

**Input:** Most Thermocouple Types  
**Output:** One 8 Amp DPDT Relay or Two 8 Amp SPDT Relays

- Automatic Cold Junction Compensation
- Field Adjustable Setpoints
- Plug-In Design for Fast Installation
- Input LoopTracker® and Alarm Status LEDs
- Alarm Test, Optional Reset Button

### Applications

- Process Limit Backup Alarm
- Temperature Alarm
- Over, Under, Out-of-Range Alarm

### Thermocouple Input

Factory configured, please specify thermocouple type and temperature range in °F or °C

Thermocouple J, K, T, E, R, S, and others  
 Most thermocouple types available

Note: 100°F (55°C) is the recommended minimum span  
 Consult factory if a smaller span is required

### Cold Junction Compensation

Automatic for specified thermocouple

### T/C Burnout Protection

Upscale burnout protection standard  
**B** option: downscale burnout protection

### T/C Current

Less than 1.0 µA, including burnout sense

### LoopTracker

Variable brightness LED indicates input level and status

### API 1200 G Relay Output

Two SPDT form C contact sets operating in unison as one DPDT contact set

One setpoint, 12 turn potentiometer, 0-100% of span

Factory configured alarm type

Standard: HI alarm, non-latching, normal acting

Options: LO alarm, latching, reverse acting

### API 1220 G Relay Output

Two independent SPDT form C contact sets

Two setpoints, two 12 turn potentiometers, 0-100% of span  
 Factory configured alarm action

Internal jumpers for HI/LO, LO/LO, HI/Hi, LO/Hi

Standard: HI/LO alarm, non-latching, normal acting

Options: LO/LO, HI/Hi, LO/Hi alarms, latching, reverse acting

### Relay Contact Rating

8 A @ 240 VAC resistive load or 30 VDC resistive load

5 A @ 240 VAC inductive load (cos φ = 0.4)

3.5 A @ 30 VDC inductive load (L/R = 7ms)

Caution: Do not exceed socket voltage rating

Use an RC snubber for inductive loads

### Deadband

Alarm trip and reset window are symmetrical about the setpoint

**API 1200 G** 1.0 to 100% of span, 12 turn potentiometer.

**API 1220 G** Fixed at 1% of span, standard

**API 1220 G A** Adjustable deadbands, 1.0 to 100% of span,  
 1 turn potentiometer for each setpoint

### Response Time

70 milliseconds typical

### Output Test/Reset Button

Toggles relay(s) to opposite state when pressed

Resets latching relay with **HT** option, available on 1200 G only

### Ambient Temperature Range and Stability

-10°C to +60°C operating ambient

Better than 0.02% of span per °C stability

### Housing and Sockets

IP 40, requires installation in panel or enclosure

API 011 or API 011 FS socket

Socket mounts to 35 mm DIN rail or can be surface mounted

### Power

Standard: 115 VAC ±10%, 50/60 Hz, 2.5 W max.

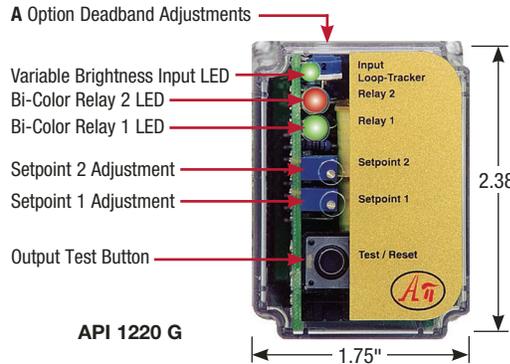
P option: 60-265 VAC 50/60 Hz, 85-300 VDC, 2.5 W typ.

A230 option: 230 VAC ±10%, 50/60 Hz, 2.5 W max.

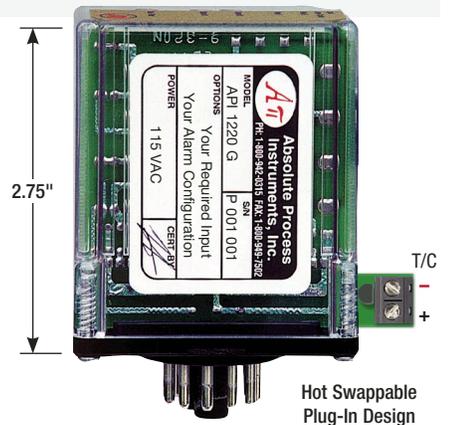
D option: 9-30 VDC, 2.5 W typical



API 1200 G



API 1220 G



Hot Swappable Plug-In Design



Quick Link  
[api-usa.com/1200](http://api-usa.com/1200)

Free Factory I/O Setup!

