



## 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°C to +75°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