

High Current AC to DC Isolator Transmitters

API 6010 G 5A
API 6010 G 20A



Input: 0-0.9 AAC to 0-5 AAC, 0-5 AAC to 0-20 AAC
Output: 0-1 V to ± 10 VDC or 0-1 mA to 4-20 mA

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

Applications

- Convert AC Signals to DC Process Signal
- Monitor For Abnormal Voltage Drops
- Detect Overloads, Monitor AC Tach Signals

Specifications

Input Ranges

Factory Configured—Please specify input range
See API 6010 G data sheet for lower current inputs
Consult factory for special ranges

	Minimum	Maximum
API 6010 G 5A	0-900 mAAC	0-5 AAC
API 6010 G 20A	0-5 AAC	0-20 AAC

System voltages must not exceed socket voltage rating

Input Impedance

0.1 Ω minimum external shunt

Input Voltage Burden (Current)

1.0 V_{RMS} maximum

Input Protection, Common Mode

750 VDC or 750 VAC_p

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):	0-1 mADC	0-20 mADC	1000 Ω at 20 mA

Consult factory for special ranges

Output Zero and Span

Multiturn potentiometers to compensate for load and lead variations
 $\pm 15\%$ of span adjustment range typical

Output Linearity, Ripple, and Noise

Better than $\pm 0.1\%$ of span linearity
Less than 10 mV_{RMS} ripple and noise

Functional Test Button

Sets output to test level when pressed.
Factory set to approximately 50% of span

Response Time

150 milliseconds typical

Isolation

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

Ambient Temperature Range

-10°C to $+60^{\circ}\text{C}$ operating

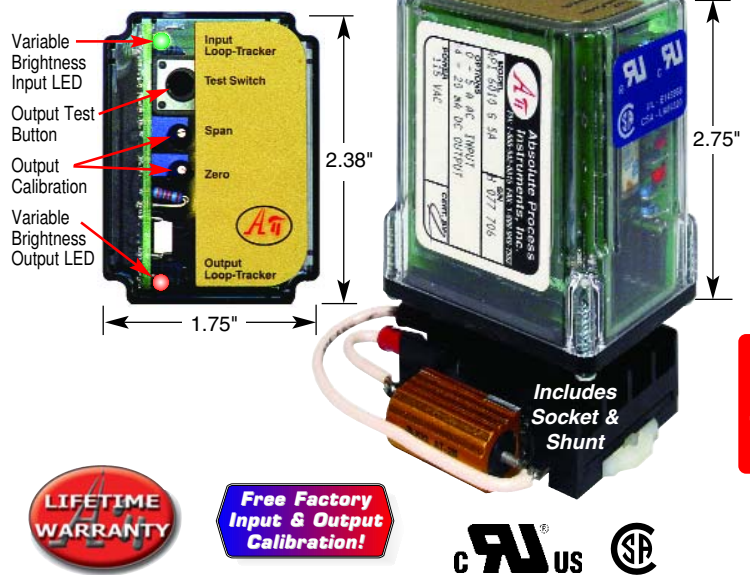
Temperature Stability

Better than $\pm 0.02\%$ of span per $^{\circ}\text{C}$

Power

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

Includes Socket & Shunt
Full Isolation



Description and Features

The API 6010 G 5A and API 6010 G 20A accept 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 voltage or current (either directly or with a CT) for speed control, preventive maintenance, load shedding, etc.

The full 3-way (input, output, power) isolation makes this module useful for ground loop elimination or noise pickup reduction. Models are factory configured to customer requirements. Consult the factory for special ranges.

The API 6010 G 5A and API 6010 G 20A include an API 008-5A or API 008-20A socket/current shunt assembly and can be factory configured for virtually any AC current input range from 0-900 mAAC to 0-20 AAC. The socket/current shunt assemblies allow either DIN rail or panel mounting.

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.

Models & Options

Factory Configured—Please specify input/output ranges and options

API 6010 G 5A 5 AAC to DC transmitter, isolated, 115 VAC

API 6010 G 20A 20 AAC to DC transmitter, isolated, 115 VAC

Options—Add to end of model number

A230	Powered by 230 VAC, 50/60 Hz
D	Powered by 9-30 VDC
HC	High current output, >20 mA to 50 mADC
EXTSUP	Open collector output when a "sinking" output is required
U	Conformal coating for moisture resistance

Accessories—Order as separate line item

API TK36	DIN rail, 35 mm W x 39" L, aluminum
CT	See Current Sensor data sheets for current transformers

