

# Model 5184

## Ultra Low Noise Preamplifier



### FEATURES

- ◆ Medium input impedance
- ◆ Ultra low noise
- ◆ Pseudo-differential input
- ◆ Fixed  $\times 1000$  gain
- ◆ 0.5 Hz to 1 MHz frequency response
- ◆ Battery or external DC power

### APPLICATIONS

- ◆ Cryogenic detector amplification
- ◆ IR detector amplification
- ◆ Increasing oscilloscope sensitivity

### DESCRIPTION

The model 5184 is a medium input impedance, AC-coupled, voltage preamplifier which features an ultra low-noise input stage. It has a frequency response from 0.5 Hz to 1 MHz and a fixed gain of  $\times 1000$  (60 dB) and incorporates a special pseudo-differential input stage that can be floated to give the ground loop immunity normally associated with true differential inputs but without the associated noise penalty. It can be powered from its own internally housed (alkaline) batteries, an external low voltage supply ( $\pm 15$  V or  $\pm 18$  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.

The model 5184 will be ideal for use with medium impedance cryogenic sources and IR detectors, such as HgCdTe, InSb and InAs.

### Specifications

#### General

AC coupled voltage amplifier with fixed  $\times 1000$  (60dB) voltage gain and a maximum frequency response extending from 0.5 Hz to 1 MHz. Pseudo-differential input and single-ended output via BNC connectors.

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

#### Inputs

Modes Asymmetrical differential. Front panel ground terminal provided.

Coupling AC  
 Impedance  $5\text{ M}\Omega // 50\text{ pF}$   
 Frequency Response 0.5 Hz - 1 MHz  
 C.M.R.R.  $> 80\text{ dB}$  (100 Hz to 1 kHz)

Max differential input voltage 10 mV pk-pk  
 Max common-mode input voltage 300 mV pk-pk  
 Max signal low potential w.r.t. ground terminal  $\pm 600\text{ mV}$   
 Max input without damage  $\pm 15\text{ V DC}$  or  $10\text{ V rms. AC @ } 50\text{ Hz}$

Noise See Figure 1; typ  $800\text{ pV}/\sqrt{\text{Hz}}$  @ 1 kHz  
 Gain  $\times 1000$  (60 dB) fixed

Gain Accuracy  $\pm 1\%$   
 Gain Stability  $\pm 800\text{ ppm}/^\circ\text{C}$

#### Output

Impedance  $450\ \Omega$   
 Max voltage swing  $> 10\text{ V pk-pk}$   
 Slew rate  $> 22\text{ V}/\mu\text{s}$   
 Polarity Non-inverting  
 Distortion  $< 0.1\%$  T.H.D.

#### Power

Internal Four 9 V alkaline batteries provide approximately 8 hours of use  
 External  
 a)  $\pm 15\text{ V}$  or  $\pm 18\text{ V DC @ } 40\text{ mA}$   
 b)  $110\text{ V AC}$  or  $240\text{ V AC}$  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

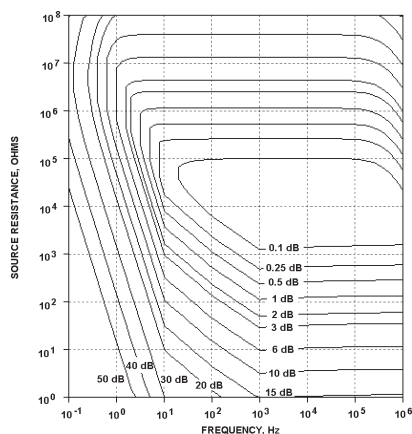


Figure 1, Model 5184 Noise Figure Contours (Typical)