# Three Channel Strain Gage Ampli ier Box

- 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.

# Specifications

| PARAMETER | SPECIFICATION |
|---|---|
| **BRIDGE EXCITATION** | |
| Type | DC Constant Voltage (Bipolar excitation) |
| Magnitude | ±5 V (10 Volts total) ±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) |
| **REMOTE CALIBRATION** | Positive & negative shunt calibration |
| Shunt Resistance | 100 KΩ and 1 MΩ |
| Shunt accuracy | 0.1% |
| **GAIN** | |
| Range | 100 & 2000 V/V |
| Accuracy (25°C, Gain =100) | ±0.05% typ (±0.50% max) |
| Accuracy (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 µV typ (±50 µV max) |
| Temperature Stability | ±0.1 µV/°C typ (±0.25 µV/°C max) |
| Time Stability | ±0.1 µV/month |
| DC CMRR | 160 dB |
| Noise (rti 0.01 - 10 Hz) | 0.7 µV p-p |
| **DYNAMIC RESPONSE** | |
| Frequency Response -3dB (@ Gain=1000) | 20 kHz |
| Frequency Response -3dB (@ Gain=100) | 40 kHz |
| Slew rate | 4 V/µs |
| Settling Time to 0.01% @ Gain=100 | 9 µs |
| **POWER REQUIREMENTS** | |
| Voltage | ±15 Vdc |
| Current (Normal Operation) | ±45 mA plus Bridge Load (3 channels) |
| Current (Shunt Operation) | ±60 mA plus Bridge Load (3 channels) |
| **ENVIRONMENT** | |
| Specification | -40 to +85°C (-40 to +185°F) |
| Operation | -40 to +125°C (-40 to +257°F) |