MODEL 6120
2-Channel Strain/Bridge/IEPE Amplifier-Filter-Analog Output

Model 6120 is a two-channel, fully automated, high bandwidth, signal conditioning amplifier and filter with dual inputs. The bridge input has voltage and current excitation, automatic balance, shunt calibration and programmable configuration for ¼, ½ and full bridge transducers. The AC-coupled auxiliary input is for ICP/IEPE, dynamic strain and other voltage output transducers.

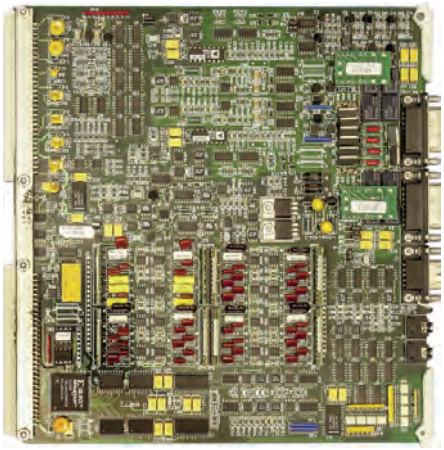
The 6120 employs an amplifier-per-channel architecture which provides the highest accuracy and completely eliminates crosstalk between channels. Using Pacific's PI660 software zero and gain calibration and correction are automatic.

The bridge inputs have programmable constant voltage or constant current excitation, automatic balance and a shielded 8-wire input that supports remote sensing, shunt calibration and programmable bridge completion for 120 and 350 Ohm gages. Strain gages other than 120 or 350 Ohms are accommodated by changing a completion resistor. A two-wire auxiliary input for ICP type transducers has 1-20 mA constant current excitation with AC signal coupling.

Two-step local and remote shunt calibration is standard. Four-step remote shunt with plug-in resistor card is optional. Voltage substitution is provided for gain calibration with programmable attenuation, which makes the distribution of calibration signals less susceptible to contamination by noise and offsets. The programmable attenuator has steps of 1, 0.1 and 0.01 with 0.02% accuracy and a post-attenuator output is available for verification and calibration.

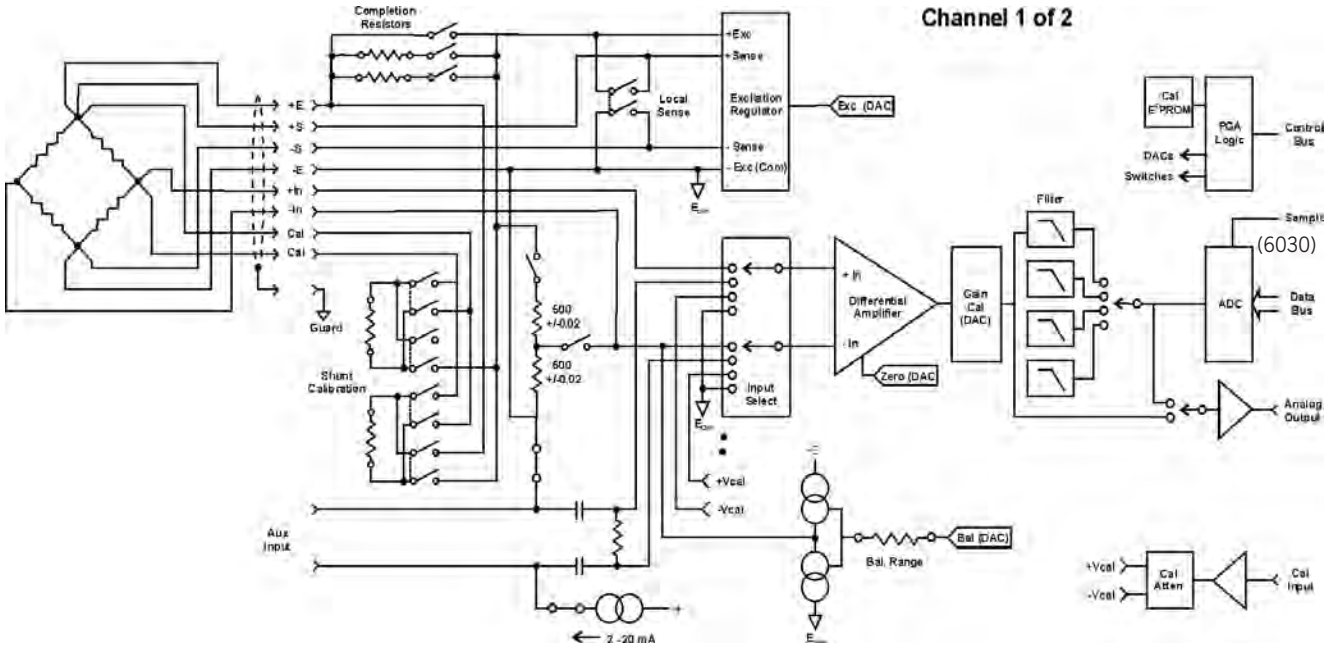
The differential instrumentation amplifier has programmable gains from 1 to 5,000 and automatic zero. Zero and gain calibration and correction are automatic using Pacific's PI660 software. Bandwidth is up to 100 kHz. The amplifier is followed by a low-pass filer that reduces alias errors in the sampled data. Each channel has a ±10 Volt calibrated analog output and a ±10 Volt monitor output.

