Input: 100 Ω to 1 MΩ Potentiometers
Output: 0-1 V to ±10 VDC, or 0-2 mA to 0-20 mADC

- *Accepts Wide Range of Potentiometers*
- *Set-up via External Rotary Switches*
- *Easy-to-use Setup Tables*
- *Selectable Voltage or Current Outputs*
- *2000 VRMS Isolation Input/Output/Power*
- *Input and Output LoopTracker® LEDs*
- *Functional Test Button*

Applications

- *Over, Under, Out-of-Range Position Monitoring*
- *Remote Control of Positioning Devices*
- *Simplify Control of Potentiometer Outputs*

Potentiometer Input Ranges

Full travel of potentiometer and 3 wire connection required

Minimum: 0-100 Ω
Maximum: 0-1 MΩ
Consult factory for other ranges and configurations

Input Impedance

10 MΩ minimum

Common Mode Rejection

100 dB minimum

LoopTracker

Variable brightness LEDs indicate I/O level and status

DC Output Ranges

Field selectable ranges via switch settings
See table on other side for complete listing or consult factory for special ranges

Voltage: 0-1 VDC to 0-10 VDC, 10 mA max
Bipolar voltage: ±5 VDC or ±10 VDC
Current: 0-2 mADC to 0-20 mADC
             20 V compliance, 1000 Ω at 20 mA

Output Logic

Normal (standard) or reverse acting with M01 option

Calibration

Multi-turn zero and span potentiometers for output
±15% of span adjustment range typical

Output Loop Power Supply

20 VDC nominal, regulated, 25 mADC, max. ripple <10 mVRMS

Output Test

Front button sets output to test level when pressed
Potentiometer adjustable 0-100% of span

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 ±0.02% of span per °C stability

Response Time

70 milliseconds typical

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
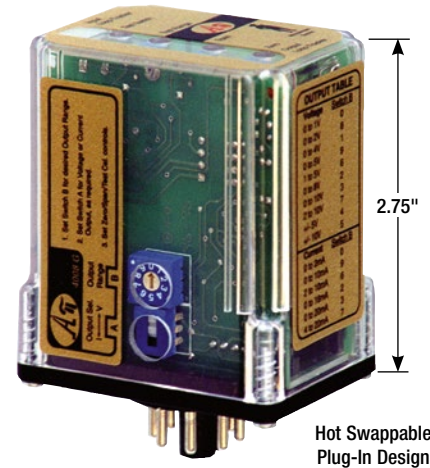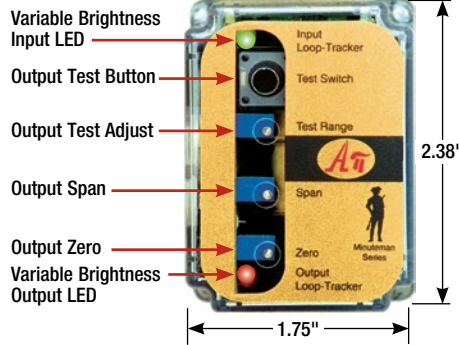UL 508C pollution degree 2 environments or better

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

Variable Brightness Input LED
Output Test Button
Output Test Adjust
Output Span
Output Zero
Variable Brightness Output LED

2.38"
1.75"

2.75"

Hot Swappable Plug-In Design

LIFETIME WARRANTY

MADE IN USA

Free Factory I/O Setup!

Quick Link
api-usa.com/4008

Description

The API 4008 G accepts a resistance input from potentiometer, slidewire, linear position, displacement, or rotational devices and provides an optically isolated DC voltage or current output that is linearly related to the potentiometer position.

The API 4008 G will accept any potentiometer with a value of 0-100 Ω through 0-1 MΩ without recalibration and without affecting accuracy as long as 100% of the potentiometer range is used. Models with offsets and/or input ranges other than 0 to 100% of the pot are available. Consult factory for assistance.

The API 4008 G output can be field-configured via external rotary and slide switches. 10 DC voltage or 8 DC current ranges can be selected from the table on the module. Other output ranges are available.

The full 3-way (input, output, power) isolation makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

Output Loop Power Supply

The API 4008 G has an 20 VDC loop excitation supply for the output. This power supply can be used to power a passive mA device.

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 test button to provide a fixed output (independent of the input) when held depressed. The test output level is potentiometer adjustable from 0 to 100% of output span.

