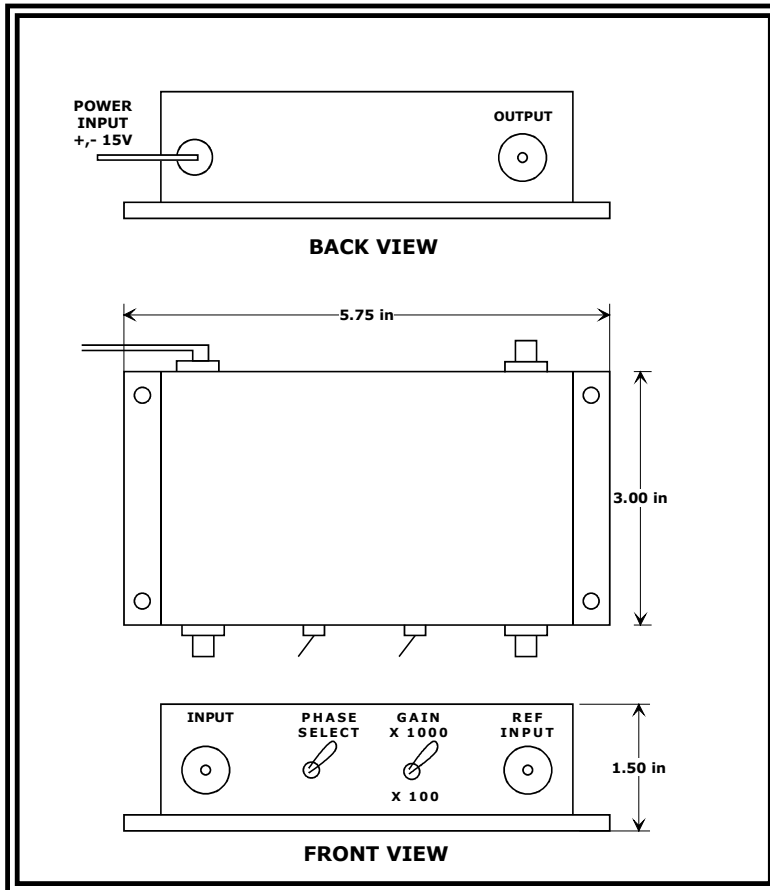


## LOCK-IN AMPLIFIER

### Application Note



Lock-in amplifiers use phase-sensitive detection techniques to separate the signal from the noise sources. Detection is achieved by using a reference signal ( usually a sine or square wave ) at a specific frequency and comparing it to the detected signal as a multiplication function - unless the the reference & signal frequencies are identical, the average of the product is zero. The phase-sensitive detector ( PSD ) performs the multiplication as part of the lock-in amplifier, driving the noise to zero and singling out the frequency of the signal. The amplifier adjusts the gain of the incoming signal, then using the PSD multiplies it by the internal lock-in reference signal. The output signal passes through a low pass filter, which removes the ac signals, leaving a dc signal that is proportional to the initial signal amplitude. Lock-in amplifiers greatly improve the signal to noise ratio of a system.

### LOCK - IN AMPLIFIER SPECIFICATIONS

<b>Sensitivity</b>	<b>10 Uv ( for 1 volt output )</b>
<b>Dynamic Range</b>	<b>0 - 60 db</b>
<b>Input Noise</b>	<b>8nv @ 500 Hz</b>
<b>Gain Adj ( Internal )</b>	<b>Potentiometer +/- 25%</b>
<b>Gain Adj ( External )</b>	<b>Customer Selection ( 1 x - 1000 x )</b>
<b>Gain Stability</b>	<b>100 ppm / C</b>
<b>Time Constant</b>	<b>Customer specified</b>
<b>Max inputs range</b>	<b>+/- 15v</b>
<b>Input impedance</b>	<b>10K ohms @ 500 Hz</b>
<b>Reference input</b>	<b>TTL / sinusoidal</b>
<b>Phase Select</b>	<b>0 / 180</b>
<b>Phase drift</b>	<b>0.1 / C</b>
<b>Power</b>	<b>+/- 15 vdc @ 50ma</b>
<b>Case Size</b>	<b>5.75" x 3" x 1.5"</b>
<b>Temperature Range</b>	<b>0 - 70 C</b>