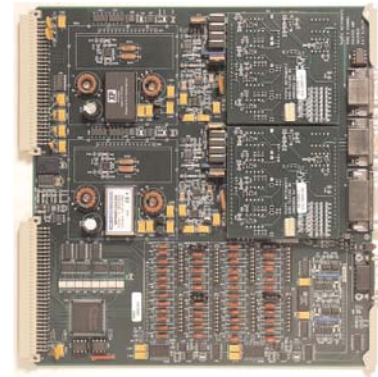


The 6060 is a two-channel signal conditioning amplifier-digitizer module with 50 kHz or 100 kHz bandwidth and both digitized and analog outputs. The bridge input is ten-wire shielded with programmable constant voltage or constant current excitation and programmable completion for quarter, half and full bridge transducers. Automatic bridge balancing accommodates large unbalances without limiting dynamic range.

The input and excitation are isolated from the outputs, power and control interface. This gives the user complete freedom to ground the input without creating ground loops that introduce noise and offset errors.

The differential instrumentation amplifier has programmable gains from 1 to 5,000 and automatic zero. The standard filter is a six-pole Bessel with four programmable bandwidths. An optional four-pole Bessel filter has continuously programmable bandwidth. The filter output is digitized to 16 bits at up to 200 kS/s.

A “features card” provides shunt calibration using dedicated inputs. Two-step, resistive shunt calibration is standard. Four-step shunt calibration and simulated shunt using a DAC with 16-bit resolution are also available. Voltage substitution using an external source is provided for traceable gain calibration.



FEATURES

- Voltage & current excitation with remote sensing
- Isolated excitation and input
- 300 Volts common mode
- Gains 1 to 5,000
- 50 kHz Bandwidth, 100 kHz optional
- Resistor or DAC shunt calibration
- High-level analog outputs

SPECIFICATIONS

Excitation Voltage/Current

Mode.....Constant voltage with local or remote sensing, constant current or off.

VoltageProgrammable from 0 to 20 Volts, 50 mA. Calibrated 2-Volt steps $\pm 0.1\%$. Regulation is $\pm 0.01\%$ and stability is $\pm 0.01\%$, $\pm 0.005\%/^{\circ}\text{C}$

CurrentProgrammable 0.1mA to 51.2 mA with 20 Volt compliance. Calibrated 5 mA steps $\pm 0.1\%$. Regulations $\pm 0.01\%$ and stability $\pm 0.01\%$.

Monitor.....Excitation voltage or current is read by a program instruction. Accuracy is $\pm 0.2\%$.

Input - Bridge

Configuration2 to 10 wire inputs. Programmable bridge completion for full and half bridges and 120 Ohm and 350 Ohm quarter bridges.

Bridge Balance ...Automatic by program control. Balance accuracy $\pm 0.05\%$ of range, ± 1 mV RTO. Stability $\pm 0.02\%$ for 8 hours, $\pm 0.005\%/^{\circ}\text{C}$. Supplied range is 2 mV/V (350 Ohm bridge).

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

Protection ± 50 Volts, differential or ± 350 Volts common mode without damage.

Calibration

ShuntTwo steps, single shunt, internal or external.

Shunt (Optional) .Four-step, single shunt, external.

DAC (Optional)....DAC shunt, 16-bit resolution.

Voltage Subst.....Input with 1, 0.1, 0.01 $\pm 0.01\%$ attenuator.

ZeroAmplifier input disconnected and shorted.

Amplifier

Gain Steps.....Sixteen calibrated gain steps are provided:1, 2, 3, 5, 10, 20, 30, 50, 100, 200, 300, 500, 1000, 2000, 3000 and 5000 with $\pm 0.05\%$ accuracy.

Gain Stability..... $\pm 0.01\%$, $\pm 0.004\%/^{\circ}\text{C}$.

Linearity $\pm 0.01\%$ for gains $< 1,000$, $\pm 0.02\%$ for gain 1,000 and higher.

Common Mode ..80 dB plus gain in dB to 120 dB for balance input and 110 dB for a 350 Ohm source unbalanced, ± 300 Volts, DC to 60Hz.

ZeroAutomatic zero ± 1.0 mV. Stability is $\pm 5\mu\text{V}$ RTI, $\pm 1\text{mV}$ RTO, $\pm 1\mu\text{V}$ RTI/ $^{\circ}\text{C}$, $\pm 0.2\text{mV}$ RTO/ $^{\circ}\text{C}$. Short term $\pm 2\mu\text{V}$ RTI, $\pm 0.4\text{mV}$ RTO.

Source Current.... ± 25 nA, ± 0.05 nA/ $^{\circ}\text{C}$.

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

Bandwidth50 kHz for gains $\leq 1,000$, 20 kHz for gains greater than 1,000.

Bandwidth (HF) ..100 kHz for gains $\leq 1,000$, 50 kHz for gains greater than 1,000.

Slew Rate.....5 V/uS

Analog Output..... ± 10 Volt full scale either filtered or wideband

Filter

Characteristic.....Six pole, low-pass Bessel

Freq. (6060).....150 Hz, 625 Hz, 2.5 kHz, 10 kHz, wideband.

Freq. (6060HF) ..300 Hz, 1.25 kHz, 5 kHz, 20 kHz, wideband.

Option PFBE2.....Four-pole, low-pass Bessel, continuously programmable 4 Hz to 10 kHz.

Option PHFBE2 ..Four-pole, low-pass Bessel, continuously programmable 10 Hz to 20 kHz.

Analog-To-Digital Converter

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

Resolution16 bits, two's complement output.

RateProgrammable up to 100 kS/s per channel.

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

General

MountingOccupies one slot in Series 6000 enclosures.

Connectors.....Inputs are 15-pin and outputs are 9-pin Type D

Temperature.....0 $^{\circ}\text{C}$ to +50 $^{\circ}\text{C}$ operating.

Ordering Information

6060	Two-channel transducer amplifier, 100 kS/s
6060HF	Two-channel transducer amplifier, 200 kS/s.

OPTIONS

6000-PFBE2	Programmable filter option, 4 Hz to 10 kHz.
6000-PHFBE2	Programmable filter option, 10 Hz to 20 kHz.
6060-DAC	DAC shunt calibration.
6060-S4	Four-step resistive shunt calibration.