

Input: 0-50 mV to ±10 VDC, 0-500 µA to 4-20 mA DC, Potentiometer, T/C, RTD, Thermistor, or Custom
Output: 0-1 V to 0-10 V, ±5 V, ±10 V, 0-2 mA to 4-20 mA, Reverse Acting Optional

[Quick Link: api-usa.com/8000](http://api-usa.com/8000)

- One Model Covers All Common Sensors
- Free Setup—No Computer or Software Needed
- Zero and Span for Output
- Full 1200 V Isolation
- Input LoopTracker® LED, Output Test Function
- Built-In Loop Power Supply for Sink/Source Output

Applications

- Convert/Isolate DC Sensors for PLC Input, Control and/or Validation
- Interface DC Sensors with Panel Meters, PLCs, Recorders, Data Acq., DCS, & SCADA Systems

Input Types, Field Selectable

DC volts 35 ranges from ±25 mVDC to ±10 VDC
 DC mA 20 ranges from ±0.5 mA DC to ±20 mA DC
 Potentiometer: 100 Ω min. to 1 Mega Ω max.
 1, 2, or 4 volt excitation
 T/Cs: J, K, T, E, R, S, N, B, C, D, G, M, P
 Full ANSI temperature ranges
 Automatic CJC
 Burnout: upscale, downscale, last valid output
 RTDs: 2, 3, or 4 wire, 10 Ω to 8000 Ω RTDs
 4 wire with or without current rotation
 Cu-10, Cu-100, Ni-100, Ni-120,
 Ni-Fe-500, Ni-Fe-1000, Ni-Fe-2000,
 Pt-10, Pt-25, Pt-50, Pt-100, Pt-200,
 Pt-470, Pt-500, Pt-1000
 Thermistors: 44004/44033 2.252 kΩ at 25°C
 44005/44030 3.000 kΩ at 25°C
 44007/44034 5.000 kΩ at 25°C
 44006/44031 10.00 kΩ at 25°C
 44008/44032 30.00 kΩ at 25°C
 YSI 400 2.252 kΩ at 25°C
 Spectrum 1003k 1 kΩ
 Custom: Provide sensor specifications, temperature curve data, and temperature range

LoopTracker

Variable brightness green LED indicates input level and status

Status LED

Yellow LED for setup and operational status

DC Output Ranges, Field Selectable

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, ±5 VDC, ±10 VDC
 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

Reverse Acting Output, Factory Set

R option: Reverse acting output
 increasing input = decreasing output signal
 Reverse acting models cannot be converted to direct acting

Output Calibration

Zero and span set by using up/down buttons, ±10% range

Output Loop Power Supply

20 VDC nom., regulated, 25 mA DC, <10 mVrms max. ripple
 May be selectively wired for sinking or sourcing mA output

Output Test

Front push button switch enables/disables test level output
 Adjustable 0-100% of span via up/down buttons

Output Resolution

18 bit

Output Ripple and Noise

Less than ±0.2% of span

Accuracy

±0.1°C input accuracy, 0.001°C input resolution

Ambient Temperature Range and Stability

-10°C to +60°C operating ambient
 Better than ±0.02% of span per °C stability

Response Time

300 milliseconds typical

Isolation

Full 3-way isolation: input, output, power, 1200 VRMS min.
 600 VACp or 600 VDC common mode protection
 75 dB minimum common mode rejection
 Simultaneous 50 Hz and 60 Hz rejection



[Applications Link
api-usa.com/apps](http://api-usa.com/apps)

**Free Factory
I/O Setup!**

Housing and Connectors

IP 40, requires vertical installation on a 35 mm DIN rail inside a panel or enclosure
 For use in Pollution Degree 2 Environment
 Four 4-terminal removable connectors, 14 AWG max. wire size

Power

85-265 VAC, 50/60 Hz or 60-300 VDC, 3 W maximum
 D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 3 W maximum

Dimensions

Height includes connectors
 0.89" W x 4.62" H x 4.81" D (22.5 x 117 x 122 mm)

Description

The APD 8000 accepts a DC, potentiometer, thermocouple, RTD or thermistor input and provides an optically isolated and linearized DC voltage or current output. The input is sampled, digitally converted (and linearized for temperature sensors), and then passed through an optocoupler to the output stage.
 Full 3 way isolation (input, output, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.

The input type and range, and output type and range are field configurable. This provides a versatile solution that works with all commonly available sensors.

Microprocessor-based linearization uses 41 to 55 segments or up to a 14th order polynomial depending on the sensor type.

The input type is set with switches and its range is configured using front buttons, a multimeter and an input simulator.

The low noise 18 bit analog output is isolated and can be set up for common voltage and milliamp output types.

How to Order

Models are field rangeable. If I/O is not specified, default settings are type J thermocouple, 0-500°C, 4-20 mA output. For free setup specify the following.

DC: Range and mV, volts, or mA
 Temperature: Range in °F or °C (for temperature input)
 T/C: Thermocouple type, burnout setting
 RTD: Model/type, resistance, curve, number of wires
 If 4 wire: with or without current rotation
 Thermistor: Sensor model/type, resistance
 Custom: Complete sensor data over temperature range
 Output: Range and type (mV, V, mA)

| Model | Description | Power |
|------------|------------------------------|------------------------------------|
| APD 8000 | Universal input to DC output | 85-265 VAC, 50/60 Hz or 60-300 VDC |
| APD 8000 D | isolated transmitter | 9-30 VDC or 10-32 VAC |

Sink or Source mA Output 1 2 3 4 Removable Plugs

5 6 7 8

Setup and Status LED

Adjustable Output Test Function

Zero and Span for Output

Input LoopTracker LED

Universal Input



See Wiring Diagrams on Next Page

Universal Power

Output Sink/Source Versatility

Standard on the APD 8000 is a 20 VDC loop excitation supply for the milliamp output. The output can be selectively wired for sinking or sourcing allowing use with a powered or unpowered milliamp device.

LoopTracker

An API exclusive feature includes a green LoopTracker LED that varies in intensity with changes in the process input signal. It provides a quick visual picture of your process input at all times and can greatly aid in saving time during initial startup and troubleshooting.

