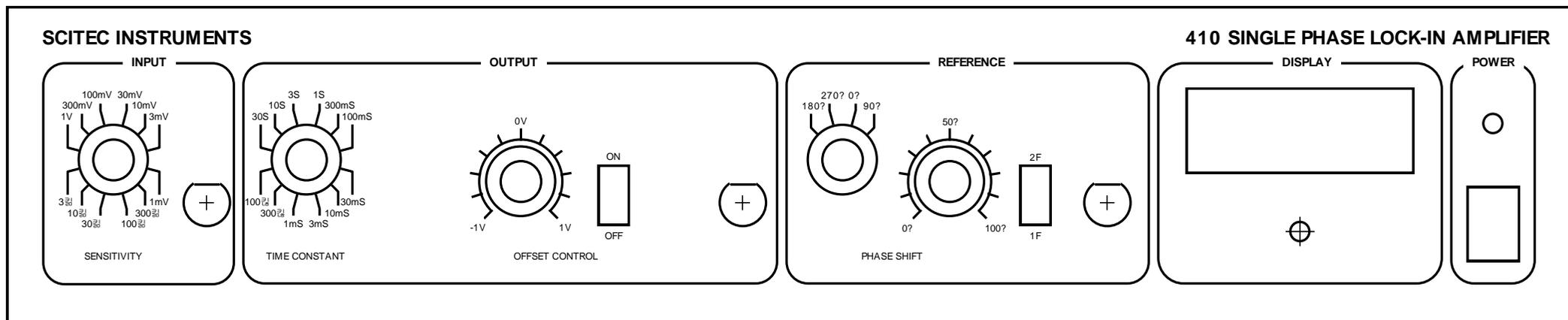


SINGLE PHASE LOCK-IN AMPLIFIER

Model 410



Scitec Instruments

MODEL 410

SINGLE PHASE LOCK-IN AMPLIFIER

Scitec Instruments' Model 410 analogue single phase lock-in amplifier uses advanced technology to provide a high performance instrument which is both versatile and easy to use.

- Single phase operation
- Differential or single-ended input
- Gain settings from 3 μ V to 1V
- High performance wide bandwidth input gain stage
- Analogue meter for display of output signal
- Offset controls
- Output time constants from 100 μ s to 30s
- 1F and 2F reference signal operation
- 90° step and fine phase control

INPUT SIGNAL CHANNEL

The input signal channel amplifies the input signal to a level suitable for the demodulator. High performance, low-noise, broad-band amplifiers are used throughout.

The input circuit can accept a differential or single-ended input via the front panel signal input BNC. Jumper options within the unit allow the outer BNC contact or screen to act as a high impedance differential input, as a low impedance (100 Ω) differential input or allow it to be connected to ground for single-ended operation.

The input channel can be either AC or DC coupled via internal jumper selection. It is recommended that the unit is used in DC coupled mode as the noise performance is improved. In this mode, through the careful design of the lock-in, up to ± 10 V of DC offset is allowed before saturation for gain settings from 1V to 300 μ V, ± 1 V of DC offset for gain settings from 100 μ V to 10 μ V and ± 300 mV of DC offset for the gain setting of 3 μ V.

- Input:
High or low impedance differential or single ended via front panel BNC
- Sensitivity:
3 μ V to 1V (for 1V output) switched in 1, 3, 10 steps
- Input Impedance:
10¹² Ω || 1nF, dc coupled
- Frequency: 10Hz to 100kHz
- Maximum Inputs:
 ± 16 V before input protection circuitry comes into operation. The input BNC has been tested for electrostatic discharge damage.
- Noise:
Scitec Instruments no longer specify input noise values as this leads to comparison with other manufacturers data sheets which are clearly grossly in error. If you wish for details of these values then please contact us and we will explain the situation.
- Gain Accuracy: 1%
- Gain Stability: 200ppm/ $^{\circ}$ C

- Dynamic Reserve: 60dB

DEMODULATOR

The output of the signal input stage is processed using a very high bandwidth demodulator to recover the input signal. Offsets introduced at this stage are automatically removed via novel feedback mechanisms.

LOW PASS FILTER

The output from the demodulator is passed through a first order low pass filter and then amplified before output via a front panel BNC.

- Time Constant:
100 μ S to 30s in 1, 3, 10 steps
- Output:
 ± 1 V output corresponds to full scale Input. Short circuit protection included.
- Offset:
Up to 1x full scale, switchable on or off

REFERENCE CHANNEL

The reference input circuitry uses a phase locked loop to lock on to a range of signals, such as TTL pulses or sinusoidal waveforms. A phase shifting circuit allows the reference signal to be moved with relation to the signal input. Signals at both the reference frequency and twice the reference frequency can be monitored.

- Frequency: 10Hz to 100kHz
- Input Impedance:
5.6M Ω ac coupled
- Trigger:
Sine: 100mV rms min (15V max.)
Pulse: 5V, 95% mark/space ratio min.
- Acquisition time: 10s max.
- Phase control:
90° steps + fine shift in range 0° - 100°
- Phase Drift: 0.1 $^{\circ}$ / $^{\circ}$ C

GENERAL

- Power: 115Vac, 230Vac; 50-60Hz; 10VA max.
- Mechanical:

440mm W x 87mm H x 190mm D
(17 $\frac{1}{2}$ in x 3 $\frac{1}{2}$ in x 7 $\frac{1}{2}$ in)

- Temperature range:
0-50 $^{\circ}$ C (operational)
- Warranty:
2 years from date of shipment

STANDARDS

- Electrostatic Discharge
BS EN 61000-4-2 Level 2
- Surge
BS EN 61000-4-5 Level 3
- Burst & Transient
BS EN 61000-4-4 Level 2
- RF Emissions
BS EN 50081-2
- RF Immunity
BS EN 61000-4-3 / BS EN 50082-2
- Low Voltage Directive
BS EN 61010-1



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