4-20 mA Input Alarm Trips with Loop Power Supply

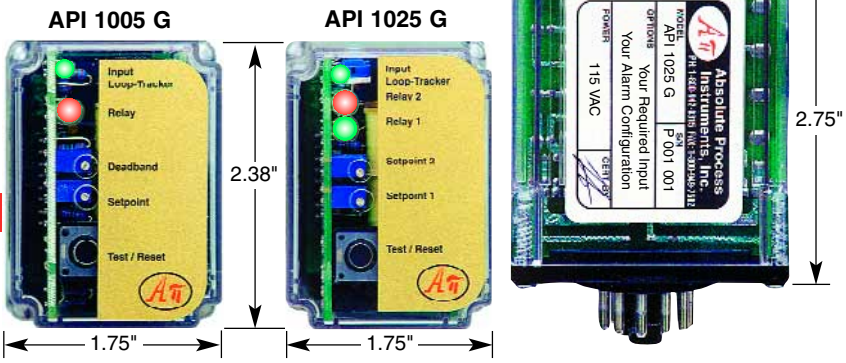
API 1005 G
API 1025 G

DC Input

Input: ***4-20 mA***

Outputs: ***One DPDT Relay or Two SPDT Relays***

- ***Built-In 4-20 mA Loop Power Supply***
- ***Field Adjustable Setpoints***
- ***High Capacity 7 Amp Relay Contacts***
- ***Input LoopTracker® & Alarm Status LEDs***
- ***Alarm Test/Reset Pushbutton***



Applications

- **Process Limit Backup Alarm**
- **Tank Level Alarm**
- **Over, Under, Out-of-Range Alarm**

Specifications

Input
4 to 20 mADC

Input Voltage Burden (Current)
1.25 VDC maximum

Input Protection, Common Mode
750 VDC or 750 VAC_p
System voltages should not exceed socket voltage rating

Input Loop Power Supply
18 VDC nominal, unregulated, 25 mADC
Maximum ripple, less than 1.5 V_{p-p}

LoopTracker®
Variable brightness LED indicates input loop level and status

Relay Output
Factory Configured—See Options for other relay configurations

API 1005 G	One DPDT contact HI alarm, normal action (failsafe), non-latching standard 7 A @ 240 VAC resistive load 3.5 A @ 240 VAC inductive load
API 1025 G	Two SPDT contacts HI/LO, normal action (failsafe), non-latching standard 7 A @ 240 VAC resistive load 3.5 A@ 240 VAC inductive load
CAUTION:	Socket voltage rating may limit system rating. External contact protection such as an RC snubber is recommended for inductive loads.

Alarm Setpoint
12 turn potentiometer, field adjustable from 0 to 100% of span

Deadband

API 1005 G	1.0 to 100% of span, 12 turn potentiometer. Alarm trip and reset window are adjusted symmetrically about the setpoint.
API 1025 G	Fixed at 1% of span, standard
API 1025 GA	1.0 to 100% of span, 1 turn potentiometer

Functional Test/Reset Button
Toggles relay(s) to opposite state when pressed
Resets latching relay with HT option, available on 1005 G only

Response Time
70 milliseconds typical

Ambient Temperature Range and Temperature Stability
–10°C to +60°C operating ambient
Better than ±0.02% of span per °C temperature 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

LIFETIME WARRANTY

Free Factory Input & Output Calibration!

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Description and Features

The **API 1005 G** and **API 1025 G** are factory configured for 4-20 mADC input and provide alarm contact outputs. These modules include an unregulated 18 VDC loop excitation supply that can be used to power an external loop-powered transmitter or other passive input device eliminating the need for an additional DC loop supply. Heavy duty relay contacts allow the module to directly control high capacity loads.

API exclusive features include a ***LoopTracker*** LED which varies in intensity with changes in the process signal, alarm status LEDs for each alarm, and a **Functional Test Pushbutton** to toggle the relays independent of the input.

The **API 1005 G** provides a single setpoint adjustment and DPDT relay contacts. The alarm output can be factory configured for HI or LO operation, non-latching or latching, normal (fail-safe) or reverse (non-fail-safe) acting.