Output Test

An API exclusive feature includes an output test switch to provide a fixed output (independent of the input) when pressed. The output test greatly aids in saving time during initial startup and/or troubleshooting.

The test output level is adjustable from 0 to 100% of the output span.

Options and Accessory

Options—add to end of model number

- NC5** 5 point NIST traceable calibration certificate
- NC11** 11 point NIST traceable calibration certificate
- U** Conformal coating for moisture resistance
- R** Reverse acting output

Accessory—order as separate line item

- API BP4** Spare removable 4 terminal plug, black

Note: An appropriate simulator and a multimeter are required for setup.

Free Setup: We can set up your I/O ranges at no extra charge. See the configuration worksheet on page 8. Please provide the exact sensor type, input range, and output range on your order.

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 are 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

Select ranges before installation. A thermistor input or a 4 wire RTD with current rotation input requires changing an internal jumper. Use the tables on the next pages to select the I/O ranges and jumper settings. The module side label lists output ranges. Ranges can also be found at api-usa.com/8000

Check the model/serial number label for module power, options, or custom range information. A custom range uses switch settings described in the Custom Range Table on page 7.

Models with R reverse acting output use the same switch settings, except the output range is reversed (4-20 mA is 20-4 mA).

1. Set switches A, B, and C from the table to set input type and range.
2. Set switches D and E from the table to set the output range and set switch E: V for voltage or I for current output.

For output ranges that fall between the listed ranges use the next highest setting. The output can be trimmed using the Output Level Adjustment procedure.

Electrical Connections

See wiring diagrams at right. A multimeter and a signal or temperature simulator are required for setup. Observe polarity. If the output does not function, check wiring and polarity.

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

Input

The sensor input is connected as shown in the wiring diagrams at right. If a custom input was specified, see the model/serial number label for sensor type, range, or options. You device must provide loop power for a milliamp input.

Output

For milliamp ranges, determine if your device 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 terminals if it provides power to the loop.

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.

Range Calibration

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

1. Connect a multimeter to the output terminals 2 and 3, or 3 and 4 depending on output type. See wiring diagram at right.
2. Connect an appropriate VDC, mADC, potentiometer or temperature simulator to the input of the module.
3. Connect power to the unit (terminals 13, 14, and 16) and apply power to the module.
4. Wait until the yellow Status LED blinks (once per second).

Low End Input Calibration

5. Use the simulator to apply the low end of the input signal.
6. Push the **Set** button to store the low end input value.
7. The Status LED will turn on to indicate the reading was saved.
8. Use the **Up** and **Down** buttons to adjust the output to the desired low output reading. For example: 4 mA for a 4-20 mA output or -10 V for a ±10V output.
9. Press and release the **Set** button to store the low output.

High End Input Calibration

10. Wait until the yellow Status LED blinks (once per second).
11. Use the simulator to apply the high end of the input signal.

12. Push the **Set** button to store the high end input value.
13. The Status LED will turn on to indicate the reading was saved.
14. Use the **Up** and **Down** buttons to adjust the output to the desired high output reading (i.e. 20 mA for a 4-20 mA output).
15. Press and release the **Set** button to store the high output.

Blinking Yellow LED Setup Error Codes

If an error occurred or invalid selection was made, the yellow Status LED blinks an error code. Check switches A, B, C, and input wiring.

- | | |
|---------------------------------------|--|
| 2 1 Invalid sensor selected | |
| 2 2 Invalid pot. excitation selected | |
| 2 3 Invalid RTD selected | |
| 2 4 Invalid thermistor selected | |
| 2 5 Invalid T/C selected | |
| 2 6 Invalid direct DC selected | |
| 2 7 Invalid input setting (Zero>Span) | |

Output Test Level Adjustment

16. Wait until the Status LED turns on and stays on.
 17. Use the **Up** and **Down** buttons to adjust the test output to the desired level (i.e. 12 mA for a 4-20 mA output).
 18. Press and release the **Set** button to store the test output.
 19. Wait until the Status LED starts blinks once per second.
 20. To change any value, turn off the power and repeat steps 1 to 19.
- Saving Setup**
21. Press and release the **Set** button to store the settings in memory. The Status LED will turn on during the storing process.
 22. Once the Status LED turns off, setup and configuration is complete. Turn off power to the unit and remove the simulator and multimeter.

Adjusting Output After Installation

It may be necessary to fine-tune the output signal after installation to account for offset, tare, lead length, or operating temperature.

1. Press and release the **Set** button. This will turn on the yellow Status LED.
2. Use the **Up** and **Down** buttons to adjust the output to the desired level. The Status LED will turn off during the adjustment.
3. Once the desired output level has been met, press and release the **Set** button to save the adjustment. The "Status" LED will flash indicating that the change has been made.

The unit has an auto Zero/Span detection for knowing which to adjust. If the output signal is greater than 50% of the Span, the unit will adjust the output signal Span.

If the output signal is less than 50% of the Span, the unit will adjust the output signal Zero.

Changing I/O Setup

To reset the unit back to factory default without changing any input switch settings press and hold the **Set** button while the module is being powered up.

If you change the input switch setting, the unit will automatically start in setup mode to allow you to calibrate and store your new configuration.

Output Test Function

When the **Test** button is pressed 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 pressed again, the output will return to normal. The button allows hands-free operation of the Test Mode.

The Test level can be adjusted by using the **Up** and **Down** buttons. The level can be saved by pressing the **Set** button, or it can default back to the setup value by not pressing the **Set** button.

Operation

The APD 8000 accepts a DC, potentiometer, or temperature input and provides a linearized and optically isolated DC voltage or current output.

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.

The yellow status LED provides a visual indication of operational modes.

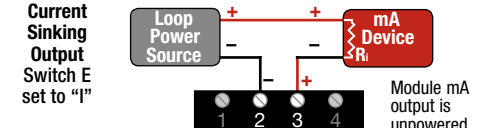
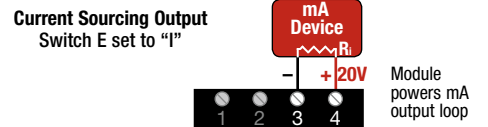
- Normal operation: Off
- Push-to-Test mode: Steadily on
- User setup mode: Blinking once per second

Note that it may be difficult to see the LEDs under bright lighting conditions.

