



API 4051 G

Non-Isolated

Strain Gauge (Bridge) to DC Transmitter

Input: 1 mV/V to 200 mV/V, 4-10 VDC Excitation
Output: 0-1 V to ± 10 VDC or 0-1 mA to 4-20 mADC

- Internal Bridge Excitation Source
- Input and Output LoopTracker® LEDs
- Functional Test Pushbutton
- Voltage or Currents Outputs

Applications

- Transmitter for Load Cells, Pressure Sensors
- Use with Strain Gauge Type Sensors
- Monitor Tanks, Hoppers, Scales, Etc.

Specifications

Input Range

Factory Configured—Please specify input range

Minimum: 1 mV/V
Maximum: 200 mV/V

Input Impedance

1 M Ω minimum

Input Protection, Common Mode

600 VDC or 600 VAC_p

Excitation Voltage

10 VDC maximum at 30 mA
Internal adjustment 4 to 10 VDC

Excitation Stability

$\pm 0.01\%$ per $^{\circ}\text{C}$

LoopTracker®

Variable brightness LEDs indicate input/output loop level and status

Output Range

Factory Configured—Please specify output range

	Minimum	Maximum
Voltage (± 10 mA max.):	0-1 VDC	± 10 VDC
Current (12 V compliance):	0-1 mADC	0-20 mADC

Output Linearity

Better than $\pm 0.1\%$ of span

Output Zero and Span

Multiturn potentiometers to compensate for load and lead variations, $\pm 15\%$ of span adjustment range typical

Functional Test Button

Sets output to test level when pressed
Potentiometer factory set to approximately 50% of span
Adjustable 0-100% of span

Response Time

70 milliseconds typical, faster response times are available

Common Mode Rejection

100 dB minimum

Ambient Temperature Range

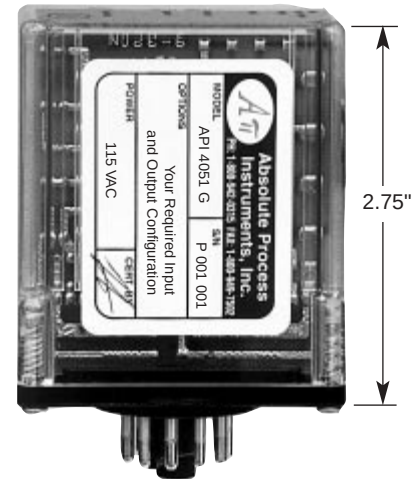
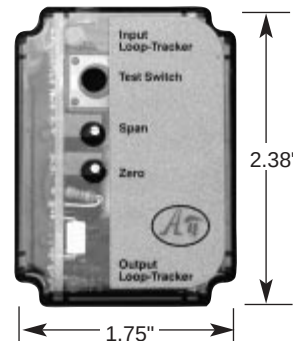
-10°C to $+60^{\circ}\text{C}$ operating

Temperature Stability

Better than $\pm 0.02\%$ of span per $^{\circ}\text{C}$

Power

Standard: 115 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.
A230 option: 230 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.
D option: 9-30 VDC, 2.5 W typical



**Free Factory
Input & Output
Calibration!**

Models and Options

Factory Configured—Specify input/output ranges and options

API 4051 G Strain gauge to DC transmitter, non-isolated, 115 VAC

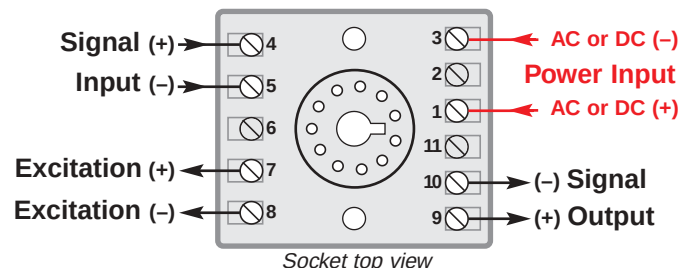
Options—Specify on Order

- A230 Powered by 230 VAC, 50/60 Hz
- D Powered by 9-30 VDC
- M01 Toggle switch with internal shunt calibration resistor
- DF Fast response, 1 millisecond nominal response time
- U Conformal coating for moisture resistance

Accessories—See other side

Electrical Connections & Dimensions

Order API 011 or API 011 FS socket separately



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API 4051 G Strain Gauge to DC Transmitter

FUNCTIONAL DESCRIPTION

The API 4051 G accepts a strain gauge (bridge) input and provides a proportional, non-isolated DC voltage or current output.

The API 4051 G generates a stable source of excitation voltage to bridge type sensors such as load cells, pressure transducers and strain gauges and amplifies and converts the resulting millivolt signal into the configured output. It includes filtering and processing to allow effective use of low-level transducers in the noisy environments common in industrial applications.

