**DC to DC Transmitters, Isolated, Field Rangeable**

**APD 4380**

**Input:**
- 0-10 mV to 0-130 VDC, ±5 mVDC to ±65 VDC, 0-200 µA to 0-50 mAADC (Sink or Source)

**Output:**
- 0-1 V to 0-10 VDC, ±5 VDC, ±10 VDC, 0-2 mA to 4-20 mA (Sink or Source)

- One Minute Setup for Hundreds of I/O Ranges
- External Switches & Tables for Range Selection
- Removable Plugs for Faster Installation
- Full 1200 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- Output Test Button
- Built-In Loop Power Supplies for Sink/Source I/O

**Applications**
- Convert, Boost, and Rescale Process Signals
- Isolate Single-Ended (Common Ground) PLC Inputs
- Interface Process Signals with Panel Meters, PLCs, Recorders, Data Acquisition, DCS, & SCADA Systems

**DC Input Ranges**
- Field selectable ranges and offsets via switch settings
- Voltage: 0-10 mVDC to 0-130 VDC
- Bipolar voltage: ±5 mVDC to ±65 VDC
- Current: 0-200 µADC to 0-50 mAADC
- Input offset: ±100% in 10% increments

**Input Impedance (Voltage)**
- Voltage: 1 MΩ typical
- Voltage burden: 1 VDC at 20 mA current input

**Common Mode Rejection**
- 1200 V
- Isolation (minimum)

- 70 milliseconds typical

**Response Time**
- 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

**Linearity**
- Better than ±0.1% of span

**Output Loop Power Supply**
- 20 VDC nominal, regulated, 25 mAADC, <10 mVrms max. ripple
- May be selectively wired for sinking or sourcing mA output

**Test/Override Function**
- Adjustable Output
- Offset
- Input LoopTracker LED
- Adjustable Output Test/Override
- Zero and Span for Output
- Hundreds of Range Selections
- Connect Sink or Source mA Input

**Dimensions**
- Universal Power
- 0.89” W x 4.62” H x 4.81” D

**Description**
- The APD 4380 accepts a DC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input.

Typical applications include signal isolation, conversion, boosting or a combination of the three. Full 3-way isolation (input, output, power) makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

**I/O Sink/Source Versatility**
- Standard on the APD 4380 is a 15 VDC loop excitation supply for the input and a 20 VDC loop excitation supply for the output. These power supplies can be used to power passive mA devices if required.

For maximum versatility the input and output can each be selectively wired for sinking or sourcing. This allows the APD 4380 to work with any combination of powered or unpowered mA inputs and powered or unpowered mA outputs.

**How to Order**
- All models are field rangeable.
- Please specify input range, output range.

**Ordering Information**
- APD 4380 D for operation on low voltage power
- Options as required

**Accessories—order as separate line item**
- API BP4—Spare removable 4 terminal plug, black

**Specifications**
- APD 4380

- Model: Field configurable—specify range if factory is to set switches

- Input: Field configurable—specify range if factory is to set switches

- Output: 85-265 VAC 60-300 VDC

- Power: 9-30 VDC or 10-32 VAC

**Options—add to end of model number**
- M01 Input/output reversal, such as 4-20 mA input to 20-4 mA output
- DF Fast response time, consult factory. DF option will cause output noise levels to be greater than standard specifications.
- U Conformal coating for moisture resistance

**API BP4**
- 4380 D

**Removable Plugs**
- For use in Pollution Degree 2 Environment
- IP 40, requires installation in panel or enclosure
- Full isolation: power to input, power to output, input to output

**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
Precautions

**Terminal 11**

Determine if your transmitter 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 transmitter’s output terminals if it provides power to the loop.

If your transmitter or an external supply provides power to the loop, use terminals 9 and 11 as shown below right.

If your transmitter does not provide the current loop, the APD can provide power using terminals 10 and 11 as shown far right.

**Voltage Input**

If your transmitter provides a voltage output, use terminals 9 and 11 as shown at right.

### Type of Input Device - Terminal + Terminal

| Sensor or transmitter with a voltage output. | 9 (-) 11 (+) |
| Transmitter with a mA (current) output that provides power to the current loop. Typically a 3 or 4-wire device. | 9 (-) 11 (+) |
| Transmitter with a mA (current) output that is unpowered. Typically a 2-wire device. APD module provides loop power. | 11 (-) 10 (+15 V) |

**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.

### Installation Location

The housing clips to a standard 35 mm DIN rail. The housing is IP40 rated and should be mounted inside a panel or enclosure.

**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.

**Voltage Output**

Set switch E to “V” for a voltage output.

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

**Current Output**

Set switch E to “I” for a 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 powers the loop.

If your device does not power the current loop, the APD can provide power using terminals 3 and 4.

If it provides power to the loop or an external supply provides power to the loop, use terminals 2 and 3.

### Type of Device for Output - Terminal + Terminal

| Measuring/recording device accepts a voltage input. | 3 (-) 4 (+) switch E set to “V” |
| 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) switch E set to “I” |
| Measuring/recording device accepts a mA (current) input and provides power to the current loop. | 2 (-) 3 (+) switch E set to “I” |

**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.

**Type of Device for Input**

| Measuring/recording device accepts a voltage input. | 3 (-) |
| Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power. | 3 (-) |
| Measuring/recording device accepts a mA (current) input and provides power to the current loop. | 2 (-) |

**Electrical Connections**

Polarity must be observed for input and output wiring connections. If the input and/or output do not function, check switch settings and wiring polarity.

**Voltage Output**

Set switch E to “V” for a voltage output.

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

**Module mA input is unpowered**

**Current Sourcing Input**

Module mA input loop

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

**Current Sinking Input**

Module mA output is unpowered

**Current Sourcing Output**

Module powers mA output loop

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

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

**Advanced Terminal Information**

See the tables on the next two pages to select I/O ranges for your application. The module side label also lists common ranges. It is generally easier to select ranges before installation.

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.
Calibration
Front-mounted Zero and Span potentiometers are used to calibrate the output to compensate for load and lead variations. Note: Perform the following calibration procedure any time switch settings are changed.

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. Example: for 4-20 mA output, the Span control will provide adjustment for the 20 ma and high end of the signal.
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 and low 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 calibrator is factory set to approximately 50% output. It can be used to set the test output from 0 to 100% of the output span. Press and hold the Test button and adjust the Test Cal calibrator for the desired output level.

Operation
If the APD accepts a DC 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.

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<th>Switches</th>
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<th>0-3 V</th>
<th>0-4 V</th>
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See next page for Bipolar Voltage and Current (mA) Input Switch Settings.
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**Absolute Process Instruments**

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