Blinking Yellow LED Operational Error Codes

If an error occurs during operation, the yellow Status LED blinks an error code. Check sensor, wiring, or consult factory.

- | | |
|--|--|
| 1 1 Analog-digital converter out-of-range | |
| 1 2 Sensor under range | |
| 1 3 Sensor over range | |
| 1 4 CJC sensor abnormal range | |
| 1 5 CJC failure | |
| 1 6 Hard ADC out-of-range | |
| 1 7 Sensor hard fault: Open circuit, hard ADC fault, or hard CJC fault | |

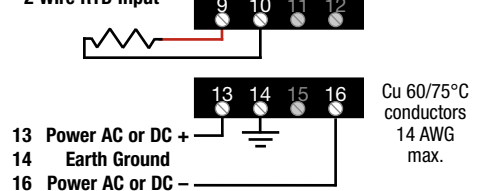


Yellow status LED Setup: blinks once per second
Off: normal operation
2 digit code: error code

To maintain full isolation and avoid malfunctions, do not connect power supplies in common with input, output or unit power.

Do not connect any devices to unused terminals.

Green LoopTracker LED brightness varies with input level





To avoid damage to the module, do not make any connections to unused terminals

Wire terminal torque
0.5 to 0.6 Nm or
4.4 to 5.3 in-lbs

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 clip the lower mount with spring clips to the bottom edge of DIN rail.
2. Push front of module upward until upper mount snaps into place.

Removal

Avoid shock hazards! Turn signal input, output, and power off before removing module.

1. Push up on bottom back of module.
2. Tilt the 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.



Range Table: Thermocouple

| | | |
|----------|---|---|
| Switch A | 7 | Single-Ended setting for grounded or ungrounded thermocouples |
| Switch A | 8 | Differential setting for ungrounded thermocouples or thermocouples operating in the negative mV range (typically below 0°C) |

