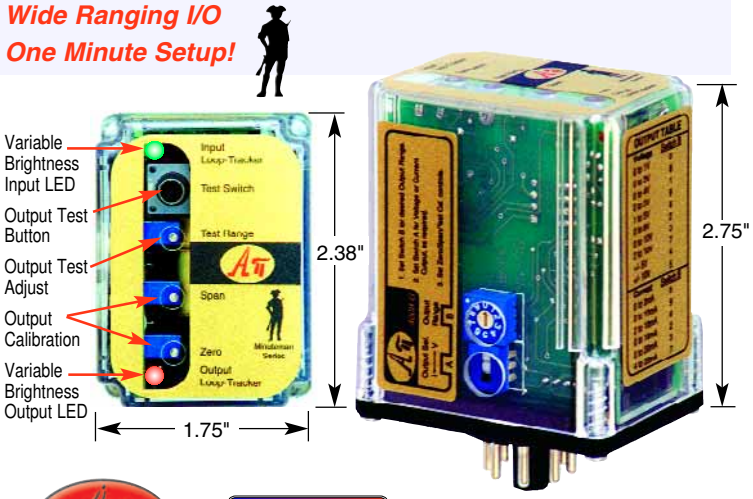
Potentiometer to DC Isolator
Field Rangeable Transmitter

API 4008 G

Input: ***100 Ω to 1 MΩ Potentiometers***
Output: ***0-1 V to ±10 VDC or 0-2 mA to 4-20 mA***

- ***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 Pushbutton***

Wide Ranging I/O
One Minute Setup!



LIFETIME WARRANTY

Free Factory Input & Output Calibration!

Applications

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

Specifications

Potentiometer Input Range
Minimum value: 0-100 Ω
Maximum value: 0-1.0 MΩ
Consult factory for other ranges and configurations
System voltages must not exceed socket voltage rating

Input Impedance
10 MΩ minimum

LoopTracker
Variable brightness LEDs indicate input/output loop level and status

Output Ranges

See table on other side	Minimum	Maximum
Voltage (±10 mA max.):	0 to 1 VDC	±10 VDC
Current (20 V compliance):	0 to 2 mA	0 to 20 mA

Consult factory for special ranges

Output Zero and Span
Multiturn potentiometers to compensate for load and lead variations
±15% of span adjustment range typical

Output Linearity
Better than ±0.1% of span

Output Ripple and Noise
Less than 10 mV_{RMS}

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

Common Mode Rejection
100 dB minimum

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

Ambient Temperature Range
–10°C to +60°C operating

Temperature Stability
Better than ±0.02% of span per °C

Power

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

Description and Features

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

The **API 4008 G** will accept any potentiometer with a value of 0 to 100 Ω through 0 to 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 without opening the case, 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.

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 process input and output signals. Monitoring the state of these LEDs can provide a quick visual picture of your process loop 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. The built-in 18 VDC unregulated loop excitation power supply can be used to power passive input devices.

The **API 4008 G** plugs 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.

Models & Options

API 4008 G Field rangeable potentiometer to DC transmitter, 115 VAC

Options—Add to end of model number

A230	Powered by 230 VAC, 50/60 Hz
D	Powered by 9-30 VDC
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

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Potentiometer

ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by qualified personnel only. This module requires an industry-standard 8-pin socket. Order API 008 or finger-safe API 008 FS socket.

Power Input Terminals – The white label on the side of the API module will indicate the power requirements. AC power is connected to terminals 1 and 3.

For DC powered modules, polarity **MUST** be observed. Positive (+) is wired to terminal 1 and negative (–) is wired to terminal 3.

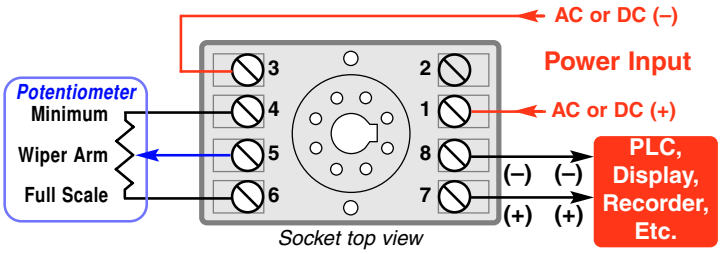
Potentiometer Input – The connections are made to the 8-pin socket. You may wish to check the potentiometer with an ohmmeter before connecting, since device wiring may vary.

The 0 Ohm side of the potentiometer is connected to terminal 4. The potentiometer wiper arm is connected to terminal 5. The full-scale side of the potentiometer is connected to terminal 6.

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 current outputs the module provides power to the output loop.

Potentiometer



API 4008 G typical output wiring

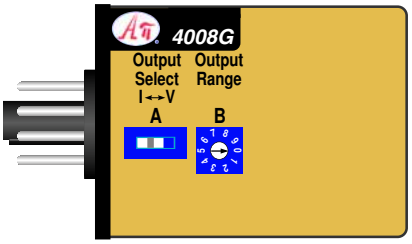
RANGE SELECTION

One slide switch and one rotary switch located on the side of the module are used to select the output range. Popular ranges are listed on the module label and below. See www.api-usa.com or contact factory for special ranges.

API 4008 G OUTPUT SWITCHES			
Slide Switch A to **V**		Slide Switch A to **I**	
Voltage Output	Switch **B**	Current Output	Switch **B**
0-1 VDC	**0**	0-2 mA	**0**
0-2 VDC	**8**	0-4 mA	**8**
0-4 VDC	**1**	0-8 mA	**1**
0-5 VDC	**9**	0-10 mA	**9**
0-8 VDC	**2**	0-16 mA	**2**
0-10 VDC	**3**	0-20 mA	**3**
1-5 VDC	**6**	2-10 mA	**6**
2-10 VDC	**7**	4-20 mA	**7**
±5 VDC	**4**		
±10 VDC	**5**		

1. Set the **OUTPUT SELECT** slide switch **A** to current (**I**) or voltage (**V**) depending on output type.
2. From the table, find the rotary switch setting that matches your output range.
3. Set rotary switch **B** to the value found in the table.
4. The Zero, Span and Test Range potentiometers can now be adjusted for the desired output range.

Depending on the rotary switch settings, the input is filtered, either amplified or attenuated as required, then passed through an optical isolation circuit to the output stage.



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

CALIBRATION

The API 4008 G comes from the factory calibrated to your specifications. Field calibration of the output is typically not required, however, Zero and Span potentiometers are available to fine-tune the module output to compensate for applications where, for mechanical reasons, the potentiometer cannot be set exactly to 0 Ω and/or 100% of travel. Input ranges that use only a part of the potentiometer range may require factory modification. Consult the factory for assistance with your specific application.

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 an input to the module equal to the minimum input required for the application.
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. Example: for a 4-20 mA output signal, the Zero control will allow adjustment of the 4 mA or low end of the signal.
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.

TEST BUTTON & TEST RANGE

The Test pushbutton may be set to provide the desired 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.

Example: If you are isolating a 4-20 mA current loop, when the pushbutton is held depressed, the output from the module will be a constant signal between 4 and 20 mA depending on the setting of the Test Range adjustment pot.

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.

Output voltage/current switch **A** and output range rotary switch **B** determine the exact DC voltage or current output available.

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, this may indicate a problem with module power or signal input wiring.

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.

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