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 0-1 mA to 4-20 mA

- *Field Selectable I/O Ranges*
- *Removable Plugs for Faster Installation*
- *Full 1200 V Input/Output/Power Isolation*
- *Input and Output LoopTracker® LEDs*
- *Functional Test Button*
- *Selectable Sink/Source for Current Output*

Applications

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











Removable Plugs

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

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
Consult factory for custom or special ranges

Input Impedance (Voltage)
2.5 MΩ

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

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 Linearity
Better than ±0.1% of span

Output Loop Power Supply
20 VDC nominal, regulated, 20 mADC
Max. ripple, less than 10 mV_{RMS}
May be selectively wired for sinking or sourcing mA output

Output Ripple and Noise
Less than 10 mV_{RMS}

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

Response Time
70 milliseconds typical

Common Mode Rejection
120 dB minimum

Isolation
1200 V_{RMS} minimum
Full isolation: power to input, power to output, input to output

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

Power
80-265 VAC or 48-300 VDC, 2 W maximum
D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 2 W maximum

Housing
Mounts to standard 35 mm DIN rail
IP 40

Connectors
Four 4-terminal removable connectors
14 AWG max wire size

Function
The API DPI 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.

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 API DPI HV-DC input and output range settings can be reconfigured in the field via external switches. Common 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
The APD HV-DC has a custom input range than can be factory set to your specifications.

Milliamp output can be field wired for sink or source.

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
Options as required

Model	Input	Output	Power
APD HV-DC	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	18 field selectable ranges 0-1 V, 0-2 V, 0-4 V, 0-5 V, 1-5 V, 0-8 V, 0-10 V, 2-10 V, ±5 V, ±10 V, 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	80-265 VAC or 48-300 VDC
APD HV-DC D			9-30 VDC or 10-32 VAC

Options–add to end of model number

DF Fast response time, consult factory
U Conformal coating for moisture resistance

Accessories—order as separate line item

API TK36 DIN rail, 35 mm W x 39" L, aluminum
API PB4 Spare removable plug, black 4 terminal

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
WARNING! All wiring must be performed by a qualified electrician or instrumentation engineer. See wiring examples below or consult factory for assistance.

Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring.

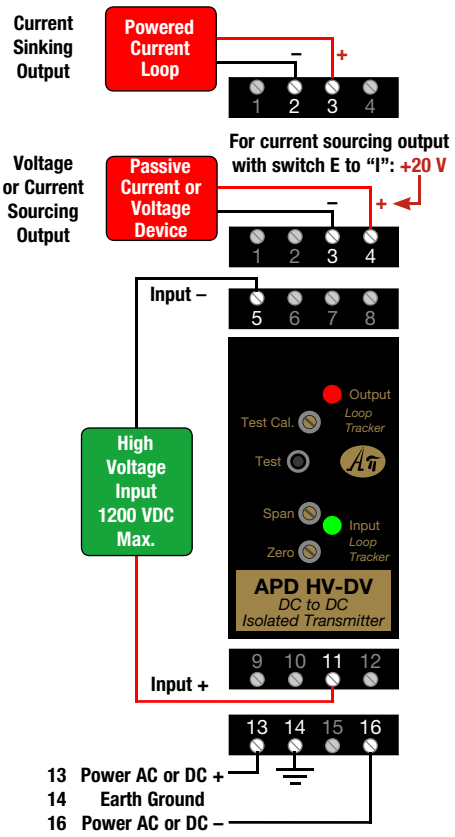
Polarity must be observed for input and output wiring connections. If the input and/or output do not function, check switch settings and wiring polarity.

Module Power Terminals
Check white 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.

Signal Input Terminals
All APD HV-DC models accept 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** (+)



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	– 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"

Calibration
Front-mounted Zero and Span potentiometers can be used to compensate for load and lead variations.

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 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 Zero control will provide adjustment for the 4 mA or low end of the signal.
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.

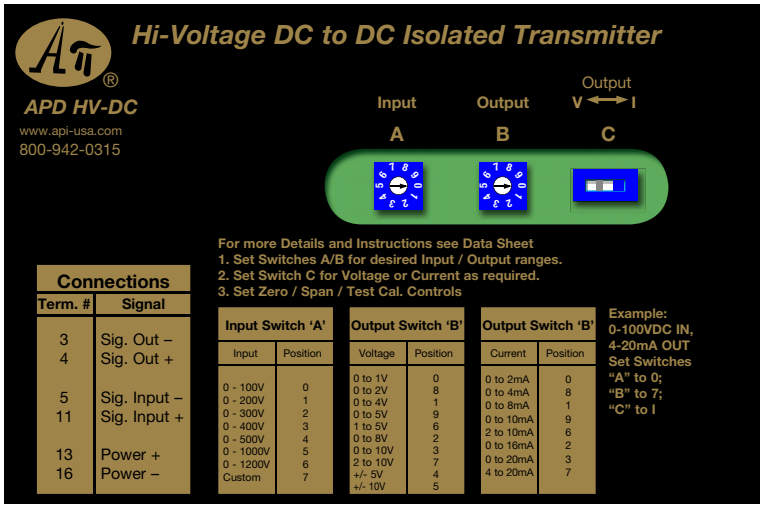
Operation
The API DPI HV-DC accepts a high-voltage DC voltage input and provides an optically isolated DC voltage or current output that is linearly related to the input. The input is filtered and attenuated as required, then passed through to the output stage.

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
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

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.