For models with "R" option, output ranges are reversed

| Thermocouple Type | Output Switches | ±10 V | 0-10 V | ±5 V | 2-10 V | 0-8 V | 0-5 V | 1-5 V | 0-4 V | 0-2 V | 0-1 V | 0-20 mA | 4-20 mA | 0-16 mA | 0-10 mA | 2-10 mA | 0-8 mA | 0-4 mA | 0-2 mA |
|-------------------|-----------------|-------|--------|------|--------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| | | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE | BCDE |
| B | Upscale | 195V | 193V | 194V | 197V | 192V | 199V | 196V | 191V | 198V | 190V | 193I | 197I | 192I | 199I | 196I | 191I | 198I | 190I |
| B | Downscale | 1A5V | 1A3V | 1A4V | 1A7V | 1A2V | 1A9V | 1A6V | 1A1V | 1A8V | 1A0V | 1A3I | 1A7I | 1A2I | 1A9I | 1A6I | 1A1I | 1A8I | 1A0I |
| B | None | 1B5V | 1B3V | 1B4V | 1B7V | 1B2V | 1B9V | 1B6V | 1B1V | 1B8V | 1B0V | 1B3I | 1B7I | 1B2I | 1B9I | 1B6I | 1B1I | 1B8I | 1B0I |
| C | Upscale | 295V | 293V | 294V | 297V | 292V | 299V | 296V | 291V | 298V | 290V | 293I | 297I | 292I | 299I | 296I | 291I | 298I | 290I |
| C | Downscale | 2A5V | 2A3V | 2A4V | 2A7V | 2A2V | 2A9V | 2A6V | 2A1V | 2A8V | 2A0V | 2A3I | 2A7I | 2A2I | 2A9I | 2A6I | 2A1I | 2A8I | 2A0I |
| C | None | 2B5V | 2B3V | 2B4V | 2B7V | 2B2V | 2B9V | 2B6V | 2B1V | 2B8V | 2B0V | 2B3I | 2B7I | 2B2I | 2B9I | 2B6I | 2B1I | 2B8I | 2B0I |
| D | Upscale | 395V | 393V | 394V | 397V | 392V | 399V | 396V | 391V | 398V | 390V | 393I | 397I | 392I | 399I | 396I | 391I | 398I | 390I |
| D | Downscale | 3A5V | 3A3V | 3A4V | 3A7V | 3A2V | 3A9V | 3A6V | 3A1V | 3A8V | 3A0V | 3A3I | 3A7I | 3A2I | 3A9I | 3A6I | 3A1I | 3A8I | 3A0I |
| D | None | 3B5V | 3B3V | 3B4V | 3B7V | 3B2V | 3B9V | 3B6V | 3B1V | 3B8V | 3B0V | 3B3I | 3B7I | 3B2I | 3B9I | 3B6I | 3B1I | 3B8I | 3B0I |
| E | Upscale | 495V | 493V | 494V | 497V | 492V | 499V | 496V | 491V | 498V | 490V | 493I | 497I | 492I | 499I | 496I | 491I | 498I | 490I |
| E | Downscale | 4A5V | 4A3V | 4A4V | 4A7V | 4A2V | 4A9V | 4A6V | 4A1V | 4A8V | 4A0V | 4A3I | 4A7I | 4A2I | 4A9I | 4A6I | 4A1I | 4A8I | 4A0I |
| E | None | 4B5V | 4B3V | 4B4V | 4B7V | 4B2V | 4B9V | 4B6V | 4B1V | 4B8V | 4B0V | 4B3I | 4B7I | 4B2I | 4B9I | 4B6I | 4B1I | 4B8I | 4B0I |
| G | Upscale | 595V | 593V | 594V | 597V | 592V | 599V | 596V | 591V | 598V | 590V | 593I | 597I | 592I | 599I | 596I | 591I | 598I | 590I |
| G | Downscale | 5A5V | 5A3V | 5A4V | 5A7V | 5A2V | 5A9V | 5A6V | 5A1V | 5A8V | 5A0V | 5A3I | 5A7I | 5A2I | 5A9I | 5A6I | 5A1I | 5A8I | 5A0I |
| G | None | 5B5V | 5B3V | 5B4V | 5B7V | 5B2V | 5B9V | 5B6V | 5B1V | 5B8V | 5B0V | 5B3I | 5B7I | 5B2I | 5B9I | 5B6I | 5B1I | 5B8I | 5B0I |
| J | Upscale | 695V | 693V | 694V | 697V | 692V | 699V | 696V | 691V | 698V | 690V | 693I | 697I | 692I | 699I | 696I | 691I | 698I | 690I |
| J | Downscale | 6A5V | 6A3V | 6A4V | 6A7V | 6A2V | 6A9V | 6A6V | 6A1V | 6A8V | 6A0V | 6A3I | 6A7I | 6A2I | 6A9I | 6A6I | 6A1I | 6A8I | 6A0I |
| J | None | 6B5V | 6B3V | 6B4V | 6B7V | 6B2V | 6B9V | 6B6V | 6B1V | 6B8V | 6B0V | 6B3I | 6B7I | 6B2I | 6B9I | 6B6I | 6B1I | 6B8I | 6B0I |
| K | Upscale | 795V | 793V | 794V | 797V | 792V | 799V | 796V | 791V | 798V | 790V | 793I | 797I | 792I | 799I | 796I | 791I | 798I | 790I |
| K | Downscale | 7A5V | 7A3V | 7A4V | 7A7V | 7A2V | 7A9V | 7A6V | 7A1V | 7A8V | 7A0V | 7A3I | 7A7I | 7A2I | 7A9I | 7A6I | 7A1I | 7A8I | 7A0I |
| K | None | 7B5V | 7B3V | 7B4V | 7B7V | 7B2V | 7B9V | 7B6V | 7B1V | 7B8V | 7B0V | 7B3I | 7B7I | 7B2I | 7B9I | 7B6I | 7B1I | 7B8I | 7B0I |
| M | Upscale | 895V | 893V | 894V | 897V | 892V | 899V | 896V | 891V | 898V | 890V | 893I | 897I | 892I | 899I | 896I | 891I | 898I | 890I |
| M | Downscale | 8A5V | 8A3V | 8A4V | 8A7V | 8A2V | 8A9V | 8A6V | 8A1V | 8A8V | 8A0V | 8A3I | 8A7I | 8A2I | 8A9I | 8A6I | 8A1I | 8A8I | 8A0I |
| M | None | 8B5V | 8B3V | 8B4V | 8B7V | 8B2V | 8B9V | 8B6V | 8B1V | 8B8V | 8B0V | 8B3I | 8B7I | 8B2I | 8B9I | 8B6I | 8B1I | 8B8I | 8B0I |
| N | Upscale | 995V | 993V | 994V | 997V | 992V | 999V | 996V | 991V | 998V | 990V | 993I | 997I | 992I | 999I | 996I | 991I | 998I | 990I |
| N | Downscale | 9A5V | 9A3V | 9A4V | 9A7V | 9A2V | 9A9V | 9A6V | 9A1V | 9A8V | 9A0V | 9A3I | 9A7I | 9A2I | 9A9I | 9A6I | 9A1I | 9A8I | 9A0I |
| N | None | 9B5V | 9B3V | 9B4V | 9B7V | 9B2V | 9B9V | 9B6V | 9B1V | 9B8V | 9B0V | 9B3I | 9B7I | 9B2I | 9B9I | 9B6I | 9B1I | 9B8I | 9B0I |
| P | Upscale | A95V | A93V | A94V | A97V | A92V | A99V | A96V | A91V | A98V | A90V | A93I | A97I | A92I | A99I | A96I | A91I | A98I | A90I |
| P | Downscale | AA5V | AA3V | AA4V | AA7V | AA2V | AA9V | AA6V | AA1V | AA8V | AA0V | AA3I | AA7I | AA2I | AA9I | AA6I | AA1I | AA8I | AA0I |
| P | None | AB5V | AB3V | AB4V | AB7V | AB2V | AB9V | AB6V | AB1V | AB8V | AB0V | AB3I | AB7I | AB2I | AB9I | AB6I | AB1I | AB8I | AB0I |
| R | Upscale | B95V | B93V | B94V | B97V | B92V | B99V | B96V | B91V | B98V | B90V | B93I | B97I | B92I | B99I | B96I | B91I | B98I | B90I |
| R | Downscale | BA5V | BA3V | BA4V | BA7V | BA2V | BA9V | BA6V | BA1V | BA8V | BA0V | BA3I | BA7I | BA2I | BA9I | BA6I | BA1I | BA8I | BA0I |
| R | None | BB5V | BB3V | BB4V | BB7V | BB2V | BB9V | BB6V | BB1V | BB8V | BB0V | BB3I | BB7I | BB2I | BB9I | BB6I | BB1I | BB8I | BB0I |
| S | Upscale | C95V | C93V | C94V | C97V | C92V | C99V | C96V | C91V | C98V | C90V | C93I | C97I | C92I | C99I | C96I | C91I | C98I | C90I |
| S | Downscale | CA5V | CA3V | CA4V | CA7V | CA2V | CA9V | CA6V | CA1V | CA8V | CA0V | CA3I | CA7I | CA2I | CA9I | CA6I | CA1I | CA8I | CA0I |
| S | None | CB5V | CB3V | CB4V | CB7V | CB2V | CB9V | CB6V | CB1V | CB8V | CB0V | CB3I | CB7I | CB2I | CB9I | CB6I | CB1I | CB8I | CB0I |
| T | Upscale | D95V | D93V | D94V | D97V | D92V | D99V | D96V | D91V | D98V | D90V | D93I | D97I | D92I | D99I | D96I | D91I | D98I | D90I |
| T | Downscale | DA5V | DA3V | DA4V | DA7V | DA2V | DA9V | DA6V | DA1V | DA8V | DA0V | DA3I | DA7I | DA2I | DA9I | DA6I | DA1I | DA8I | DA0I |
| T | None | DB5V | DB3V | DB4V | DB7V | DB2V | DB9V | DB6V | DB1V | DB8V | DB0V | DB3I | DB7I | DB2I | DB9I | DB6I | DB1I | DB8I | DB0I |

