Model 5186

Differential Voltage Preamplifier

FEATURES

- High input impedance
- Low noise
- True differential input
- Adjustable gain
- 0.5 Hz to 1 MHz frequency response
- Battery or external DC power

APPLICATIONS

- Acoustic research
- Radio astronomy
- AC bridge measurements
- Oscilloscope preamplification
- Hall-effect signal amplification

DESCRIPTION

The model 5186 is a high input impedance, low-noise, AC-coupled voltage preamplifier which offers a true differential input. It has a frequency response from 0.5 Hz to 1 MHz and three switched gain settings of ×10, ×100 and ×1000. It is a general purpose preamplifier which has the facility to be connected to grounded sources in a manner which breaks ground loops and since it has a true differential input it can be used to measure floating sources, such as the output from an AC bridge, without imposing an asymmetrical load onto the source. It can be powered from its own internally housed (alkaline) batteries, an external low voltage supply (±15 V or ±18 V) or from the model PS0108 remote line power supply (optional extra). This preamplifier can also be powered from most of our range of lock-in amplifiers and from the model 7310 noise rejecting voltmeter.

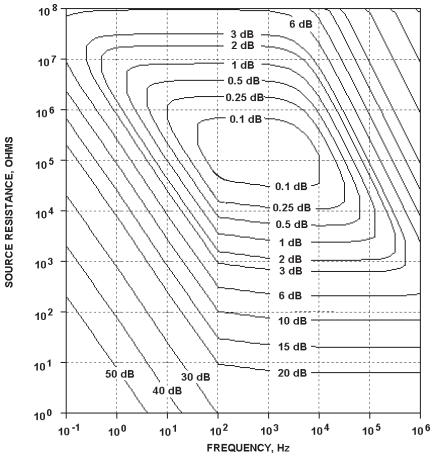

Figure 1, Model 5186 Noise Figure Contours (Typical)

Specifications

General

AC coupled voltage amplifier with adjustable voltage gain and a maximum frequency response extending from 0.5 Hz to 1 MHz. True differential input and single-ended output via BNC connectors.

Battery powered from internal alkaline batteries or external DC power supplies.

Inputs

Modes	True differential
Coupling	AC
Impedance	100 MΩ // 20 pF
Frequency Response	0.5 Hz to 1 MHz
C.M.R.R.	
x1000 gain	> 110 dB (100 Hz to 1 kHz), degrading by 6 dB/octave above 1 kHz
x10 or x100 gain	> 90 dB (100 Hz to 1 kHz), degrading by 6 dB/octave above 1 kHz
Max common-mode input voltage, x1000 gain	5 V pk-pk
Max input without damage	±15 V DC or 10 V rms. AC @ 50 Hz
Noise	see Figure 1. Typically 4 nV/√Hz @ 1 kHz and x1000 gain; 10 nV/√Hz @ 1 kHz and x10 or x1000 gain
Gain	x10, x100 or x1000 switch selectable
Gain Accuracy	±1%
Gain Stability	±150 ppm/°C

Output

Impedance	450 Ω
Max voltage swing	>10 V pk-pk
Slew rate	> 22 V/µs
Polarity	Non-inverting
Distortion	< 0.01% T.H.D.

Power

Internal	Four 9 V alkaline batteries provide approximately 12 hours of use
External	
a)	±15 V or ±18 V DC @ 27 mA
b)	110 V AC or 240 V AC via optional external model PS0108 power supply

Dimensions

(excluding connectors)	8.25" wide x 11" deep x 3.5" high (210 mm wide x 279 mm deep x 89 mm high)
Weight	5.3 lbs. (2.4 kg) excluding power supply