PACIFIC INSTRUMENTS
A VPG Brand

Metromatics MODEL 6060GV

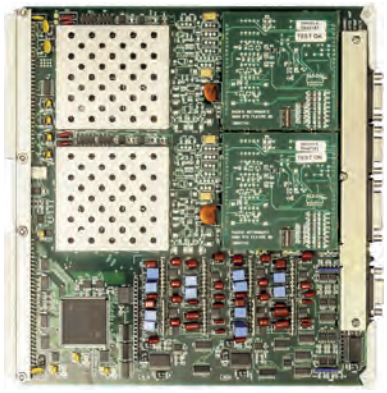
2-Channel Transducer Amplifier-Filter-Digitizer, Galvanic 300CMV

The 6060GV is a two-channel Galvanically isolated 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 imbalances 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

- Galvanically isolated excitation & input with 300 Volts common mode
- Plug-in channel configuration & calibration card
- Voltage & current excitation with remote sensing
- Automatic zero & balance
- Voltage substitution, DAC or 2/4 step shunt calibration
- Gains 1 to 5,000 with 50 kHz or 100 kHz bandwidth
- Four six-pole low-pass filters, optional programmable filter
- Up to 200kS/s per channel with 16-bit resolution
- Dual buffered 10 Volt analog outputs

SPECIFICATIONS

INPUT

Configuration.....Input configuration based on installed Features Cards. Features cards available for Bridge, IEPE and RTD. Other features cards available upon request.

BRIDGE INPUT

Bridge Configuration..2 channels, 2 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 ±0.05% of range, ±1 mV RTO. Stability ±0.02% for 8 hours, ±0.005%/°C. Supplied range is 2 mV/V (350 Ohm bridge).

VOLTAGE EXCITATION / TRANSDUCER POWER

Voltage Excitation..Programmable from 0.1 to 20 Volts with 0.5 mV resolution. Calibrated 2-Volt steps ±0.1%. 50mA limited to 70mA maximum..

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

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

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

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

CONSTANT CURRENT EXCITATION / TRANSDUCER POWER

Current Excitation ....Programmable 0.1mA to 51.2 mA with 1 µA resolution. Calibrated 5 mA steps ±0.1%.

Compliance .....0.1 to 20 Volts minimum.

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

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

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

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

AMPLIFIER

Input Range.....±2 mV to ±10 Volts full scale, DC or AC coupled.

Gain.....Programmable from 1 to 5,000 in 1, 2, 3, 5 steps with ±0.05% accuracy.

Gain Stability .....±0.01% for 30 days, 0.004%/°C

Gain Linearity.....±0.02% for gain <1000, ±0.025% for Gain 1000 and higher

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

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

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.

CM Voltage.....Common Mode ±300 Volts operating, ±350 Volts without damage.

Zero .....Automatic zero ±1.0 mV. Stability is ±5µV RTI, ±1mV RTO, ±1µV RTI/°C, ±0.2mV RTO/°C. Short term ±2µV RTI, ±0.4mV RTO.

Zero Stability.....±1 µV/°C RTI, ±0.2 mV/°C RTO or (±1 µV RTI, ±0.2 mV RTO) /°C

Source Current .....±25 nA, ±0.05 nA/°C.

Noise (10 kHz) .....2.0 µV RTI plus 1.0 mV RTO, RMS.

Bandwidth.....6060: 50 kHz for gains 1 to 1,000, 20 kHz for gains greater than 1,000.
6060HF: 100 kHz for gains 1 to 1,000, 50 kHz for gains greater than 1,000.

Slew Rate .....5 V/uS

Analog Output.....±10 Volt full scale outputs. Each may be programmed for filtered or wideband response.

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SPECIFICATIONS CONTINUED

FILTER

Type.....4 Frequency Six-pole, low-pass Bessel or continuously programmable 4-pole Bessel.

Standard Filter .....6060: 4-Frequency 6-Pole Bessel with 150 Hz, 625 Hz, 2.5 kHz, 10 kHz and wideband..
6060HF: 4-Frequency 6-Pole Bessel with 300 Hz, 1.25 kHz, 5 kHz, 20 kHz and wideband.

Programmable Filter ..6060: 4-Pole Bessel, continuously programmable 4 Hz to 10 kHz..
6060HF: 4-Pole Bessel, continuously programmable 10 Hz to 20 kHz.

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

DIGITIZER

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

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

Rate.....6060: Programmable up to 100 kS/s digitizer per channel.
6060HF: 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

Voltage Subst. .....Voltage substitution, signal from external calibration source is applied to the amplifier input. Programmable attenuator with steps of 1, 0.1 and 0.01, ±0.02% accuracy. Output of the attenuator is provided for calibration.

Zero .....Amplifier input disconnected and shorted.

Shunt Calibration ...Shunt Calibration based on capability of Installed Features Card
FC1: Two steps, single shunt, internal or external.
FC2: Programmable resistive "DAC" shunt, 16-bit resolution.
FC5: Four-step, single shunt, external.
FC11: Four-step, double shunt, external.

MECHANICAL

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

Connectors.....15-pin inputs, 9-pin outputs, Type D. Mating connectors supplied.

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

ACCESSORIES

6087-6060..... .....Test Fixture. Attached to the test connector on the 6160 module it provides test points for: Transducer input, amplifier input, shunt calibration, excitation output, excitation sense and amplifier output.

ORDERING INFORMATION

6060GV-PF4-BE6.....2-Ch Transducer Amp, 4-Freq 6-Pole Bessel

6060GV-PF4/10K-BE4.....2-Ch Transducer Amp, 4-Pole PF 4Hz-10kHz 4-Pole Bessel

6060GVHF-PF4-BE6.....2-Ch Transducer Amp, 4-Freq 6-Pole Bessel

6060GVHF-P10/20K-BE4.....2-Ch Transducer Amp, 4-Pole PF 10Hz-20kHz 4-Pole Bessel

6060-FC1 .....2-step local / remote shunt.

6060-FC2 .....DAC shunt.

6060-FC5 .....4-step single shunt.

6060-FC7 .....Fixed AC Coupling.

6060-FC8 .....RTD Input.

6060-FC11 .....4-step double shunt.