Internal Jumper for 4 Wire RTD with Current Rotation Input

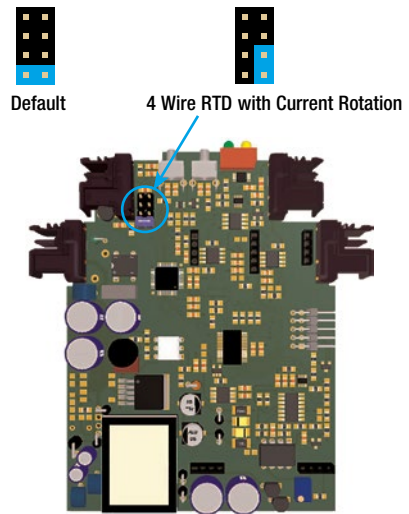
To use the 4 wire RTD with current rotation input, an internal jumper must be moved by following the procedure below.
This measuring method eliminates errors from parasitic millivolts generated by dissimilar metal connections.

1. Remove all power from the module, unplug all connectors, and remove unit from DIN rail.
2. Using a small flat-blade screwdriver remove the front panel as shown.
3. Note the locations of the seven tabs attaching the side cover.
4. Using a small flat-blade screwdriver gently pry the tab away from the housing. Start with the large tab at the rear of the unit, and work towards the front while gently pulling up on the side cover.
5. When all tabs are unlatched, remove the side cover.
6. Pull it out of its holder and place it in the location shown for a thermistor input.
7. Align the side cover and snap into place making sure all seven tabs are engaged. Snap front cover back into place. Reinstall unit.

