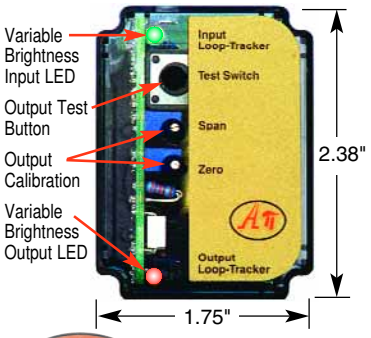
RTD to DC Transmitters

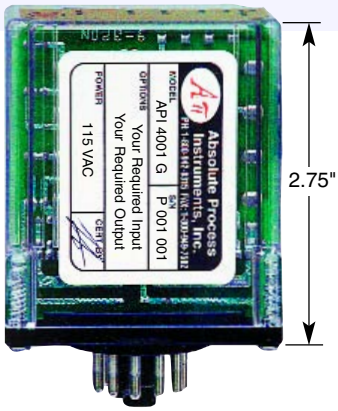
API 4001 G
API 4001 G L

Input: ***Most 10 Ω to 2000 Ω RTDs***
Output: ***0-1 V to ±10 VDC or 0-1 mA to 4-20 mA***

API 4001 G L: ***Isolated & Linearized***
API 4001 G: ***Non-Isolated***

- ***Automatic Leadwire Compensation***
- ***Input and Output LoopTracker® LEDs***
- ***Functional Test Pushbutton***









Applications

- **Convert and Transmit RTD Signals**
- **Interface Standard & Special RTDs to PLCs**
- **Rescale Temperature Ranges to Full 4-20 mA**

Specifications

RTD Input Type

Factory Configured—Please specify input parameters

RTD type: 10 Ω to 2000 Ω RTD, consult factory for special inputs
100 Ω DIN 0.00385 (“385”)
100 Ω American 0.003916 (“3916”)
10 Ω Cu
1000 Ω Ni-Fe
120 Ω Ni

RTD curve: 385 DIN, 3916 American, etc.

Temperature span: In °F or °C, 100°F (55°C) is the recommended minimum span, consult factory if a smaller span is required

RTD Excitation Current

10 Ω	10 mA
100 Ω	5 mA
1000 Ω	0.5 mA
2000 Ω	0.2 mA

RTD Linearization

API 4001 G Non-linearized
API 4001 G L Linearized to better than ±0.1% of span

Leadwire Compensation

Less than ±0.05% of span per 1 Ω change in leadwire resistance

LoopTracker

Variable brightness LEDs indicate input/output loop level and status

Output Range

Factory Configured—Please specify output range

	Minimum	Maximum	Load Factor
Voltage:	0-1 VDC	0-10 VDC	
Bipolar Voltage:	±1 VDC	±10 VDC	
Current (20 V compliance):	0-2 mADC	0-20 mADC	1000 Ω at 20 mA

Consult factory for special ranges

Output Linearity

Better than ±0.1% of span

Functional Test Button

Sets output to test level when pressed
Test level factory set to approximately 50% of span

Response Time

70 milliseconds typical

Isolation

API 4001 G Isolated power supply, non-isolated input to output
API 4001 G L 2000 V_{RMS} minimum, full isolation; power to input, power to output, input to output

Ambient Temperature Range

–10°C to +60°C operating ambient

Temperature Stability

Better than ±0.04% of span per °C stability

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

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Description and Features

The **API 4001 G** and **API 4001 G L** accept an RTD input and provide a DC voltage or current output. The module power supply in both models is isolated from the input and output. The **API 4001 G** is not isolated from the RTD input to the output, nor is it linearized. It is used primarily to convert the RTD signal over narrow temperature spans where linearization and signal isolation is not an issue.

The **API 4001 G L** is isolated and linearized and provides a DC voltage or current output that is optically isolated from input to output. It is linear to the process temperature for applications requiring ground loop elimination, common mode signal rejection or noise pickup reduction.

Both models require factory configuration to a specific RTD type, temperature span (°C or °F), and corresponding DC voltage or current output. Automatic leadwire compensation is standard. Configurations for most RTD types are available. Minimum and maximum temperature spans are dependent upon the RTD type. Consult the factory to confirm your specific range requirements.

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 is fixed at 50% of output span. Both the LoopTracker LEDs and functional test pushbutton greatly aid in saving time during initial startup and/or troubleshooting.

The **API 4001 G** and **API 4001 G L** 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.

Models & Options

Factory Configured—Please specify RTD type, temperature range, output range, and options

API 4001 G RTD transmitter, non-isolated, 115 VAC powered
API 4001 G L RTD transmitter, isolated, 115 VAC powered

Options—Add to end of model number

A230 Powered by 230 VAC, 50/60 Hz
D Powered by 9-30 VDC
EXTSUP Open collector output when a “sinking” output is required
M01 API 4001 G L only; Input/output reversal, such as 20-4 mA out instead of 4-20 mA
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

MOD-TRONIC INSTRUMENTS LIMITED
1 Delta Park Blvd #12
Brampton, ON L6T 5G1
905-457-6322 or 800-794-5883
www.mod-tronic.com

Temperature

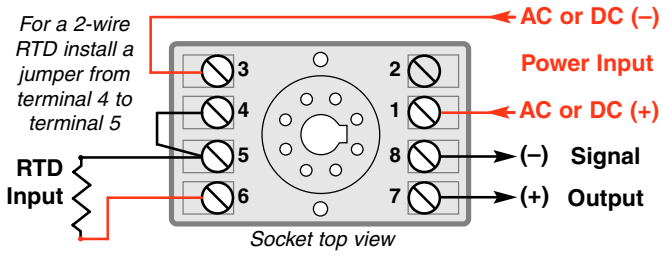
ELECTRICAL CONNECTIONS

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.

