

Strain Gauge Transducer Alarm Trips, Factory Ranged, Isolated

APD 1500, APD 1520 

Input: 100 Ω to 10,000 Ω Bridges, 5 mV to 2000 mV, 1-10 VDC Excitation

Output: Two 8 Amp SPDT Relays

- Factory Set Input Range
- Removable Plugs for Faster Installation
- Input LoopTracker® and Alarm Status LEDs
- Full 1200 V Isolation
- Alarm Test, Optional Reset Button

Applications

- Load Cell Weighing Systems and Scales
- Strain Gauge Pressure Sensors and Transducers
- Tanks, Scales, Extruder Melt Pressure, Crane Loads

Strain Gauge Input Range

Factory configured, specify sensor mV/V rating and mV range

Minimum sensor rating: 5 mV

Maximum sensor rating: 2000 mV

Millivolt range is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied.

mV/V sensitivity X excitation voltage = total mV range

Input Impedance

1 MΩ minimum

Isolation

Power to input isolation: 1200 V

Common mode protection: 600 VACp or 600 VDC

Excitation Voltage

Factory configured, please specify excitation voltage

Refer to the sensor manufacturer's recommendations.

Excitation: 1 to 10 VDC, 30 mA max.

Fine adjustment: Approximately ±0.25 VDC

Stability: ±0.01% per °C

Designed for one 350 Ω (or greater) sensor

LoopTracker

Variable brightness LED indicates input loop level and status

APD 1500 Relay Output

Dual SPDT Form C contact sets operating in unison

1 setpoint adjustment, 1 deadband adjustment

Standard: HI alarm, non-latching, normal acting

Options: LO alarm, latching, reverse acting

APD 1520 Relay Output

2 independent SPDT Form C contact sets

2 setpoint adjustments, 2 deadband adjustments

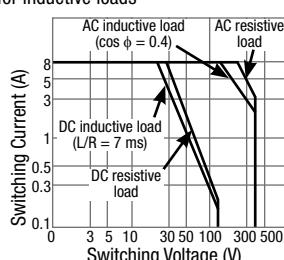
Standard: HI/LO alarm, non-latching, normal acting

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

Relay Contact Ratings

8 A max @ 240 VAC resistive load

External contact protection such as an RC snubber is recommended for inductive loads



Setpoint

12 turn potentiometer adjustable from 0 to 100% of span

Deadband

12 turn potentiometer adjustable from 1 to 100% of span

Response Time

70 milliseconds typical

Output Test/Reset Button

Front button or external contact closure toggles relays to opposite state when pressed.

Resets relay if latching relay option is ordered.

Ambient Temperature Range and Stability

-10°C to +60°C operating ambient

Better than 0.02% of span per °C



See Wiring
Diagrams on
Next Page



Free Factory
I/O Setup!

Dimensions

0.89" W x 4.62" H x 4.81" D
(22.5 x 117 x 122 mm)

Height includes connectors

Housing and Connectors

IP 40, requires installation in panel or enclosure

For use in Pollution Degree 2 Environment

Mount vertically to a 35 mm DIN rail

Four 4-terminal removable connectors, 14 AWG max wire size

Power

85-265 VAC, 50/60 Hz or 60-300 VDC, 2 W maximum

D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 2 W maximum

Model	Input	Standard Alarm Configuration	Power
APD 1500	Factory ranged, specify sensor mV/V rating, mV range, excitation voltage	Single setpoint dual SPDT relays HI alarm, non-latching, normal acting	85-265 VAC or 60-300 VDC
APD 1500 D			9-30 VDC or 10-32 VAC
APD 1520		2 setpoints, 2 SPDT relays HI/LO alarms, non-latching, normal acting	85-265 VAC or 60-300 VDC
APD 1520 D			9-30 VDC or 10-32 VAC

Alarm Options—add to end of model number

L APD 1500 with LO trip. Alarm trips on decreasing signal.

HH APD 1520 with HI/HI trip. Alarms trip at their respective trip points on increasing signal.

LL APD 1520 with LO/LO trip. Alarms trip at their respective trip points on decreasing signal.

LH APD 1520 with LO/HI trip. Alarm 1 trips on decreasing signal. Alarm 2 trips on increasing signal.

HT Latching alarm with push button reset

HP Latching alarm with power-off reset. Module power must be turned off to reset alarms

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

U Conformal coating for moisture resistance

Accessory—order as separate line item

API BP4 Spare removable 4 terminal plug, black

Installation and Setup

APD 1500, APD 1520 

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! Évitez 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 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

Input

The strain gauge input range is factory configured. See the model/serial number label for input type, range, and options. Refer to strain gauge manufacturer's data sheet for wire color-coding. Polarity must be observed when connecting inputs. See the wiring diagrams below right.

