AC to DC Transmitters, Isolated

### Input
- 0-50 mVAC to 0-300 VAC, 0-1 mAAC to 0-5 AAC

### Output
- 0-1 V to 0-10 VDC, ±5 VDC, ±10 VDC, 0-1 mA to 0-20 mAADC, 4-20 mAADC

- Precision Internal AC/DC Converter
- Input and Output LoopTracker LEDs
- Full 2000 V Input/Output/Power Isolation
- Functional Test Button

### Applications
- Convert an AC Signal to a DC Process Signal
- Monitor Voltage Ranges
- Convert, Amplify Low Level AC Signals

### AC Input Range
- Factory configured, please specify input range
- Consult factory for special ranges
- 9-30 VDC Input
- Convert, Amplify Low Level AC Signals
- 230 VAC Output
- 85-265 VAC or 60-300 VDC
- Full 2000 V Input/Output/Power Isolation
- Functional Test Button

### DC Output Range
- Factory configured, please specify output range
- Voltage: 0-1 VDC to 0-10 VDC
- Bipolar voltage: ±1 VDC to ±10 VDC
- Current: 0-2 mAADC to 0-20 mAADC
- 20 V compliance, 1000 Ω at 20 mA

### System Description
- The API 6010 G accepts an AC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input. Typical applications include monitoring line, power supply, shunt, and motor voltages or current (either directly or with a current transducer) for control, preventive maintenance, etc.

### Functional Test
- The full 3-way (input, output, power) isolation makes this module useful for ground loop elimination or noise pickup reduction. The API 6010 G is factory configured to customer requirements. Consult the factory for assistance with special ranges.

### LoopTracker
- Variable brightness LEDs indicate I/O loop level and status

### Input Impedance (Voltage Input)
- 1.0 Vrms maximum

### Input Frequency
- 40 Hz to 1000 Hz sinusoidal

### Input Protection, Common Mode
- 750 VDC or 750 VACp

### I/O Setup
- Standard: 115 VAC ±10%, 50/60 Hz, 2.5 W max.
- UL 508C pollution degree 2 environments or better
- Socket mounts to 35 mm DIN rail or can be surface mounted
- 6010 G 5A: Includes API 008 socket with shunt resistor
- 6010 G: Use API 008 or API 008 FS socket
- IP 40, requires installation in panel or enclosure

### Output Loop Power Supply
- ±15% of adjustment range typical
- Multi-turn zero and span potentiometers
- ±15% of adjustment range typical

### Output Calibration
- System voltages must not exceed socket voltage rating

### Output Zero
- Factory set to approximately 50% of span
- Button sets output to test level when pressed

### Output Span
- Less than 10 mV

### 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
- 150 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
- 6010 G: Use API 008 or API 008 FS socket
- 6010 G 5A: Includes API 008 socket with shunt resistor
- Socket mounts to 35 mm DIN rail or can be surface mounted
- Conformal coating for moisture resistance

### 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: 85-265 VAC 50/60 Hz, 60-300 VDC 2.5 W typ.
- D option: 9-30 VDC, 2.5 W typical

### Options—add to end of model number
- EXTSUP: Open collector output when a “sinking” output is required for an external loop supply
- R: Input/output reversal
- U: Conformal coating for moisture resistance

### Accessories—order as separate line item for API 6010 G
- 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

### Model
- API 6010 G
- API 6010 G A230
- API 6010 G P
- API 6010 G D
- API 6010 G 5A
- API 6010 G A230 5A
- API 6010 G P 5A
- API 6010 G D 5A

### Input
- Factory configured, specify mVAC, VAC, or mAAC input range

### Output
- Factory configured, specify VDC or mAADC output range
- 85-265 VAC or 60-300 VDC

### Power
- 115 VAC
- 230 VAC
- 9-30 VDC
- 115 VAC
- 230 VAC
- 9-30 VDC

### Quick Link
api-usa.com/6010

### API 6010 G 5A
Includes Socket & Shunt

### Lifetime Warranty
Made in USA

### UL
115 VAC, 230 VAC models with input up to 150 VAC without 5A option

### Free Factory I/O Setup!

### Hot Swappable Plug-In Design

### API 6010 G

### API 6010 G 5A

### API CLP1

### api-usa.com © 06-19
Installation and Setup

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 descriptions des bornes et des exemplaires 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

Electrical Connections

Polarity must be observed for output wiring connections. If the output does not function, check wiring and polarity. Each product is factory configured to your exact input and output ranges as indicated on the serial number label.

