHz to 140 MHz)

- Frequency range of 0.01 to 280 MHz covers LW, AM, FM and VHF TV bands to allow testing of anything from hi-fi tuners, car audio and pagers to communications equipment.
- 8-digit high resolution setting: 20 Hz (140.00002 to 280.00000 MHz) and 10 Hz (below 140 MHz).
- Frequency sweep function provided as standard.

### 2

VP-8130 series features long-life electronic attenuator for all bands

- RF section employs electronic attenuator to achieve the reliable long life required for high speed automated testing systems.

#### Built-in direct digital synthesizer (VP-8133A)

- The VP-8133A features a DDS in addition to 400 Hz/1 kHz internal oscillators to allow 1 Hz step frequency response measurements from 20 Hz to 20 kHz.

### 3

Space saving design simplifies measurements

- Built-in AM/FM stereo modulation (VP-8132B/VP8122A) makes it easy to configure measurement instruments and set up optimal measurement conditions. Switching signals and connecting instruments is greatly simplified.

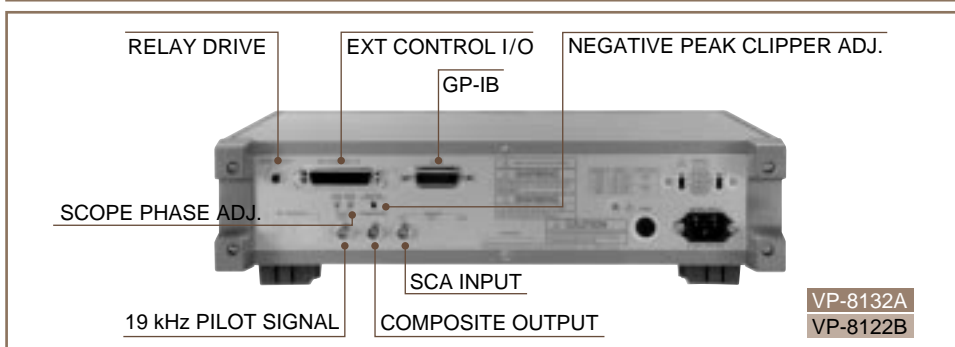
#### High-speed frequency settling, GP-IB interface

- Standard GP-IB interface with fast 70 ms frequency settling time supports high-speed system automation.

#### Flexible memory and interfaces

- An auto sequence function makes it simple to create an automatic measurement system by combining the SSG with a Panasonic audio analyzer, etc. No external PC or controller is required. Standard memory can hold up to 100 combinations of panel settings.
- External control of other instruments and automated test system peripherals is supported by a 2-port, 8-bit TTL I/O external control interface.

## Rear Panel



Common Specification

Frequency

Frequency range: 0.01 to 280 MHz  
 Display/Resolution: 0.01000 to 280.00000 MHz

Band	RF frequency	Resolution
4	140.00002 to 280.00000	20
3	70.00001 to 140.00000	10
2	35.00001 to 70.00000	10
1	0.01000 to 35.00000	10
VP-8132A/8122B AM ST	0.010000 to 2.000000	1

Switching speed: To be within 100 Hz to final frequency  
 Processing time: ≤ 15 ms  
 Settling time: ≤ 55 ms

Accuracy: ± 2 × 10<sup>-6</sup> ± 1 digit  
 Aging rate: ± 2 × 10<sup>-7</sup>/week  
 Temperature coefficient: ± 2 × 10<sup>-6</sup> / (10 to 35 °C)

Output Level

Output level range: - 133 to + 19 dBm (50 Ω)  
 - 134.8 to + 17.2 dBm (75 Ω)

Resolution: 0.1 dB  
 Accuracy: ± 1 dB (≥ - 113 dBm: 50 Ω)  
 ± 1.5 dB (< - 113 dBm: 50 Ω)

Flatness: ± 1 dB or less (Output level: + 8 dBm, 50 Ω)  
 Output impedance: 50 Ω/75 Ω  
 VSWR: ≤ 1.2 (Output level ≤ + 3 dBm: 50 Ω)  
 Radiation interference: ≤ 1 μV (25 mm apart from the main body)  
 Unit: dBm, dBμV, dBμV [emf], V, mV, μV, V [emf], mV [emf], μV [emf]

Attenuator contact:  
 VP-8120B series Mechanical contact  
 VP-8130A series Semiconductor contact

Signal purity

Spurious:

Harmonics:  
 RF: 0.01 to 35 MHz ≤ - 30 dBc (Output > +13dBm: 50 Ω)  
 RF: 0.01 to 35 MHz ≤ - 40 dBc (Output ≤ +13dBm: 50 Ω)  
 RF: 35.000 1 to 280 MHz ≤ - 30 dBc (Output ≤ +13dBm: 50 Ω)  
 Non-harmonics: ≤ - 60 dBc (± 10 kHz offset from carrier)

