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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, setup data stored in a non-volatile EEPROM memory.

Specifications:

	Input Impedance:	DC-coupled: 100MΩ shunted by 450 pF		
		AC-coupled: 1 μF in series with 78 $k\Omega$		
Analogue Inputs	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 V DC		
Constant	Range:	0.0 V to 10.23 V, in steps of 2.5 mV (software programmable), current max. 40 mA		
Voltage	Accuracy:	0.1 % ± 5 mV in a range of 1.0V to 10.23 V		
Bridge Ex- citation	Temperature Stability:	Better than 0.01 %/°C		
Constant	Range:	0.0 mA bis 20.040 mA, in steps of 0.005 mA (software programmable), Voltage max. 11VDC		
Current Bridge Ex- citation	Noise:	$1\mu A(p-p) + 10\mu V(p-p)$; DC to 20kHz		
	Accuracy:	0.1% ±0,005mA in a range of 2,0mA bis 20,040mA		
(only SGA- 0B/M)	Temperature Stability:	Better than 0.01% /°C		

Radivastion: Activastion: Activasted by software or by front-panel button		Туре:	Internal micro controller electronic balance circuitry		
Internal shunt calibration ACT 2500 (1000 NV/V) Fit 10 gains: 1-40, 80 mV/V	Balance	Activation:	Activated by software or by front-panel button		
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 RC2 = 174.8 kΩ 0.1%, 1000 μm/m (0.50 mV/V) for 350 Ω and gauge factor K=2.00 RC3 = 59.94 kΩ 0.1%, 1000 μm/m (0.50 mV/V) for 120 Ω and gauge factor K=2.00 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 Gain: 1, 2, 4, 8, 10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000 (only \$GA-0B MM)		Range:			
Calibration RC2 = 174.8 kΩ 0.1%, 1000 μm/m (0.50 mV/V) for 350 Ω and gauge factor K=2.00			±512 000 μm/m (256mV/V) RTI for gains: 1-40, 80 mV/V.		
Calibration 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 procedure: Calibration procedure: Calibration resistors can be switched via software Calibration resistors can be switched via software selectable.			RC2 = 174.8 k Ω 0.1%, 1000 μ m/m (0.50 mV/V) for 350 Ω and gauge factor K=2.00		
Calibration level: Bipolar ± 1000 µm/m for half- and quarter bridges	Calibration		RC3 = 59.94 k Ω 0.1%, 1000 μ m/m (0.50 mV/V) for 120 Ω and gauge factor K=2.00		
Gain: 1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 100000 (only SGA-0B and SGA-0B/M) 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		Calibration procedure:	Calibration resistors can be switched via software		
Accuracy: 2		calibration level:	Bipolar ± 1000 μm/m for half- and quarter bridges		
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. (only SGA-0B and SGA-0BM) DC to 120kHz: -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0BM) DC to 1 MHz, -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0BM) DC to 1 MHz, -3 dB max at all gains setting and full output. (only SGA-0B/WB) Slew Rate: 4 Vi/µs Noise: 0.5Hz - 20kHz: 2.5 mV _{ms} max, referred to Input, 0.5Hz - 120kHz: 6 mV _{ms} max, referred to Input (RTI, 350Q source impedance, DC-coupled). Temperature coefficient of zero: 1000 coupled). Temperature coefficient of zero: 1000 coupled). Common-Mode Rejection: G= 1 mV _{ms} for gain: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000; ± 5 µV/°C typical for gain: 1-40, 80 V/V Common-Mode Rejection: G= gain: 1-40, 80 V/V Common-Mode Rejection: G= gain: 1-40, 80 V/V Common-Mode Rejection: G= gain: 1-40, 80 V/V Low-pass filter: 5 V (full short circuit protection) (only SGA-0B and SGA-0B/MB) ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/MB) ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/MB) ± 10 V (full short circuit protection) (only SGA-0B/MB) Low-pass filter: 4-pole Butterworth low-pass filter -3 dB; software selectable; bandwidth: 2 kHz, 5 kHz, 10 kHz, 20 kHz and dVideband (120 kHz or 1 MHz) A-pole Butterworth high-pass filter -3 dB; software selectable; bandwidth: 100 Hz, 250 Hz, 500 Hz, 1 kHz and off Coupling: Cut-off frequency (-3 dB) 2.0 Hz Dimensions: 12 kH x 40,3 B x 187 T mm (inclusive Connector and Switch) Weight: 2 kHz 40,3 B x 187 T mm (inclusive Connector and Switch) Bossign Game should be current state of the bridge amplifier (three-colour: red/green/yellow). Connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector (input): 1000 Hz, 10		Gain:			
Linearity: 0.02 % of full scale range			1, 2, 4, 8,10, 20, 40, 50, 80, 100, 200, 400, 500, 1000, 2000 (only SGA-0B/WB)		
Frequency Response Input: DC to 50kHz: -0.5 dB typically at all gains setting and full output. (only SGA-0B and SGA-0B/M) DC to 120kHz: -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0B/M) DC to 1 MHz, -3dB max. at all gains setting and full output. (only SGA-0B/WB) Slew Rate: 4 V/µs		Accuracy:	± 0.2 %		
DC to 120kHz: -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0B/M) 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 _{ms} max, referred to Input, 0.5Hz - 120kHz: 6 mV _{ms} max, referred to Input (RTI, 350Q source impedance, DC-coupled). Temperature coefficient of ± 1 µV/°C max. for gain: 50, 100, 200, 400, 500, 1000, 2000, 4000, 5000 and 10000; ± 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 (G= gain) Output: ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/M) ± 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) 250 Hz, 500 Hz, 1 kHz and off AC Coupling: Cut-off frequency (-3 dB) 2.0 Hz 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 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 BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows* operating systems from Windows* XP; Windows* Vista and 7 only 32-bit versions		Linearity:	0.02 % of full scale range		
