High Voltage DC to DC Transmitters, Isolated, Field Rangeable

APD HV-DC

Input: 0-100 VDC to 0-1200 VDC
Output: 0-1 V to ±10 VDC or 0-2 mA to 4-20 mA

Quick Link: api-usa.com/HVDC

- *Field Selectable I/O Ranges*
- *Zero and Span Output Calibration Potentiometers*
- *Full 1200 V Input/Output/Power Isolation*
- *Input and Output LoopTracker® LEDs*
- *Output Test Button*
- *Selectable Sink/Source for Current Output*

Applications

- *High Voltage Battery Systems*
- *DC Motor and Variable Speed Drives*
- *Electric Railway Voltages*
- *Power Supply and Voltage Converters*

6 YEAR WARRANTY

MADE IN USA

Applications Link
api-usa.com/apps

Free Factory I/O Setup!

1 Minute Setup!

See Wiring Diagrams on Next Page

Input Ranges
8 field selectable ranges
- 0-100 VDC
- 0-200 VDC
- 0-300 VDC
- 0-400 VDC
- 0-500 VDC
- 0-1000 VDC
- 0-1200 VDC
- Custom range—consult factory, 2000 VDC max.

Input Impedance (Voltage)
2.5 MΩ

Common Mode Rejection
120 dB minimum

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

Output Ranges
18 field selectable ranges

Voltage:	0-1 V, 0-2 V, 0-4 V, 0-5 V, 1-5 V, 0-8 V, 0-10 V, 2-10 V
Bipolar voltage:	±5 V, ±10 V
Current:	0-2 mA, 0-4 mA, 0-8 mA, 0-10 mA, 2-10 mA, 0-16 mA, 0-20 mA, 4-20 mA

20 V compliance, 1000 Ω at 20 mA
Consult factory for special ranges

Output Calibration
Multi-turn zero and span potentiometers to compensate for load and lead variations
±15% of span adjustment range typical

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

Output Test
Front button sets output to test level when pressed
Potentiometer adjustable 0-100% of span

Output Ripple and Noise
Less than 10 mVRMS 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
100 milliseconds nominal

Isolation
1200 VRMS minimum
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

Housing and Connectors
IP 40, requires installation in panel or enclosure
Mount vertically to a 35 mm DIN rail
Four 4-terminal removable connectors, 14 AWG max wire size

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

Function
The APD HV-DC accepts a DC voltage input and provides an optically isolated DC voltage or current output that is linearly related to the input. This module is unique because it is field rangeable for voltage inputs from 100 VDC to 1200 VDC. Typical applications include signal isolation and signal conversion for a high voltage DC input.

Isolation
The optical isolation between input and output makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction. The module power supply is isolated, resulting in full 3-way (input, output, power) isolation.

Fast Field Setup
The APD HV-DC input and output range settings can be reconfigured in the field via external switches. Range settings are on the module label. A user specified range is available that can be factory configured to meet your specific requirements. Consult the factory for assistance.

Sink/Source Output
For maximum versatility the output can be selectively wired for sinking or sourcing. The built-in 20 VDC loop excitation supply may be used to power passive mA devices. This allows the APD HV-DC to work with powered or unpowered mA devices.

LoopTracker
API 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.

Output Test
An API exclusive feature includes a 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 output test button greatly aids in saving time during initial startup and/or troubleshooting.

How to Order

All models are field rangeable
Free factory setup and calibration

The APD HV-DC has a custom input range than can be factory set to your specifications at no extra cost

Please specify
Model
Input range (if you would like us to set the switches)
Output range (if you would like us to set the switches)
Custom range, if required
Option as required

Model	Input	Output	Power
APD HV-DC	8 field selectable ranges 1 custom input range can be specified if required	18 field selectable ranges	85-265 VAC or 60-300 VDC
APD HV-DC D			9-30 VDC or 10-32 VAC

Options–add to end of model number

C Custom range, >1200 VDC to 2000 VDC max.
U Conformal coating for moisture resistance

Accessory—order as separate line item

API PB4 Spare removable plug, black 4 terminal

1220 American Way Libertyville, IL 60048
Phone: 800-942-0315 Fax: 800-949-7502
api-usa.com

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 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

Range Selection
See table below to select I/O ranges for your application. It is generally easier to select ranges before installation. See model/serial number label for custom range settings if specified.

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.

* 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!

Signal Output Terminals
Polarity must be observed when connecting the signal output. If your device requires a current input, determine if it provides power to the current loop or if it must be powered by the APD module. Use a multi-meter to check for voltage at the input terminals. Typical voltage may be in the range of 9 to 24 VDC

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

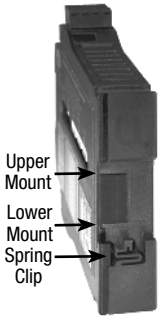
Signal Input Terminals
The APD HV-DC accepts a DC voltage input. Polarity must be observed when connecting the signal input.

