

# Strain Gage Amplifiers

## Series AMP-SGx-xx

- Single or multiple channel compact amplifiers
- Highly accurate bridge excitation
- Provides high level voltage signal output
- Externally adjustable shunt resistance
- Externally adjustable gain
- Precision low noise differential amplifier
- Remote bridge excitation On/Off capability
- Remote shunt calibration capability



**MODEL AMP-SG1-M1**  
(Single Channel Strain Gage Amplifier)

## Description

Michigan Scientific's *AMP-SGx-xx Series Strain Gage Amplifiers* are ideal for applications where signal conditioning is needed and space is limited. They are designed to provide signal amplification prior to passing the signal through a slip ring. Superior data accuracy is achieved by locating the signal amplifier on the rotating side of the slip ring. This configuration greatly improves signal quality because the amplifier is located closer to the sensor which reduces errors due to long lead wires, connector resistance variations, and electro-magnetic interference.

These Strain Gage Amplifiers incorporate a precision low drift bridge excitation supply, a stable differential amplifier, and a remotely activated shunt calibration resistor for system span verification. Each amplifier provides strain gage bridge excitation and amplification for one channel. Multiple channel configurations are available.

## Configurations



**MODEL AMP-SG4-R4**  
(Four Channel Strain Gage Amplifier)



**MODEL AMP-SG2-R2 & B6-2W Slip Ring**  
(Two channel strain gage amplifier installed in a housing and mounted to a B-Series slip ring.)

# Strain Gage Amplifiers

## Specifications

| <b>PARAMETER</b>                                | <b>SPECIFICATION</b>                     |
|---|--|
| <b>BRIDGE EXCITATION</b>                        |  |
| Type  | DC Constant Voltage (Bipolar excitation) |
| Magnitude                                       | ± 5 V                                    |
| Accuracy  | 0.40%                                    |
| Temperature Coefficient                         | 0.0005 %/°C Max (0.00028 %/°F)           |
| Current Limit                                   | 84 mA                                    |
| <b>REMOTE CALIBRATION</b>                       |  |
| Positive & negative shunt Calibration           |  |
| Shunt Resistance                                |  |
| internal values                                 | 100KΩ and 1MΩ                            |
| external values                                 | 100kΩ Through 1MΩ                        |
| Shunt accuracy                                  |  |
| @ 100kΩ   | 0.01%                                    |
| @ 1MΩ   | 0.01%                                    |
| <b>GAIN</b>                                     |  |
| Range   |  |
| with external jumper                            | 100 or 2000 V/V                          |
| w/ external resistor                            | 100 to 2000 V/V                          |
| Accuracy  |  |
| @ 25°C, Gain =100                               | ±0.05 % typ (±0.50 %max)                 |
| @ 25°C, Gain =1000                              | ±0.50 %typ (±1.0 %max)                   |
| Temperature Coefficient                         | 0.0025 %/°C (0.0014 %/°F)                |
| <b>OUTPUT</b>                                   |  |
| Range   | ±10V Max                                 |
| Capacitive Load                                 | 1000 pF Max                              |
| <b>VOLTAGE OFFSET</b>                           |  |
| Referred to input of amplifier                  |  |
| Initial @ 25°C                                  | ±10 μV                                   |
| Temperature Stability                           | ±0.2 μV /°C                              |
| Time Stability                                  | ±0.1 μV / month                          |
| DC CMRR   | 120 dB                                   |
| <b>NOISE</b>                                    |  |
| Referred to input of amplifier                  |  |
| r <sub>ti</sub> 0.01 - 10 Hz                    | 0.2 μV p-p                               |
| <b>DYNAMIC RESPONSE</b>                         |  |
| Limited by an input filter (factory selectable) |  |
| Frequency Response                              |  |
| @ Gain=1000                                     | 10 kHz                                   |
| -3dB @ Gain=100                                 | 10 kHz                                   |
| Slew rate                                       | 4 V/ μs                                  |
| Settling Time to 0.01% @ Gain=100               | 9 μs                                     |
| <b>POWER REQUIREMENTS</b>                       |  |
| Voltage   | ±15 VDC                                  |
| Current   |  |
| Normal Operation                                | ±15 mA plus Bridge Load / channel        |
| During Shunt                                    | ±20 mA plus Bridge Load / channel        |
| <b>ENVIRONMENT</b>                              |  |
| Specification                                   | -40 to +85°C (-40 to +185°F)             |
| Operation                                       | -40 to +125°C (-40 to +257°F)            |

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