DC TO DC TRANSFORMERS, ISOLATED, FACTORY CONFIGURED

APD 4300

**Input:**
- 0-100 mV to 0-300 VDC, Bipolar Voltages, 0-1 mA to 0-1000 mADC

**Output:**
- -1 V to ±10 VDC or 0-1 mA to 4-20 mA

- Removable Plugs for Faster Installation
- 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 Supplies for Input and Output

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

**DC Input Range**
Factory configured, please specify input range or consult factory for special ranges. See table on other side for common ranges.

- Voltage: 0-100 mVDC to 0-300 VDC
- Bipolar voltage: ±100 mVDC to ±10 VDC
- Current: 0-1 mA to 0-1000 mADC

**Input Impedance (Voltage)**
200 kΩ minimum

**Input Voltage Burden (Current)**
1.25 VDC maximum

**Common Mode Rejection**
120 dB minimum

**Input Loop Power Supply**
15 VDC nominal, regulated, 25 mAADC

**Max. ripple, less than 10 mV RMS**
May be selectively wired for sinking or sourcing mA input

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

**DC Output Range**
Factory configured, specify output range

- Voltage, 10 mA max.: 0-1 VDC to 0-10 VDC
- Voltage, M09 option: 0-10 VDC to 0-20 VDC
- Bipolar voltage: ±1 VDC to ±10 VDC
- Current: 0-1 mA to 0-20 mA

**20 V compliance, 1000 Ω at 20 mA**

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

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

**Output Test/Override**
Front button sets output to test level when pressed or via external contact closure
Potentiometer adjustable 0-100% of span

**Output Ripple and Noise**
Less than 10 mV RMS ripple and noise

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

**Ambient Temperature Range and Stability**
~10°C to ~60°C operating ambient
Better than ±0.04% of span per °C stability

**Response Time**
Standard: 70 milliseconds nominal
DF option: Fast response time. Output noise levels will be greater than standard specifications. Consult factory.

**Isolation**
1200 Vrms minimum

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

**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

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

**Description**
The APD 4300 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.**

**The APD 4300 can be factory configured for 4-20 mA input and 4-20 mA output to solve signal isolation, ground loop, common mode, or noise pickup problems for non-isolated PLC inputs.**

**For maximum versatility loop excitation power supplies are included for the input and output. A mA input and a mA output can be selectively wired for sinking or sourcing. This allows the APD 4300 to work with any combination of sinking or sourcing mA transmitters and sinking or sourcing mA receiving devices.**

**How to Order**
All models are factory ranged
The APD 4300 is configured to your specifications.
Milliamp inputs and outputs can be field wired for sink or source.

Please specify:
- Model
- Input range
- Output range
- Options as required

**Model**
- APD 4300: Factory configured—specify input range
- APD 4300 D: Factory configured—specify output range

**Input**
- 85-265 VAC or 60-300 VDC
- 9-30 VDC or 10-32 VAC

**Options**
- M01: Input/output reversal, such as 4-20 mA input to 20-4 mA output
- M09: High voltage output up to 20 V (specify range)
- DF: Fast response time, consult factory.
- U: Conformal coating for moisture resistance

**Accessories**
- Order as separate line item
- API BP4: Spare 4-terminal plug, black

**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**
### 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.

**Précéutions**

**ATTENTION!** Tout le câblage doit être effectué par un électricien ou un 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’élimination électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d’installer le module. API maintient un constant effort à améliorer et à améliorer ses produits. Spécifications sont sujets à changement sans préavis. Consultez le site Web de l’API pour les informations les plus récentes.

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**Précautions**

**ATTENTION!** Tutte le cáblish debe efectuarse por un electricista o ingeniero de instrumentación calificado. Ver el diagrama para designaciones de las bornas y ejemplos de cáblish. Consultar con la fábrica para su requerimientos específicos.

**ATTENTION!** Éviter les risques de choc! Fermez le signal d’entrée, le signal de sortie et l’élimination électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d’installer le module. API maintient un constant effort à améliorer et à améliorer ses produits. Spécifications sont sujets à changement sans préavis. Consultez le site Web de l’API pour les informations les plus récentes.

### Electrical Connections

See wiring diagrams. Observe 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!

### Ranges

**APD 4300** I/O ranges are set at the factory and must be specified when ordering. Listed below are commonly ordered input and output ranges. Consult factory for other available ranges or special ranges. See the model/serial number label for module information, options, and I/O range information.

