

DensityPRO Series of Gauges

Non-contacting, minimal source, high precision density gauges for challenging applications

The advanced Thermo Scientific™ DensityPRO Series are non-contacting, easy to use density gauges, that offer accurate material density measurements using a smaller source for a variety of challenging applications.

Features

- Highest precision over the widest temperature range
- Small source size for increased safety and lower capital costs
- Multiplex capability for independent control of four gauges with one microprocessor
- Designed to meet shock and vibration standards for all major industries
- Flexible configuration of integrated and remote transmitter options
- Common electronics and transmitter platform with our LevelPro Series of gauges

The Thermo Scientific DensityPRO series of non-contacting density gauges offers flexibility, durability and precision. Capable of the widest stable operating temperature range, the precision afforded by this level of stability improves process control.

Industrial Design

The non-contacting DensityPRO gauges are mounted on to the outside of the pipe or vessel. Using the principal of gamma transmission, energy is emitted by one of two types of radioactive sources, Cesium 137 or Cobalt 60. These sources are contained in a lead filled, steel-encapsulated housing. The



scintillation detector is mounted on the opposite side of the pipe or vessel. Tested and certified to meet numerous specifications for humidity, extreme temperature ranges, shock and vibration the DensityPRO series is designed to withstand varying conditions.

Operating Principles

The gamma energy emitted by the source is the transmitted through the pipe or vessel walls, process material and any insulation. The process reduces the energy relative to the density of the material and using energy attenuation, the reduced energy is then measured by a scintillation detector.

The electronics within the DensityPRO gauge then converts the energy reading

to a density measurement. The combination of unique signal processing and the design of the detector mount afford the DensityPRO series the ability to use a smaller source size without impacting precision, responsiveness and signal stability. The smaller source emits up to 50% less radiation depending on application and in turn, increases worker safety, reduces capital costs, and complies with global ECO requirements.

Flexible Configuration

The DensityPRO series can function as an integrated detector or with a remote transmitter. Multiplex capable, the DensityPRO series also offers independent control of up to four gauges with one microprocessor which allows for a reduced cost of ownership of multiple units. The user friendly EZ Cal II software includes multiple self diagnostic capabilities and alarms.



Thermo Scientific™ DensityPRO Gauge and Remote Transmitter

Thermo Scientific™ DensityPRO Series of Gauges

Specifications	
System performance	± 0.5% of span, typical
Stability	less than ± 0.05% or radiation change over six months
Ambient temperature (field)	± 0.009% of radiation change per degree °C
Physical Dimensions	Maximum of 2 seconds
Source type	Cs-137: 5 mCi to 10,000 mCi; Co-60: 1,000 mCi to 5,000 mCi
Source housing	Carbon steel, lead filled, polyurethane painted. Two-position shutter, locks in OFF (closed) position
Compressor	± 5% using NIST-traceable mass foil set
System architecture	32-bit, 60 MHz micro computer unit; Real-time clock (RTC). Lithium backup battery; voltage monitor for the RTC and SRAM circuits allows for configuration retentions in the event of power failure. Local I/O consisting of: four analog inputs; one 100-ohm Pt RTD input; two digital outputs (DO); two digital inputs (DI); one local serial communication port connection; one RS232/RS485 host serial communication port; connection for optional Intrinsically safety Input/output boards (ISIO); one +15 V power supply output; one Isolated 24 V output; one 10/100 Ethernet communication port with ESD protection; and one USB port.
Detection type	Poly Vinyl Toluene (PVT) scintillation detector
Detector stabilization	Electronic control without heater stabilization for optimum performance over operating temperature range
Integrated/Remote detector enclosure	316 stainless steel or carbon steel polyurethane painted; optional water-cooled detector for higher temperature applications
Transmitter	Stainless Steel; Nema 4X and IP66; 20 push button keypad; 8 line monochrome LCD
Power requirements	115/230 Vac, ± 10%, 50/60 Hz or 24 Vdc
Operating temperature	-40°C to +75°C (-40°F to +167°F) ambient
Inputs	Two 4 – 20 mA inputs; two 0 – 10 Vdc inputs; two Digital inputs (DI); provides contact input with internal +5 Vdc wetting voltage; temperature compensation circuitry with 100-ohm Platinum RTD, 3 or 4 wire
Outputs	4 – 20 mA output; Optional Intrinsically Safe
Input/Output	4 – 20 mA output; Isolated, loop-powered (default); Isolated, self-powered output; compliance with NAMUR standard
Communications	RS485 half duplex, RS232 full duplex, Profibus PA, HART, Foundation Fieldbus
Contact closure (relay) outputs	Two relays, SPDT Fully Seated at 250 Vac
Ratings and approvals	Vibration (sinusoidal): IEC 60068-2-6; Vibration (random): IEC 60068-2-64; Shock Resistance: IEC 60068-2-27; Composite temperature / humidity cyclic: IEC 60068-2-38

Ordering information

The Thermo Scientific DensityPRO series may require custom configuration based on your application. Please contact your local Thermo Fisher Scientific sales representative and we will work with you to accurately determine the best configuration for your process. To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Scientific products.

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