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## SIGNAL CONDITIONER AMPLIFIER MODEL SGA-0B(/M) (/WB)

**Description:**

The Mod. SGA-0B(/M) (/WB) Signal Conditioner Amplifier is a fully programmable high-precision analogue bridge amplifier which accepts inputs from strain gauges, strain gauge based transducers, potentiometers and general voltage sources.

The single channel version comes in EUROPE-card design. The multi-channel system rack contains a 24 VDC power supply which powers the amplifier plug-in units.

The USB interface and a dedicated software package allows for set-up, and programming of the system as well as measurement control via personal computer.

**Features:**

- Constant voltage bridge excitation
- Constant current bridge excitation **(SGA-0B/M version only)**
- Internal dummy resistors for strain gauge quarter and half bridge circuits with 120, 350 and 1000 Ω and transducer circuitry.
- Built-in shunt calibration circuits with internal switches for user-programmable calibration configurations.
- Internal software-programmable 4-pole-Butterworth low-pass filters.
- Internal software-programmable 4-pole high-pass filters **(SGA-0B/M version only)**
- Analogue bandwidth up to 120 kHz **(SGA-0B and SGA-0B/M)**, up to 1 MHz **(SGA-0B/WB)**
- Software-programmable, ultra-wide, high-precision bridge balance.
- Fully programmable: Bridge excitation, gain, low-pass filters, calibration and bridge balance.
- All amplifier functions set up and controlled by High-Speed LOW Power CMOS Microprocessor, set-up data stored in a non-volatile EEPROM memory.

**Specifications:**

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|---|---|---|
| **Analogue Inputs:** | **Input Impedance:** | DC-coupled: 100MΩ shunted by 450 pF<br>AC-coupled: 1 µF in series with 78 kΩ |
| | **Configuration:** | Strain gauge quarter-, half-, and full bridge circuits, transducers, voltage and current signals. Bridge completion resistors 120 Ω, 350 Ω, and 1000 Ω; internal and external connections for shunt calibration resistors. |
| | **Common Mode Voltage:** | ± 10 V |
| | **Differential Voltage:** | ± 10 V |
| | **Input Protection:** | Protected against up to 40 VDC |
| **Constant Voltage Bridge Excitation:** | **Range:** | 0.0 V to 10.23 V, in steps of 2.5 mV (software programmable), current max. 40 mA |
| | **Accuracy:** | 0.1 % ± 5 mV in a range of 1.0V to 10.23 V |
| | **Temperature Stability:** | Better than 0.01 %/°C |
| **Constant Current Bridge Excitation (only SGA-0B/M):** | **Range:** | 0.0 mA to 20.040 mA, in steps of 0.005 mA (software programmable), Voltage max. 11VDC |
| | **Noise:** | 1µA(p-p) + 10µV(p-p); DC to 20kHz |
| | **Accuracy:** | 0.1% ±0,005mA in a range of 2,0mA to 20,040mA |
| | **Temperature Stability:** | Better than 0.01% /°C |
| **Balance:** | **Type:** | Internal micro controller electronic balance circuitry |
| | **Activation:** | Activated by software or by front-panel button |
| | **Range:** | ±10240 µm/m (5.12mV/V) RTI for gains: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000, 10000V/V.<br>±512 000 µm/m (256mV/V) RTI for gains: 1-40, 80 mV/V. |