Cover Removal



Internal Jumper



For models with "R" option, output ranges are reversed

| 4 Wire RTD Current Rotation | Output Switches | ±10 V | 0-10 V | ±5 V | 2-10 V | 0-8 V | 0-5 V | 1-5 V | 0-4 V | 0-2 V | 0-1 V | 0-20 mA | 4-20 mA | 0-16 mA | 0-10 mA | 2-10 mA | 0-8 mA | 0-4 mA | 0-2 mA |
|--------------------------------|--------------------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| | | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE |
| Cu-10 | 0.00427 | 5185V | 5183V | 5184V | 5187V | 5182V | 5189V | 5186V | 5181V | 5188V | 5180V | 5183I | 5187I | 5182I | 5189I | 5186I | 5181I | 5188I | 5180I |
| Cu-100 | 0.00427 | 5285V | 5283V | 5284V | 5287V | 5282V | 5289V | 5286V | 5281V | 5288V | 5280V | 5283I | 5287I | 5282I | 5289I | 5286I | 5281I | 5288I | 5280I |
| Ni-100 | 0.00618 | 5385V | 5383V | 5384V | 5387V | 5382V | 5389V | 5386V | 5381V | 5388V | 5380V | 5383I | 5387I | 5382I | 5389I | 5386I | 5381I | 5388I | 5380I |
| Ni-120 | 0.00672 | 5485V | 5483V | 5484V | 5487V | 5482V | 5489V | 5486V | 5481V | 5488V | 5480V | 5483I | 5487I | 5482I | 5489I | 5486I | 5481I | 5488I | 5480I |
| Ni-Fe-500 | 0.00518 | 5585V | 5583V | 5584V | 5587V | 5582V | 5589V | 5586V | 5581V | 5588V | 5580V | 5583I | 5587I | 5582I | 5589I | 5586I | 5581I | 5588I | 5580I |
| Ni-Fe-1000 | 0.00527 | 5685V | 5683V | 5684V | 5687V | 5682V | 5689V | 5686V | 5681V | 5688V | 5680V | 5683I | 5687I | 5682I | 5689I | 5686I | 5681I | 5688I | 5680I |
| Ni-Fe-2000 | 0.00527 | 5785V | 5783V | 5784V | 5787V | 5782V | 5789V | 5786V | 5781V | 5788V | 5780V | 5783I | 5787I | 5782I | 5789I | 5786I | 5781I | 5788I | 5780I |
| Pt-10 | 0.00385 | 58A5V | 58A3V | 58A4V | 58A7V | 58A2V | 58A9V | 58A6V | 58A1V | 58A8V | 58A0V | 58A3I | 58A7I | 58A2I | 58A9I | 58A6I | 58A1I | 58A8I | 58A0I |
| Pt-10 | 0.003911 | 58B5V | 58B3V | 58B4V | 58B7V | 58B2V | 58B9V | 58B6V | 58B1V | 58B8V | 58B0V | 58B3I | 58B7I | 58B2I | 58B9I | 58B6I | 58B1I | 58B8I | 58B0I |
| Pt-10 | 0.003916 | 58C5V | 58C3V | 58C4V | 58C7V | 58C2V | 58C9V | 58C6V | 58C1V | 58C8V | 58C0V | 58C3I | 58C7I | 58C2I | 58C9I | 58C6I | 58C1I | 58C8I | 58C0I |
| Pt-10 | 0.003926 | 58D5V | 58D3V | 58D4V | 58D7V | 58D2V | 58D9V | 58D6V | 58D1V | 58D8V | 58D0V | 58D3I | 58D7I | 58D2I | 58D9I | 58D6I | 58D1I | 58D8I | 58D0I |
| Pt-25 | 0.003926 | 59D5V | 59D3V | 59D4V | 59D7V | 59D2V | 59D9V | 59D6V | 59D1V | 59D8V | 59D0V | 59D3I | 59D7I | 59D2I | 59D9I | 59D6I | 59D1I | 59D8I | 59D0I |
| Pt-50 | 0.00385 | 5AA5V | 5AA3V | 5AA4V | 5AA7V | 5AA2V | 5AA9V | 5AA6V | 5AA1V | 5AA8V | 5AA0V | 5AA3I | 5AA7I | 5AA2I | 5AA9I | 5AA6I | 5AA1I | 5AA8I | 5AA0I |
| Pt-50 | 0.003911 | 5AB5V | 5AB3V | 5AB4V | 5AB7V | 5AB2V | 5AB9V | 5AB6V | 5AB1V | 5AB8V | 5AB0V | 5AB3I | 5AB7I | 5AB2I | 5AB9I | 5AB6I | 5AB1I | 5AB8I | 5AB0I |
| Pt-50 | 0.003916 | 5AC5V | 5AC3V | 5AC4V | 5AC7V | 5AC2V | 5AC9V | 5AC6V | 5AC1V | 5AC8V | 5AC0V | 5AC3I | 5AC7I | 5AC2I | 5AC9I | 5AC6I | 5AC1I | 5AC8I | 5AC0I |
| Pt-50 | 0.003926 | 5AD5V | 5AD3V | 5AD4V | 5AD7V | 5AD2V | 5AD9V | 5AD6V | 5AD1V | 5AD8V | 5AD0V | 5AD3I | 5AD7I | 5AD2I | 5AD9I | 5AD6I | 5AD1I | 5AD8I | 5AD0I |
| Pt-100 | 0.00385 | 5BA5V | 5BA3V | 5BA4V | 5BA7V | 5BA2V | 5BA9V | 5BA6V | 5BA1V | 5BA8V | 5BA0V | 5BA3I | 5BA7I | 5BA2I | 5BA9I | 5BA6I | 5BA1I | 5BA8I | 5BA0I |
| Pt-100 | 0.003911 | 5BB5V | 5BB3V | 5BB4V | 5BB7V | 5BB2V | 5BB9V | 5BB6V | 5BB1V | 5BB8V | 5BB0V | 5BB3I | 5BB7I | 5BB2I | 5BB9I | 5BB6I | 5BB1I | 5BB8I | 5BB0I |
| Pt-100 | 0.003916 | 5BC5V | 5BC3V | 5BC4V | 5BC7V | 5BC2V | 5BC9V | 5BC6V | 5BC1V | 5BC8V | 5BC0V | 5BC3I | 5BC7I | 5BC2I | 5BC9I | 5BC6I | 5BC1I | 5BC8I | 5BC0I |
| Pt-100 | 0.003926 | 5BD5V | 5BD3V | 5BD4V | 5BD7V | 5BD2V | 5BD9V | 5BD6V | 5BD1V | 5BD8V | 5BD0V | 5BD3I | 5BD7I | 5BD2I | 5BD9I | 5BD6I | 5BD1I | 5BD8I | 5BD0I |
| Pt-200 | 0.00385 | 5CA5V | 5CA3V | 5CA4V | 5CA7V | 5CA2V | 5CA9V | 5CA6V | 5CA1V | 5CA8V | 5CA0V | 5CA3I | 5CA7I | 5CA2I | 5CA9I | 5CA6I | 5CA1I | 5CA8I | 5CA0I |
| Pt-200 | 0.003911 | 5CB5V | 5CB3V | 5CB4V | 5CB7V | 5CB2V | 5CB9V | 5CB6V | 5CB1V | 5CB8V | 5CB0V | 5CB3I | 5CB7I | 5CB2I | 5CB9I | 5CB6I | 5CB1I | 5CB8I | 5CB0I |
| Pt-200 | 0.003916 | 5CC5V | 5CC3V | 5CC4V | 5CC7V | 5CC2V | 5CC9V | 5CC6V | 5CC1V | 5CC8V | 5CC0V | 5CC3I | 5CC7I | 5CC2I | 5CC9I | 5CC6I | 5CC1I | 5CC8I | 5CC0I |
| Pt-200 | 0.003926 | 5CD5V | 5CD3V | 5CD4V | 5CD7V | 5CD2V | 5CD9V | 5CD6V | 5CD1V | 5CD8V | 5CD0V | 5CD3I | 5CD7I | 5CD2I | 5CD9I | 5CD6I | 5CD1I | 5CD8I | 5CD0I |
| Pt-470 | 0.003926 | 5DD5V | 5DD3V | 5DD4V | 5DD7V | 5DD2V | 5DD9V | 5DD6V | 5DD1V | 5DD8V | 5DD0V | 5DD3I | 5DD7I | 5DD2I | 5DD9I | 5DD6I | 5DD1I | 5DD8I | 5DD0I |
| Pt-500 | 0.00385 | 5EA5V | 5EA3V | 5EA4V | 5EA7V | 5EA2V | 5EA9V | 5EA6V | 5EA1V | 5EA8V | 5EA0V | 5EA3I | 5EA7I | 5EA2I | 5EA9I | 5EA6I | 5EA1I | 5EA8I | 5EA0I |
| Pt-500 | 0.003911 | 5EB5V | 5EB3V | 5EB4V | 5EB7V | 5EB2V | 5EB9V | 5EB6V | 5EB1V | 5EB8V | 5EB0V | 5EB3I | 5EB7I | 5EB2I | 5EB9I | 5EB6I | 5EB1I | 5EB8I | 5EB0I |
| Pt-500 | 0.003916 | 5EC5V | 5EC3V | 5EC4V | 5EC7V | 5EC2V | 5EC9V | 5EC6V | 5EC1V | 5EC8V | 5EC0V | 5EC3I | 5EC7I | 5EC2I | 5EC9I | 5EC6I | 5EC1I | 5EC8I | 5EC0I |
| Pt-500 | 0.003926 | 5ED5V | 5ED3V | 5ED4V | 5ED7V | 5ED2V | 5ED9V | 5ED6V | 5ED1V | 5ED8V | 5ED0V | 5ED3I | 5ED7I | 5ED2I | 5ED9I | 5ED6I | 5ED1I | 5ED8I | 5ED0I |
| Pt-1000 | 0.00375 | 5F95V | 5F93V | 5F94V | 5F97V | 5F92V | 5F99V | 5F96V | 5F91V | 5F98V | 5F90V | 5F93I | 5F97I | 5F92I | 5F99I | 5F96I | 5F91I | 5F98I | 5F90I |
| Pt-1000 | 0.00385 | 5FA5V | 5FA3V | 5FA4V | 5FA7V | 5FA2V | 5FA9V | 5FA6V | 5FA1V | 5FA8V | 5FA0V | 5FA3I | 5FA7I | 5FA2I | 5FA9I | 5FA6I | 5FA1I | 5FA8I | 5FA0I |
| Pt-1000 | 0.003911 | 5FB5V | 5FB3V | 5FB4V | 5FB7V | 5FB2V | 5FB9V | 5FB6V | 5FB1V | 5FB8V | 5FB0V | 5FB3I | 5FB7I | 5FB2I | 5FB9I | 5FB6I | 5FB1I | 5FB8I | 5FB0I |
| Pt-1000 | 0.003916 | 5FC5V | 5FC3V | 5FC4V | 5FC7V | 5FC2V | 5FC9V | 5FC6V | 5FC1V | 5FC8V | 5FC0V | 5FC3I | 5FC7I | 5FC2I | 5FC9I | 5FC6I | 5FC1I | 5FC8I | 5FC0I |
| Pt-1000 | 0.003926 | 5FD5V | 5FD3V | 5FD4V | 5FD7V | 5FD2V | 5FD9V | 5FD6V | 5FD1V | 5FD8V | 5FD0V | 5FD3I | 5FD7I | 5FD2I | 5FD9I | 5FD6I | 5FD1I | 5FD8I | 5FD0I |