The API 4051 G requires factory configuration to a specific excitation voltage, millivolt input (mV/V rating of the sensor times excitation voltage), DC voltage or DC current output, and power.

Inputs from most bridge type sensors are accepted and can be configured as zero-based (i.e., 0 to 20 mV), bi-polar (i.e., -30 to +30 mV) for push-pull applications, or offset (i.e., 5 to 33 mV) to electronically compensate for deadweights (tare).

Outputs can also be configured as zero-based, bi-polar, or offset. In addition to the standard process ranges (i.e., 0-10 VDC, 4-20 mA DC, etc.), the API 4051 G output can be configured meet most non-standard requirements. Contact the factory for assistance.

Standard module power is 115 VAC. Options include 230 VAC or 9 to 30 VDC.

The API 4051 G plugs into an industry standard 11-pin socket sold separately. Sockets API 011 and finger-safe API 011 FS allow either DIN rail or panel mounting.

UNIQUE FEATURES

API exclusive features include two **LoopTracker®** LEDs and a **Functional Test Pushbutton**. The LoopTracker LEDs (Green for input, Red for output) vary in intensity with changes in the input and output signals. Monitoring the state of these LEDs can provide a quick visual picture of your system at all times.

The functional test pushbutton provides a fixed output, independent of the input, when held depressed. The test output level can be field-adjusted via a multiturn potentiometer.

Both the LoopTracker LEDs and functional test pushbutton greatly aid in saving time during initial startup and/or troubleshooting.

A bridge excitation power supply is standard and can be used to drive from one to four 350 Ω (or greater) bridges.

OPERATION

Strain gauges and load cells are normally passive devices that are commonly referred to as "bridges" due to the four-resistor Wheatstone bridge configuration used in their design. These sensors require a precise excitation source to produce an output that is directly proportional to the load, pressure, etc. that is applied to the sensor.

The exact output of the sensor (measured in millivolts) is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied. For example, a load cell rated for 3 mV/V sensitivity and 10 VDC excitation will produce an output of 0 to 30 mV for load variations from 0 to 100%.

$$3 \text{ mV/V sensitivity} \times 10 \text{ VDC excitation} = 30 \text{ mV range}$$

The API 4051 G provides the excitation voltage to the sensors and receives the resulting millivolt signal in return. This input signal is filtered and amplified, offset, if required, then passed to the output stage where it is scaled to the desired output range.

RELATED PRODUCTS

The following products are also available for use with a strain gauge (bridge) input. Refer to the appropriate data sheets for details.

API 4059 G

Strain gauge (bridge) to DC isolator. Field selectable excitation voltage capable of driving up to four 350 Ω sensors, input spans, output voltage or current and offset ($\pm 100\%$ of span). Optically isolated input to output, non-interactive zero and span adjustments

API 1500 G

Single setpoint alarm

API 1520 G

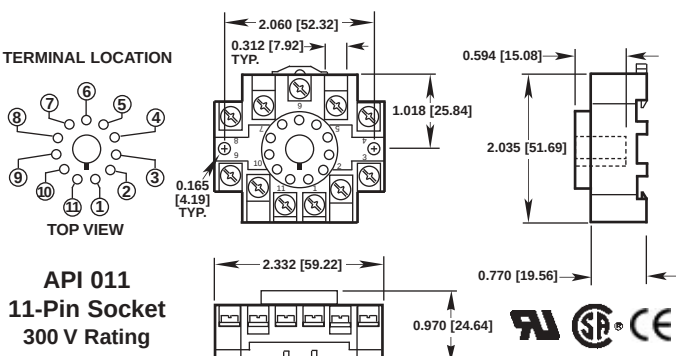
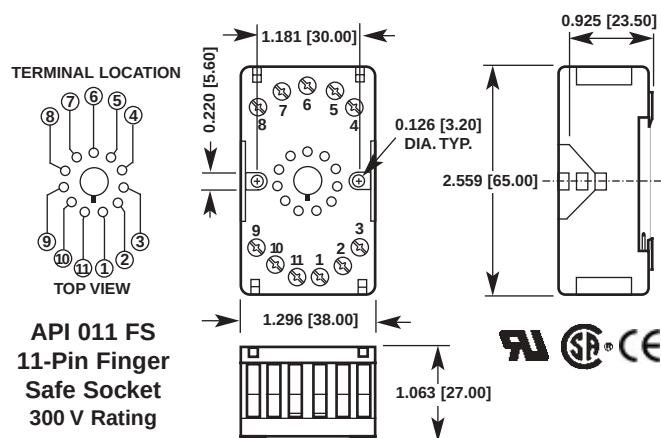
Dual setpoint alarm

ACCESSORIES

API 011 11-pin socket

API 011 FS 11-pin finger-safe socket

API TK36 DIN rail, 35 mm W x 39" L, aluminum



API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.