The **API 1025 G** contains two independent setpoints with two SPDT relay contact outputs. The alarm output can be factory configured for HI/HI, HI/LO, LO/HI or LO/LO operation, normal acting (fail-safe) or reverse acting (non-fail-safe).

Models, Options & Accessories

Factory Configured—Please specify input range and options

API 1005 G	DC input, DPDT HI alarm, normal action, non-latching,115 VAC
API 1025 G	DC input, 2 SPDT, HI/LO, normal action, non-latching, 115 VAC

Options—Add to end of model number

A230	Powered by 230 VAC, 50/60 Hz
D	Powered by 9-30 VDC
R	Reverse-acting alarms (non-failsafe)
L	Low trip (on decreasing signal) for 1005 G
HT	Latching alarm with pushbutton reset, API 1005 G only
HP	Latching alarm with power-off reset, API 1005 G only
A	Adjustable deadbands for 1025 G
HH	High/High trip for 1025 G instead of High/Low
LL	Low/Low trip for 1025 G instead of High/Low
U	Conformal coating for moisture resistance

Accessories—Order as a separate line item

API 011	11-pin socket
API 011 FS	11-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
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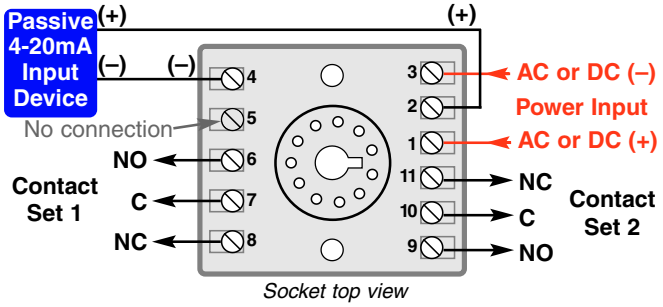
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ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by qualified personnel only. This module requires an industry-standard 11-pin socket. Order API 011 or finger-safe API 011 FS socket separately.

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.

Signal Input – Polarity must be observed when connecting the 4-20 mA signal input. The positive connection (+) is applied to terminal 2 and the negative (–) is applied to terminal 4.



Socket top view

Relay Output Terminals – Terminals 6, 7, 8 and 9, 10, 11 provide the appropriate connections for the desired relay operations. (NO = Normally Open, NC = Normally Closed, C = Common). NOTE: Although the API 1005 G has a pair of relays, these relays will energize and de-energize in unison. The API 1025 G will accommodate independent relay operations.

SETUP

The input range and alarm types are pre-configured at the factory as specified on your order. No input calibration is necessary. Contact factory for custom ranges or modifications.

Setpoint Control – This multi-turn potentiometer (one for each setpoint on the API 1025 G) allows the operator to adjust the level at which the alarm is activated. This control is adjustable from 0 to 100% of the input range.

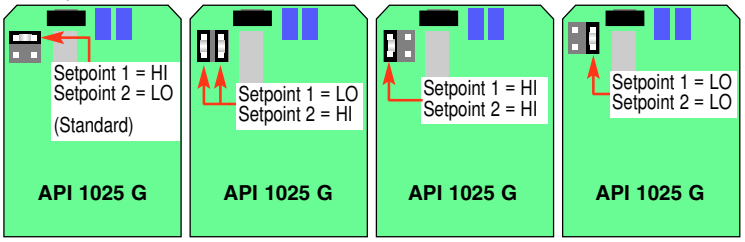
Deadband Control – The API 1005 G deadband potentiometer allows the alarm trip and reset window to be adjusted symmetrically about the setpoint from 1 to 100% of the span.

The deadband is fixed at 1% of span on the API 1025 G. The API 1025 GA with adjustable deadband option allows deadbands to be adjusted symmetrically about each setpoint from 1 to 100% of the span.

Adjustable deadband allows the operator to fine tune the point at which the alarm trips (alarm condition) and resets (non alarm condition). The deadband is typically used to prevent chattering of the relays or false trips when the process signal is unstable or changes rapidly.