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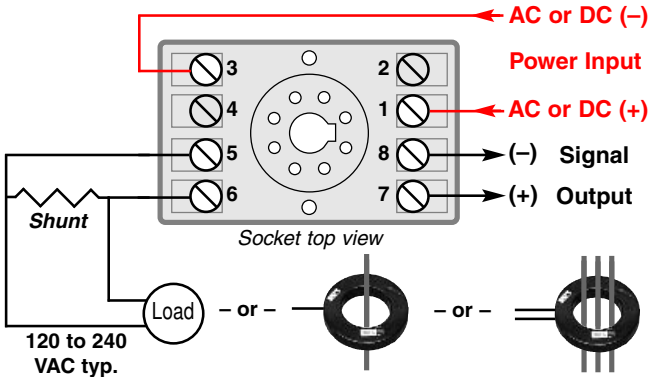


ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by qualified personnel only. This module includes and 8-pin socket and shunt. Input voltages must not exceed socket voltage rating.

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.

AC Input

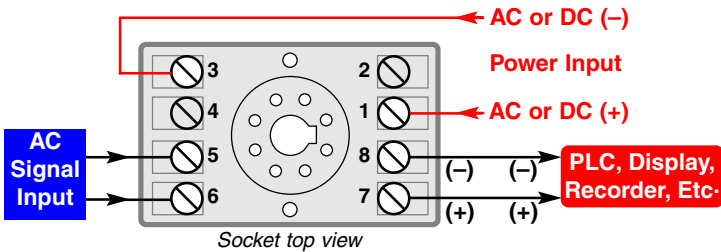


Typical wiring using a direct voltage or current transformer input
Order 2RL, 5RL, 7RL, 8RL series current transformers separately

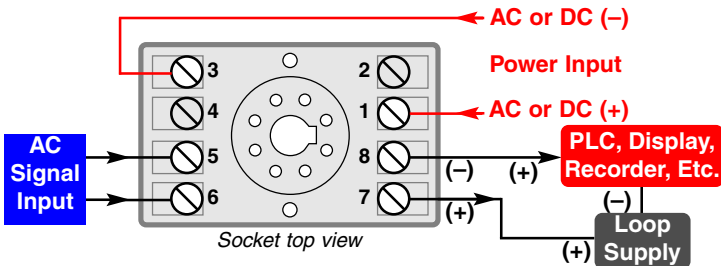
Signal Input – The AC signal input is applied to terminal 5 and terminal 6. These modules are factory configured for the input range listed on the module label. Input voltages must not exceed socket voltage rating.

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. The module provides power to the output current loop.

When a current output is ordered, it provides power to the output current loop (sourcing). If an unpowered (sinking) current output is required, order the API 6010 G EXTSUP with open collector output.



API 6010 G 5A and 20A typical output wiring



Typical output wiring with EXTSUP option

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 should fine-tuning be necessary. Custom ranges may require factory modification.

1. Apply power to 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.
4. Set the input at maximum, and 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.
5. Repeat adjustments for maximum accuracy.

TEST SWITCH

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.

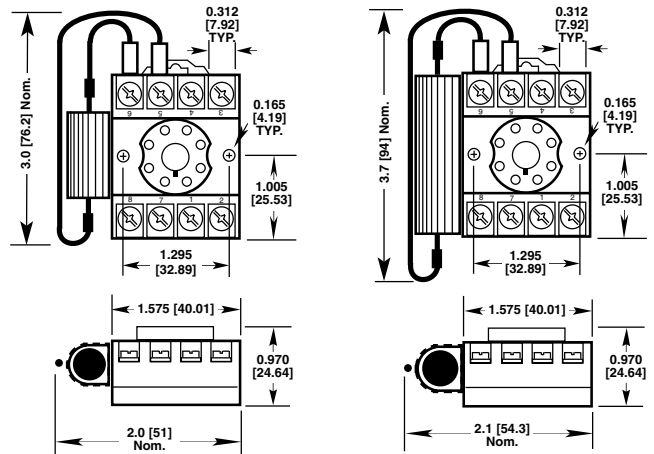
Turn the multi-turn Test Range potentiometer while holding the Test Switch depressed until the desired output test level is reached.

OPERATION

Depending upon the configuration required, the input is either amplified or attenuated, then filtered and processed by a precision full-wave rectification circuit. The resulting signal is passed thru a low pass active filter that provides a DC voltage representing the average value of the input. The module is calibrated assuming a sinusoidal input. This DC voltage is passed through an optical isolation circuit to the output stage where it is converted to the DC voltage or current required in the application.

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.



API 008-5A
8-Pin Socket/Shunt
600 V Rating

API 008-20A
8-Pin Socket/Shunt
600 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.



