Single Range Tritium Signal Processor Kit

Model: 7501-TSPKIT-001-C

Application

The Single Range Tritium Signal Processor is used to measure the amount of tritium directly in line of a process loop in real time and transmit a 0 – 10V output signal The unique small footprint detector head has the ability to handle up to 150 psig. It is leaktight and can operate at elevated temperatures. Up to 10 transmitters may be powered by one low cost power supply making this the most cost effective solution for a process with many detection locations.

Features

- Direct inside process line installation
- Low sensitivity of 1 µCi/m³
- 150 Psig Pressure vessel
- Operates at temperatures above 100°C
- Leak tight to 1x10-9
- 0 – 10 V output for integration into data systems
- User selectable scale of up to 10,000 units
- Low cost

Description

The Single Range Tritium Signal Processor is the most cost effective solution for measuring multiple locations in a process loop in real time. The detector and transmitter are packaged into a single small footprint device that can be located directly inline with your process. Only the power line, which can daisy chain up to 10 units, and the BNC voltage output are needed to measure the activity in your process. The Single Range Tritium Signal Processor is user selectable between 1µCi/m³ to 10,000 kCi/m³ with 10,000 measurement steps. For example one unit can measure from 1 µci/m³ to 10,000 µCi/m³ while the second unit in the line can measure from 10 mCi/m³ to 100 Ci/m³. The measurement signal is mapped to a voltage output from 1 mV to 10,000 mV which can be measured by a simple volt meter or incorporated into a 16 bit data acquisition system.

Tritium Signal Processor with 10cc ion chamber

The detector heads can be either a 1000cc or 10cc detection volume. The 1000cc volume gives the maximum amount of sensitivity to 1 µCi/m³ while the 10cc volume which has a “virtual wall” gives the highest range of 10,000 kCi/m³ with very little tritium hang up. Both detector heads have a small in-line footprint with VCR 8 connections which is ideal for installing into your current piping. They are both pressure vessels that can handle up to 150 psig, can be heated to 350°C without damage, and are 1x10-9 Helium Leak tight to conform to current tritium handling requirements. The detector heads are of stainless steel construction with a ceramic insulator and an electro polished interior to minimize tritium surface contamination. In the event of contamination the detectors are very easily flushed with air to decontaminate them.

The external electronics of a detector head is inside a leak tight enclosure that can be connected to a purge gas. This will explosion proof the detector heads so they may be placed inside a Hydrogen environment. Purging the electronics is also suggested if they detector head will be operated at temperatures higher then 50°C.

Specifications

Detection Sensitivity with 1000 cc Detector	1 µCi/m3
Detection Sensitivity with 10 cc Detector	1mCi/m3
Detection Range with 1000 cc Detector	0 to 10 Ci/m3
Detection Range with 10 cc Detector	0 to pure tritium
Measurement Steps with 1000 cc Detector	10,000 steps
Measurement Steps with 10 cc Detector	10,000 steps
Flow Rates	2000 cc/s
Flow Rates	1000 cc/s
Operating Pressure	Vacuum to 150 psig
Operating Temperature	15 °C to 200 °C
Operating Humidity	0% - 95% Relative Humidity
Leak Tightness	less than1x10-9 atm-cc/s He
Temperature Offset	Under 1 mCi/°C
Gamma Offset	0.1 Ci/m3 per 1 R/h gamma fieldLinear response from 10-3 R/h to 102 R/h
Tritium Recovery	Chamber bakeable up to 350°C
Tritium Wetted Parts	316L Stainless Steel, High density Ceramic
Fittings	VCR8
Instrument Response Time	less than 10 s
Analogue Output	0 - 10 V
Compliance	DOE Tritium Monitor Standard Rev 4 June 1999 ISO 9001

Power Requirements	135 VDC floating from ground, 0.1 A
Dimensions with 1000 cc Detector	4.5" diameter x 15" length
Dimensions with 10 cc Detector	3" diameter x 15" length