The standard filter is a programmable four-frequency, eight-pole Bessel low-pass. A programmable, four-pole Bessel, low-pass filter with 1 Hz or 5 Hz frequency resolution is optional. Either the standard or optional filters may be obtained with Butterworth or other response characteristic.



FEATURES

- Dual inputs, strain/bridge or IEPE transducers
- Programmable bridge configuration
- Voltage & current excitation with remote sensing per channel
- Automatic zero & balance
- Voltage substitution and two or four step shunt calibration
- Gains 1 to 5,000 up to 100 kHz bandwidth with 0.05% accuracy
- Programmable low-pass filters
- Dual buffered 10 Volt analog outputs



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SPECIFICATIONS

INPUT

BRIDGE INPUT

Configuration.....2 channels, 2 to 8 wire inputs, input (2), excitation (2), excitation sense (2) and shunt calibration (2) with shield. Programmable bridge completion for half bridges and 120 Ohm and 350 Ohm quarter bridges. Other gage resistances by request.

Bridge Balance.....Automatic by program control. Balance accuracy ±0.05% of range, ±1 mV RTO.

Stability .....±0.02% for 8 hours, ±0.005%/°C. Range set by resistor up to 25 mV/V, 2.5 mV/V (350 Ohms) installed.

Impedance.....50 Megohms, shunted by 500 pF.

Protection .....±50 Volts differential, ±30 Volts common mode without damage.

IEPE INPUT

Configuration.....AC-coupled, 2-wire with shield.High-pass <1Hz.

ICP Transducer.....Current source 1 to 20 mA, 6 mA supplied.

Input Impedance...100K Ohms.

Input Protection ....±50 Volts without damage.

EXCITATION / TRANSDUCER POWER

CONSTANT VOLTAGE

Voltage.....Programmable from 0.1 to 10.24 Volts with 2.5mV resolution. Calibrated 1-Volt steps ±0.1%.

Current .....50 mA limited to 70 mA maximum.

Regulation.....Each channel individually regulated. ±0.01% over input voltage range and no-load to full load.

Stability .....±0.01% for 30 days. Temperature coefficient less than ±0.005%/°C.

Noise .....200 µV peak-to-peak, DC to 10 kHz

Monitor .....Excitation voltage or current is read by a program instruction. Accuracy is ±0.2%.

CONSTANT CURRENT

Output Range.....Programmable 0.1mA to 51.2 mA with 12.5 µA resolution. Calibrated 5 mA steps ±0.1%.

Compliance .....0.1 to 10 Volts.

Regulation.....±0.01% or ±0.1 µA for 10% line change.

Noise .....2 µA or 5 µV peak-to-peak DC to 10 kHz.

Stability .....±0.01% or ±2 µA for 30 days. Temperature coefficient is less than ±0.005% or ±1 µA/°C.

Monitor .....Excitation voltage or current is read by a program instruction. Accuracy is ±0.2%.

AMPLIFIER

Range .....±2 mV to ±10 Volts.

Gain.....Programmable 1 to 5000, in 1, 2, 3, 5 steps, with ±0.05% accuracy.

Gain Stability .....±0.02% for 30 days, ±0.005%/°C.

Linearity.....±0.01% for gains <1,000, ±0.02% for gains 1,000 and above.