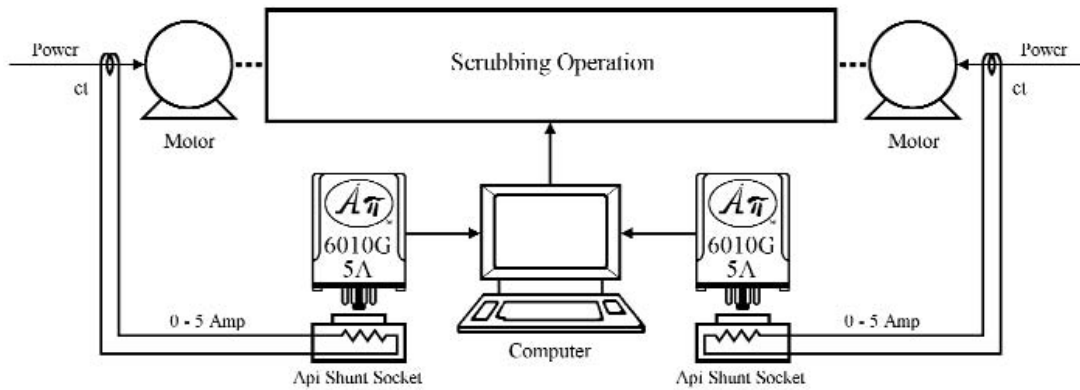
Monitoring the Speed of Scrubbers

PROBLEM

Material is fed to a pair of scrubbers rotating at 3600 RPM. If the speed of the scrubbers decreases due to overloading, the material is not adequately cleaned.

SOLUTION

As loading on a motor increases its speed will decrease and its electrical current draw will increase. The amount of current drawn by the motor can be monitored and used as an indication of motor speed.



Current transformers are installed on the electrical lines supplying the motors. Each current transformer is connected to an **API 6010 G 5A** isolated AC to DC Transmitter, which consists of a socket with a built-in shunt, and a plug-in module. This arrangement prevents damage to the current transformer if the plug-in module is removed from the socket without powering down the scrubbers. The DC output from each **API 6010 G 5A** is connected to a computer and can be used for monitoring scrubber speed or for controlling the feed rate of material to the scrubbers for most efficient operation. The 2000 VRMS optical isolation protects against unwanted ground loops and electrical interference.

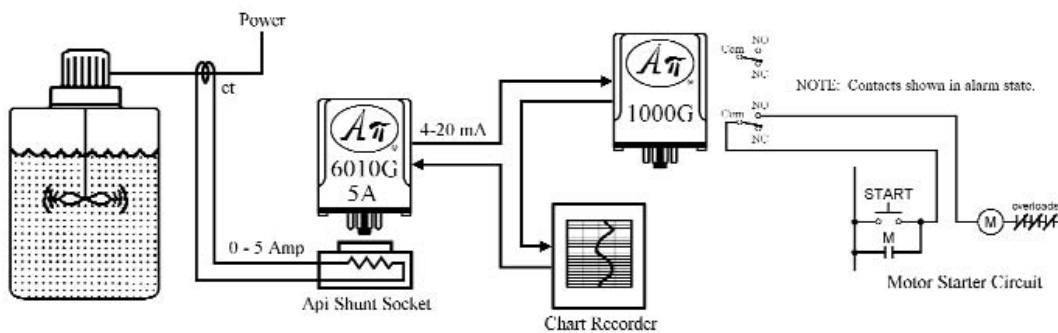
Motor Current Monitor and Overcurrent Shutdown

PROBLEM

Monitor and record mixer motor current and provide overcurrent shutdown.

SOLUTION

Install a properly sized current transformer in the power line feeding the motor to provide a 0-5 Amp signal for an **API 6010 G 5A** AC to DC Transmitter module. Use the 4-20 mADC output to drive an **API 1000 G** DC Input Single Alarm Trip module and a chart recorder. Use one set of relay contacts of the **API 1000 G** in the motor starter circuit to shut down the motor if the current exceeds the setpoint.



The other set of relay contacts may be wired to an annunciator or an alarm horn if so desired. The dual SPDT contacts are isolated and are rated 7A @ 240VAC resistive, making them capable of driving most loads directly.