Residual modulation

FM component: (AF 1 kHz, FM 75 kHz)  
 ≥ 90 dB (10.7 ± 1/76 to 108 MHz)  
 ≥ 80 dB (0.3 to 280 MHz)  
 (BW 50 Hz to 15 kHz)  
 (De-emphasis 50 μs)

AM component: (AF 1 kHz, AM 30 %)  
 ≥ 65 dB (0.4 to 1.7 MHz)  
 ≥ 60 dB (0.15 to 280 MHz)  
 (BW 50 Hz to 15 kHz)  
 (Except beat element)

Modulation

Internal modulation signal:  
 RC oscillator: 400 Hz, 1 kHz ± 3 %  
 DDS: VP-8133A only  
 Frequency range/Accuracy: 20 Hz to 20 kHz/± 0.01 %  
 Resolution: 1 Hz  
 Flatness: Same as ext. modulation frequency response

Ext. modulation input impedance: Approx. 10 kΩ  
 Ext. modulation input voltage: Approx. 1V [peak]

Amplitude modulation

Modulation depth: 0 to 100 % (Output level ≤ + 13 dBm, RF ≥ 0.15 MHz)  
 Resolution: 0.5 % (0 to 100 %)  
 Accuracy: (AF 1 kHz)  
 (0.4 to 1.7 MHz) ± (Reading × 0.04 + 2) % (≤ 80 %)  
 (0.15 to 280 MHz) ± (Reading × 0.06 + 2) % (≤ 80 %)  
 Distortion: (BW 50 Hz to 15 kHz, AF 1 kHz: RC)

Modulation:	0 to 30 %	30 to 60 %	60 to 80 %
Band 1: 0.4 to 1.7 MHz	≤ 0.1 %	≤ 0.5 %	≤ 1 %
All band: 0.15 to 280 MHz	≤ 1 %	≤ 2 %	≤ 3 %

(Except beat element)

(VP-8120 series: + 13 dBm, VP-8130 series: + 8 dBm)

Incidental FM: (AF 1kHz AM 30 %)  
 (0.4 to 1.7 MHz) ≤ 75 Hz  
 (0.15 to 280 MHz) ≤ 200 Hz

Ext. modulation frequency response: ≤ ± 1 dB: 20 Hz to 10 kHz  
 (Ref.: 1 kHz RF ≥ 0.3 MHz)  
 (Max. modulation frequency is up to 2 % of carrier frequency at 30 % AM.)

Frequency modulation

Frequency deviation range:	0 to 9.99 kHz	10 to 99.9 kHz	100 to 999 kHz
Resolution:	10 Hz	100 Hz	1 kHz

(Max. FM deviation is up to 25 % of carrier frequency)

Accuracy: ± (Reading × 0.08+1digit)

Distortion: (BW 50 Hz to 15 kHz, AF 1 kHz: RC FM 75 kHz)  
 ≤ 0.01 % (10.7 ± 1/76 to 108 MHz)  
 ≤ 0.1 % (0.3 to 140 MHz)  
 ≤ 0.5 % (140.000 02 to 280 MHz)

Stereo separation: (AF 1 kHz 67.5 kHz deviation 76 to 108 MHz)  
 ≥ 60 dB

Incidental AM: (AF 1 kHz FM 75 kHz)  
 ≤ 0.5 % (10.7 ± 1/76 to 108 MHz)

Ext. modulation frequency response: MONO mode (20 Hz to 100 kHz, 1 kHz ref.)  
 ≤ ± 0.3dB (76 to 108 MHz)  
 ≤ ± 1dB (0.3 to 280 MHz)  
 Other than MONO mode (20 Hz to 15 kHz, 1 kHz ref.)  
 ≤ ± 1dB (2.000 01 to 280 MHz)

FM • AM simultaneous modulation: 4 kinds

VP-8132A/VP-8122B (VP-8132A: +8 dBm, VP-8122B: +13 dBm)

AM stereo  
 AM stereo: C-QUAM (Motorola system)  
 RF frequency: 0.200000 to 2.000000 MHz  
 Resolution: 1 Hz

Residual modulation

AM component: (AF 1 kHz, Main ch. 50 % modulation)  
 ≥ 65 dB (BW 50 Hz to 10 kHz)  
 (AF 1 kHz, Sub ch. 50 % modulation)  
 ≥ 54 dB (BW 50 Hz to 10 kHz)

PM component: ≥ 54 dB (BW 50 Hz to 10 kHz)

Main • Sub ch. modulation:

Mode	Modulation signal	Contents
OFF	-	Pilot signal only
L=R	INT/EXT R	Stereo modulation by single signal
L		
R		
L= - R		
MONO	INT/EXT R	Monophonic modulation
EXT L,R	Lch: EXT L Rch: EXT R	Stereo modulation by Ext. two signals

Specification of monophonic modulation mode is based on the common specification of this series.

Main channel modulation

Modulation: AM  
 Range: 0 to 100 %  
 Resolution: 1 %  
 Accuracy: ± (Reading × 0.05 + 2)% (0 to 99 %)  
 Distortion: (AF 1 kHz BW 50 Hz to 10 kHz)  
 ≤ 0.2 % (50 % modulation)

Sub channel modulation

Modulation: PM  
 Range: 0 to 100 % (100 %: ± 45 °)  
 Resolution: 1 %  
 Accuracy: ± (Reading × 0.05 + 2)%  
 Distortion: (AF 1 kHz BW 50 Hz to 10 kHz)  
 ≤ 1 % (50 % modulation)

L,R modulation

Range: 0 to 80 %  
 Resolution: 1 %  
 Accuracy: ± (Reading × 0.05 + 2)%  
 Distortion: (AF 1 kHz BW 50 Hz to 10 kHz)  
 ≤ 1 % (50 % modulation)

Cross talk: (AF 1kHz 50 % modulation)  
 Main to Sub ch: ≥ 40 dB  
 Sub to main ch: ≥ 46 dB  
 Separation: ≥ 36 dB (BW 400 Hz to 4 kHz)  
 ≥ 26 dB (BW 100 Hz to 7.5 kHz)

Pilot signal

Frequency: 25 Hz  
 Frequency accuracy: ± 1 %  
 Range: 0 to 10 % (Display: 0 to 12.5 %)  
 Resolution: 0.1 %  
 Modulation accuracy: ± (Reading × 0.05 + 2)%

Negative peak clipper

ON-OFF control:  
 Variable range: ≥ (95 % ± 5 %)

VP-8133A/VP-8132A/VP-8131A/VP-8122B/VP-8121B

FM stereo  
 Frequency range: 2.00001 to 280 MHz

Modulation mode:

Mode	Modulation signal	Contents
OFF	-	Pilot signal only
L=R	INT L, EXT L	Stereo modulation by single signal
L		
R		
L= - R		
MONO	INT/EXT L	Monophonic modulation
INT L	Lch: INT L	Stereo modulation by Int. & Ext.
EXT R	Rch: EXT R	
EXT L,R	Lch: EXT L Rch: EXT R	Stereo modulation by Ext. two signals

Specification of monophonic modulation mode is based on the common specification of this series.

**Signal level ratio (M + S variable)**

Range:	0 to 114 % (Other than Monophonic) 0 to 127 % (MONO)
Resolution:	1 %
Accuracy:	± 5 %
Pre-emphasis:	25 µs/50 µs/75 µs/OFF

**Pilot Signal**

Frequency/Accuracy:	19 kHz/± 1 Hz
Level setting/Resolution:	0 to 19.9%/0.1 %
Accuracy:	± 1 %

**Composite output (Against the internal modulation)**

Level:	0 to 9.99 V [p-p] Open end ± 5 %
Output impedance:	Approx. 75 Ω
Stereo separation:	≥ 60 dB, 90 % level ratio (AF: 1 kHz)
Distortion:	0.01 % (RC oscillator)
S/N:	≥ 90 dB, 100 % level ratio
38 kHz sub carrier leakage:	≥ - 50 dB

**19 kHz output signal**

Level:	Approx. 1 V [rms]
Impedance:	Approx. 1 kΩ

**SCA signal**

Frequency range:	20 to 99 kHz ±1 dB (57 kHz ref.)
Input level:	0.56 V [p-p] (0.2 V [rms]) Equivalent to 10 % level ratio
Input impedance :	Approx. 10 kΩ

**Preset function**

Assorted preset:	100 data (Panel condition, I/O condition, Output level)
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**Interface**

GP-IB:	Listener/talker, Listen only, Talk only, Remote/local, Device clear SH1, AH1, T7, L3, SR0, RL1, PP0, DC1, DT0, C0
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External control interface:	(1) Sequential recall (Up/Down/Clear) (2) Modify (Freq./Level) (3) Direct recall (4) 8 bits TTL control (5) Print out of memory contents (6) 8 bits data read (7) Relay drive (Dummy antenna switching)
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**Others**

Power requirement:	AC100/120/220/230 V
Frequency:	50 Hz/60 Hz
Power consumption:	Approx. 90 VA
Mass • Dimension:	W 426 x H 99 x D 400 mm Approx. 15 kg
Accessories:	Output cable, GP-IB connector shield cap, Power cable, Spare fuse, Operation manual