2 Channel DC-DC Transmitters, Isolated

API 4390 DIN, API 4391 DIN, API 4392 DIN

Discontinued, see APD 2000

2 Inputs: mVDC, ±10 to 0-10 VDC, 0-1 mA to 4-20 mA
2 Outputs: 0-5 V, 0-10 V, ±5 V, ±10 V, 0-20 mA, 4-20 mA

- 2 Independent Channels in a 55 mm Package
- 2000 V Power/Input/Output/Channel Isolation
- Full Isolation Eliminates Ground Loops
- Input and Output LoopTracker LEDs
- Functional Test Button for Each Channel
- Independent Zero and Span for Each Channel

Applications
- Isolate, Convert, Boost, Rescale Process Signals
- One Model to Interface Two Process Signals with Panel Meters, Recorders, Data Acquisition Cards, PLCs, DCS Systems, SCADA Systems

Input Ranges
Factory configured—specify an input for each channel
Voltage: 0-100 mVDC, 0-5 VDC, 0-10 VDC, 0-100 VDC, ±5 VDC, ±10 VDC
Current: 0-20 mA, 0-20 mA, 4-20 mA, see sinking or sourcing options
Consult factory for special ranges

Input Characteristics
Voltage: 200 kΩ minimum input impedance per channel
Current: 1.25 VDC maximum voltage burden per channel

Input Loop Supply for L1 Versions
15 VDC nominal, regulated, 25 mADC

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

Output Ranges
Factory configured—specify an output for each channel
Voltage: 0-100 mV, 0-5 VDC, 0-10 VDC, ±5 VDC, ±10 VDC
Current: 0-20 mA, 4-20 mA, both mA output channels are sourced
Consult factory for special ranges

Output Drive for Sourcing Output
1000 Ω at 20 VDC typical

Output Zero and Span
Multi-turn zero and span potentiometers for each channel to compensate for load and lead variations.
±15% of span adjustment range typical
Ultra-low interaction zero and span, <0.001 ppt

Output Linearity
Better than ±0.1% of span

Output Ripple and Noise
Less than 10 mV/AC

Functional Test Buttons
Sets output to approximately 50% of span when pressed
One button per channel

Response Time
70 milliseconds typical
Consult factory for optional response times

Isolation
2000 Vrms minimum
Full isolation: power to each channel, input to each output, each channel to each channel

Common Mode Rejection
120 db minimum

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

Housing
Polycarbonate UL #94V-1 housing and UL #94V-2 terminals
35 mm DIN rail or surface mount

Power
Both input power supplies are fuse protected
80-265 VAC or 40-300 VDC, 50/60 Hz, 5 W max., 4 linearity type
DD: 9-30 VDC or 10-32 VAC, 5 W max., 4 switching type

Dimensions
2.17” W x 3.0” H x 4.33” D (not including connectors)

Description
The API 4390 DIN, API 4391 DIN and API 4392 DIN accept two analog DC voltage or current inputs and provide two optically isolated analog DC voltage or current outputs that are linearly related to the inputs. The two independent channels provide an economical signal conversion solution where space is limited. For each channel the input signal is filtered, either amplified or attenuated as required, then passed through an opto-coupler to the output stage. The optical isolation between the inputs and outputs make this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

Applications include signal isolation, signal scaling, signal conversion, signal boosting or a combination of the four. This product is designed to function effectively in electrically noisy industrial environments.

LoopTracker
API exclusive features include two LoopTracker LEDs for each channel. The LoopTracker LEDs (green for input, red for output) vary in intensity with changes in the process input and output signals and can provide a quick visual picture of your process loop at all times.

Functional Test
An API exclusive feature includes a Functional Test Button for each channel. The functional test button provides a fixed output (independent of the input) when held depressed. This output is factory set to approximately 50% of the output span. Both the LoopTracker LEDs and functional test button greatly aid in saving time during initial startup and/or troubleshooting.

How to Order
All models are factory ranged

API 4390 DIN 4-20 mA version sink and source options L and EX options can be combined. See 4390 table below.

Please specify
Model number with L and EX options if required

Input range channel 1
Output range channel 1
Input range channel 2
Output range channel 2
Options as required

Model Input 1 Input 2 Input 1 Input 2 Input 1 Input 2 Input 1 Input 2
API 4390 DIN VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN EX1 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN EX2 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L1 Sourcing mA VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L1 EX1 Sourcing mA VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L1 EX2 Sourcing mA VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L1 EX3 Sourcing mA VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L2 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L2 EX1 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L2 EX2 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L2 EX3 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L3 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L3 EX1 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L3 EX2 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA
API 4390 DIN L3 EX3 VDC or sinking mA VDC or sinking mA VDC or sinking mA VDC or sinking mA

Options—add to end of model number

Accessories—order as separate line item

DD
API TK36 DIN rail, 35 mm W x 39” L, aluminum
Use DD instead of DIN in model number
API GP8 Spare removable plug, green
DF
Fast response time, consult factory
U
Conformal coating for moisture resistance

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Power Loop

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Loop – may be returned to API for fuse replacement.

The power supplies are fuse protected and the unit label. The power supplies are fuse protected and the unit may be returned to API for fuse replacement. may 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.

6. Repeat adjustments for second channel.

Module Power Terminals

The white label on the side of the API module will indicate the power requirements. Power is connected to terminals 12 and 13.

Signal Input Terminals

Polarity must be observed when connecting the signal input. The positive connection (+) for channel 1 is applied to terminal 9 and the negative (–) is applied to terminal 10. The positive connection (+) for channel 2 is applied to terminal 16 and the negative (–) is applied to terminal 15.

Signal Output Terminals

Polarity must be observed when connecting the signal output to the load. The positive connection (+) for channel 1 is connected to terminal 6 and the negative (–) is connected to terminal 7. The positive connection (+) for channel 2 is connected to terminal 3 and the negative (–) is connected to terminal 2.

WARNING!

Installation and Setup API 4390 DIN, API 4391 DIN, API 4392 DIN

Front-mounted Zero and Span potentiometers for each channel 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.

6. Repeat adjustments for second channel.

Test Function

The functional test buttons are factory set to provide approximately 50% output. When depressed they 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.

Operation

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 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.

API 4390, 4391, 4392 with Voltage Inputs and Outputs

Both mA inputs sink current. Both mA outputs source current.

API 4390 Current Input and Output Sink/Source Options

L and EX options may be combined, such as API 4390 DIN L1 EX2

API 4390, 4391, 4392 with Current Inputs and Outputs

Both mA inputs sink current. Both mA outputs source current.

The functional test buttons are factory set to provide approximately 50% output. When depressed they 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.

Test Function

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.

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