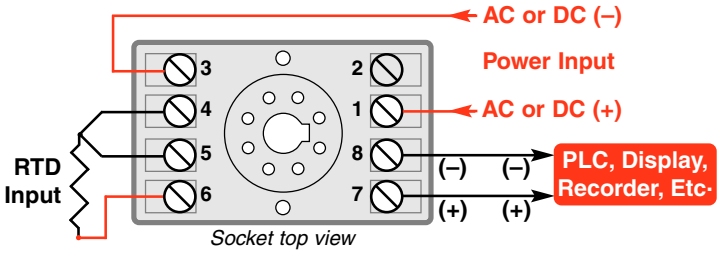
Power Input Terminals – The white label on the side of the API module will indicate the power requirements. AC power is connected to terminals 1 and 3. For DC powered modules, polarity **MUST** be observed. Positive (+) is wired to terminal 1 and negative (–) is wired to terminal 3.

RTD Input – The connections are made to the 8-pin socket. You may wish to check the RTD sensor with an ohmmeter before connecting since RTD wire color coding varies. The red (or black) wire is connected to terminal 6 and the other two wires with the same color are connected to terminals 4 and 5. When using a 2-wire RTD install a jumper from terminal 4 to terminal 5.

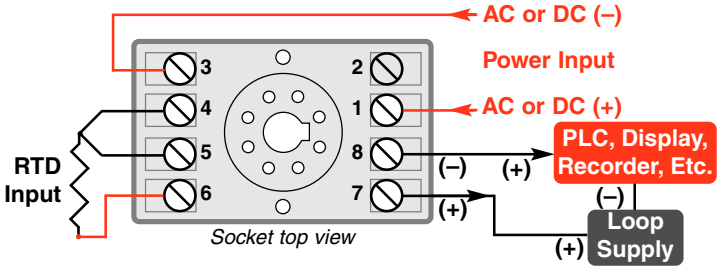
Signal Output Terminals – Polarity must be observed when connecting the signal output to the load. The positive connection (+) is connected to terminal 7 and the negative (–) is connected to terminal 8. Note that with current outputs the module provides power to the output loop unless option **EXTSUP** was ordered for a sinking output requirement.



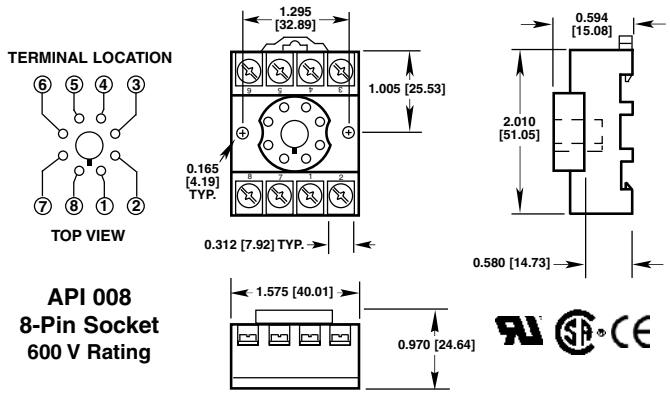
API 4001 G and API 4001 G L typical wiring with 2 wire RTD



API 4001 G and API 4001 G L typical output wiring



API 4001 G EXTSUP and API 4001 G L EXTSUP typical output wiring



API 008
8-Pin Socket
600 V Rating

CALIBRATION

The API 4001 G and API 4001 G L are factory configured to your exact input and output requirements.

Input and output ranges are listed on module labels. Input changes require factory modification. Field calibration of the input is NOT recommended and may void the warranty. Top-mounted, Zero and Span potentiometers can be used should fine-tuning of the output be necessary.

1. Apply power to the module and allow a minimum 20 minute warm up time.
2. Using an accurate temperature simulator, provide an input to the module equal to the minimum input required for the application.
3. Connect an accurate measurement device to 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 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 at maximum, and 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 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

The Test pushbutton provides approximately 50% 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. When released, the output will return to normal.

Example: If you are checking a 4-20 mA current loop, when the pushbutton is held depressed, the output from the module will be approximately 12 mA.

OPERATION

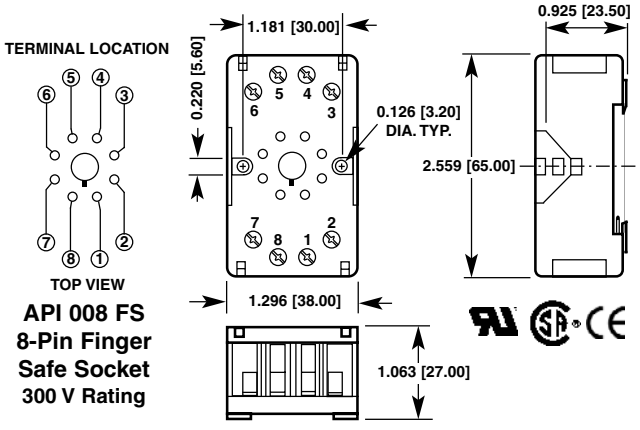
The input circuitry in both models provides a constant-current excitation source to the RTD and automatically cancels leadwire effects.

In the API 4001 G, the input from the RTD is amplified, then passed directly to the output stage and scaled to the desired output range.

In the API 4001 G L, the amplified RTD signal first passes through an optical isolator, then is passed to the output stage where it is corrected for the inherent non-linearity of the specified RTD type and scaled to the desired output range.

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.

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 008 FS
8-Pin Finger Safe Socket
300 V Rating

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