



Model NDG-421 Density Gauge

The Density Sensor Set

The Density Sensor set comprises:-

- Source holder with fitted radio isotope (source)
- Gamma detector in housing
- Pipe clamp assembly
- Optional Remote Transmitter

Source Holder Assembly

The source holder is a lead filled, steel fabrication designed to exceed the requirements of the Department of Health / Directorate Radiation Control. The isotope standardly used is Caesium¹³⁷, which provides a good balance between measurement precision, longevity and cost. Other isotopes may be required for special applications.

Depending on the source holder model, the shutter mechanism may be either a *Slide* type or *Rotary* type. The standard shutter mechanism is a two position device – “ON (Measure)” & “OFF” (Closed). Alternative (optional) source holder models can be provided which feature either **three-** or **four-position** shutter mechanisms. These additional shutter positions provide **Calibration References** for simplified calibration/ maintenance checks.

Servo actuation of the source shutter is also possible to allow automated calibration checking.

A single calibration point alone cannot reliably define the system calibration. At least two points are required. Our unique **four-position** shutter assembly provides for both a **Zero** reference and an on-scale **Span** calibration reference.

I-Tag®

The source holder may be equipped with our optional electronic Isotope Tag (I TAG®) which removes the problems encountered in traditional stamped stainless steel tags which could become illegible or lost. The I-Tag® allows for a far safer & more reliable system of reading Radio Nuclide & Source Holder information. This is because:

- The I-Tag® does not require the close up reading of the metal Tag (safety).
- The I-Tag® is read using non-contacting technology, thereby preventing possible contamination.
- The I-Tag® Reader allows easy (electronic) reading of the Source Tag – especially in those difficult to reach situations.
- The I-Tag® is read error free.
- Corrosion and environment effects are eliminated due to the construction materials used.



Gamma Detector Assembly

The detector housing is fabricated from mild steel (optionally others) and bolts to the process pipe via the Pipe Clamp.

An **optional safety shield** is available for fitting to the detector housing, to significantly reduce through radiation, such as could be experienced under empty pipe conditions.

Scintillation Detector

The scintillation detector used has a far greater sensitivity than that available from the previous Ion Chamber technology, resulting in greatly reduced isotope activities. Features of this detector are:

- Greater sensitivity
- Lower isotope activity.
- Lower radiation levels – greater margins of safety.

- Auto (electronic) shut down under empty pipe conditions (to protect the detector from over radiation damage).
- High noise immunity, RS-485 type output.

The density transmitter is incorporated into the detector housing, providing a compact arrangement.

Pipe Clamp Assembly

The pipe clamp bolts around the process pipe and provides attachment points for the Density Detector Assembly and Source Holder. The clamps are fabricated from mild steel (optionally others) and the mounting bolts are from stainless steel.

Specifications - NDG-421

Detector Type	High Sensitivity Scintillation Type
Detector Sensitivity	From 200 to 13 000 counts per second for 1 mR/h of ¹³⁷ Cs.
Transmitter	Integrated into detector electronics
Outputs	4 - 20 mA - Density or Control; RS-485 to UNIPRO® transmitter.
Field Bus support	Profibus PA, Profibus DP, Devicenet
Power Supply	Requires transient free, Instrumentation Quality power, either: 220 VAC, 50/60 Hz at 10 VA or; 110 VAC, 50/60 Hz at 10 VA or; 24V DC at 10 VA (optional).
Detector Enclosure	Epoxy painted, welded mild steel enclosure to IP 66 protection. - Stainless steel optional.
Operating Temp	Std: -10° to +45° Celsius. Others on request.
Mass	Subject to Isotope activity and source holder model

