

Series AP5103

DC Strain Gage DIN-rail Amplifier



Description

The Series AP5103 DIN-rail Amplifier is a low cost, easy-to-use, general-purpose single-channel conditioner designed for input of pressure, force, torque, weight, and other variables measured by standard DC-excited strain gage transducers. DIN mount construction gives the user ready access to screw terminal connections for power, analog output, shunt, and sensor signals. The AP5103 provides exceptional signal stability and accuracy over a wide range of sensor inputs. A powerful low-pass active filter, selectable by the user, removes unwanted high-frequency measurement-signal components. This DIN-rail signal conditioner provides filtered analog output of $\pm 5\text{Vdc}$, $\pm 10\text{Vdc}$, or 4-20 mA which are switch selectable by the user. The AP5103 will accommodate a wide range of full bridge DC strain gage sensors with bridge resistance for 120 to 10K Ohm. The Series AP5103 is especially user friendly because it features external, front panel accessible settings for mode, volts, current, filter, excitation, and zero. It is an excellent complement to STI's mV/V miniature and subminiature load cells/force sensors and miniature pressure transducers. The AP5103 DIN-rail signal conditioner is also available in an in-line fully enclosed housing configuration as the Series AP5201.

Standard Features

- DIN mount construction
- Filtered Analog Outputs: ± 0 to 5 Vdc, ± 0 to 10 Vdc, 4-20 mA
- Accepts Standard Full Strain Gage Bridges of 120 Ω to 10K Ω
- Easy access to screw terminal connections
- Front Panel Access to DIP Switch Settings for Mode, Volts, Current, Filter, Excitation, Zero
- Wide Zero & Span Adjustment
- Wide Input Power Range of 11 – 28 Vdc
- Field Selectable Bridge Excitation: 2.5 Vdc or 5.0 Vdc
- Switch-Based Shunt Calibration
- Power Status Indicator
- Over-Range Indicator

AP5103

Series AP5103 Specifications

Baseline Configuration Specs Represented.
Modifications Encouraged - See Below
Custom Designs Available

Performance

Transducer Types

Conventional 4-arm strain gage bridges, 120 ohm to 10 kohm; zero range is 100% of the stated full scale; a screw terminal is provided for user-supplied shunt calibration resistor (see diagram, below, for typical cabling).

Input Ranges (Nominal, Full-Scale)

.5 to 5 mv/V or 1 to 10 mv/V via internal switch settings.

Front Panel Switch Settings

| | Left | Right |
|-----------------------|------------|---------|
| Output Mode | Current | Voltage |
| Voltage Level | 10 Vdc | 5 Vdc |
| Current Level | 4-12-20 mA | 4-20 mA |
| Filter Setting | 5 kHz | 200 Hz |
| Filter Setting | 10 Hz | 200 Hz |
| Excitation | 5.0 Vdc | 2.5 Vdc |
| Zero Adjust | Extended | Normal |

Calibration

To calibrate, use either the "deadweight" or "shunt" method. Through the use of internal switch controls, the user will specify the mV/V range desired and adjust the fine and coarse controls to achieve the desired analog output, ± 5 or ± 10 VDC or 4-20 ma full-scale. Zero-ing of the sensor is achieved in the same manner with the coarse and fine controls which will adjust the zero position $\pm 100\%$.

Mechanical Characteristics

Housing

DIN mount housing; non-removable screw terminals.
(See STI Series AP5201 for in-line, enclosed version.)

Dimensions

4.7" deep x 0.9" wide x 3.9" high.

Electrical Characteristics

Power Requirements

11- 28 VDC, 2 watts max.

Common-Mode Range

0 to 3 V.

Common-Mode Rejection Ratio (at @1/2 Excitation)

-60 dB.

Input Impedance (Differential and Common-Mode)

Greater than 10,000 Mohm.

Offset

Adjustable; vs. temperature: $\pm 0.10 \mu\text{V}/^\circ\text{C}$;
vs. time: $\pm 5 \mu\text{V}/\text{month}$

Gain Accuracy

Limited only by calibration accuracy.

Gain Stability

vs. temperature: $\pm 30 \text{ ppm}/^\circ\text{C}$; vs. time: $\pm 10 \text{ ppm}/\text{month}$.

Transducer Excitation

Nominal 2.50 VDC up to 70 mA or 5.00 VDC up to 70 mA. Selectable via front panel switch setting.

Analog Filters

10, 200, or 5000 Hz, switch selectable.

Electrical Characteristics

Analog Outputs

Filtered ± 0 to 5 Vdc or ± 0 to 10 Vdc, 4-12-20 mA, or 4-20 mA (sourcing). Mode is switch selectable with linearity maintained for 20% overrange (in voltage mode only)

Shunt Logic Input

Activated by input taken to power common potential; $\pm 25 \text{ V}$ without damage; internal pull-up nom. 5 kohm; input assume Logic 1 state in the absence of connection.

Shunt Resistor Installed

59k Ω standard (user replaceable).

Power Status Indicator

Green; indicates module power input.

Over-Range Indicator

Yellow; indicates analog output over-range.

Environmental Characteristics

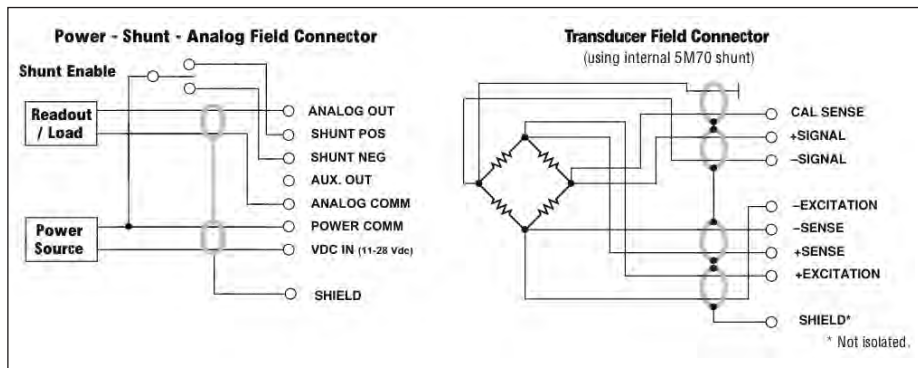
Operating Temperature Range

14° F to 158° F.

Operating Relative Humidity

5% to 95%, noncondensing.

Connection and Adjustment



MODIFICATIONS: We realize amplifier applications vary greatly and as such our designs are flexible. Specifications on this datasheet represent the standard configuration only. Product and company names listed are trademarks of their respective companies. Specifications subject to change without notice.

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Due to the nature of technology, changes are inevitable. For latest technical specifications, see our website.

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