

**Input:** True RMS 0-50 mVAC to 0-300 VAC, 0-1 mAAC to 0-1000 mAAC  
**Output:** 0-1 V to 0-10 VDC,  $\pm 5$  VDC,  $\pm 10$  VDC, 0-1 mA to 0-20 mADC, 4-20 mADC

**Quick Link:** [api-usa.com/6010](http://api-usa.com/6010)

- Full 1200 V Input/Output/Power Isolation
- Zero and Span Output Calibration Potentiometers
- Input and Output LoopTracker® LEDs
- Functional Test Button with Remote Capability
- Built-In Loop Power Supply for Sink/Source Output



**Applications Link**  
[api-usa.com/apps](http://api-usa.com/apps)

**Free Factory I/O Setup!**

## Applications

- Convert an AC Signal to a DC Process Signal
- Monitor Voltage Ranges
- Convert, Amplify Low Level AC Signals

## AC Input Range

Factory configured, please specify input range  
 Consult factory for special ranges

Voltage: 0-50 mVAC to 0-300 VAC  
 Current: 0-1 mAAC to 0-1000 mAAC  
 Measurements are true RMS

## Input Impedance (Voltage Input)

220 k $\Omega$  minimum

## Input Voltage Burden (Current Input)

1.0 VRMS maximum

## Input Frequency

40 Hz to 1000 Hz sinusoidal

## Input Protection, Common Mode

750 VDC or 750 VACp

## Common Mode Rejection

120 dB minimum

## LoopTracker

Variable brightness LEDs indicate I/O loop level and status

## DC Output Ranges

Factory configured, please specify input range  
 Consult factory for special ranges

Voltage: 0-1 VDC to 0-10 VDC, 10 mA max  
 Voltage, M09 option: 0-10 VDC to 0-20 VDC  
 Bipolar voltage:  $\pm 1$  VDC to  $\pm 10$  VDC  
 Current: 0-1 mADC to 0-20 mADC  
 20 V compliance, 1000  $\Omega$  at 20 mA

Reverse output available

## Output Calibration

Multi-turn zero and span potentiometers  
 $\pm 15\%$  of span adjustment range typical

## Output Loop Power Supply

20 VDC nominal, regulated, 25 mADC  
 Max. ripple, less than 10 mVRMS

May be selectively wired for sinking or sourcing mA output

## Output Test/Override

Front momentary button or external contact closure sets output to test level. Potentiometer adjustable 0-100% of span.

## Output Ripple and Noise

Less than 10 mVRMS at 40 Hz and above

## Linearity

Better than  $\pm 0.1\%$  of span

## Ambient Temperature Range and Stability

$-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  operating ambient  
 Better than  $\pm 0.02\%$  of span per  $^{\circ}\text{C}$  stability

## Response Time

150 milliseconds nominal (0-90%)

## Isolation

1200 VRMS minimum

Full isolation: power to input, power to output, input to output

## 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

Connect mA Output for Sink or Source 1 2 3 4 Removable Plugs

Custom Output Ranges 5 6 7 8

Output LoopTracker LED

Adjustable Output Test/Override Function

Zero and Span for Output

Input LoopTracker LED

Custom Input Ranges

9 10 11 12

Universal Power 13 14 15 16



See Wiring Diagrams on Next Page

## 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

## Description

The APD 6010 accepts an AC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input. Typical applications include monitoring line, power supply, shunt, and motor voltages or current (either directly or with a current transducer) for control, preventive maintenance, etc.

The full 3-way (input, output, power) isolation makes this module useful for ground loop elimination or noise pickup reduction. The APD 6010 is factory configured to customer requirements. Consult the factory for assistance with special ranges.

## Sink/Source Output Versatility

For maximum versatility a milliamp output can be selectively wired for sinking or sourcing. This allows the APD 6010 milliamp output to connect to a powered or unpowered current loop. The 20 VDC output loop supply can be used to power a passive mA device if required.

## How to Order

All models are factory ranged. Please specify

Model APD 6010 or

APD 6010 D for operation on low voltage power

Order options and accessories as required

I/O are factory set to your specifications. Please provide

Input range

Output range

Options as required

Model	Input	Output	Power
APD 6010	Factory configured—specify mVAC, VAC, or mAAC range	Factory configured—specify VDC or mADC range	85-265 VAC or 60-300 VDC
APD 6010 D			9-30 VDC or 10-32 VAC

## Options—add to end of model number

- R Output reversal, such as 20-4 mA output
- M09 High voltage output up to 20 V (specify range)
- 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](http://api-usa.com) for latest product information. Consult factory for your specific requirements.

**WARNING:** This product can expose you to chemicals including nickel, which is 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](http://www.P65Warnings.ca.gov)

## Electrical Connections

Polarity must be observed for output wiring connections. If the output does not function, check wiring and polarity.

See wiring diagrams at right. Observe polarity. If the output does not function, check wiring and polarity.

\* Do not make any connections to unused terminals or use them as wiring junctions for external devices. This may cause permanent damage to the module!

Each product is factory configured to your exact input and output ranges as indicated on the serial number label.

## Input

For an AC signal it is not necessary to observe polarity when connecting the input.

Connect the AC signal input to terminals 9 and 11 as shown in the wiring diagram.

