

The 6053 input module has four channels of high performance signal-conditioning amplifier-digitizers for strain gages and bridge transducers. Each channel has programmable excitation with remote sensing, 300V CMR, voltage calibration, local or remote shunt calibration, programmable gain instrumentation amplifier and low pass filter. Front-end signal conditioner is isolated channel to channel and channel to output. 300V continuous isolation between Input, Output, and Power supply and between channels is maintained. The high level outputs are digitized to 16 bits then output to the 6000 data bus. In addition to the digitized output, each channel provides dual continuous, calibrated analog output.

The 6053 is used with quarter, half and full bridge transducers, potentiometers and low-level voltage signals in demanding applications such as load control. The Programmable Filter is a four or six pole filter with programmable cutoff frequency from 4 Hz to 5 kHz in 1 Hz steps.

Voltage substitution using an external voltage standard is provided for traceable gain calibration. Internal or external shunt calibration is provided for transducer calibration. Transducer balance, zero and gain calibration are automatic. Two programmable alarms with upper and lower limits are checked for each digitized output. The high-level analog outputs provide a means to independently monitor or record each channel. The 6053-I has individual programmable constant current excitation to be used with RTDs and other current excited transducers.

SPECIFICATIONS

INPUT

Configuration4 channels, 2 to 8 wire with guard shield. Bridge configuration is programmable for ¼, ½ and full bridge, 120 Ohm and 350 Ohm.
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 10 mV/V, 2mV/V (for 350 Ohms) installed.

EXCITATION / TRANSDUCER POWER

CONSTANT VOLTAGE (6053)

VoltageProgrammable from 0-12 Volts in 1 Volt ±0.1% steps, with 3.3 mV resolution adjustment.
Current.....50 mA limited to 70 mA.
Regulation±0.01% for ±10% line and no-load to full-load using remote sensing.
Stability.....±0.01% for 24 hours at constant temperature, ±0.005%/°C.
Noise200 µV peak to peak.
MonitorCalibration mode applies excitation voltage to amplifier input.

CONSTANT CURRENT (6053-I)

Current.....0.2 mA to 0.5 mA, ±0.05% in 0.01 mA steps.
Compliance10 Volts.
Stability.....±0.01% for 24 hours at constant temperature, ±0.005%/°C.

AMPLIFIER

Gain.....Programmable from 1 to 5,000 in 1, 2, 3, 5 steps with ±0.05% accuracy
Gain Stability.....±0.01% FSO for one month,, ±0.004%/°C.
Gain Linearity.....±0.01% for gains <1,000, ±0.02% for gains 1,000 and higher.
Input Impedance ..50 Megohms, shunted by 1000 pF,
Input Protection±50 Volts, differential without damage.
Common Mode74 dB plus gain in dB up to 106 dB, DC to 60Hz.
CM Enhanced Ver..83 dB plus gain in dB up to 110 dB, DC to 60Hz.
CM Voltage.....±300 Volts operating, ±350 Volts without damage.
ZeroAutomatic to ±1 µV RTI, ±0.5 mV RTO.
Zero Stability±5 µV RTI, ±1 mV RTO for one month at constant temperature, ±1 µV/°C RTI, ±0.2 mV/°C RTO.
Short term: ±2 µV RTI, ±0.4 mV RTO.
Source Current±25 nA, ±0.01 nA/°C
Noise (10 Hz)0.1 µV rms, RTI.
Noise (1 kHz).....≤2 µV rms, RTI + 0.3 mV rms, RTO.



FEATURES

- Programmable input configuration ¼, ½ & full bridge, RTDs with 6053-I
- 300 Volts Common Mode rejection
- Shunt & voltage calibration
- Gains 1 to 5,000 with 0.05% accuracy
- Up to 20kS/s per channel with 16-bit resolution
- Buffered 10 Volt analog outputs
- Two alarms with programmable upper & lower limits

Bandwidth.....5 kHz (-3dB) or better.
Slew Rate.....5 V/uS.
Overload Recovery..800 µS to ±0.1% for 10X overload to ±10 V.
Analog OutputTwo ±10 Volt full scale, wideband or filtered.
Accuracy is ±0.05%.
Output Impedance..<1Ω .

FILTER

PROGRAMMABLE FILTER

Type.....Four or Six pole, low pass Butterworth.
Frequency.....Continuously programmable 4Hz to 5kHz, 1Hz resolution, 3% accuracy.
Noise0.5 mV rms, RTO
Other.....Other filter characteristics and cut offs available.

DIGITIZER

Resolution16 bits, two's complement output per channel.
Sample RateUp to 20kS/s per channel.
Linearity±1.5 LSB (±0.004%)
Synchronization100ns, channel to channel
Continuity.....Monotonic to 15 bits.
AlarmsTwo alarms each with programmable upper and lower limits and persistence checked on each ADC sample.

CALIBRATION

ShuntTwo step shunt, internal or external connection, 0.245 & 0.502 mV/V (350 Ohm bridge), ±0.1%.
Voltage Subst.Alternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01, ±0.01% accuracy. Output of the attenuator is provided for calibration.
ZeroAmplifier input disconnected and shorted.

MECHANICAL

Mounting.....Occupies one slot in Series 6000 enclosures.
ConnectorsInput is 50-pin Type D output is 9-pin Type D.
Temperature0°C to +50°C operating.

ORDERING INFORMATION

- 6053-PF4/5K-BU44-Ch Strain-Bridge, PF 4Hz-5kHz 4-Pole Butterworth
- 6053-PF4/5K-BU64-Ch Strain-Bridge, PF 4Hz-5kHz 6-Pole Butterworth
- 6053-I-PF4/5K-BU4.....4-Ch Strain-Bridge, PF 4Hz-5kHz 4-Pole Butterworth
- 6053-I-PF4/5K-BU6.....4-Ch Strain-Bridge, PF 4Hz-5kHz 6-Pole Butterworth