DC Voltage Input	Terminal
DC voltage negative	5 (–)
DC voltage positive	11 (+)

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 up 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, if specified on your order, are factory pre-configured (at 24°C ±1°C). Use the front-mounted Zero and Span potentiometers to calibrate the output.

Note: Perform the following calibration procedure any time switch settings are changed.

1. Apply power to the module and allow a minimum 30 minute warm-up time.
2. Using an accurate calibration source, provide an input to the module equal to the min. 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. 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 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
The output test potentiometer is factory set to provide approximately 50% output. When the test button is depressed it will drive the output side of the loop 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 can be used to set the test output to the desired level. It is adjustable 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.

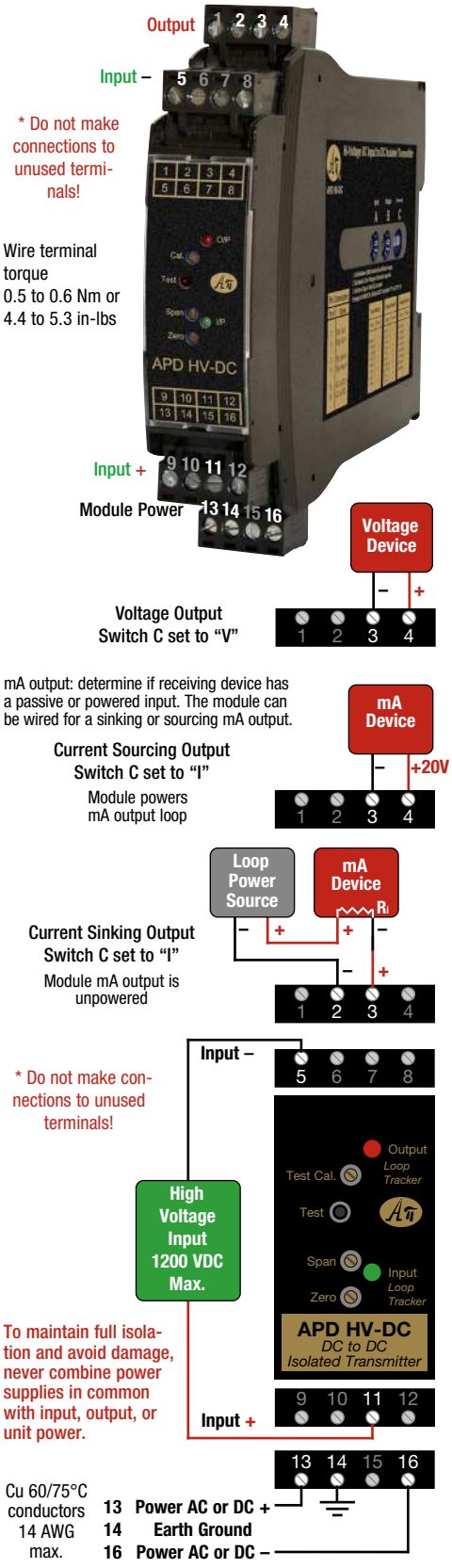
Operation
The APD HV-DC accepts a high-voltage DC voltage input and provides an optically isolated DC voltage or current output that is linearly related to the input. The input is filtered and attenuated as required, then passed through to the output stage.

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, this may indicate a problem with module power or signal input wiring.

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.



Output	0-1 V	0-2 V	0-4 V	1-5 V	0-5 V	0-8 V	2-10 V	0-10 V	±5 V	±10 V	0-2 mA	0-4 mA	0-8 mA	2-10 mA	0-10 mA	0-16 mA	4-20 mA	0-20 mA
Switches / Input	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC
0-100 V	00V	08V	01V	06V	09V	02V	07V	03V	04V	05V	00I	08I	01I	06I	09I	02I	07I	03I
0-200 V	10V	18V	11V	16V	19V	12V	17V	13V	14V	15V	10I	18I	11I	16I	19I	12I	17I	13I
0-300 V	20V	28V	21V	26V	29V	22V	27V	23V	24V	25V	20I	28I	21I	26I	29I	22I	27I	23I
0-400 V	30V	38V	31V	36V	39V	32V	37V	33V	34V	35V	30I	38I	31I	36I	39I	32I	37I	33I
0-500 V	40V	48V	41V	46V	49V	42V	47V	43V	44V	45V	40I	48I	41I	46I	49I	42I	47I	43I
0-1000 V	50V	58V	51V	56V	59V	52V	57V	53V	54V	55V	50I	58I	51I	56I	59I	52I	57I	53I
0-1200 V	60V	68V	61V	66V	69V	62V	67V	63V	64V	65V	60I	68I	61I	66I	69I	62I	67I	63I
Custom	70V	78V	71V	76V	79V	72V	77V	73V	74V	75V	70I	78I	71I	76I	79I	72I	77I	73I