

THE 3314A FUNCTION GENERATOR

The 3314A is a multi-mode, HP-IB programmable Function Generator featuring Sine, Square and Triangle functions from .001Hz to 19.99MHz. Sophisticated implementation of the operating modes (see below) plus precision control of the trigger signal make the 3314A a flexible, easy to use function generator.

Modes of Operation

FREE RUN Mode. The 3314A output signal is continuous or swept.



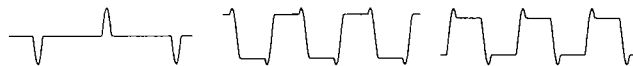
GATE Mode. The 3314A output signal is gated ON or OFF.



N CYCLE Mode. The 3314A output signal is a counted burst of "N" cycles.



1/2 CYCLE Mode. The 3314A output signal is alternate 1/2 cycles.



Fin X N Mode. The 3314A output frequency is locked to and "N" times the reference frequency.



Fin ÷ N Mode. The 3314A output frequency is locked to and "1/N" times the reference frequency.



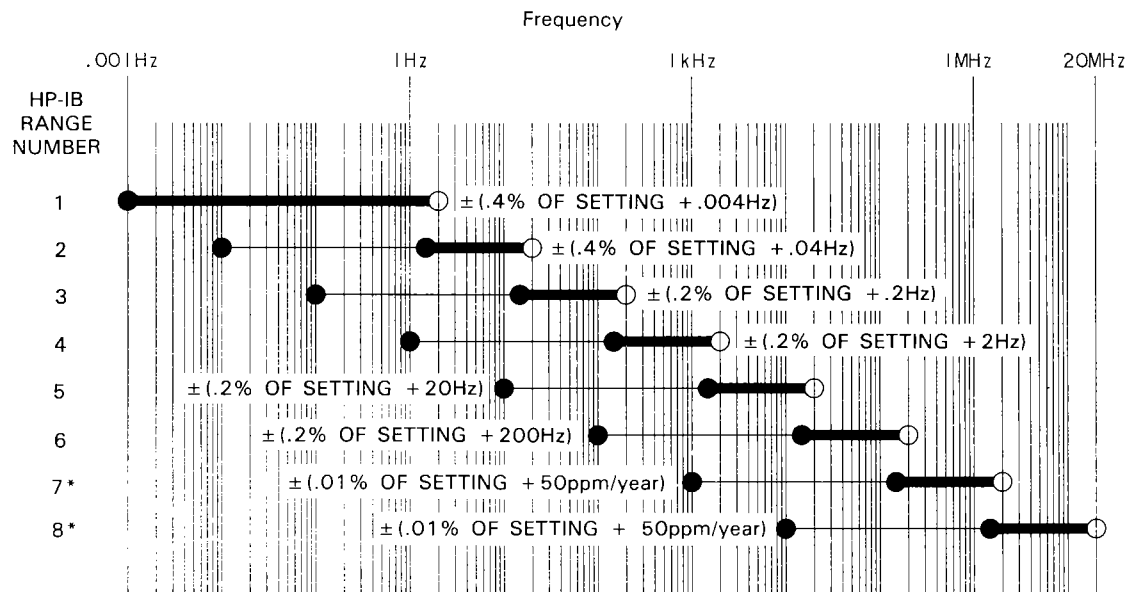
ARB Mode. The 3314A is redefined as an Arbitrary Waveform Generator capable of producing user defined waveforms.



SPECIFICATIONS

The specifications listed here are taken from the Service Manual at the time this manual was printed. They may not apply to your instrument if the manuals were not printed at the same time. Refer to the Service Manual to determine the exact specifications that apply to your instrument. This table contains specifications only. The rest of this manual deals with operating characteristics and includes specifications where necessary.

Frequency Accuracy



●——○ DENOTES FREQUENCY RANGE USING AUTO-RANGING.

●—— DENOTES EXTENDED FREQUENCY RANGE USING RANGE HOLD.

○ FREQUENCIES UP TO BUT NOT INCLUDING THIS POINT ARE ALLOWED.

* FREQUENCY IS SYNTHESIZED IN RANGES 7 AND 8 IN THE FREE RUN MODE WITH VCO = OFF.

ACCURACY APPLIES IN THE FREE RUN MODE WITH SYMMETRY = 50% (FIXED), AND VCO = OFF AND WITH RANGE HOLD ON OR OFF.

SPECIFICATIONS (cont)

Amplitude

Absolute Amplitude Accuracy:

$\pm(1\% \text{ of display} + .035\text{Vp-p})$, sinewave and squarewave
 $\pm(1\% \text{ of display} + .06\text{Vp-p})$, triangle

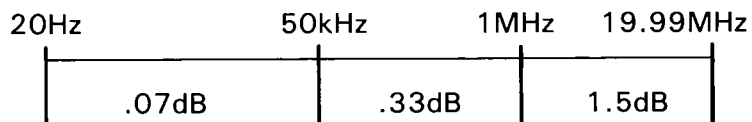
Amplitudes: 1.00Vp-p to 10.00Vp-p (Range 4)