### Description

The API 1200 G and API 1220 G are factory configured for a thermocouple input and provide alarm contact outputs. Heavy duty relay contacts allow the module to directly control high capacity loads.

The API 1200 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 or reverse acting. Top-accessible potentiometers are used to adjust the alarm setpoint and deadband.

The API 1220 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 or reverse acting. Top-accessible potentiometers are used to adjust each alarm setpoint. Deadband is fixed at 1% of span. Adjustable deadbands are optional.

### LoopTracker and Alarm Status LEDs

API exclusive features include a LoopTracker LED that varies in intensity with changes in the thermocouple input signal.

A red/green bi-color alarm status LED (two on the API 1220 G) visually indicate alarm status. These LEDs provide a quick visual picture of your process at all times.

### Output Test/Unlatch

API's exclusive functional test button can be used to verify the alarm and system operation. The output test button greatly aids in saving time during initial startup and/or troubleshooting.

The HT latching option provides the additional function of unlatching the alarm when the reset button is pressed. The alarm will reset if the alarm condition not longer exists.

Model	Input	Standard Alarm Configuration	Power
API 1200 G	Factory ranged, specify thermocouple type temperature range °F or °C	Single setpoint one DPDT relay HI alarm, non-latching, normal acting	115 VAC
API 1200 G A230			230 VAC
API 1200 G P			60-265 VAC or 85-300 VDC
API 1200 G D			9-30 VDC
API 1220 G	Factory ranged, specify thermocouple type temperature range °F or °C	2 setpoints, 2 SPDT relays HI/LO alarms, non-latching, normal acting	115 VAC
API 1220 G A230			230 VAC
API 1220 G P			60-265 VAC or 85-300 VDC
API 1220 G D			9-30 VDC

### Options—add to end of model number

**L** 1200 G with LO trip. Alarm trips on decreasing signal.

**HT** 1200 G latching alarm with push button reset

**HP** 1200 G latching alarm with power-off reset. Module power must be turned off to reset alarms

**HH** 1220 G with HI/Hi trip. Alarms trip at their respective trip points on increasing signal.

**LL** 1220 G with LO/LO trip. Alarms trip at their respective trip points on decreasing signal.

**A** 1220 G with adjustable deadbands

**B** Downscale burnout protection

**R** Reverse-acting alarms. Relay coils energized in an alarm condition. No alarm condition with module power off.

**U** Conformal coating for moisture resistance

### Accessories—order as a separate line item

**API 011** 11-pin socket, DIN rail or surface mount

**API 011 FS** 11-pin finger safe socket, DIN rail or surface mount

**API CLP1** Module hold-down spring for high vibration or mobile applications



API 011 FS  
 300 V Rating



API 011  
 300 V Rating



API CLP1

## Electrical Connections

**WARNING!** All wiring must be performed by a qualified electrician or instrumentation engineer. See diagram below for terminal designations and wiring examples. Consult factory for assistance.

Avoid shock hazards! Turn power off to signal input, relay wiring, and module power before connecting or disconnecting wiring.

## Mounting

This module requires an industry-standard 11-pin socket. Order API 011 or finger-safe API 011 FS socket separately. The socket mounts to a standard 35 mm DIN rail or flat surface.

When plugging the module into the socket, orient the module key with the keyway in the socket. The module is IP40 rated and requires a protective panel or enclosure.

## Input Terminals

The input is factory configured. See the model/serial number label for input type, range, and options.

The thermocouple connection is made to the block on the side of the module. Polarity must be observed. ANSI/ASTM thermocouples use red for negative. IEC thermocouples use white for negative. Other countries may use other color coding.

## Relay Output Terminals

See wiring diagram for connections. The module does not provide power to the relay contacts.

Inductive loads (motors, solenoids, contactors, etc.) will greatly shorten relay contact life unless an appropriate RC snubber is installed.

## Module Power Terminals

Check model/serial number label for module operating voltage to make sure it matches available power.

When using DC power, polarity must be observed. The positive (+) must be wired to terminal 1 and negative (-) must be wired to terminal 3.

## Input

The input is factory calibrated and does not require adjustment. Check thermocouple response to confirm correct polarity.

## Setpoint

This multi-turn potentiometer (one for each setpoint on the API 1220 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

The API 1200 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 1220 G. The API 1220 G A with adjustable deadband option allows deadbands to be adjusted symmetrically about each setpoint from 1 to 100% of the span.

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

## Adjustments

To calibrate the alarm section, set the deadband control to the minimum (counterclockwise). The deadband will be 1.0% of input span in this case.

Set the signal source to a reference that represents the desired trip point.

Adjust the setpoint control to the point at which the relay changes state from a non-alarm to an alarm condition.

