

**Input:** 0-10 mV to 0-500 VDC, ±10 mV to ±10 VDC, 0-100 µA to 0-900 mADC  
**Output:** 0-1 V to ±10 VDC or 0-1 mA to 4-20 mA

- Factory Set Custom I/O Ranges
- Easy-to-Install Plug-In Design
- Full 2000 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- Output Test Button
- Built-In Loop Power Supplies for Input and Output

**Applications**

- Convert, Boost, Rescale Process Signals
- Isolate Single-Ended (Common Ground) PLC Inputs
- Interface Signals with Panel Meters, PLCs, Recorders, Data Acquisition, DCS, and SCADA Systems

**DC Input Range**

Factory configured, please specify input range or consult factory. See table on other side for common ranges.

**API 4300 G Input Range**

Voltage: 0-100 mVDC to 0-500 VDC\*  
 Bipolar voltage: ±100 mVDC to ±10 VDC  
 Current: 0-1 mADC to 0-900 mADC

\*150 VDC max. for UL  
 500 VDC max. with API 008 socket  
 300 VDC max. with API 008 FS socket  
 Voltages must not exceed socket voltage rating

**API 4310 G Low Input Range Version**

Voltage: 0-10 mVDC to 0-100 mVDC  
 Bipolar voltage: ±10 mVDC to ±100 mVDC  
 Current: 0-100 µADC to 0-1 mADC

**Input Impedance (Voltage)**

200 kΩ minimum

**Input Voltage Burden (Current)**

1.25 VDC maximum

**Common Mode Rejection**

120 dB minimum

**Input Loop Power Supply**

18 VDC nom., unregulated, 25 mADC, max. ripple, <1.5 V<sub>p-p</sub>  
 May be selectively wired for sinking or sourcing mA input

**LoopTracker**

Variable brightness LEDs indicate I/O loop level and status

**DC Output Range**

Factory configured, specify output range

Voltage, 10 mA max.: 0-1 VDC to 0-10 VDC  
 Bipolar voltage: ±1 VDC to ±10 VDC  
 Current: 0-1 mADC to 0-20 mADC  
 20 V compliance, 1000 Ω at 20 mA

**Output Calibration**

Multi-turn zero & span potentiometers, ±15% span adj. typ.

**Output Loop Power Supply**

20 VDC nominal, regulated, 25 mADC, max. ripple <10 mVRMS  
 Order EXTSUP option for unpowered mA output

**Output Test**

Sets output to test level when pressed. Test level factory set to approx. 50% of span. Specify custom setting.

**Output Ripple and Noise**

Less than 10 mVRMS

**Linearity**

Better than ±0.1% of span

**Ambient Temperature Range and Stability**

-10°C to +60°C operating ambient  
 Better than ±0.04% of span per °C stability

**Response Time**

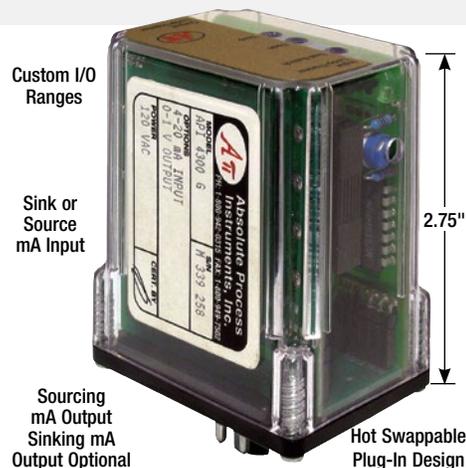
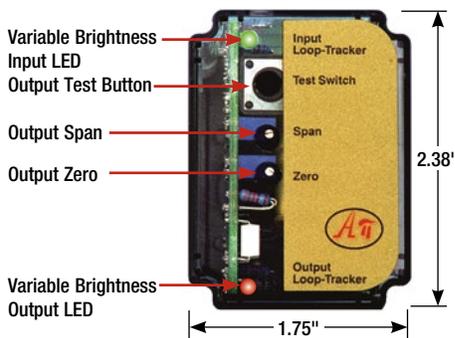
70 milliseconds typical, faster response times are available  
 DF option: 1 millisecond response time

**Isolation**

2000 VRMS minimum  
 Full isolation: power to input, power to output, input to output

**Installation Environment**

IP 40, requires installation in panel or enclosure  
 Use with API 008 or API 008 FS socket  
 Socket mounts to 35 mm DIN rail or can be surface mounted  
 UL 508C pollution degree 2 environments or better



**Power**

Standard: 115 VAC ±10%, 50/60 Hz, 2.5 W max.  
 P option: 85-265 VAC 50/60 Hz, 60-300 VDC, 2.5 W  
 A230 option: 230 VAC ±10%, 50/60 Hz, 2.5 W max.  
 D option: 9-30 VDC, 2.5 W typical

**Description**

The API 4300 G and API 4310 G are factory configured to accept a DC voltage or current input and provide an optically isolated DC voltage or current output that is linearly related to the input.