FREE APPLICATION ASSISTANCE
Call Customer Service
800-794-5883



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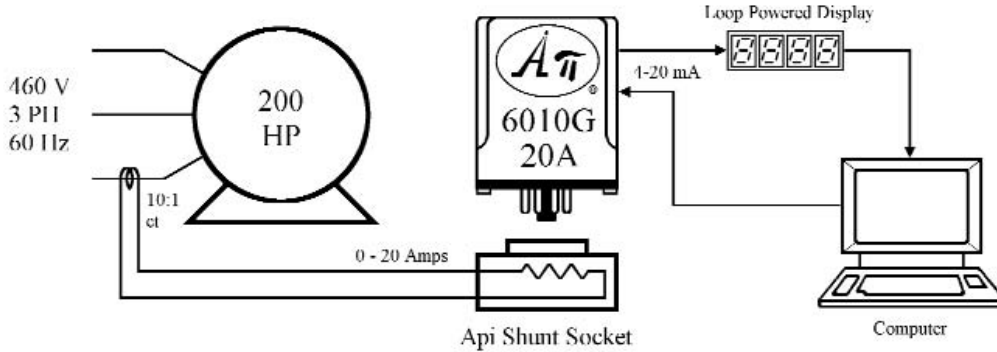
Monitor and Display AC Motor Load

PROBLEM

The load on a motor is to be monitored by a computer and displayed locally as a percent of full load current. The motor is rated 200 horsepower, and operates at 460 volts, 3-phase, with a full load current of 200 amps.

SOLUTION

Install a suitable current transformer (CT) with a 10:1 ratio on one of the legs of the input power to the motor, and connect the CT output to an Api Shunt Socket with an **API 6010 G 20A** AC to DC Transmitter.



Use the 4-20 mA output of the **API 6010 G 20A** to drive a loop powered local display and the computer input. Scale the loop powered display for an indication of 100% at 200 amps motor load. The 2000 VRMS optical isolation protects against unexpected ground loops and electrical interference commonly found in industrial applications.

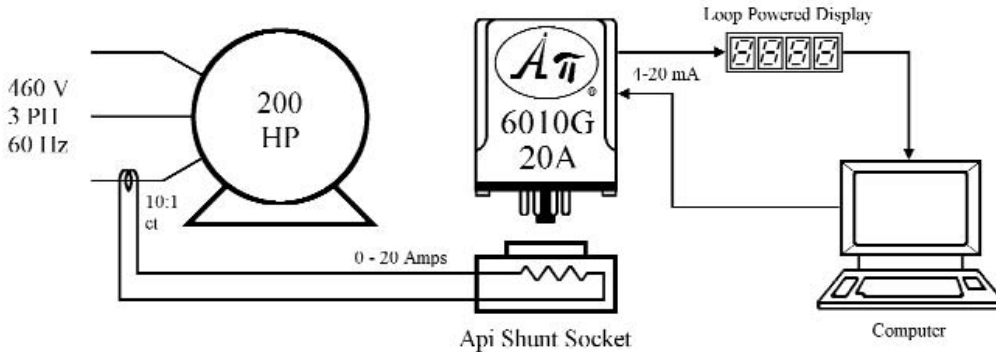
Monitoring Computer and Process Status

PROBLEM

A critical process is monitored by a computer which is powered independently. If power is lost to either the process or the computer, or if the computer locks up, an alarm is to be activated.

SOLUTION

The computer is programmed to produce an output of 100 Hz at its analog output port. This output will not be present when power to the computer is lost or when the program locks up for any reason.



Use the 4-20 mA output of the **API 6010 G 20A** to drive a loop powered local display and the computer input. Scale the loop powered display for an indication of 100% at 200 amps motor load. The 2000 V_{RMS} optical isolation protects against unexpected ground loops and electrical interference commonly found in industrial applications.

AC Current Transformers

1.05" ID x 2.46" OD x 1.05" W

Part #	Ratio
AL-500	50:5
AL-600	60:5
AL-750	75:5
AL-800	80:5
AL-101	100:5
AL-1250	125:5
AL-151	150:5
AL-201	200:5
AL-251	250:5
AL-301	300:5

2.50" ID x 4.58" OD x 1.10" W

Part #	Ratio
7RL-101	100:5
7RL-151	150:5
7RL-201	200:5
7RL-251	250:5
7RL-301	300:5
7RL-401	400:5
7RL-501	500:5
7RL-601	600:5
7RL-751	750:5
7RL-801	800:5
7RL-102	1000:5
7RL-122	1200:5
7RL-152	1500:5
7RL-162	1600:5

1.56" ID x 3.56" OD X 1.10" W

Part #	Ratio
5RL-500	50:5
5RL-750	75:5
5RL-101	100:5
5RL-151	150:5
5RL-201	200:5
5RL-251	250:5
5RL-301	300:5
5RL-401	400:5
5RL-501	500:5
5RL-601	600:5
5RL-751	750:5
5RL-801	800:5
5RL-102	1000:5
5RL-122	1200:5

3.25" ID x 5.73" OD X 1.15" W

Part #	Ratio
8RL-201	200:5
8RL-251	250:5
8RL-301	300:5
8RL-401	400:5
8RL-501	500:5
8RL-601	600:5
8RL-751	750:5
8RL-801	800:5
8RL-102	1000:5
8RL-122	1200:5
8RL-152	1500:5

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AC Input