

Features

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



Input Signal Channel

Input	High or low impedance differential or single ended via front panel BNC
Sensitivity	$3\mu\text{V}$ to 1V (for 1V output) switched in 1, 3, 10 steps
Input Impedance	$10^{12}\Omega$ /1nF, dc coupled
Frequency	10Hz to 100kHz
Maximum Inputs	$\pm 16\text{V}$ before input protection circuitry comes into operation. The input BNC has been tested for electrostatic discharge damage.
Gain Accuracy	1%
Gain Stability	200ppm/ $^\circ\text{C}$
Dynamic Reserve	60dB limited by a maximum signal input noise voltage of 10V

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

Time Constant	$100\mu\text{s}$ to 30s in 1, 3, 10 steps
Output	$\pm 1\text{V}$ output corresponds to full scale input. Short circuit protection included.
Offset	Up to 1x full scale, switchable on or off

Reference Channel

Frequency	10Hz to 100kHz	
Input Impedance	$5.6\text{M}\Omega$ 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 $0^\circ - 100^\circ$	
Phase Drift	$0.1^\circ / ^\circ\text{C}$	

General

Power	115Vac, 230Vac; 50-60Hz; 10VA max.
Mechanical	440mm (W) x 87mm (H) x 190mm (D)
Temperature range	$0-50^\circ\text{C}$ (operational)

Ordering Information

Model	Descriptions
410	A complete cased analogue single phase lock-in amplifier with IEC power lead.
410-RMK	A complete cased analogue single phase lock-in amplifier with IEC power lead but with lid designed for 19" rack mounting.