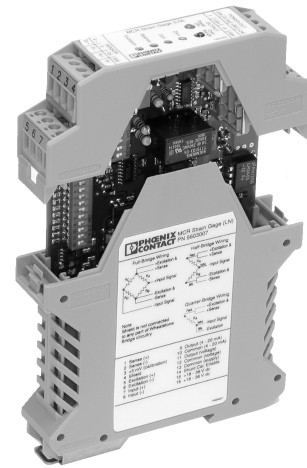


MCR Strain Gage Amplifiers

Universal Strain Gage/Load Cell Amplifier



INTERFACE

Data Sheet
1520_en_D

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1 Description

The MCR-SGA-4/6-DC and MCR-Strain Gage LN signal conditioners provide everything needed to amplify and condition all varieties of strain gage and load cell sensors, delivering highly accurate signal outputs. Both modules include 1000 V, three-way galvanic isolation between the power supply, input and output circuits.

The modules provide DIP switch-selectable, sensor-style, filter/frequency response and amplifier gain. Sensors may be connected in 3-, 4-, or 6-wire configurations. The modules offer adjustable excitation to energize load cells. Current limiting provides extra protection.

Maximum resolution of measurement data is achieved with a multi-stage differential amplifier. The module also filters and conditions strain gage signals with four-pole Butterworth low-pass filters utilizing DIP switch selectable cut-off frequencies to accommodate static and dynamic (high-speed) applications.

The amplifier provides outputs for voltage (0-5 V, 0-10 V, ± 5 , ± 10 V) and current loop (4-20 mA) operation, depending on the model. The MCR-Strain Gage LN module can be calibrated using either an internal 5 mV precision reference or a shunt resistor across one arm of the strain gage bridge. An over-voltage alarm LED signifies when the signal is outside the operational voltage limits.

2 Features

- Accepts signals from strain gages, load cells, torque transducers, pressure transducers, and piezoresistive-type accelerometers
- 120 to 20,000 Ω bridge resistance
- 1.25 to 12-volt adjustable excitation
- Selectable filter/response time
- 3-way 1000-volt isolation
- 0-5 V, 0-10 V and 4-20 mA output options for the MCR-SGA-4/6-DC; MCR-Strain Gage LN also includes ± 5 V and ± 10 V options
- Voltage and shunt calibration options



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This data sheet is valid for all products listed on the following page:

3 Ordering Data

Products

Description	Type	Order No.	Pcs./Pkt.
Signal conditioner, strain gage/load cell	MCR-SGA-4/6-DC	5604058	1
Signal conditioner, strain gage/load cell, low noise	MCR-Strain Gage LN	5603007	1

4 Technical Data

General Data	
Supply voltage U_S	11-30 V DC
Operating temperature	-25 to 70°C (-13 to 158°F)
Storage temperature	-40 to 85°C (-40 to 185°F)
Humidity, non-condensing	10-90%
Altitude	3300 m (10,280 ft.)
Atmosphere	Non-flammable, non-corrosive and dust free
Mounting	NS 35 (EN 50022)
Dimensions (H x W x D)	99 x 22.5 x 111 mm (3.9 x 0.89 x 4.37 in.)
Weight	
MCR-SGA-4/6-DC	158 g
MCR-Strain Gage LN	182 g
Connection	Removable COMBICON with screw-clamp terminals
Conductor sizes	0.2-4.0 mm ² solid, 0.2-2.5 mm ² stranded, 24-12 AWG

Electrical Data	MCR-SGA-4/6-DC	MCR-Strain Gage LN
		$V_S=24$ V DC; $T_C=25^\circ$ C
Electrical performance	120-20,000 Ω	
Bridge resistance	1.25-12 V	
Excitation voltage	100 mA	
Excitation current (short circuit protected)	1-2000 V/V (10 steps)	1-10,000 V/V (13 steps)
Amplification range	0.5-1000 mV/V	0.1-1000 mV/V
Sensor input range (0-10 V output, 10 V excitation)	90-110%	
Amplification trim	10 G Ω	
Input impedance	110 dB	86 dB
CMRR at a gain of 1000	0 to +10 V	-10 to +10 V
Zero adjust	30/1000 Hz	30/5000 Hz
Filter -3 dB cut-off frequency (switch selectable)	5%	
Filter cut-off frequency accuracy	0.01% of selected range	
Accuracy with alignment	1000 V (input, output and power supply)	
Test voltage according to EN 61010, EN 50178	15 mV _{P-P}	2 mV _{P-P}
Output noise	15 mV _{P-P}	5 mV _{P-P}
Peak-to-peak at gain of 1	1 mV _{RMS}	0.5 mV _{RMS}
Peak-to-peak at gain of 2000	13 ms	13 ms
RMS at gain of 500	0.4 ms	-
Rise time for 30 Hz filter (10-90%)	-	80 μ s
Rise time for 1000 Hz filter (10-90%)	0.05% at full scale	-
Rise time for 5000 Hz filter (10-90%)	1000 Ω	-
Zero offset temperature drift (°C)	-	1000 Ω
Load resistance (0-5 V/ 0-10 V)	525 Ω	600 Ω
Load resistance (\pm 10 V/ 0-10 V)	11-30 V DC	
Load resistance (4-20 mA)	250 mA	
Supply voltage range	100 mA	105 mA
Maximum operating current, I_{max}	105 mA	
Typical operating current (with 350 W, full bridge at 10 V excitation)	105 mA	