**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.

**Signal Input**

For safety, input must be off while connecting wiring. The AC signal input is connected to terminals 5 and 6. Input voltages must not exceed socket voltage rating.

The API 6010 G 5A includes a 5 Amp shunt. The module input is set to measure the mV AC drop across the shunt.

**Signal Output**

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.

The module provides 20 VDC to the output loop (sourcing) when current output is ordered. A module with the EXSUP option will have an unpowered (sinking) current output.

**Module Power**

Check model serial number label for module operating voltage. Module Power (sinking) current output.

The module provides 20 VDC power to the output loop (sourcing) and the negative (–) is connected to terminal 8. Polarity must be observed when connecting the signal output to the module input.

AC power is connected to terminals 1 and 3. Check model/serial number label for module operating voltage.

The API 6010 G 5A includes a 5 Amp shunt. The module input must not exceed socket voltage rating.

**Polarity**

Polarity must be observed when connecting the signal output to the module input. If the input signal is at its minimum, this will produce the corresponding minimum output signal. For example: 4 mA for a ±20 mA output or –10 V for a ±10V output.

Set the input at maximum, and adjust the Span pot for the exact maximum output desired. The Span pot should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal.

5. Repeat adjustments for maximum accuracy.

**Functional Test Button**

The functional test button provides a 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 is factory set to 50% of output. When the button is released, the output will return to normal.

**Operation**

The input is either amplified or attenuated, then filtered and processed by a precision full-wave rectification circuit. The result is passed thru a low pass active filter that provides a DC voltage representing the average value of the input. This DC voltage is passed through an optical isolation circuit 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 signal 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.

**Terminations**

<table>
<thead>
<tr>
<th>Terminal Location</th>
<th>1.180 [30.00]</th>
<th>0.220 [5.60]</th>
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</thead>
<tbody>
<tr>
<td>Top View</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacts: Nickel plated brass, 10 Amps max. Screw: M3, zinc plated steel Wiring: #14 AWG solid or stranded</td>
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<td></td>
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<tr>
<td>1.360 [34.00]</td>
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<tr>
<td>API 008 FS 8-Pin Finger Safe Socket, 300 V Rating</td>
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<tr>
<th>Terminal Location</th>
<th>0.163 [4.11]</th>
<th>2.959 [75.00]</th>
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<tr>
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<tr>
<td>API 008 8-Pin Socket, 600 V Rating</td>
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**Specifications**

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<th>0.163 [4.11]</th>
<th>1.295 [32.89]</th>
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<tr>
<td>Top View</td>
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<tr>
<td>External Power Source</td>
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**Calibration**

The Zero and Span potentiometers can be used fine-tune the output range.

1. Power 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 ±20 mA output or –10 V for a ±10V output.

4. Set the input at maximum, and adjust the Span pot for the exact maximum output desired. The Span pot should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal.

**PLC, Display, Recorder w. mA Input**

<table>
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<td>Contacts: Nickel plated brass, 10 Amps max. Screw: M3, zinc plated steel Wiring: #14 AWG solid or stranded, or 1/4&quot; spade lug</td>
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<tr>
<td>1.180 [30.00]</td>
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</tr>
<tr>
<td>API 008 8-Pin Socket with Shunt, 600 V Rating</td>
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**G. 5A** 8-Pin Socket with Shunt, 600 V Rating

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**API 008 FS 8-Pin Socket with Shunt, 300 V Rating**

1220 American Way Libertyville, IL 60048
Phone: 800-942-0315 Fax: 800-949-7502
api-usa.com