CAUTION: Never short the excitation terminals together. This will cause internal damage to the module.

After installation and after all connections are made, the excitation fine adjust potentiometer may be used to precisely trim the excitation voltage, if desired.

Alarm Types

Note that the deadband is symmetrical about the setpoint; relay trip and reset points will both change if either the setpoint or deadband are changed.

High Alarm (default, H, or HH): The alarm relay changes state when the input signal exceeds the deadband trip point. The relay resets when the input signal drops below the deadband reset point. 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 signal goes below the deadband trip point. The relay resets when the input signal exceeds the deadband reset point. For a low alarm the trip point is below the reset point.

HT: Latching alarm with push button reset

HP: Latching alarm with power-off reset. Module power must be turned off to reset alarms

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

Relay Output Terminals

See wiring diagrams below right for connections. APD modules do 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.

The APD 1500 operates two sets of relays in unison with a single setpoint. The dual SPDT contact sets are in a Form C configuration.

The APD 1520 operates two sets of relays independently, each with its own setpoint. The dual SPDT contact sets are in a Form C configuration.

Module Power Terminals

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

When using DC power, either polarity is acceptable, but for consistency with similar API products, positive (+) can be wired to terminal 13 and negative (-) can be wired to terminal 16.

Mounting to a DIN Rail

Install module vertically on a 35 mm DIN rail in a protective enclosure away from heat sources. Do not block air flow. Allow 1" (25 mm) above and below housing vents for air circulation.

1. Tilt front of module downward and position against DIN rail.
2. Clip lower mount to bottom edge of DIN rail.
3. Push front of module upward until upper mount snaps into place.

Removal

1. Push up on the bottom back of the module.
2. Tilt front of module downward to release upper mount from top edge of DIN rail.
3. The module can now be removed from the DIN rail.

Setup and Calibration

Relay operation is factory configured. See model/serial number label for relay configurations.

The Setpoint potentiometer 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.

The Deadband potentiometer allows the alarm trip and reset window to be adjusted symmetrically about the setpoint from 1 to 100% of the span. This 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.

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 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.

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

Relay set and reset points will both change if the setpoint or deadband are changed. Alternately set the setpoint and deadband until the desired trip and rest points are set.

Output Test Function

When the front test button is depressed it will drive the relays to their opposite state. A customer-supplied switch connected to terminals 4 and 8 can also be used to toggle the relays. When released, the relays will return to their prior states.

This can be used as a diagnostic aid during initial start-up or troubleshooting, or as a manual over-ride function. The Test button also resets the relays on models with the HT option.

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 bicolor 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.

In the normal mode of operation, 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.

For a reverse acting alarm, the relay coil is de-energized in a non-alarm condition and energized in an alarm condition. The alarm activates when the input signal exceeds the setpoint (Hi alarm) or falls below the setpoint (Lo alarm), then automatically resets when the alarm condition no longer exists.

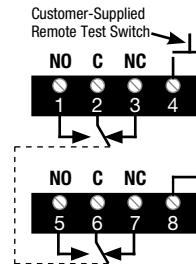
For models with the latching relay option, it will be necessary to push the Test button or remove power from the module to reset the alarm, depending on the type of latching option. The alarm will only reset if the alarm condition no longer exists.



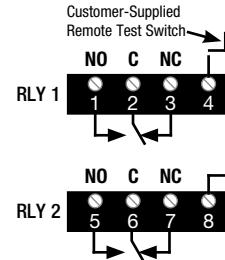
Wire terminal torque
0.5Nm to 0.6Nm
(4.4 to 5.3 in-lbs)

To avoid damage
to the module,
do not make any
connections to
unused terminals

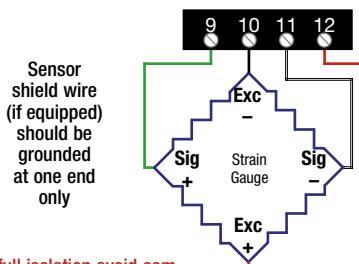
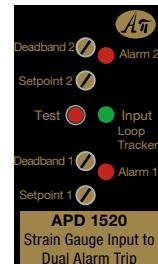
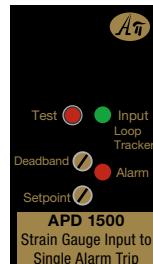
To maintain full isolation avoid combining power supplies in common with input, output, or unit power.



Relay Wiring APD 1500



Relay Wiring APD 1520



To maintain full isolation avoid combining power supplies in common with input, output, or unit power.

Cu 60/75°C
conductors
14 AWG
max.