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|---|---|---|
| **Calibration:** | **Internal shunt calibration resistors:** | RC1 = 499.0 kΩ 0.1%, 1000 µm/m (0.50 mV/V) for 1000 Ω and gauge factor K=2.00<br>RC2 = 174.8 kΩ 0.1%, 1000 µm/m (0.50 mV/V) for 350 Ω and gauge factor K=2.00<br>RC3 = 59.94 kΩ 0.1%, 1000 µm/m (0.50 mV/V) for 120 Ω and gauge factor K=2.00 |
| | **Calibration procedure:** | Calibration resistors can be switched via software |
| | **Calibration level:** | Bipolar ± 1000 µm/m for half- and quarter bridges |
| **Amplifier:** | **Gain:** | 1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000 **(only SGA-0B and SGA-0B/M)**<br>1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000 **(only SGA-0B/WB)** |
| | **Accuracy:** | ± 0.2 % |
| | **Linearity:** | 0.02 % of full scale range |
| | **Frequency Response Input:** | DC to 50kHz: -0.5 dB typically at all gains setting and full output,<br>DC to 120kHz: -3 dB max at all gains setting and full output. **(only SGA-0B and SGA-0B/M)**<br>DC to 1 MHz, - 3dB max. at all gains setting and full output. **(only SGA-0B/WB)** |
| | **Slew Rate:** | 4 V/µs |
| | **Noise:** | 0.5Hz - 20kHz: 2.5 $mV_{rms}$ max, referred to Input,<br>0.5Hz - 120kHz: 6 $mV_{rms}$ max, referred to Input (RTI, 350Q source impedance, DC-coupled). |
| | **Temperature coefficient of zero:** | ± 1 µV/°C max. for gain: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000;<br>± 5 µV/°C typical for gain: 1-40, 80 V/V |
| | **Common-Mode Rejection:** | G=1 CMR=80dB; G=10 CMR=90dB; G=100 CMR=100dB; G=1000 CMR=120dB<br>(G = gain) |
| | **Output:** | ± 10 V (full short circuit protection) **(only SGA-0B and SGA-0B/M)**<br>± 5 V (full short circuit protection) **(only SGA-0B/WB)** |
| | **Low-pass filter:** | 4-pole Butterworth low-pass filter -3 dB; software selectable; bandwidth: 2 kHz, 5 kHz, 10 kHz, 20 kHz and Wideband (120 kHz or 1 MHz) |
| | **High-pass filter (only SGA-0B/M):** | 4-pole Butterworth high-pass filter -3 dB; software selectable; bandwidth: 100 Hz, 250 Hz, 500 Hz, 1 kHz and off |
| | **AC Coupling:** | Cut-off frequency (- 3 dB) 2.0 Hz |
| **Design:** | **Dimensions:** | 128 H x 40,3 B x 187 T mm (inclusive Connector and Switch) |
| | **Weight:** | 0,6 kg |
| | **Power supply:** | ± 15 VDC, ± 120 mA max.; + 5 V, 100 mA |
| **Indicator and connector:** | **LED:** | Shows the current state of the bridge amplifier (three-colour: red/green/yellow). |
| | **Connector (Input):** | 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon |
| | **Connector (Output):** | BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) |
| **Programming interface:** | **Type:** | USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used |
| **Software:** | **Driver:** | USB driver for all Windows® operating systems from Windows® XP; Windows® Vista, 7, 8 and 10 (32 bit and 64 bit) |
| | **Amplifier setting:** | SGA0BTST.EXE program; Alternative: open setup software (Possible integration with user software, type of DLL) |
| | **Adjustment of the calibration:** | Software for automatic adjustment of the calibration function of user-specific data |

 

**Comparative overview of the various versions of the amplifier series SGA-0B:**

| | SGA-0B | SGA-0B/M | SGA-0B/WB |
|---|---|---|---|
| **Constant Voltage Bridge Excitation:** | 0 to 10.23 V | 0 to 10.23 V | 0 to10.23 V |
| **Constant Current Bridge Excitation:** | unavailable | 0 to 20.40 mA | unavailable |
| **AC/DC Input coupling:** | standard | standard | standard |
| **Bridge balance range:** | ± 10 240 µm/m | ± 10 240 µm/m | ± 10 240 µm/m |
| **Input configuration:** | Quarter, half and full bridge circuits | Quarter, half and full bridge circuits | Quarter, half and full bridge circuits |
| **Calibration for all input configurations:** | standard | standard | standard |
| **Voltage input range:** | ± 10 V | ± 10 V | ± 5 V |
| **Gain:** | 1 to 10 000 V/V | 1 to 10 000 V/V | 1 to 2000 V/V |
| **Frequency range (- 3 dB):** | DC to 120 kHz | DC to 120 kHz | DC to 1 MHz |
| **Selectable low-pass filter:** | standard | standard | standard |
| **Selectable high-pass filter :** | unavailable | standard | unavailable |
| **Output voltage range :** | ± 10 V | ± 10 V | ± 5 V |
| **Software-programmable via USB interface:** | standard | standard | standard |
| **Manual bridge balance with key:** | standard | standard | standard |


View amplifier plug SGA-0B

 


View of an 8-channel amplifier system

**Subject to technical changes and modifications without notice!**

 