Type of Input Device	Terminal	Terminal
Device with an AC voltage or AC milliamp output.	9	11

## Voltage Output

If your receiving device (such as a PLC or a display) uses a voltage input, use terminals 3 and 4 as shown in the wiring diagram.

## Current Output

Determine if your receiving device (such as a PLC or a display) provides power to the current loop or if the loop must be powered by the APD module. Typical voltage may be 9-24 VDC at your device's input terminals if it provides power to the loop.

If your device does not power the current loop, the APD can provide power using terminals 3 and 4 as shown as shown in the wiring diagram.

If it provides power to the loop or an external supply provides power to the loop, use terminals 2 and 3 as shown as shown in the wiring diagram.

Type of Device for Output	- Terminal	+ Terminal
Measuring/recording device accepts a voltage input.	3 (-)	4 (+)
Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.	3 (-)	4 (+20 V)
Measuring/recording device accepts a mA (current) input and provides power to the current loop.	2 (-)	3 (+)

## Module Power

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

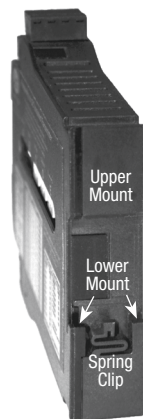
When using DC power, either polarity is acceptable, but for consistency with similar API products, positive (+) can be wired to terminal 13 and negative (-) can be wired to terminal 16.

The power supplies are fuse protected and the unit may be returned to API for fuse replacement.

## 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

Input and output ranges are factory pre-configured (at 24°C ±1°C). Front-mounted Zero and Span potentiometers are used to calibrate the output to compensate for load and lead variations.

1. Apply power to the module and allow a minimum 20 minute warm up time.
2. Using an accurate calibration source, provide an input to the module equal to the minimum input required for the application.
3. Using an accurate measurement device for the output, adjust the Zero potentiometer for the exact minimum output desired. The Zero control should only be adjusted when the input signal is at its minimum. This will produce the corresponding minimum output signal. For example: 4 mA for a 4-20 mA output or -10 V for a ±10V output.
4. Set the input at maximum and adjust the Span pot for the exact maximum output desired. The Span control should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal. Example: for 4-20 mA output, the Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for maximum accuracy.

## Output Test Function

When the Test button is depressed it will drive the output with a known good signal that can be used as a diagnostic aid during initial start-up or troubleshooting. When released, the output will return to normal.

The Test Cal. potentiometer is factory set to approximately 50% output. It can be adjusted to set the test output from 0 to 100% of the output span. Press and hold the Test button and adjust the Test Cal. potentiometer for the desired output level.

## Operation

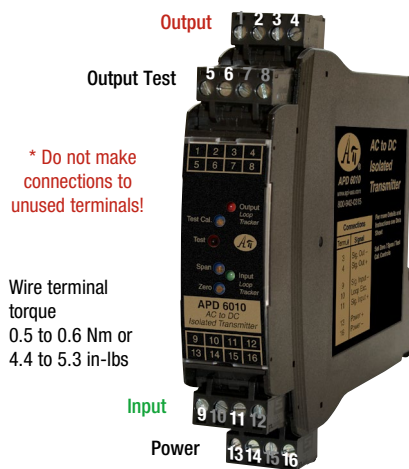
The APD 6010 accepts an AC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input.

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.

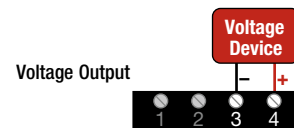
If the LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring. Note that it may be difficult to see the LEDs under bright lighting conditions.

The red LoopTracker output LED provides a visual indication that the output signal is functioning. It becomes brighter as the input and the corresponding output change from minimum to maximum.

For current outputs, the red LED will only light if the output loop current path is complete. For either current or voltage outputs, failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module power or signal output wiring.

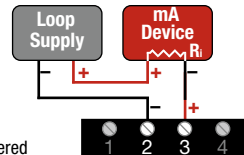


Wire terminal torque  
0.5 to 0.6 Nm or  
4.4 to 5.3 in-lbs



mA output: determine if receiving device has a passive or powered input. The module can be wired for a sinking or sourcing mA output.

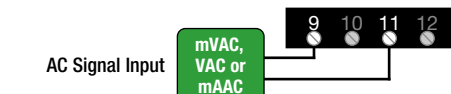
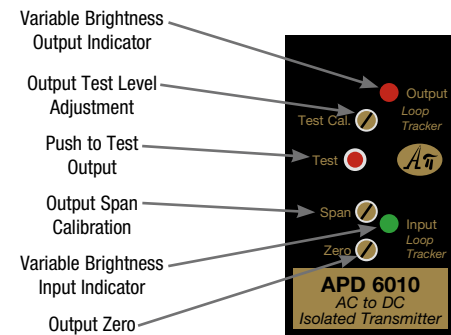
3- or 4-wire transmitter or 2 wire transmitter with external power supply



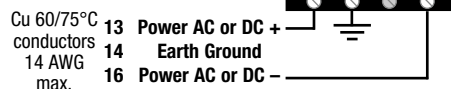
Sinking mA Output  
Module mA output is unpowered



Sourcing mA Output  
Module powers mA output loop



\* Do not make connections to unused terminals!



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