Frequency: 10kHz

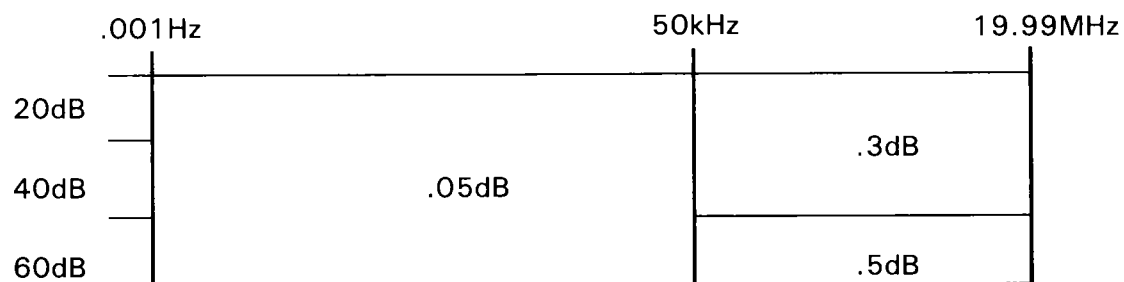
Auto-Range: ON

Flatness--sine wave:

Relative to 10kHz, 1.00 V to 10.00Vp-p (Range 4)



Step Attenuator Accuracy:



SPECIFICATIONS (cont)

DC Offset

Offset Accuracy:

$\pm(3\% \text{ of display} + 10 \text{ mVDC} + 0.5\% \text{ of AC Amplitude Range})$

Frequency: $< 100\text{kHz}$

Auto-Range: ON

Residual DC Offset:

$< \pm.5\% \text{ of AC Amplitude Range}$

Setting: OVDC

Frequency: $\leq 100\text{kHz}$

Symmetry

Symmetry Accuracy (Fixed):

$50\% \pm 0.2\%$

Fixed Symmetry: 50% (SYM light OFF)

Frequency: 1Hz to 100kHz

Function: square wave

Symmetry Accuracy (Variable)

$\pm 0.5\% \text{ of period:}$

Frequency: 1Hz to 100kHz

Function: square wave

SPECIFICATIONS (cont)

Phase

Phase Offset--Phase lock Modes:

Accuracy: $\pm 2^\circ$ (50Hz to 25kHz)

Phase Offset is referenced to the signal output for $F_{in} \div N$ or the trigger input for $F_{in} \times N$.

Start/Stop Phase--Burst Modes:

Accuracy: $\pm 3^\circ$ (applies from .001Hz to 1kHz)

Function Characteristics

Sine Harmonic Distortion:

Individual harmonics will be below these levels, relative to the carrier level. Offset = 0V. Function Invert = OFF. *Add 4dB for ambient temperature 0 to 5°C or 45 to 55°C.

| 20Hz | 50kHz | 1999kHz | 19.99MHz |
|---------|--------|---------|----------|
| - 55dB* | - 40dB | - 25dB | |

Square Wave Rise/Fall Time:

$\leq 9\text{ns}$, 10% to 90% of a 10 Vp-p output

Square Wave Aberrations:

< 5% at 10 Vp-p output

Triangle Linearity:

$\pm 0.2\%$ of the p-p voltage

Frequency: .01 Hz to 1kHz, Amplitude = 10 Vp-p

Deviation is from a best fit straight line, from 10% to 90% of each ramp.

SPECIFICATIONS (cont)

Internal Trigger Interval

Period Accuracy: $\pm(0.01\% + 50 \text{ ppm/year})$ of displayed interval (excluding sweep intervals)

Frequency Sweep

Sweep Frequency Accuracy--Manual Sweep:

$\pm(0.2\%$ of Stop Freq $+0.1\%$ of Stop Freq Range), Stop Freq Range $\leq 200\text{kHz}$
 $\pm 1\%$ of Stop Freq, Stop Freq in 2MHz Range
 $\pm 3\%$ of Stop Freq, Stop Freq in 20MHz Range

Modulation

Amplitude Modulation Envelope Distortion:

$\leq -40\text{dB}$

Carrier: = 1MHz, 10Vp-p, sine wave

Modulating Input: 1kHz, sine wave

Index of Modulation: 95%

VCO Linearity:

$\pm 0.15\%$ of p-p frequency, .1Hz through 200kHz Range
 $\pm 1\%$ of p-p frequency, 2MHz Range
 $\pm 3\%$ of p-p frequency, 20 MHz Range

-8 Vdc to +1 Vdc input (-80% to +10%)

Deviation is from a best fit straight line.

SPECIFICATIONS (cont)

Option 001--Simultaneous X 3 Output

Specifications for Option 001 were not available for this printing.

SPECIFICATIONS (cont)

General

Specifications apply when:

Main signal output is terminated into 50 ± 0.1 ohms
Warm-up is ≥ 30 minutes
Within $\pm 5^\circ\text{C}$, and 24 hours of last internal calibration
Temperature 0° to 55°C
Relative Humidity $\leq 95\%$ at 40°C
Altitude $\leq 15,000$ ft.

Storage Limits:

Temperature -40° to $+75^\circ\text{C}$
Altitude $\leq 50,000$ ft.

Power:

100/120/220/240 V, +5% -10%, 48 to 66 Hz
90 VA maximum

Weight:

7.3 kg (16 lbs) net
10.5 kg (23 lbs) shipping

Dimensions:

132.6 mm (5.22 in) high
212.3 mm (8.36 in) wide
419.0 mm (16.50 in) deep

Accessories Included:

11048C 50 ohm feed through

Accessories:

Transit case for one 3314A; -hp- #9211-2677