Wall Mount Tritium-in-Air Monitor

Model: 7065

Application

Tyne Engineering's Model 7065 Wall Mounted Tritium-in-Air Monitor is an extension of our popular Model 7043 Portable Tritium Monitor. The 7065 is intended for room monitoring for both tritium and gamma with the convenience of simple wall mounting for ease of removal for calibration, maintenance or relocation.

Features

- Simple to use, with only one operating switch with four settings: Off, Sample, Pump, Set Up.
- Gamma Compensation with four large ion chambers arranged in a symmetrical configuration. Two chambers are used for measuring the air sample, and two are used for compensation.
- Better than 90% accurate in 20 mR/hr field.
- High Sensitivity. The current amplification circuit employs ultra-low leakage technology. Each chamber has its individual amplifier, improving the Signal-Noise Ratio of the analog circuit.
- Radon compensation is provided by the analog filter circuit designed to separate the radon spike from the tritium signal. The unit's software can distinguish the radon spike from the tritium signal occurring as a slow-change signal.
- Ion-traps are built into each ion chamber.
- Direct, wide range gamma measurement is provided using an installed GM tube.
- Decontamination is easily performed by purging the ion chambers whilst simultaneously heating them using a centrally installed cartridge heater.
- Customer's choice of hard-wired RS-232, Ethernet or an industry standard wireless connectivity.
- Self monitoring with low air flow alarm.

Tel: (289) 288-0490 / info2@tyne-engineering.com
www.tyne-engineering.com

Description

This instrument is designed for continuous tritium monitoring at a number of diverse locations in a nuclear facility. Communication can be via RS-232, Ethernet or Wireless system to a central radiation protection computer location. This provides near-real-time tritium and gamma monitoring at each location and is far superior to conventional central, manifold tritium detection systems.

Compensation for Gamma background is crucial in tritium measurement, since a gamma field of 1mR/Hr will generate 500 times the ionization generated by 1 uCi/m3 of tritium. Tyne designed the four ion chambers in this instrument in a symmetrical arrangement with each chamber connected to an ultra sensitive electrometer amplifier and filter. All signals pass through an ADC converter, and a micro-processor calculates and displays the measured tritium values. A separate, much smaller ion chamber is used to cover higher tritium concentration ranges. The microprocessor also monitors air flow rate through the instrument using a solid-state flow meter. It also controls the chamber temperatures during the heated purge cycle.

Instrument output includes external communication via RS232, Ethernet and industry standard wireless to enable downloading or recording of information on a central radiation protection computer. The thin-film transistor (TFT) color LCD display mounted on the surface plate clearly displays instrument readings in both digital and graphic format, showing real-time measurements and trends. A separate, large digit numerical display shows the current tritium values and is clearly visible at a distance.

The 7065 instrument is based on the same platform used in Tyne's successful 7043 handheld tritium in-air monitor. The wall mount version employs four ion chambers that are about 3 times larger than those used in the 7043 hand held instrument. This increases the sensitivity by a factor of three. The wall mounted instrument also employs a larger and more powerful, low noise, and high reliability pump. The pump is easily accessible by removing the front panel. The 7065 instrument also allows for easy removal from the wall mounted location for ease of maintenance, repair or calibration.

The larger ion chambers, configured in a compact internal module, enable a sensitivity that precludes the need for Methane or P-10 counting gases and the need to use less reliable flow proportional counting systems. The 7065 ion chambers are robust and reliable. If they do become contaminated, they can be purged by using an internally mounted heater whilst simultaneously pumping dry air through the ion chambers.

The unit employs a front panel mounted, high efficiency internal inlet air filter to ensure that the ion chambers do not become contaminated. If required, a sniffer probe adapter can be provided with a length of tubing and the filter mounted at the end. The sniffer allows users to locate suspected tritium leaks by sniffing around a seal or flange to help tracing of leak origins. The sniffer is supplied with 15 meters of flexible, chemically resistant tubing.

The front mounted LCD screen is touch sensitive and is used to change device settings and alarm levels. The instrument has both visual and audible alarm annunciation. The audible alarm can be cancelled without canceling the visual annunciation. The touch screen panel is accessed by a two level password system. One password provides higher level access to Health Physics personnel to set up the device and the lower level password provides restricted access enabling operators to adjust alarms or settings. The touch screen is augmented by use of a large digital read-out to provided better, longer distance visibility for operators.

This wall mounted unit is powered by internal power supplies and only needs a standard 120 VAC three prong outlet to operate.

Wall Mount Tritium-in-Air Monitor

Specifications

Measuring chamber effective volume	1.5 L, (2 X 0.75L)
Pump	Positive displacement gas pump: 12 VDC, flow rate up to 8 L/min, discharge pressure up to 30 psig, up to 90% relative vacuum.
Tritium measuring range	0.2µCi/m^3 (7,400Bq/ m^3) to 1Ci/m^3 (3.7E10 Bq/m^3)
Ion Chamber Configuration	Cruciform configuration of ion chambers: two for measuring and two for background compensation
Radiation measured	Total tritium and total gamma
Sensitivity	0.2µCi/m^3 (0.01 DAC)
Accuracy	0.4µCi/m^3 from 0 µCi/m^3 to 100µCi/ m^3; ±10% from 100µCi/ m^3 to 1Ci/ m^3;
Zero stability	±0.4µCi/ m^3;
Gamma measurement	Gamma is measured simultaneously with tritium. Measuring range is from 0.1mR/ h to 10 R/hr;
Radon compensation	Instrument provides radon compensation
Gamma background compensation	less than ±10% or 5µCi/m^3 reading change whichever is greater response to 20mR/Hr;
Ion trap	built into each ion chamber;
Flow rate	Up to 8 L/min
Response time	2s to 5s with 0-15 m air hose, within 30s with hose from 100 to 150m at 90% of signal
Drift	±3% per 24 hours, ±10% per 30 days;
Alarms	Local audio and visual alarms for tritium, gamma, air flow, detector failure and micro processor failure. Remote data and alarm display via RS-232 or analog output (0 to 3 VDC)
Alarm Response	< 30s with 2-150m hose;
Ion Chamber purge and decontamination	Chambers can be heated using an internal temperature controlled cartridge heater
Condensation Prevention	The heater cartridge temperature can be raised above ambient temperature to prevent condensation in the instrument
Communication port	RS232 (short distance)
Data Communication	Ethernet connection and Industrial wireless connectivity are optional per customer specification
Data Logging frequency	The tritium and gamma readings can be logged at a defined interval. Each data reading is date and time stamped.
Displays	One 2.8” TFT LCD touch screen display showing the values of tritium and gamma radiation in both numerical and graphical format. One LED screen 6 x ¾” digits showing tritium concentration.

Tel: (289) 288-0490 / info2@tyne-engineering.com
www.tyne-engineering.com

Wall Mount Tritium-in-Air Monitor

Specifications

Power supply	120 VAC (±10%) Standard 220VAC (±10%) upon request. Power consumption < 3A
Temperature	Operating Range 0 to 50°C degrees
Humidity	Operating range 0-90%, Non-condensing
Size	Approx 13.25" High x 8.1" Deep x 18.25" Wide;
Weight	Approx.: 25lb;
Mounting	Unit is designed for wall mounting on a pre-installed wall plate. Unit hangs from two upper hooks and is retained by a single screw at the base for positive and secure installation.

Note: **The User Manual is supplied with the instrument and training can be provided upon request.**

Agent Stamp / Business Card

Tel: (289) 288-0490 / info2@tyne-engineering.com
www.tyne-engineering.com