API 1025 G Alarm Configuration – The alarm configuration of the API 1025 G is pre-configured at the factory per your order, but if a change is necessary, internal jumpers can be used to modify the alarm type as follows.

1. Unplug the module from the socket.
2. Remove the 4 screws from the module bottom and remove the plastic case.
3. Unplug the circuit board with the test button from the base.
4. Note location of jumper block at top left of circuit board next to test button.
5. Place jumpers as indicated for desired alarm operation. The standard HI/LO setting is with one jumper across the two top pins or with no jumper at all. Never place a jumper across the two bottom pins!
6. Replace board, cover, and screws.



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

TEST SWITCH

The functional test pushbutton toggles the alarm status independent of the input when depressed. It verifies the alarm and system operation and also provides the additional function of unlatching the alarm on the API 1005 GHT with the latching alarm option.

OPERATION

LEDS – 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 to provide a quick visual picture of your process loop at all times. 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. This features greatly aid in saving time during initial start-up or troubleshooting.

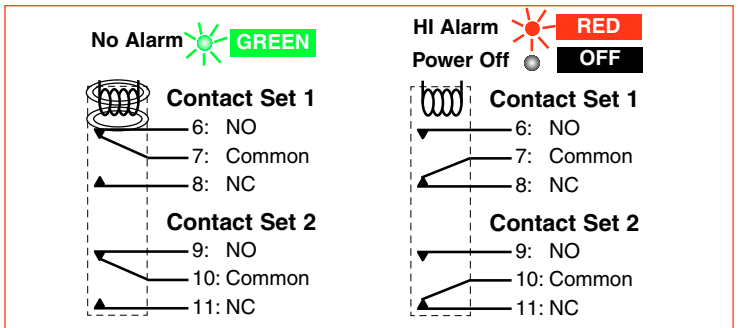
The bi-color alarm LED provides a visual indication of the alarm status. In all configurations, a GREEN LED indicates a non-alarm condition and a RED LED indicates an alarm condition.

Alarm Relays – In the normal mode of operation (failsafe), the relay coil is energized in a non-alarm condition and de-energized in an alarm condition. This will create an alarm condition if the module loses power. For a normal acting, non-latching configuration, the alarm will activate when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then will automatically reset when the alarm condition no longer exists.

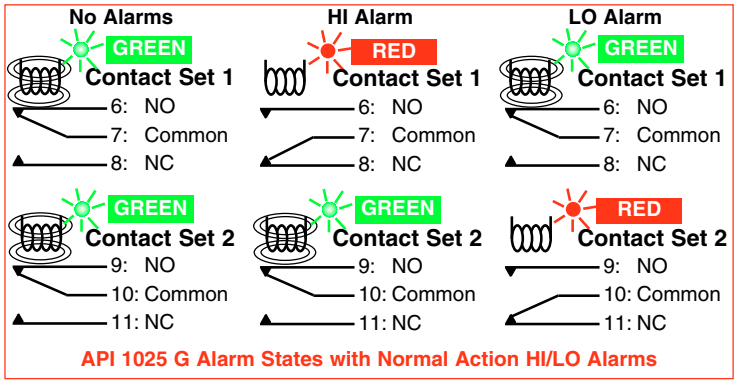
If reverse acting mode is selected (non-failsafe), the relay coil is de-energized in a non-alarm condition and energized in an alarm condition. The alarm will activate when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then will automatically reset when the alarm condition no longer exists.

API 1005 GHT Latching Alarm – For units with the **HT** latching alarm option, the Test Switch is also used to reset the alarm relays. The alarm relay contacts will remain in the alarmed condition until the input signal falls below the high alarm setpoint (or above low alarm setpoint, depending on configuration) and the Test/Reset pushbutton has been pressed or power to the unit has been switched off.

API 1005 GHP Latching Alarm – For units with the **HP** latching alarm option, the alarm relay contacts will remain in the alarmed condition until the input signal falls below the high alarm setpoint (or above low alarm setpoint, depending on configuration) and the power to the unit has been switched off.



API 1005 G Alarm States with Normal Action HI Alarm



API 1025 G Alarm States with Normal Action HI/LO Alarms