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

Model	Input	Output	Power	
API 4008 G	Any full-range potentiometer from 0-100 Ω to 0-1 MΩ Specify if custom range is required	Field configurable specify range if factory is to set switches	115 VAC	cULus
API 4008 G A230			230 VAC	cULus
API 4008 G P			85-265 VAC or 60-300 VDC	
API 4008 G D			9-30 VDC	

Options—add to end of model number

M01   Input/output reversal, such as 4-20 mA input to 20-4 mA output

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

API 008 FS
300 V Rating

API 008
600 V Rating

API CLP1

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 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

Range Selection

See model/serial number label for any applicable options or custom ranges. Select ranges before installation.

See table below for module output range settings. From the table, find the switch setting that matches your output range.

Make sure to set the V—I switch for voltage or current output respectively.
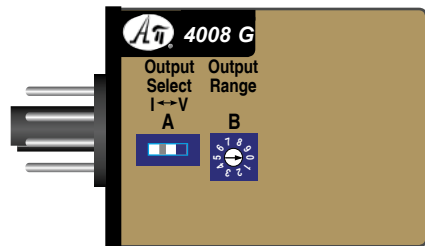
Voltage Output	A B	Current Output	A B
0-1 VDC	V 0	0-2 mA	I 0
0-2 VDC	V 8	0-4 mA	I 8
0-4 VDC	V 1	0-8 mA	I 1
0-5 VDC	V 9	0-10 mA	I 9
0-8 VDC	V 2	0-16 mA	I 2
0-10 VDC	V 3	0-20 mA	I 3
1-5 VDC	V 6	2-10 mA	I 6
2-10 VDC	V 7	4-20 mA	I 7
±5 VDC	V 4		
±10 VDC	V 5		

Socket and Mounting

The module installation requires a protective panel or enclosure. Use API 008 or finger-safe API 008 FS socket.

The socket clips to a standard 35 mm DIN rail or can be attached to a flat surface using the two mounting holes.

Electrical Connections

See model/serial number label for module power requirements, and any applicable options or custom ranges.

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

Signal Input Terminals

The potentiometer must be connected to all three signal input terminals as shown. 0-100% of the potentiometer range must be used. The API 4008 G utilizes a stable 1 VDC source to excite the potentiometer.

Potentiometer Input	Terminal
Zero or low end of potentiometer	4
Potentiometer wiper arm	5
Full scale or high side of potentiometer	6 (+1 VDC)

Signal Output Terminals

Polarity must be observed when connecting the signal output to the load. The positive connection (+) is connected to terminal 7 and the negative (–) is connected to terminal 8.

Note that with a mA current output the module provides power to the output loop.

For ranges that fall between the listed ranges use the next highest setting and trim the output signal with the zero and span potentiometers.

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, polarity MUST be observed.
Positive (+) is wired to terminal 1
Negative (–) is wired to terminal 3

Calibration

After the API 4008 G range switches are set, and the module is installed and powered, top-mounted Zero and Span potentiometers are available to fine-tune the module output.

Note: Perform the following calibration procedure any time switch settings are changed.

1. Apply power to the module and allow a minimum 20 minute warm up time.

2. Set the input potentiometer to its minimum value to provide a minimum input to the module.

3. Connect an accurate measurement device to the module output. Adjust the module's Zero potentiometer for the exact minimum output desired. The Zero control should only be adjusted when the input signal is at its minimum to produce the corresponding minimum output signal. For example: 4 mA for a 4-20 mA output or –10 V for a ±10V output.

4. Set the input potentiometer at its maximum, and then adjust the module's 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 signal, 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 pushed to provide a fixed output when depressed. This will drive the device on the output side of the loop (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.

It can be adjusted to vary the output signal from 0 to 100% of the calibrated output range. When released, the output will return to normal.

Turn the multi-turn Test Range potentiometer while holding the Test Switch depressed until the desired output test level is reached.

Operation

The API 4008 G utilizes a stable 1 VDC source to excite the potentiometer. This voltage is stabilized against the potentiometer resistance value variations over the entire operating range.

The resulting potentiometer wiper voltage is amplified and passed through an optical coupler to the output stage where it is scaled to the desired output range.

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.

Potentiometer Input

Potentiometer Full Scale and Minimum may be switched for reverse output

Terminal Location

Top View

Contacts: Nickel plated brass, 10 Amps max.
Screws: M3, zinc plated steel
Wiring: #14 AWG solid or stranded

API 008 FS 8-Pin Finger Safe Socket

Terminal Location

Top View

Contacts: Nickel plated brass, 10 Amps max.
Screws: 6-32 x 1/4", zinc plated steel
Wiring: #12 to #22 AWG solid or stranded, or 1/4" or 5/16" spade lug

API 008 8-Pin Socket