Valve Positioner/Actuator/Controller — APD 3200

Control Input: 0-1 V to 0-100 VDC or 0-10 mA to 0-1 ADC **Position Feedback:** Potentiometer, Current, or Voltage
Output: 8 A SPDT Relay with Neutral Position

- *Automatic or Manual Valve Control*
- *Test/Manual Positioning Buttons*
- *Input LoopTracker® LED*
- *Relay Status LEDs*
- *High Capacity Relay Contacts*
- *Removable Plugs for Faster Installation*
- *Input/Power Isolation*
- *Potentiometer, Voltage or mA Feedback Models*

c UL us
File E145968
85-265 VAC, 60-300 VDC
UL version available on request

LIFETIME WARRANTY

MADE IN USA

Free Factory I/O Setup!



Applications

- *Valve Position Controller*
- *Linear Actuator Controller*
- *Damper Controller*

Control Input and Feedback

Factory configured, please specify input range and feedback
M01 and M420: input and feedback must be the same

API 3200 G:	**Voltage or mA input / potentiometer or slidewire feedback**
Voltage input:	0-1 V to 0-100 VDC
Current input:	0-10 mA to 0-1000 mADC
Pot. feedback:	0-100 Ω to 0-100 kΩ
Pot. excitation:	1.0 VDC nominal, 10 mA max.
API 3200 G M01:	**Voltage input / voltage feedback**
Input and feedback:	0-1 V, 0-5 V, 1-5 V, 0-10 VDC
API 3200 G M420:	**mADC input / mADC feedback**
Input and feedback:	0-20 mA, 4-20 mA, 10-50 mA

Control Input Impedance

Voltage: 200 kΩ min.
Current: 50 Ω typical

Input Voltage Burden (Current)

1.25 VDC maximum

Common Mode Rejection

100 dB minimum

Input Calibration

Single-turn zero and span potentiometers
±10% of span adjustment range typical

Manual Controls

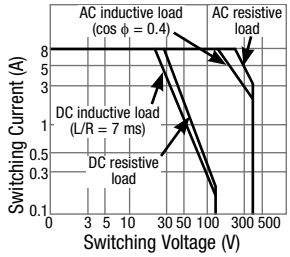
Automatic/manual switch. Manual open and close buttons.

LoopTracker

Variable brightness LEDs for input level and status

Relay Output

SPDT relay with neutral contact position
8 A max @ 240 VAC resistive load
An RC snubber is recommended for inductive loads



Deadband

12 turn potentiometer adjustable from 1 to 25% of span

Response Time

100 milliseconds typical

Isolation

Power to input isolation

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

Ambient Temperature Range and Stability

–10°C to +60°C operating ambient
Better than ±0.02% of span per °C stability

Dimensions

0.89" W x 4.62" H x 4.81" D
22.5 mm W x 117 mm H x 122 mm D
Height includes connectors

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

Description

The APD 3200 controls the position of a valve or linear actuator by comparing a DC input (control signal) to that of a position feedback potentiometer or slidewire.

An SPDT relay provides bi-directional (open-close) signals to drive a motor to open or close a valve. A bi-color LED indicates the Open/Close relay contact status.

When the valve position, as indicated by the feedback potentiometer, becomes equal to the position as represented by the control input, the relay will go to the neutral position and the motor will halt.

A multi-turn deadband control allows precise tuning of the motor response to eliminate hunting or oscillation.

Heavy-duty relay contacts allow the module to directly control high capacity loads as long as the switching current with within the limits shown at left.

Auto/Manual Switch

An Auto/Manual switch allows either closed-loop automatic valve position control or manual positioning via the Open/Close buttons.

The manual mode is useful for troubleshooting, calibration, system testing or as a manual bypass.

LoopTracker

A green LoopTracker LED varies in intensity with changes in the control input signal. Monitoring this LED can provide a quick visual picture of your process at all times and save time during initial startup and/or troubleshooting.

How to Order

Specify: Input range (factory ranged)
Feedback range (factory ranged)
For APD 3200, specify if UL version is required
Order options and accessories as required

Model	Input	Position Feedback	Control Output	Power
APD 3200	Factory ranged, specify DC voltage or current range	Potentiometer feedback 0-100 Ω to 0-100 kΩ	SPDT relay with neutral position	85-265 VAC or 60-300 VDC
APD 3200 D				9-30 VDC or 0-32 VAC
APD 3200 M01	Factory ranged, specify DC voltage range	Voltage feedback specify 0-1 V, 0-5 V, 1-5 V, 0-10 V or custom	SPDT relay with neutral position	85-265 VAC or 60-300 VDC
APD 3200 D M01				9-30 VDC or 0-32 VAC
APD 3200 M420	Factory ranged, specify DC current range	Milliamp feedback specify 0-20 mA, 4-20, mA, 10-50 mA or custom	SPDT relay with neutral position	85-265 VAC or 60-300 VDC
APD 3200 D M420				9-30 VDC or 0-32 VAC

Options and Accessories

Optional—add to end of model number

U Conformal coating for moisture resistance

Accessory—order as separate line item

API BP4 Spare removable 4 terminal plug, black

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 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

Electrical Connections
See the model/serial number label for module information, power requirements, options, or if a custom version was specified.

