

Strain Gage Amplifiers

Model AMP-SG3-U2 Series

- Three-channel modular amplifier
- Highly accurate bridge excitations
- Provides high level voltage signal outputs
- Externally adjustable shunt resistances
- Externally adjustable gains
- Remote bridge excitation on/off capability
- Remote shunt calibration capability

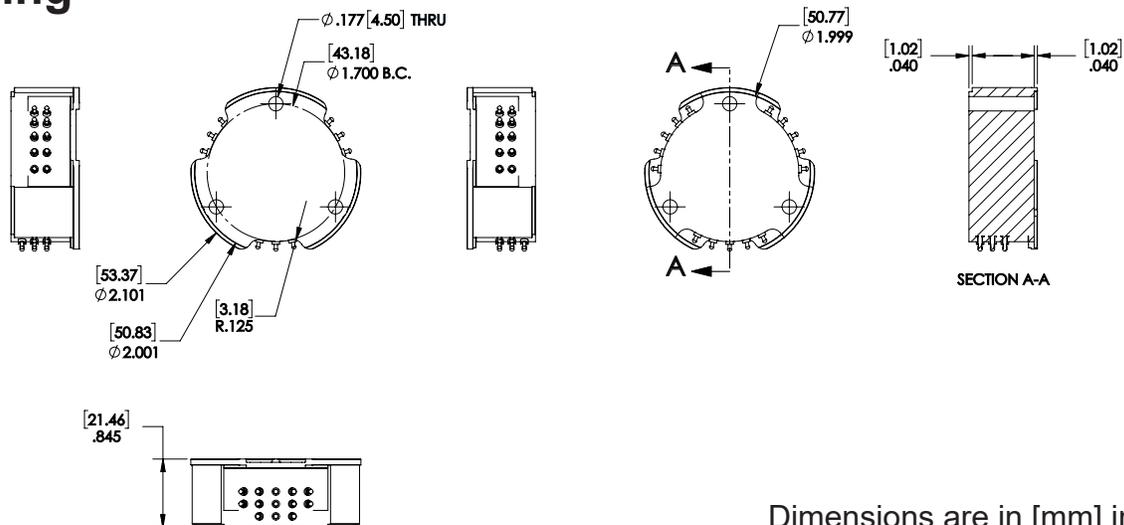


Description

The *Modular Spinning Strain Gage Amplifier* is designed to mount on the rotor of all Michigan Scientific *SR-Series Slip Rings*. 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.

The *Modular Spinning 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 module provides strain gauge bridge excitation and amplification for three channels. For more than three channels, the amplifiers may be stacked or arrayed around an adapter plate. Refer to the literature in the Technical Notes section for a wiring schematic of an individual amplifier and recommended wiring techniques when using multiple amplifiers.

Drawing



Dimensions are in [mm] in

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08-25-22
Rev. A

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Specifications

PARAMETER	SPECIFICATION
BRIDGE EXCITATION	
Type	DC Constant Voltage (Bipolar excitation)
Magnitude	AMP-SG3-U2-5 ± 2.5 V (5 V total) AMP-SG3U2-10 ± 5.0 V (10 V total)
Accuracy	0.40%
Temperature Coefficient	0.0005 %/°C Max (0.00028 %/°F)
Current Limit	AMP-SG3-U2-5 42 mA AMP-SG3-U2-10 84 mA
REMOTE CALIBRATION	
Positive & negative shunt Calibration	
Shunt Resistance	internal value 100 k Ω and 1 M Ω external value 100 k Ω Through 1 M Ω
Shunt accuracy	@ 100 k Ω 0.1% @ 1 M Ω 0.1%
GAIN	
Range	with external jumper 100 & 2000 V/V w/ external resistor 100 through 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)
OUTPUT	
Range	± 10 V Max
Capacitive Load	1000 pF Max
VOLTAGE OFFSET	
Referred to input of amplifier	
Initial	@ 25 °C ± 10 μ V typ (± 50 μ V max)
Temperature Stability	± 0.1 μ V / °C typ (± 0.25 μ V / °C max)
Time Stability	± 0.1 μ V / month
DC CMRR	160 dB
Noise	rti 0.01 Hz - 10 Hz 0.7 μ V p-p
DYNAMIC RESPONSE	
Frequency Response	-3 dB @ Gain=1000 20 kHz @ Gain=100 20 kHz
Slew rate	4 V/ μ s
Settling Time to 0.01% @ Gain=100	9 μ s
POWER REQUIREMENTS	
Voltage	@ 25 °C ± 15 Vdc
Current	± 45 mA plus Bridge Load (+30 mA additional during shunt calibration)
ENVIRONMENT	
Specification	-40 °C to +85 °C (-40 °F to +185 °F)
Operation	-40 °C to +125 °C (-40 °F to +257 °F)
MECHANICAL	
Weight	AMP-SG3-U2 68.5 g (2.42 oz)