

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 Hot Swappable Plug-In Design*
- *Full 1200 V Input/Output/Power Isolation*
- *Input and Output LoopTracker® LEDs*
- *Functional 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 Process Signals with Panel Meters, PLCs, Recorders, Data Acquisition, DCS, and SCADA Systems*

Input Ranges

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

API 4300 G Input Ranges

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

*500 VDC max with API 008 socket only, 300 VDC max with API 008 FS socket. System 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

Input Loop Power Supply

18 VDC nom., unregulated, 25 mADC, max. ripple, <1.5 V_{p-p}
 May be selectively wired for sinking or sourcing mA input

LoopTracker

Variable brightness LEDs indicate I/O loop level and status

Output Ranges

Factory configured—please specify output range or consult factory for special ranges. See table on other side for common ranges.

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 Linearity, Ripple & Noise

Better than ±0.1% of span, <10 mV_{RMS} ripple and noise

Output Loop Power Supply

20 VDC nom., regulated, 25 mADC, max. ripple, <10 mV_{RMS}
 Order EXTSUP option for unpowered mA output

Output Zero and Span

Multi-turn potentiometers to compensate for load and lead variations
 ±15% of span adjustment range typical

Functional Test

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

Response Time

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

Common Mode Rejection

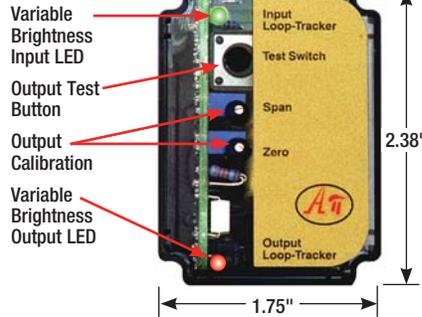
120 dB minimum

Isolation

2000 V_{RMS} minimum
 Full isolation: power to input, power to output, input to output

Ambient Temperature Range and Stability

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



Custom I/O Ranges

Sink or Source mA Input

Sourcing mA Output
 Sinking mA Output Optional

Hot Swappable Plug-In Design



Quick Link
api-usa.com/4300

Housing and Sockets

IP 40, plugs into API 008 or API 008 FS socket
 Socket mounts to 35 mm DIN rail or can be surface mounted

Power

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

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 API 4300 G EXTSUP with open collector output.

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

How to Order

All models are factory ranged. Please specify

Model number, power if non-standard, options
 Input range
 Output range

Model	Input Ranges	Power
API 4300 G		115 VAC
API 4300 G A230	0-100 mVDC to 0-500 VDC	230 VAC
API 4300 G P	±100 mVDC to ±10 VDC 0-1 mADC to 0-900 mADC	60-265 VAC or 85-300 VDC
API 4300 G D		9-30 VDC
Model	Low Range Inputs	Power
API 4310 G		115 VAC
API 4310 G A230	0-10 mVDC to 0-100 mVDC	230 VAC
API 4310 G P	±10 mVDC to ±100 mVDC 0-100 µADC to 0-1 mADC	60-265 VAC or 85-300 VDC
API 4310 G D		9-30 VDC

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.

Functional 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.

Example

API 4300 G D EXTSUP
 ±10 mV input
 4-20 mA sinking output

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
- HC** High current output, >20 mA to 50 mADC
- 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 TK36** DIN rail, 35 mm W x 39" L, aluminum

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 white 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

Electrical Connections

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

This module requires API 008 or finger-safe API 008 FS socket. See specifications for maximum allowable socket voltages. Note that some relay sockets may have lower voltage ratings.

Each product is factory configured to your exact input and output ranges as indicated on the white serial number label. Check label for module operating voltage to make sure it matches available power.

See wiring diagrams at right. All wiring must be performed by a qualified electrician or instrumentation engineer. Consult factory for assistance.

Signal Input Terminals

Polarity must be observed when connecting the signal input.

For a transmitter with 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 it is very important to consult the manufacturer of 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 provides power to the current loop. Typically a 3 or 4-wire device.	6 (-)	5 (+)
Transmitter with mA (current) output that is unpowered. Typically a 2-wire device. API module provides loop power.	5 (-)	4 (+18 VDC)

Signal Output Terminals

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

If you ordered the module with a current output and your device requires a current input, the current loop will be powered by the API module.

If you ordered the module with a current output and the EXTSUP option the API module will have a sinking (unpowered) output. Your device powers the current loop.

See table above right 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 Terminals

Check white 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 are pre-configured at the factory as specified on your order. Top-mounted, Zero and Span potentiometers can be used to calibrate the output to compensate for load and lead variations.

- Apply power to the module and allow a minimum 20 minute warm up time.
- Using an accurate calibration source, provide an input to the module equal to the minimum input required for the application.
- 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. Example: for 4-20 mA output, the Zero control will provide adjustment for the 4 mA or low end of the signal.
- 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.
- 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.

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