The API 4310 G utilizes an ultra-stable input amplifier for reliable operation with input signals as low as 10 mVDC.

Typical applications include signal isolation, conversion, boosting or a combination of the three. Full 3-way isolation (input, output, power) makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

When a milliamp input is specified, a loop excitation power supply is included that may be wired for sinking or sourcing to allow you to use a powered or passive input device.

When a milliamp output is ordered, it provides power to the output current loop (sourcing). If an unpowered (sinking) current output is required, order the EXTSUP option for an open collector output.

Common ranges as well as custom ranges are possible. Consult the factory for assistance with special ranges.

Model	Input	Output	Power
API 4300 G	Factory ranged	Factory ranged Specify output range	115 VAC 
API 4300 G A230	0-100 mVDC to 0-500 VDC		230 VAC 
API 4300 G P	±100 mVDC to ±10 VDC		85-265 VAC or 60-300 VDC
API 4300 G D	0-1 mADC to 0-900 mADC		9-30 VDC
API 4310 G	Factory ranged	Factory ranged Specify output range	115 VAC 
API 4310 G A230	0-10 mVDC to 0-100 mVDC		230 VAC 
API 4310 G P	±10 mVDC to ±100 mVDC		85-265 VAC or 60-300 VDC
API 4310 G D	0-100 µADC to 0-1 mADC		9-30 VDC

**Options—add to end of model number**

- 5A** Up to 5 amp DC input with socket and 25 W shunt
- DF** Fast response, 1 millisecond nominal response time  
DF option will cause output noise levels greater than standard specifications.
- EXTSUP** Open collector sinking (unpowered) output
- M01** Input/output reversal (API 4310 G only)
- U** Conformal coating for moisture resistance

**Accessories—order as separate line item**

- API 008** 8-pin socket
- API 008 FS** 8-pin finger-safe socket
- API CLP1** Module hold-down spring for high vibration or mobile applications



115 VAC, 230 VAC models with input up to 150 VDC

**Free Factory I/O Setup!**

**Quick Link**  
[api-usa.com/4300](http://api-usa.com/4300)

**LoopTracker**

API exclusive features include two LoopTracker LEDs (green for input, red for output) that vary in intensity with changes in the process input and output signals. These provide a quick visual picture of your process loop at all times and can greatly aid in saving time during initial startup and/or troubleshooting.

**Output Test**

An API exclusive feature includes the Functional Test Button to provide a fixed output (independent of the input) when held depressed. The test output level is factory set via an internal potentiometer to approximately 50% of output span.

The functional test button greatly aids in saving time during initial startup and/or troubleshooting.

**Installation**

The API 4300 G and API 4310 G plug into an industry standard 8-pin octal socket sold separately. Sockets API 008 and finger-safe API 008 FS allow either DIN rail or panel mounting.

The plug-in design, 3-way isolation, and robust electronics allows the module to be quickly hot-swapped without removing the power or I/O signals.



## Precautions

**WARNING!** All wiring must be performed by a qualified electrician or instrumentation engineer. See diagram for terminal designations and wiring examples. Consult factory for assistance.

**WARNING!** Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring, or removing or installing module.

## Précautions

**ATTENTION!** Tout le câblage doit être effectué par un électricien ou ingénieur en instrumentation qualifié. Voir le diagramme pour désignations des bornes et des exemples de câblage. Consulter l'usine pour assistance.

**ATTENTION!** Éviter les risques de choc! Fermez le signal d'entrée, le signal de sortie et l'alimentation électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d'installer le module.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. See [api-usa.com](http://api-usa.com) for latest product information. Consult factory for your specific requirements.

 **WARNING:** This product can expose you to chemicals including lead and nickel, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Socket and Mounting

Install module in a protective panel or enclosure. Allow space around module for air flow. Use API 008 or API 008 FS socket. See specifications for maximum allowable socket voltages. The socket clips to a standard 35 mm DIN rail or can be mounted to a flat surface.

## Ranges

API 4300 G and API 4310 G input and output ranges are set at the factory and must be specified when ordering. Listed below are commonly ordered input and output ranges. Consult factory for other available ranges or special ranges. See the model/serial number label for module information, module power requirements, options, and I/O range information.

When a current output is ordered, it provides power to the output current loop (sourcing). Models with an unpowered (sinking) current output will have EXTSUP as part of the model number.

