Thermocouple Input Alarm Trips, Factory Ranged

API 1200 G, API 1220 G

Input: Most Thermocouple Types

Output: One 8 Amp DPDT Relay or Two 8 Amp SPDT Relays

New Microprocessor-Based Version 12-2018

- *Automatic Cold Junction Compensation*
- *Field Adjustable Set and Reset*
- *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
J, K, T, E, R, S, N, B, C, D, G, M, P
Full ANSI temperature ranges
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
N option: None, last valid output

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 set point, 12 turn potentiometer, 0-100% of span
One reset point, 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 set points, two 12 turn potentiometers, 0-100% span
Two reset points, two 12 turn potentiometers, 0-100% span
Factory configured alarm action
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)
See graph on other side for relay load ratings
Caution: Do not exceed socket voltage rating
Use an RC snubber for inductive loads

Output Test/Reset Button
Toggles relay(s) to opposite state when pressed
Resets latching relay with **HT** option

Response Time
300 milliseconds typical

Ambient Temperature Range and Stability
−10°C to +60°C operating ambient
Better than 0.04% 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: 85-265 VAC 50/60 Hz, 60-300 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

Variable Brightness Input LED — Input Loop-Tracker
Bi-Color Relay LED — Alarm
Setpoint Adjustment — Set Point
Reset Adjustment — Reset Point
Output Test Button Reset w. HT Option — Test / Reset

2.38"

API 1200 G

1.75"

2.75"

POWER 115 VAC | MODEL API 1220 G | OPTIONS Your Required Input Your Alarm Configuration | Absolute Process Instruments, Inc.

T/C − +

Hot Swappable Plug-In Design

A Option Deadband Adjustments

Variable Brightness Input LED — Input Loop-Tracker
Bi-Color Relay 2 LED — Alarm 1
Bi-Color Relay 1 LED — Alarm 2
Setpoint 1 Adjustment — Set Point 1
Setpoint 2 Adjustment — Set Point 2
Reset 1 Adjustment — Reset Point 1
Reset 2 Adjustment — Reset Soint 2
Output Test Button Reset w. HT Option — Test / Reset

2.38"

API 1220 G

1.75"

LIFETIME WARRANTY

MADE IN USA

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 set point and reset point 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 trip and reset points.

The API 1220 G contains two independent set and reset adjustments 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 trip and reset points.

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/Reset
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			85-265 VAC or 60-300 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			85-265 VAC or 60-300 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 Latching alarm with push button reset
HP 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.
B Downscale burnout protection
N No burnout protection, last valid reading
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

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 désignations des bornes et des exemples 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

Socket and Mounting

The module installation requires a protective panel or enclosure. Use API 011 or finger-safe API 011 FS socket. See specifications for maximum allowable socket voltages. Note that some relay sockets may have lower voltage ratings. The socket clips to a standard 35 mm DIN rail or can be attached to a flat surface using the two mounting holes.

Input

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

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

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.

Set Point

This multi-turn potentiometer (one for each alarm 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.

Reset Point

This multi-turn potentiometer (one for each alarm on the API 1220 G) allows the operator to adjust the level at which the alarm resets. This control is adjustable from 0 to 100% of the input range.

Sufficient deadband (difference between trip and reset point) should be used to prevent chattering of the relays or false trips when the process signal is unstable or changes rapidly.

Adjustments

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

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

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

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

Operate the signal source through the set and reset points to confirm desired operation and adjust if necessary.

For the API 1220, repeat the above procedure for the second alarm.

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.

With the HT latching alarm option, the test button provides the additional function of unlatching the alarm relays provide the alarm condition no longer exists.
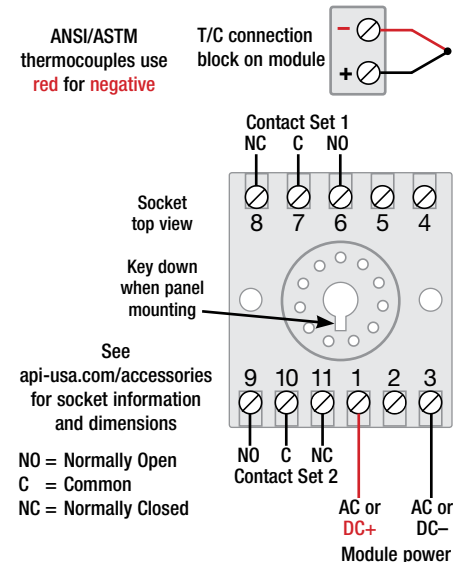
Operation

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.

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 set point. The relay resets when the input drops below the reset point unless the module has a latching relay option. For a high alarm, the set point is above the reset point.

Low Alarm (L or LL)

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

HT Option

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.
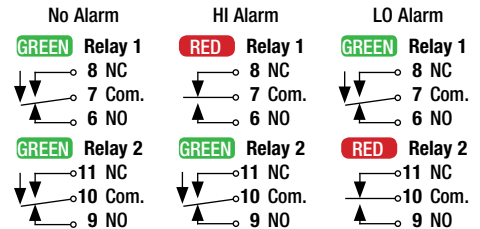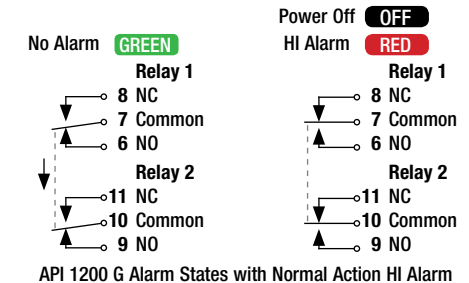
HP Option

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.

ANSI/ASTM thermocouples use red for negative

T/C connection block on module

Contact Set 1
NC　C　NO

Socket top view
8　7　6　5　4

Key down when panel mounting

See api-usa.com/accessories for socket information and dimensions

9　10　11　1　2　3

NO = Normally Open
C = Common
NC = Normally Closed

NO　C　NC
Contact Set 2

AC or DC+
Module power

AC or DC–

No Alarm GREEN

Power Off OFF
HI Alarm RED

Relay 1
8 NC
7 Common
6 NO
Relay 2
11 NC
10 Common
9 NO

Relay 1
8 NC
7 Common
6 NO
Relay 2
11 NC
10 Common
9 NO

API 1200 G Alarm States with Normal Action HI Alarm

No Alarm	HI Alarm	LO Alarm
GREEN **Relay 1**	RED **Relay 1**	GREEN **Relay 1**
8 NC	8 NC	8 NC
7 Com.	7 Com.	7 Com.
6 NO	6 NO	6 NO
GREEN **Relay 2**	GREEN **Relay 2**	RED **Relay 2**
11 NC	11 NC	11 NC
10 Com.	10 Com.	10 Com.
9 NO	9 NO	9 NO

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

Switching Current (A)

AC inductive load (cos φ = 0.4)　AC resistive load

DC inductive load (L/R = 7 ms)

DC resistive load

Switching Voltage (V)

Relay Contact Ratings