If a larger amount of deadband is desired turn the deadband potentiometer clockwise. The deadband is symmetrical about the setpoint; both transition points will change as deadband is increased.

Alternately set the setpoint and deadband until the desired trip and reset points are set.

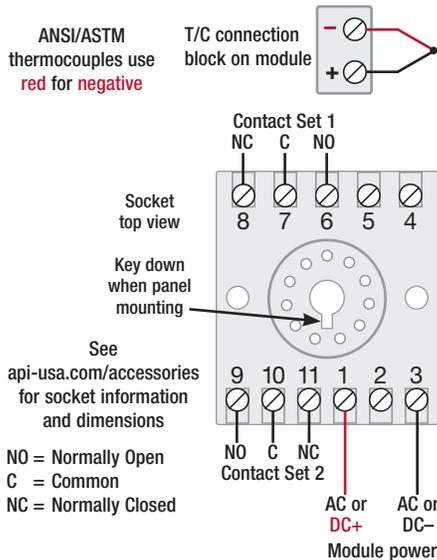
## Output Test Function

The functional test button toggles the alarm status independent of the input when depressed. It verifies the alarm and system operation. When released, the relays will return to their prior states. This can be used as a diagnostic aid during initial start-up or troubleshooting.

The API 1200 G with the HT latching alarm option, the test button provides the additional function of unlatching the alarm relays provided the alarm condition no longer exists.

## Operation

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.

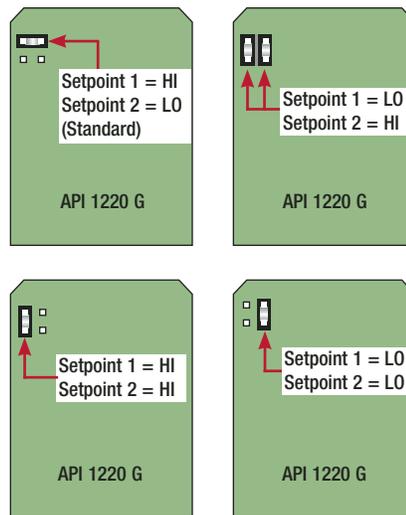


## Alarm Configuration

API 1200 G relay operation is factory configured. The default configuration is HI alarm normal acting. See model/serial number label for non-standard relay configuration options.

API 1220 G relay operation is factory configured, but 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. See diagram at right.
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 1220 G Internal Alarm Configuration Jumpers

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

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 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.

NOTE: Although the API 1200 G has a pair of relays, these relays will energize and de-energize in unison.

The API 1220 G will accommodate independent relay operations.

## High Alarm (Default, H, or HH)

The alarm relay changes state when the input exceeds the deadband trip point. The relay resets when the input drops below the deadband reset point unless the module has a latching relay option. For a high alarm, the trip point is above the reset point.

## Low Alarm (L or LL)

The alarm relay changes state when the input goes below the deadband trip point. The relay resets when the input exceeds the deadband reset point unless the module has a latching relay option. For a low alarm, the trip point is below the reset point.

## HT Option (API 1200 G Only)

The module has a latching alarm with a push button reset. The Test button or powering the module off can be used to reset the alarm provided the alarm condition no longer exists.

## HP Option (API 1200 G Only)

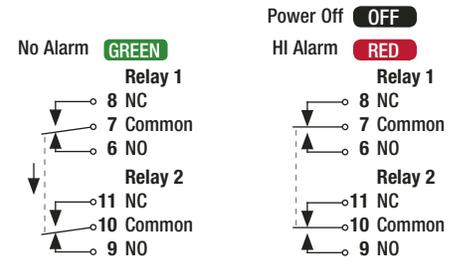
The module has a latching alarm with a power-off reset. Module power must be turned off to reset alarms. The alarm will reset provided the alarm condition no longer exists.

## Normal Acting Alarms (Standard)

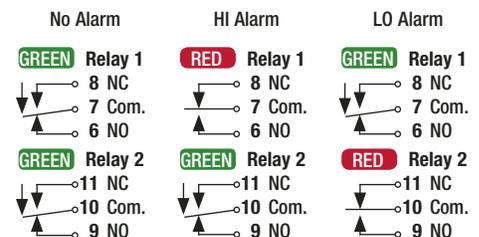
Normal acting alarms energize the relay coils in a non-alarm condition and de-energize them in an alarm condition. This will create an alarm condition if the module loses power.

## Reverse Acting Alarms (R Option)

Reverse-acting alarms energize the relay coils in an alarm condition and de-energize them in a non-alarm condition. There is no alarm condition with module power off.



API 1200 G Alarm States with Normal Action HI Alarm



API 1220 G Alarm States with Normal Action HI/LO Alarms