Common Mode ....60 dB plus gain in dB to 120 dB for balanced input and 110 dB for a 350 Ohm source unbalanced, DC to 60Hz.

CM Voltage .....±10 Volts.

Zero.....Automatic zero to ±2 µV RTI or ±1.0 mV RTO whichever is greater.

Zero Stability.....±5µV RTI, ±1mV RTO at constant temperature, ±1µV RTI/°C, ±0.2mV RTO/°C. Short term: ±2µV RTI, ±0.4mV RTO for 8 hours.

Source Current.....±5 nA, ±0.05 nA/°C.

Noise (10kHz).....2.0 µV RTI plus 0.3 mV RTO, RMS.

Bandwidth (6120)...50 kHz(-3dB) for gains to 1,000, 20 kHz for gains above 1,000.

Bandwidth (6120HF) 100 kHz (-3dB) for gains to 1,000, 50 kHz for gains above 1,000.

Slew Rate .....5 V/uS.

Overload.....Recovery time is 120 µS to within ±0.1% for a 10 times overload to ±10 Volts.

Analog Output.....Two outputs, one calibrated and one monitor. ±10 Volt full scale either filtered or wideband

FILTER

STANDARD FILTER

Type.....Eight pole, low-pass Bessel (48 dB/octave).

Frequency (6120)....4 programmable filter bandwidths, 150 Hz, 625 Hz, 2.5 kHz, 10 kHz and wideband.

Frequency (6120HF) 4 programmable filter bandwidths, 300 Hz, 1.25 kHz, 5 kHz, 20 kHz and wideband.

OPTIONAL PROGRAMMABLE FILTER

Type.....Four-pole, low-pass Bessel (24 dB/octave).

Frequency (6120)....4 Hz to 1 kHz, 1 Hz resolution, ±2% accuracy. 1 kHz to 10 kHz, 5 Hz resolution, ±5% accuracy.

Frequency (6120HF) 10Hz to 20kHz, 5 Hz resolution, ±5% accuracy.

Other .....Other filter characteristics and cut offs available..

DIGITIZER (6030)

See Model 6030 for the following Digitizing Capabilities:

Sample .....±50 nS channel-to-channel time correlation.

Resolution.....16 bits, two's complement output.

Rate (6030).....Programmable up to 100 kS/s digitizer per channel.

Rate (6030HF) .....Programmable up to 200 kS/s digitizer per channel.

Linearity.....±1½ LSB (±0.004%)

Continuity .....Monotonic to 15 bits.

Alarms .....Two alarms each with upper and lower limits that are programmable from negative to positive full scale. Limits checked on each ADC sample.

CALIBRATION

Shunt (Standard)...Two steps, single shunt. Calibration resistors mount in bifurcated terminals. Program selection of internal or external shunt connection.

Shunt (Optional)....Four-step, single, external shunt. Calibration resistors mounted on a plug-in card. May be wired for local shunt at the input connector.

Shunt Resistors.....Installed shunt resistors provide 0.502 and 0.250, ±0.1% mV/V for 350 Ohm bridge. Customer specified and 0.01% shunt resistors are available.

Voltage Subst. .....Alternate input for external calibration source. Programmable 1, 0.1 and 0.01, attenuation with ±0.01% accuracy. Attenuator output may be connected to bus for external monitoring.

Zero.....Amplifier input disconnected and shorted for zero calibration.

MECHANICAL

Mounting .....Occupies one slot in Series 6000 enclosures.

Connectors.....Input connectors are 15-pin Type D. Outputs are a 9-pin Type D. Type D mates supplied.

Temperature.....0°C to +50°C operating.

ORDERING INFORMATION

6120-PF4-BE8	2-Ch Strain-Bridge-IEPE, 50kHz, 4-Freq, 8-Pole Bessel
6120-PF4/10K-BE4	2-Ch Strain-Bridge-IEPE, 50kHz, 4-Pole PF 4Hz-10kHz Bessel
6120HF-PF4-BE8	2-Ch Strain-Bridge-IEPE, 100kHz, 4-Freq, 8-Pole Bessel
6120HF-PF10/20K-BE4	2-Ch Strain-Bridge-IEPE, 100kHz, 4-Pole PF 10Hz- 20kHz Bessel
6120-S4	4-Step Shunt Calibration Plug-In Resistor Card (no resistors).

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