#### Common Voltage Inputs

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Terminal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100 mV</td>
<td>±200 mV</td>
</tr>
<tr>
<td>0-200 mV</td>
<td>±500 mV</td>
</tr>
<tr>
<td>0-500 mV</td>
<td>±1 V</td>
</tr>
<tr>
<td>0-1 V</td>
<td>±2 V</td>
</tr>
<tr>
<td>0-2 V</td>
<td>±5 V</td>
</tr>
<tr>
<td>0-5 V</td>
<td>±10 V</td>
</tr>
</tbody>
</table>

#### Common Current Inputs

<table>
<thead>
<tr>
<th>Current Range</th>
<th>Terminal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 mA</td>
<td>0-20 mA</td>
</tr>
<tr>
<td>0-10 mA</td>
<td>0-200 mA</td>
</tr>
<tr>
<td>0-16 mA</td>
<td>0-500 mA</td>
</tr>
</tbody>
</table>

#### Common Voltage Outputs

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>Terminal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10 V</td>
<td>±10 V</td>
</tr>
<tr>
<td>0-16 V</td>
<td>±5 V</td>
</tr>
<tr>
<td>0-20 mA</td>
<td>±10 V</td>
</tr>
</tbody>
</table>

#### Common Current Outputs

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</tr>
<tr>
<td>0-16 mA</td>
<td>0-500 mA</td>
</tr>
</tbody>
</table>

### Input

Polarity must be observed when connecting the signal input.

For a transmitter with a current output, determine if it provides power to the current loop or if it must be powered by the APD module. Use a multimeter to check for voltage at the transmitter output terminals. Typical voltage may be in the range of 9 to 24 VDC. In this case, wire the device to terminals 9 and 11.

#### Type of Input Device

<table>
<thead>
<tr>
<th>Device Connected to Output</th>
<th>Terminal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring or recording device accepts a voltage input.</td>
<td>3 (+) 4 (+)</td>
</tr>
<tr>
<td>Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.</td>
<td>3 (+) 4 (+) 20 V</td>
</tr>
<tr>
<td>Measuring/recording device accepts a mA (current) input and provides power to the current loop.</td>
<td>2 (+) 3 (+)</td>
</tr>
</tbody>
</table>

### Voltage Device

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

#### Current Sourcing Output

Module mA input is unpowered.

#### Current Sinking Output

Module mA output is powered.

### Calibration

Input and output ranges as specified on your equipment are factory pre-configured (at 24°C ±1°C). Front-mounted, Zero and Span potentiometers can be 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 that is 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 mA for a 4-20 mA output or –10 V for a ±10 V output.
4. Next, set the input at maximum, then 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 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

The test button may be used to drive the device on the output (a panel meter, chart recorder, etc.) with a known good signal that is used as a system diagnostic aid during initial start-up or during troubleshootining.

When depressed it will drive the output with a known good signal. When released, the output will return to normal.

You can also enable the test function by connecting an external switch or button to terminals 5 and 6. This can be used as a remotely operated manual override to set the output at a fixed value regardless of the input signal.

The Test Cal. potentiometer can be used to set the test output to the desired level. It is factory set for the exact maximum output desired. The Zero control can be used to adjust the Span pot for the exact maximum output desired. When released, the output will return to normal.

#### Operation

The APD 4300 is factory configured to your exact input and output requirements. The input is filtered, whether attenuated or amplified as required, then passed through to the output stage.

The green LoopTracker® input LED provides a visual indication that a signal is being input 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. Notice that it may be difficult to see the LEDS under bright lighting conditions.

The red LoopTracker output LED provides a visual indication of the signal 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.

### APD 4300 I/O Ranges

- **0-10 V** for ±10 V output.
- **0-1 V** for ±500 mV input.
- **0-100 V** for ±500 mV input.
- **0-500 mA** for ±500 mV input.
- **4-20 mA** for ±10 V output.
- **0-5 V** for ±10 V output.
- **0-16 mA** for ±10 V output.

### APD 4300 I/O Ranges

- **0-10 mA** for ±10 V output.
- **0-1 V** for ±500 mV input.
- **0-100 mA** for ±500 mV input.
- **0-500 mA** for ±500 mV input.
- **4-20 mA** for ±10 V output.
- **0-5 V** for ±10 V output.
- **0-16 mA** for ±10 V output.

### APD 4300 I/O Ranges

- **0-10 mA** for ±10 V output.
- **0-1 V** for ±500 mV input.
- **0-100 mA** for ±500 mV input.
- **0-500 mA** for ±500 mV input.
- **4-20 mA** for ±10 V output.
- **0-5 V** for ±10 V output.
- **0-16 mA** for ±10 V output.

### APD 4300 I/O Ranges

- **0-10 mA** for ±10 V output.
- **0-1 V** for ±500 mV input.
- **0-100 mA** for ±500 mV input.
- **0-500 mA** for ±500 mV input.
- **4-20 mA** for ±10 V output.
- **0-5 V** for ±10 V output.
- **0-16 mA** for ±10 V output.

### APD 4300 I/O Ranges

- **0-10 mA** for ±10 V output.
- **0-1 V** for ±500 mV input.
- **0-100 mA** for ±500 mV input.
- **0-500 mA** for ±500 mV input.
- **4-20 mA** for ±10 V output.
- **0-5 V** for ±10 V output.
- **0-16 mA** for ±10 V output.