PORTABLE TRITIUM-IN-AIR MONITOR

MODEL: 7043

Compensation for Gamma background is crucial in tritium measurement, since 10 µSv/hr of Gamma field will generate 500 times the ionization generated by 37 kBq/m^3 of tritium. Tyne designed the 4-chamber cruciform (250 cc each) in the hand held tritium-in-air monitor with each chamber connected to an ultra sensitive electrometer amplifier and filter.

All signals pass through the ADC converter, and the microprocessor calculates and displays the tritium value. To cover high ranges of tritium a separate small ion chamber is used. Measurements such as flow from the solid-state flowmeter and chamber temperature are monitored by the micro-processor.

Instrument output includes analog (0-5 v, 4-20 mA); relay alarm contact (30 V DC, 1A) for operation of external equipment; and communication (RS232/RS485) to enable downloading or recording of information onto a computer. The TFT full colour LCD display mounted on the surface plate clearly displays instrument readings in both digital and graphic format to show real time measurements and trends.

The well balanced, easy to carry instrument can be placed on its end for easy visibility of the screen to operators working away from the instrument.

FEATURES

- Simplicity. Only one operating switch with four settings: Off, Sample, Pump and Set Up
- Gamma compensation is achieved using four (4) large ion chambers arranged in a cruciform configuration Two chambers are used for measuring an air sample and 2 are for compensation
- Less than 10% of the reading change in a 100 µSv/hr field
- High sensitivity. The total effective volume of the 2 active measuring chambers is 500 cc. The current amplification circuit employs ultra-low leakage technology. Each chamber has its own individual amplifier, increasing the Signal-Noise Ratio of the analog circuit
- Sensitivity is 37 kBq/m^3
- Radon compensation is provided by the analog filter circuit which is designed to separate the radon spike. The software can distinguish the radon spike from the tritium signal which occurs as a slow-change signal
- Ion-traps are built into each ion chamber
- Noble gas compensation. The inlet outlet ports of measuring and compensation chambers are accessible on the surface plate. By interposing a desiccant cartridge between the ports, the signal from HTO (DTO) can be calculated and displayed by the micro-processor
- Direct Gamma measurement is provided using an installed GM tube
- Purge/Decontamination is provided for all 4 chambers by the centrally installed cartridge heater controlled by the unit

SPECIFICATIONS

Sensitivity	37 kBq/m^3
Accuracy	±110 kBq/m^3 from 37 to 3700 kBq/m^3 ±±10% from 3.7 to 740 MBq/m^3
Range	37 kBq/m^3 to 740 MBq/m^3
Detector	4 matched chambers: 2 for measuring, 2 for compensation
Measuring chamber effective volume	500 cc (2 x 250cc measuring chambers)
Flow rate	1.4 L/m
Zero stability	±37 kBq/m^3
Background cancellation	Less than 10% of the reading change in 100 µSv/hr field (2.58 x 10^{-6} c/kg)
Radon compensation	Included in the software
Ion trap	Removes charge in the air before the measuring chambers
Dust filter	Built into the unit
Noble gas cancellation	Ports for air inlet/outlet of measuring chambers and compensation chambers accessible on surface plate so silica gel drier can be placed between chambers to compensate for presence of noble gas
Tritium Discrimination	Can discriminate in a field of HTO and elemental H3 using the silica gel drier
Purge/Decontamination	Chambers can be heated by a cartridge heater
Display	LCD display. Values (tritium and Gamma) shown in numerical format and graphic trend
Communication	Can be configured to RS232 (Short distance) or RS485 (Long distance)
Analog output	0-5 V linear or logarithmic voltage output
Power supply	2.5 V - 5 V external power supply, or 3 C-cell battery. Total power consumption is 150 mA
Alarm	Tritium, Gamma and low air flow alarms. Red LED light and sound by audible device.
Data logging	Tritium and Gamma values logged every minute with current time and date stamp
Size and weight	203 x 127 x 127 mm, 2.3 kg
Drier	Silica gel drier is not part of the standard equipment. It requires an additional accessories kit

Batteries installed in the handle are easily replaced without the need for opening the unit.

A powerful long-life pump can be used to draw air through a 6 meter tube. This allows the instrument to be used to measure the inside of rooms without the need to enter the room.

APPLICATIONS

Tyne Engineering's new handheld Tritium Monitor is designed to exacting quality standards to meet your Tritium-in-Air monitoring requirements.

It is a robust, portable instrument that uses all the latest technology. Adding this monitor to your collection of standard portable devices currently used in health physics monitoring increases your overall tritium monitoring capability.

southern scientific

Scientific House, The Henfield Business Park,
Shoreham Road, Henfield, West Sussex, BN5 9SL
Tel: +44 (0)1273 497600
Email: info@southernscientific.co.uk