Ballantine Laboratories, Inc.

323 Wideband True RMS AC Voltmeter

Product Description

The Ballantine 323 True RMS analog AC voltmeter uses advanced true rms circuitry to achieve square law response from rugged, fast responding silicon diode detectors with no thermal lag and overload vulnerability inherent in thermocouple devices.

These true rms meters respond to the equivalent heating power of the waveform being measured, yielding accurate readings for signals from pure sine waves to complex waveshapes such as distorted sines, squarewaves, pulses, noise, switching power supplies signals, and more. Also, when used with instrument shunts, the 323 provides true rms current measurements on non-sinusoidal waveforms.

Using a Ballantine proprietary suppressed-zero logarithmic voltage scale (linear dB scale), the 323 provides constant reading accuracy from end to end, as well as increased resolution and readability.

Product Features

- True RMS Response, including harmonics & crest factors to 21
- Voltage range: 300 µV to 300 V full scale, 1% basic accuracy
- Superior input flexibility
- Selectable floating or grounded operation
- Frequency range: 2 Hz to 25 MHz, usable from 1 Hz to 75 MHz
- Full field portability, AC mains powered, optional rechargeable battery
- Fastest response without thermal lag or delicate thermocouples

Product Specifications

Model	323–06 323–07	323–20 323–21
Voltage Range	300µV to 300 V (300 µV Full Scale in METER + 10 dB Mode)	
Calibration	True rms (effective heating value) of input waveform	
Min. – Max. Scale Indication	100 µV to 330 V	
Decible Range	-78 dBm to +52 dBm (0 dBm = 1 mW/600 W)	-80 dB to + 50 dB (0 dB = 1 Volt)
Frequency Range	2 Hz to 25 MHz (Usable 1 Hz to 75 MHz)	
Scale Calibrations	Log Voltage: .095 to .33 and .3 to 1.06 Linear dB: -8.2 to +2.6	Log Voltage: .095 to .33 and .3 to 1.06 Linear dB: 0 to 10

Accuracy (in ± percent of reading at reference conditions. Limited to 108 Volts-Hz)

12 Basic Ranges	Accuracy
2 Hz to 5Hz	10%
5Hz to 20Hz	5%
20Hz to 50Hz	3%
50Hz to 1 MHz	1% F.S. or 2% rdg*
1 MHz to 10 MHz	2%
10 MHz to 15 MHz	3%
15 MHz to 20 MHz	5%
20 MHz to 25 MHz	8% F.S. or 10% rdg*

+ 10 dB Range	Accuracy
5 Hz to 10 Hz	10%
10 Hz to 20 Hz	2%
20 Hz to 2 MHz	3%
2 MHz to 10 MHz	5%

Crest Factor

10 at 0.7 Full Scale, 7 at Full Scale, increasing to 21 at 1/3 Full Scale, except as limited by maximum input of 330 V rms sinewave or ±465 V pk

Noise

< 30 µV (input terminated with 50Ω). Noise adds to signal as the square root of the sum of the squares.

Input Impedance

Signal High to Low, 2 MΩ || 15 pF, ranges above 30 mV; 2 MΩ || 25 pF, ranges 1 mV to 30mV. Signal Low to Case ground, > 40 MΩ || 400 pF.

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Input Terminal
BNC, floating or grounded with respect to chassis. Convertible to floating or grounded 3/4-inch spaced banana jack binding posts with supplied Model 618 adapter.

Overvoltage Protection
500 V (dc + pk ac) all ranges to 1 kHz. Ranges above 30 mV, limited to 10Ranges 30 8 V-Hz. mV and below limited to 107 V-Hz.

Common Mode Rejection Ratio
> 120 dB @ dc. > 80 dB at 60 Hz.

Meter Response
Front panel meter time constant control provides selectable meter responses of 0.25 sec for input frequencies above 100 Hz; 0.5 sec for frequencies above 40 Hz; 5 sec for frequencies from 2 Hz to 40 Hz.

AC to DC Converter Output
Positive 1 V dc at full scale, to 0.1 V at bottom scale any range. Accuracy ±1% full scale. Output available simultaneously with meter indications. Output proportional to mean square of input signal.

Reference Conditions
24° ± 2 °C, 80% RH, ac mains 117 V ±2%, mains frequency 50 to 420 Hz, warm-up 1 hr. Temperature coefficient typically 0.1% per °C from 15° to 30°C and 0.2% per °C from 0° to 10°C and 30° to 40°C.

Power
323-06, 323-20 ac mains or internal rechargeable NiCad by front panel switch, 10 W max. Battery operating time 40 hrs.
323-07, 323-21, ac mains only, 10 W max.
ac: 103 to 132V, 206 to 264 V, 50 to 420 Hz

Environmental
Operating Temperature: 0 °C to 40 °C
Nonoperating Temperature: -40 °C to 75 °C
Humidity: 0 to 80% RH to 40 °C, non-condensing
Operating Altitude:0 to 3 km
Nonoperating Altitude: 0 to 15 km

Size & Weight
H-155 mm (6.1”) x W-198 mm (7.8”)x D-259 mm (10.2”)
Net: 3.4 kg (7.5 lbs), with battery 4.3 kg (9.5 lbs)
Shipping: 5.4 kg (12 lbs), with battery 6.3 (14 lbs)