Slew Rate: 4 V/µs		Frequency Response Input:	DC to 120kHz: -3 dB max at all gains setting and full output. (only SGA-0B and SGA-0B/M)		
Amplifier Connector and indicator Connector (input)		Slew Rate:			
Common-Mode Rejection: £5 µV/°C typical for gain: 1-40, 80 V/V	Amplifier	Noise:	0.5Hz - 20kHz: 2.5 mV _{rms} max, referred to Input, 0.5Hz - 120kHz: 6 mV _{rms} max, referred to Input (RTI, 350Q source impedance,		
Common-Mode Rejection: G=1 CMR=80dB; G=10 CMR=90dB; G=100 CMR=100dB; G=1000 CMR=120dB (G = gain) Output: ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/M) ± 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) 250 Hz, 500 Hz, 1 kHz and off AC Coupling: Cut-off frequency (- 3 dB) 2.0 Hz Dimensions: 128 H x 40,3 B x 187 T mm (inclusive Connector and Switch) Power supply: ± 15 VDC, ± 120 mA max.; + 5 V, 100 mA 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 Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions					
Output: ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/M) ± 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) Ad-pole Butterworth low-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 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 LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator Connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions			± 5 μV/°C typical for gain: 1-40, 80 V/V		
Output: ± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/M) ± 5 V (full short circuit protection) (only SGA-0B/MB) 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/MB) AC Coupling: 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 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 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 BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions		Common-Mode Rejection:	G=1 CMR=80dB; G=10 CMR=90dB; G=100 CMR=100dB; G=1000 CMR=120dB		
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) High-pass filter: (only SGA-0B/M) Ac Coupling: Cut-off frequency (- 3 dB) 2.0 Hz 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 LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator 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 Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions			(G = gain)		
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 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 LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator 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) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions		Output:	± 10 V (full short circuit protection) (only SGA-0B and SGA-0B/M)		
High-pass filter: (only SGA-OB/M) High-pass filter: (only SGA-OB/M) 4-pole Butterworth high-pass filter -3 dB; software selectable; bandwidth: 100 Hz, 250 Hz, 500 Hz, 1 kHz and off					
Design AC Coupling: Cut-off frequency (- 3 dB) 2.0 Hz Dimensions: 128 H x 40,3 B x 187 T mm (inclusive Connector and Switch) Design Weight: 0,6 kg Power supply: ± 15 VDC, ± 120 mA max.; + 5 V, 100 mA LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator Connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon 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 Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions	_	Low-pass filter:	kHz, 10 kHz, 20 kHz and Wideband (120 kHz or 1 MHz)		
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 LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator Connector (input): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions		• • • • • • • • • • • • • • • • • • • •	250 Hz, 500 Hz, 1 kHz and off		
Design Weight: 0,6 kg Power supply: ± 15 VDC, ± 120 mA max.; + 5 V, 100 mA LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator 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 Driver: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions					
Power supply: ± 15 VDC, ± 120 mA max.; + 5 V, 100 mA LED: Shows the current state of the bridge amplifier (three-colour: red/green/yellow). Connector and indicator Connector (output): 15-PIN Sub D; Option: KPT 06 B14-15P ITT/Cannon BNC connector on the front panel, additional output on the connector of the EUROPE-card (DIN 41612 type C, 32 pins) Type: USB 2.0 or USB 1.1 compatible interface; in the master-slave mode, if more than 2 channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions	_				
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channels are used Driver: USB driver for all Windows® operating systems from Windows® XP; Windows® Vista and 7 only 32-bit versions	indicator	Connector (output):			
Vista and 7 only 32-bit versions	ming inter-	Туре:	· · · · · · · · · · · · · · · · · · ·		
Coffusion Amplifier cotting: SCAODTST EVE program: Alternative: onen cotun coffusion (Possible integration	Software	Driver:			
with user software, type of DLL)		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		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!