Polarity must be observed when connecting the signal input or feedback.

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

See diagrams for terminal designations and wiring examples.

If a 4-20 mA control input is specified the module does not provide power to the loop. The 4-20 mA signal must be from a powered transmitter or a loop with a power supply.

Type of Input Device	– Terminal	+ Terminal
Voltage signal	9 (–)	11 (+)
mA (current) signal that provides power to the current loop. Typically a 3 or 4-wire transmitter.	9 (–)	11 (+)
mA (current) signal that is unpowered. Typically a 2-wire device. APD module provides loop power.	11 (–)	10 (+15 V)

Potentiometer (Slidewire) Feedback Signal
See diagrams for terminal designations and wiring examples.

Voltage (M01) or mA (M420) Feedback Signal
See diagrams for terminal designations and wiring examples. Polarity must be observed.

The APD 3200 M420 uses a 4-20 mA feedback signal. The module does not provide power to the loop, thus the feedback signal must be from a powered transmitter or a loop with a power supply.

Relay Output Terminals
See diagrams for terminal designations and wiring examples.

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

Calibration
For most applications the deadband is the only required adjustment.

1. Deadband is normally adjusted after installation is complete.
2. Turn the deadband potentiometer counterclockwise to minimum.
3. Provide a near mid-level control input signal.
4. Allow the valve to stabilize.
5. If overshoot, oscillation, or hunting are detected, slowly increase the deadband clockwise to eliminate the oscillation.

Input zero and span normally do not need to be adjusted.

1. If adjustment is required, apply a control input that represents the fully closed position.
2. Adjust the zero control to just close the valve.
3. Apply a full open control input signal.
4. Adjust the span control to just fully open the valve.

Operation
The APD 3200 provides an excitation voltage to the feedback potentiometer on the valve or valve actuator and monitors its position. If the difference between the control signal and the feedback signal is greater than the deadband setting, the appropriate relay is energized to actuate the positioning motor.

The APD 3200 M01 has a voltage feedback signal and control signal input (unless another voltage range was specified). The difference between the control signal input and the feedback signal is compared to the deadband setting. If the difference between the two is greater than the deadband setting, the appropriate relay contact is energized to actuate the positioning motor.

The APD 3200 M420 uses a 4-20 mA control signal input and feedback signal (unless another current range was specified). The difference between the control signal input and the feedback signal is compared to the deadband setting. If the difference between the two is greater than the deadband setting, the appropriate relay contact is energized to actuate the positioning motor.

The 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.

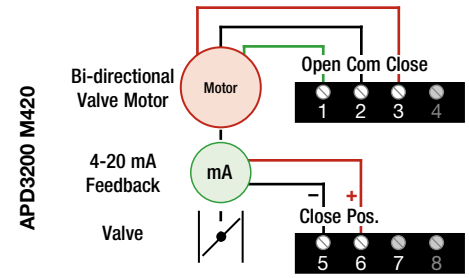
Control Relays
For all versions an electronic lockout circuit is used to prevent both relay contacts from closing simultaneously. When the input and the feedback signals are equal, the relay contacts will go to the neutral position.

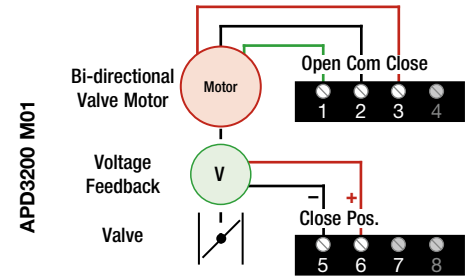
The bi-color relay LED provides a visual indication of the relay status. In all configurations, a green LED indicates a valve open relay position and a red LED indicates a valve closed relay position. In the neutral position, the LED will be off.

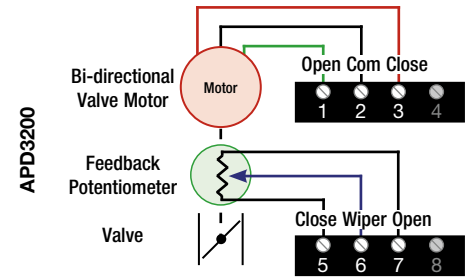
Manual/Auto Mode
Switching the top-mounted toggle switch to Manual allows the Open and Close push buttons to be used to position the valve independent of the control and feedback signals. The manual mode is useful for troubleshooting, calibration, system testing, or as a manual bypass. The bi-color relay LED indicates the controller's Open/Close relay contact status. Switching to Auto mode allows normal operation.



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







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

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

