

# Three Channel Strain Gage Amplifier Box

## Model SGA3A

- Ideal for use with Michigan Scientific Load Cells
- Highly accurate bridge excitation
- Provides high level voltage signal output
- Precision low noise differential amplifier
- Remote bridge excitation On/Off capability
- Remote shunt calibration capability
- Available in a variety of channel configurations
- Optional strain gauge summation wiring, for use with multiple loads cells used in parallel



## Description

The Michigan Scientific *SGA3A Strain Gage Amplifier Box* is ideal for use with any of MSC's wide variety of three directional load cells. The SGA3A provides highly accurate excitation voltage to the load cell, a stable differential amplifier, and a remotely activated shunt resistor for system span verification. The result is an accurate, high level voltage output signal. The shunt calibration can be easily invoked with the flip of a switch when used with a Michigan Scientific *PS-DC* or *PS-AC Power Supply*.

MSC will select the appropriate amplifier gain and shunt resistors for use with your selected load cell. The fixed precision resistors are factory installed.

The standard SGA3A is comprised of three independent miniature strain gauge amplifiers. MSC can customize the amplifier box to any number of channels desired. The SGA3A can also incorporate strain gauge summation wiring. This saves cost when using an array of load cells to measure three directions of force because only one amplifier box is required.



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## Specifications

PARAMETER	SPECIFICATION
<b>BRIDGE EXCITATION</b>	
Type	DC Constant Voltage (Bipolar excitation)
Magnitude	$\pm 5$ V (10 Volts total) $\pm 2.5$ V (5 Volts total)
Accuracy	0.40%
Temperature Coefficient	0.0005%/°C Max (0.00028%/°F)
Current Limit	84 mA per channel (10 Volt Excitation)
<b>REMOTE CALIBRATION</b>	
Shunt Resistance	100 K $\Omega$ and 1 M $\Omega$
Shunt accuracy	0.1%
<b>GAIN</b>	
Range	100 & 2000 $\Omega$
Accuracy (25°C, Gain =100)	$\pm 0.05\%$ typ ( $\pm 0.50\%$ max)
Accuracy (25°C, Gain =1000)	$\pm 0.50\%$ typ ( $\pm 1.0\%$ max)
Temperature Coefficient	0.0025%/°C (0.0014%/°F)
<b>OUTPUT</b>	
Range	$\pm 10$ V Max
Capacitive Load	1000 pF Max
<b>VOLTAGE OFFSET</b>	
	Referred to input of amplifier
Initial (25°C)	$\pm 10$ $\mu$ V typ ( $\pm 50$ $\mu$ V max)
Temperature Stability	$\pm 0.1$ $\mu$ V/°C typ ( $\pm 0.25$ $\mu$ V/°C max)
Time Stability	$\pm 0.1$ $\mu$ V/month
DC CMRR	160 dB
Noise (rti 0.01 - 10 Hz)	0.7 $\mu$ V p-p
<b>DYNAMIC RESPONSE</b>	
Frequency Response -3dB (@ Gain=1000)	20 kHz
Frequency Response -3dB (@ Gain=100)	40 kHz
Slew rate	4 V/ $\mu$ s
Settling Time to 0.01% @ Gain=100	9 $\mu$ s
<b>POWER REQUIREMENTS</b>	
Voltage	$\pm 15$ Vdc
Current (Normal Operation)	$\pm 45$ mA plus Bridge Load (3 channels)
Current (Shunt Operation)	$\pm 60$ mA plus Bridge Load (3 channels)
<b>ENVIRONMENT</b>	
Specification	-40 to +85°C (-40 to +185°F)
Operation	-40 to +125°C (-40 to +257°F)