



## Description

The 3311A Function Generator offers wide functional capability at a modest price. This compact unit has seven decades of range from 0.1 Hz to 1 MHz. Pushbutton range and function selection add convenience to versatility. Added features normally not found on function generators in this price range are 10:1 voltage control and a separate pulse output suitable for synchronization or driving TTL logic circuits.

## Output

Ten V p-p into 600  $\Omega$  (20 V p-p open circuit). This output may be attenuated by  $>30$  dB by a variable attenuator and offset by  $\pm 5$  V. The dc offset allows the sine, square, and triangle functions to be positioned to the most desired level. This feature adds to the usefulness of all three functions.

## VCO

The dc coupled voltage control allows the use of an external source to sweep the 3311A  $>10:1$  in frequency.

## Pulse Output

A separate TTL compatible pulse output provides current sinking for up to 20 TTL loads. The pulse has a 15/85 aspect ratio with a  $<25$  ns rise time.

## Specifications

**Waveforms:** sinusoid, square, triangle, and positive pulse.

**Frequency range:** 0.1 Hz to 1 MHz in seven decade ranges.

**Dial accuracy:**  $\pm 5\%$  of full scale.

**Isolation:** using an external supply, outputs may be floated up to  $\pm 500$  V relative to the instrument case (earth ground).

## 600 Ohm Output

**Maximum output amplitude:** 20 V p-p open circuit; 10 V p-p into 600  $\Omega$ .

**Amplitude control:** continuously variable,  $>30$  dB range. DC off-

set: up to  $\pm 10$  V open circuit,  $\pm 5$  V into 600  $\Omega$ , continuously adjustable and independent of amplitude control. Maximum  $V_{ac}$  peak +  $V_{dc}$  offset without clipping is  $\pm 10$  V open circuit,  $\pm 5$  V into 600  $\Omega$ .

**Output impedance:** 600  $\Omega \pm 10\%$ .

**Sine wave amplitude flatness:** within  $\pm 3\%$  of 10 kHz reference (maximum output amplitude) to 100 kHz,  $\pm 6\%$  to 1 MHz.

**Sine wave total harmonic distortion:**  $<3\%$  (maximum output amplitude).

**Triangle linearity:** deviation  $<1\%$  from best straight line at 100 Hz (maximum output amplitude).

**Square wave transition time:** rise time:  $<100$  ns; fall time:  $<100$  ns.

**Square wave time axis symmetry error:**  $\pm 2\%$  maximum to 100 kHz.

## Pulse Output

**Output amplitude:**  $>3$  V positive (open circuit) TTL compatible.

**Duty cycle:** 13.5% to 16.5% of the total period.

**Transition times:**  $<25$  ns.

## External Frequency Control

**VCO range:**  $>10:1$  on any frequency range.

**Input requirement:** with frequency dial set to 1.0, a linear ramp of 0.0 V to  $-10$  V  $\pm 2$  V will linearly increase frequency  $>10:1$

**Input impedance:** 10 k $\Omega \pm 10\%$  in parallel with  $<60$  pF.

## General

**Operating temperature:** 0°C to 55°C; specifications apply from +15°C to +35°C.

**Storage temperature:**  $-40^\circ\text{C}$  to  $+75^\circ\text{C}$ .

**Power:** 100/120/220/240 V  $-10\%$ ,  $+5\%$  switchable; 48 Hz to 66 Hz;  $\leq 12$  VA.

**Size:** 89 mm H x 159 mm W x 248 mm D (3.5" x 6.3" x 9.8").

**Weight:** net, 1.5 kg (3.3 lb). Shipping, 2.5 kg (5.5 lb).

**Rack mount kits:** 10851A for one 3311A, 10852A for two.

3311A Function Generator

\$395