Range Table: Potentiometer

For models with "R" option, output ranges are reversed

| Potentiometer up to 1 MΩ | Output Switches | ±10 V | 0-10 V | ±5 V | 2-10 V | 0-8 V | 0-5 V | 1-5 V | 0-4 V | 0-2 V | 0-1 V | 0-20 mA | 4-20 mA | 0-16 mA | 0-10 mA | 2-10 mA | 0-8 mA | 0-4 mA | 0-2 mA |
|-----------------------------|--------------------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| | | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE | ABCDE |
| 4 V | 1 kΩ | 1405V | 1403V | 1404V | 1407V | 1402V | 1409V | 1406V | 1401V | 1408V | 1400V | 1403I | 1407I | 1402I | 1409I | 1406I | 1401I | 1408I | 1400I |
| 2 V | 500 Ω | 1205V | 1203V | 1204V | 1207V | 1202V | 1209V | 1206V | 1201V | 1208V | 1200V | 1203I | 1207I | 1202I | 1209I | 1206I | 1201I | 1208I | 1200I |
| 1 V | 100 Ω | 1105V | 1103V | 1104V | 1107V | 1102V | 1109V | 1106V | 1101V | 1108V | 1100V | 1103I | 1107I | 1102I | 1109I | 1106I | 1101I | 1108I | 1100I |

| Model | Power | Options—add to end of model number | Optional NIST Tracability—Choose One |
|-------------------------------------|------------------------------------|--|---|
| <input type="checkbox"/> APD 8000 | 85-265 VAC, 50/60 Hz or 60-300 VDC | <input type="checkbox"/> R Reverse acting output | <input type="checkbox"/> NC5 5 point NIST traceable calibration certificate |
| <input type="checkbox"/> APD 8000 D | 9-30 VDC or 10-32 VAC | <input type="checkbox"/> U Conformal coating for moisture resistance | <input type="checkbox"/> NC11 11 point NIST traceable calibration certificate |

Factory Default Settings—Choose One Input Type and One Output Type

We can set up the I/O ranges at no extra charge. Please provide the exact sensor type, input range, and output range on your order or use this handy sheet. Models are field rangeable. If I/O is not specified, default settings are type J thermocouple, 0-500°C, 4-20 mA output.

