AC to DC Transmitters, Isolated

**APD 6010**

**Input:** True RMS 0-50 mVAC to 0-300 VAC, 0-1 mAAC to 1000 mAAC

**Output:** 0-1 V to 10-10 VDC, ±5 VDC, ±10 VDC, 0-1 mA to 20-20 mAAC, 4-20 mAAC

- Removable Plugs for Faster Installation
- Full 1200 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- Functional Test Button with Remote Capability
- Built-In Loop Power Supply for Sink/Source Output

### Applications
- Convert an AC Signal to a DC Process Signal
- Monitor Voltage Ranges
- Input and Output LoopTracker
- Full 1200 V Input/Output/Power Isolation
- Factory configured—specify
- Built-In Loop Power Supply for Sink/Source Output

### DC Output Ranges
Factory configured, please specify input range

- Voltage: 0-1 mVAC to 0-300 VAC
- Current: 0-1 mAAC to 0-1000 mAAC

Measurements are true RMS

### Input Impedance (Voltage Input)
220 kΩ minimum

### Input Voltage Burden (Current Input)
1.0 V/mA maximum

### Input Frequency
40 Hz to 1000 Hz sinusoidal

### Input Protection, Common Mode
750 VDC or 750 VAC

### Common Mode Rejection
120 dB minimum

### LoopTracker
Variable brightness LEDs indicate I/O loop level and status

### Output Calibration
Multi-turn zero and span potentiometers • ±15% of span adjustment range typical

### Output Loop Power Supply
20 VDC nominal, regulated, 25 mAAC

Max. ripple, less than 10 mVAC

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 mVAC at 40 Hz and above

### Linearity
Better than ±0.1% of span

### Ambient Temperature Range and Stability
-10°C to +60°C operating ambient
Better than ±0.02% of span per °C stability

### Response Time
150 milliseconds typical (0-90%)

### Isolation
1200 VAC 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

### 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 model 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

### Accessories
- API BP4 Spare removable 4 terminal plug, black

### Dimensions
0.89” W x 4.62” H x 4.81” D

Height includes connectors

### API Exclusive Features
- LoopTracker exclusive features include two LoopTracker LEDs (green for input, red for output) that vary in intensity with changes in the process input and output signals. These provide a quick visual picture of your process loop at all times and can greatly aid in saving time during initial startup and/or troubleshooting.

- **Functional Test**
  - An API exclusive feature includes the Functional Test Button to provide a fixed output (independent of the input) when held depressed. The test output level is potentiometer adjustable from 0 to 100% of output span. The functional test button greatly aids in saving time during initial startup and/or troubleshooting.

  - The functional test can also be enabled with a customer-supplied external contact closure across terminals 5 and 6. This allows remote testing of the output or, for example, a PLC-controlled manual override setting.

### Order Options
- Add to end of model number

- **M01** Output reversal, such as 20-4 mA output
- **M09** High voltage output up to 20 V (specify range)
- **U** Conformal coating for moisture resistance

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

**Options**–add to end of model number

- **APD 6010** Factory configured—specify mAAC, VAC, or mAAC range

- **APD 6010 D** Factory configured—specify VDC or mAAC range

- **APD 6010** Power: 85-265 VAC or 60-300 VDC

- **APD 6010 D** Power: 9-30 VDC or 10-32 VAC

**Order as separate line item**

**API BP4** Spare removable 4 terminal plug, black

**APD 6010**

85-265 VAC, 60-300 VDC model only

Connect mA Output for Sink or Source

Custom Output Ranges

Output LoopTracker LED

Adjustable Output Test/OVERRIDE Function

Zero and Span for Output

Input LoopTracker LED

Custom Input Ranges
Electrical Connections

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

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 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 in the wiring diagram.

Calibration

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.

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.

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