Common Voltage Inputs				
0-10 mV*	0-200 mV	1-5 V	±10 mV*	±200 mV
0-20 mV*	0-500 mV	0-10 V	±20 mV*	±1 V
0-25 mV*	0-1 V	0-20 V	±25 mV*	±2 V
0-50 mV*	0-2 V	0-50 V	±50 mV*	±5 V
0-100 mV*	0-5 V	0-100 V	±100 mV*	±10 V
Common Current Inputs				
0-100 µA*	0-500 µA*	0-5 mA	0-20 mA	0-100 mA
0-200 µA*	0-1 mA*	0-10 mA	4-20 mA	0-200 mA
0-250 µA*	0-2.5 mA	0-16 mA	10-50 mA	0-500 mA
Common Voltage Outputs				
0-1 V	0-5 V	0-10 V	±1 V	±10 V
0-2 V	1-5 V	1-10 V	±5 V	
Common Current Outputs				
0-5 mA	0-16 mA	0-20 mA	4-20 mA	10-50 mA**

\* API 4310 G range \*\*with HC option

## Signal Input

Polarity must be observed when connecting the signal input. If your transmitter has a current output, determine if it provides power to the current loop or if it must be powered by the API module. Use a multi-meter to check for voltage at the transmitter output terminals. Typical voltage may be in the range of 9 to 24 VDC. In this case, wire the device to terminals 6 and 5.

A passive input device can be powered by the 18 volt DC power supply at terminal 4. This may save the expense of purchasing a separate power supply for the input device. A typical example is shown, however consult the instructions for your specific sensor to determine its compatibility and proper wiring.

Type of Input Device	- Terminal	+ Terminal
Sensor or transmitter with a voltage output.	6 (-)	5 (+)
Connection when using 5A current shunt. The input measures the mV drop across shunt.	6 (-)	5 (+)
Transmitter with a mA (current) output that powers the current loop. Typically a 3 or 4-wire device.	6 (-)	5 (+)
Transmitter with unpowered mA (current) output. Typically a 2-wire device. API module powers loop.	5 (-)	4 (+18 VDC)

## Signal Output

Polarity must be observed for output wiring connections. If the output does not function, check wiring and polarity.

Note that with a current output the module provides power to the output loop unless option EXTSUP was ordered for a sinking output.

See table for terminal designations.

Device Connected to Output	- Terminal	+ Terminal
Measuring or recording device accepts a voltage input.	8 (-)	7 (+)
Measuring/recording device accepts a mA (current) input and its input is unpowered or passive. API module provides the loop power.	8 (-)	7 (+20 V)
With EXTSUP option only. Measuring or recording device accepts a mA (current) input and provides power to the current loop.	8 (-)	7 (+)

## Module Power

Check model/serial number label for module operating voltage to make sure it matches available power.

AC power is connected to terminals 1 and 3. For DC powered modules (D option), polarity MUST be observed. Positive (+) is wired to terminal 1 and negative (-) is wired to terminal 3.

## Calibration

Input and output ranges as specified on your order are factory pre-configured (at 24°C ±1°C). Top-mounted, Zero and Span potentiometers can be used to calibrate the output to compensate for load and lead variations.

1. Apply power to the module and allow a minimum 20 minute warm up time.
2. Using an accurate calibration source, provide an input to the module equal to the minimum input required for the application.
3. Using an accurate measurement device for the output, adjust the Zero potentiometer for the exact minimum output desired. The Zero control should only be adjusted when the input signal is at its minimum. This will produce the corresponding minimum output signal. For example: 4 mA for a 4-20 mA output or -10 V for a ±10V output.
4. Next, set the input at maximum, then adjust the Span pot for the exact maximum output desired. The Span control should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal. Example: for 4-20 mA output, the Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for maximum accuracy.

## Output Test Function

The test button may be used to drive the device on the output (a panel meter, chart recorder, etc.) with a known good signal that can be used as a system diagnostic aid during initial start-up or during troubleshooting.

When depressed it will drive the output with a known good signal. When released, the output will return to normal.

The single-turn Output Test potentiometer is factory adjusted to approximately 50% of the output span. For a bipolar output it is set to approximately 50% of the positive output. It can be field adjusted if required.

The potentiometer access hole is covered with a label. It is adjustable from 0 to approximately 80% of the positive output

span. Press and hold the Test button and adjust the potentiometer for the desired output level. When released, the output will return to normal.

## Operation

The API 4300 G and API 4310 G are factory configured to your exact input and output requirements. The input is filtered, either amplified or attenuated as required, then passed through to the output stage.

The green LoopTracker® input LED provides a visual indication that a signal is being sensed by the input circuitry of the module. It also indicates the input signal strength by changing in intensity as the process changes from minimum to maximum.

If the LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring. Note that it may be difficult to see the LEDs under bright lighting conditions.

The red LoopTracker output LED provides a visual indication that the output signal is functioning. It becomes brighter as the input and the corresponding output change from minimum to maximum.

For current outputs, the red LED will only light if the output loop current path is complete. For either current or voltage outputs, failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module power or signal output wiring.