| DC Input | | | | RTD Input | RTD Wires | | Output |
|--|--|----------------------------------|----------------------------------|--|--|-------------------------|----------------------------------|
| <input type="checkbox"/> ±25 mV | <input type="checkbox"/> 0-2.5 V | <input type="checkbox"/> 0-4 V | <input type="checkbox"/> ±16 mA | <input type="checkbox"/> Cu-10, 0.00427 | <input type="checkbox"/> 2 wire | | <input type="checkbox"/> ±10 V |
| <input type="checkbox"/> ±100 mV | <input type="checkbox"/> ±8 V | <input type="checkbox"/> 0-5 V | <input type="checkbox"/> ±20 mA | <input type="checkbox"/> Cu-100, 0.00427 | <input type="checkbox"/> 3 wire | | <input type="checkbox"/> 0-10 V |
| <input type="checkbox"/> ±50 mV | <input type="checkbox"/> ±10 V | <input type="checkbox"/> 1-5 V | <input type="checkbox"/> 0-1 mA | <input type="checkbox"/> Ni-100, 0.00618 | <input type="checkbox"/> 4 wire | | <input type="checkbox"/> ±5 V |
| <input type="checkbox"/> ±.125 V | <input type="checkbox"/> 0-50 mV | <input type="checkbox"/> 0-8 V | <input type="checkbox"/> 0-2 mA | <input type="checkbox"/> Ni-120, 0.00672 | <input type="checkbox"/> 4 with current rotation | | <input type="checkbox"/> 2-10 V |
| <input type="checkbox"/> ±0.2 V | <input type="checkbox"/> 0-100 mV | <input type="checkbox"/> 0-10 V | <input type="checkbox"/> 0-4 mA | <input type="checkbox"/> Ni-Fe-500, 0.00518 | Low Value °F/°C | High Value °F/°C | <input type="checkbox"/> 0-8 V |
| <input type="checkbox"/> ±0.25 V | <input type="checkbox"/> 0.1-0.5 V | <input type="checkbox"/> 2-10 V | <input type="checkbox"/> 0-5 mA | <input type="checkbox"/> Ni-Fe-1000, 0.00527 | | | <input type="checkbox"/> 0-5 V |
| <input type="checkbox"/> ±0.5 V | <input type="checkbox"/> 0.2-1 V | <input type="checkbox"/> ±500 µA | <input type="checkbox"/> 0-8 mA | <input type="checkbox"/> Ni-Fe-2000, 0.00527 | | | <input type="checkbox"/> 1-5 V |
| <input type="checkbox"/> ±0.8 V | <input type="checkbox"/> 0-0.2 V | <input type="checkbox"/> ±1 mA | <input type="checkbox"/> 0-10 mA | <input type="checkbox"/> Pt-10, 0.00385 | | | <input type="checkbox"/> 0-4 V |
| <input type="checkbox"/> ±1 V | <input type="checkbox"/> 0-0.25 V | <input type="checkbox"/> ±2 mA | <input type="checkbox"/> 2-10 mA | <input type="checkbox"/> Pt-10, 0.003911 | | | <input type="checkbox"/> 0-2 V |
| <input type="checkbox"/> ±1.25 V | <input type="checkbox"/> 0-0.4 V | <input type="checkbox"/> ±2.5 mA | <input type="checkbox"/> 0-16 mA | <input type="checkbox"/> Pt-10, 0.003916 | | | <input type="checkbox"/> 0-1 V |
| <input type="checkbox"/> ±2 V | <input type="checkbox"/> 0-0.5 V | <input type="checkbox"/> ±4 mA | <input type="checkbox"/> 0-20 mA | <input type="checkbox"/> Pt-10, 0.003926 | | | <input type="checkbox"/> 0-20 mA |
| <input type="checkbox"/> ±2.5 V | <input type="checkbox"/> 0-0.8 V | <input type="checkbox"/> ±5 mA | <input type="checkbox"/> 4-20 mA | <input type="checkbox"/> Pt-25, 0.003926 | | | <input type="checkbox"/> 4-20 mA |
| <input type="checkbox"/> ±4 V | <input type="checkbox"/> 0-1 V | <input type="checkbox"/> ±8 mA | | <input type="checkbox"/> Pt-50, 0.00385 | | | <input type="checkbox"/> 0-16 mA |
| <input type="checkbox"/> ±5 V | <input type="checkbox"/> 0-2 V | <input type="checkbox"/> ±10 mA | | <input type="checkbox"/> Pt-50, 0.003911 | | | <input type="checkbox"/> 0-10 mA |
| Thermocouple Input | T/C Burnout | Low Value °F/°C | High Value °F/°C | <input type="checkbox"/> Pt-50, 0.003916 | | | <input type="checkbox"/> 2-10 mA |
| <input type="checkbox"/> J | <input type="checkbox"/> Upscale | | | <input type="checkbox"/> Pt-50, 0.003926 | | | <input type="checkbox"/> 0-8 mA |
| <input type="checkbox"/> K | <input type="checkbox"/> Downscale | | | <input type="checkbox"/> Pt-100, 0.00385 | | | <input type="checkbox"/> 0-4 mA |
| <input type="checkbox"/> T | <input type="checkbox"/> Last valid output | | | <input type="checkbox"/> Pt-100, 0.003911 | | | <input type="checkbox"/> 0-2 mA |
| <input type="checkbox"/> E | T/C Setting | | | <input type="checkbox"/> Pt-100, 0.003916 | | | Custom Output |
| <input type="checkbox"/> R | <input type="checkbox"/> Single-ended setting for grounded or ungrounded thermocouples | | | <input type="checkbox"/> Pt-100, 0.003926 | | | Low Value, Units |
| <input type="checkbox"/> S | <input type="checkbox"/> Differential setting for ungrounded thermocouples or thermocouples operating in the negative mV range (typically below 0°C) | | | <input type="checkbox"/> Pt-200, 0.00385 | | | |
| <input type="checkbox"/> N | | | | <input type="checkbox"/> Pt-200, 0.003911 | | | |
| <input type="checkbox"/> B | | | | <input type="checkbox"/> Pt-200, 0.003916 | | | High Value, Units |
| <input type="checkbox"/> C | | | | <input type="checkbox"/> Pt-200, 0.003926 | | | |
| <input type="checkbox"/> D | | | | <input type="checkbox"/> Pt-470, 0.003926 | | | |
| <input type="checkbox"/> G | | | | <input type="checkbox"/> Pt-500, 0.00385 | | | |
| <input type="checkbox"/> M | | | | <input type="checkbox"/> Pt-500, 0.003911 | | | |
| <input type="checkbox"/> P | | | | <input type="checkbox"/> Pt-500, 0.003916 | | | |
| Thermistor Input | Resistance | Low Value °F/°C | High Value °F/°C | <input type="checkbox"/> Pt-500, 0.003926 | | | |
| <input type="checkbox"/> 44004/44033 | 2.252 kΩ | | | <input type="checkbox"/> Pt-1000, 0.00375 | | | |
| <input type="checkbox"/> 44005/44030 | 3 kΩ | | | <input type="checkbox"/> Pt-1000, 0.00385 | | | |
| <input type="checkbox"/> 44007/44034 | 5 kΩ | | | <input type="checkbox"/> Pt-1000, 0.003911 | | | |
| <input type="checkbox"/> 44006/44031 | 10 kΩ | | | <input type="checkbox"/> Pt-1000, 0.003916 | | | |
| <input type="checkbox"/> 44008/44032 | 30 kΩ | | | <input type="checkbox"/> Pt-1000, 0.003926 | | | |
| <input type="checkbox"/> YSI 400 | 2.252 kΩ | | | | | | |
| <input type="checkbox"/> Spectrum 1003 | 1 kΩ | | | | | | |
| 3-Wire Potentiometer Input, 1 MΩ max. | | | | Custom Input—provide curve data if non-linear | | | |
| Excitation | Min. Span | Low Value Ω | High Value Ω | Sensor Type | | Low Value, Units | High Value, Units |
| <input type="checkbox"/> 4 V | 1 kΩ | | | | | | |
| <input type="checkbox"/> 2 V | 500 Ω | | | | | | |
| <input type="checkbox"/> 1 V | 100 Ω | | | | | | |

Ordering Example

APD 8000 D U NC11, Input: Pt-100, 0.00385, 3 wire, Output: 4-20 mA

APD 8000, low voltage powered, conformal coated circuit boards, 11 point NIST, input: 100 Ohm RTD, 385 curve, 3 wire, output: 4-20 mA output

| Date installed | Model | Serial number | Sensor type | Sensor range | Sensor burnout setting | Output range | A | B | C | D | E |
|----------------|-------|---------------|-------------|--------------|------------------------|--------------|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |