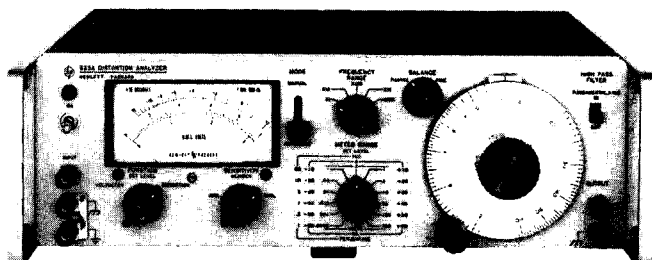




# SIGNAL ANALYZERS

## Distortion analyzers

Models 331A, 332A, 333A, 334A



333A

### Description

Hewlett-Packard's models 331A, 332A, 333A and 334A Distortion Analyzers measure total distortion down to 0.1% full scale at any frequency between 5 Hz to 600 kHz; harmonics are indicated up to 3 MHz. These instruments measure noise as low as 50 microvolts and measure voltages over a wide range of level and frequency. Refer to table below for available models and features.

Model No.	Auto Nulling	Hi-Pass Filter	Lo-Pass Filter	AM Detector
331A				
332A				X
332A Opt. H05			X	X
333A	X	X		
334A	X	X		X
334A Opt. H05	X		X	X

Option 001, for each model, features VU meter characteristics conforming to FCC requirements.

### 331A Specifications

**Distortion measurement range:** any fundamental frequency, 5 Hz to 600 kHz. Distortion levels of 0.1%–100% are measured full scale in 7 ranges.

#### Distortion measurement accuracy

#### Harmonic measurement accuracy (full scale)

Fundamental Input Less Than 30 V

Range	±3%	±6%	±12%
100%–0.3%	10 Hz–1 MHz	10 Hz–3 MHz	
0.1%	30 Hz–300 kHz	20 Hz–500 kHz	10 Hz–1.2 MHz

Fundamental Input Greater Than 30 V

Range	±3%	±6%	±12%
100%–0.3%	10 Hz–300 kHz	10 Hz–500 kHz	10 Hz–3 MHz
0.1%	30 Hz–300 kHz	20 Hz–500 kHz	10 Hz–1.2 MHz

**Elimination characteristics:** fundamental rejection >80 dB. Second harmonic accuracy for a fundamental of 5 to 20 Hz; better than +1 dB; 20 Hz to 20 kHz; better than ±0.6 dB; 20 kHz to 100 kHz; better than –1 dB; 100 kHz to 300 kHz; better than –2 dB; 300 kHz to 600 kHz; better than –3 dB.

**Distortion introduced by instrument:** >–70 dB (0.03%) from 5 Hz to 200 kHz. >–64 dB (0.06%) from 200 kHz to 600 kHz. Meter indication is proportional to average value of a sine wave.

**Frequency calibration accuracy:** better than ±5% from 5 Hz to 300 kHz. Better than ±10% from 300 to 600 kHz.

**Input impedance:** distortion mode; 1 MΩ ±5% shunted by <70 pF (10 MΩ shunted by <10 pF with HP 10001A 10:1 divider probe).

**Voltmeter mode:** 1MΩ ±5% shunted by <35 pF 1 to 300 V rms; 1 MΩ ±5% shunted by <70 pF, 300 μV to 0.3 V rms.

**Input level for distortion measurements:** 0.3 V rms for 100% set level or 0.245 V for 0 dB set level (up to 300 V may be attenuated to set level reference).

**DC isolation:** signal ground may be ±400 V dc from external chassis.

**Voltmeter range:** 300 μV to 300 V rms full scale (13 ranges) 10 dB per range.

**Voltmeter accuracy:** (using front panel input terminals)

Range	±2%	±5%
300 μV	30 Hz–300 kHz	20 Hz–500 kHz
1 mV–30 V	10 Hz–1 MHz	5 Hz–3 MHz
100 V–300 V	10 Hz–300 kHz	5 Hz–500 kHz

**Noise measurements:** voltmeter residual noise on the 300 μV range: <25 μV rms, when terminated in 600 (shielded) ohms, <30 μV rms terminated with a shielded 100 kΩ resistor.

**Output:** 0.1 ±0.01 V rms open circuit and 0.05 ±0.005 V rms into 2 kΩ for full scale meter deflection.

**Output impedance:** 2 kΩ.

**Power supply:** 115 or 230 V ±10%, 50 to 66 Hz, approximately 4 VA.

### 332A Specifications

Same as Model 331A except as indicated below:

**AM detector:** high impedance DC restoring peak detector with semi-conductor diode operates from 550 kHz to greater than 65 MHz. Broadband input, no tuning is required.

**Maximum input:** 40 V p-p AC or 40 V peak transient.

**Distortion introduced by detector:** carrier frequency: 550 kHz–1.6 MHz: <50 dB (0.3%) for 3–8 V rms carriers modulated 30%. 1.6 MHz–65 MHz: <40 dB (1%) for 3–8 V rms carriers modulated 30%. Note: Distortion introduced at carrier levels as low as 1 Volt is normally <40 dB (1%) 550 kHz to 65 MHz for carriers modulated 30%.

### 333A Specifications

Same as Model 331A except as indicated below:

**Automatic nulling mode:** set level: at least 0.2 V rms

**Frequency ranges:** X1, manual null tuned to less than 3% of set level; total frequency hold-in ±0.5% about true manual null. X10 through X10 k, manual null tuned to less than 10% of set level; total frequency hold-in ±1% about true manual null.

**Automatic null accuracy:** 5 Hz to 100 Hz: meter reading within 0 to +3 dB of manual null. 100 Hz to 600 kHz: meter reading within 0 to +1.5 dB of manual null.

**High-pass filter:** 3 dB point at 400 Hz with 18 dB per octave roll off. 60 Hz rejection 40 dB. Normally used with fundamental frequencies greater than 1 kHz.

**Power supply:** same as Model 331A.

### 334A Specifications

Same as Model 333A except includes AM Detector described under Model 332A:

#### General

**Dimensions:** 426 mm W × 126 mm H × 337 mm D (16.75" × 5" × 13.25").

**Weight:** net, 7.98 kg (17.75 lb). Shipping, 10.35 kg (23 lb).

#### Ordering instructions

Option 001, indicating meter has VU characteristics conforming to FCC requirements for AM/FM and TV broadcasting

H05-332A (meets FCC requirements)

H05-334A (meets FCC requirements)

331A Distortion Analyzer

332A Distortion Analyzer

333A Distortion Analyzer

334A Distortion Analyzer

#### Price

add \$23

add \$129

add \$105

\$1100

\$1150

\$1250

\$1300