

Portable Monitors used in the Measurement of Airborne Tritium

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Portable tritium monitors have long been used in laboratories and nuclear power stations where highly trained, technically knowledgeable operators need to protect against events that could lead to tritium contamination. To ensure protection, they impose strict, demanding requirements on their tritium monitors. Operators are aware that improvements in modern electronics offer opportunities for better features, better performance and more stringent design specifications for their instruments.

Tyne Engineering Inc has compiled operator's comments and aspirations and using its own knowledge of available modern electronics, and having an understanding of the needs of the tritium community, Tyne has come up with suggested improvements.

A new portable tritium monitor containing five built-in ion chambers has been designed. The chambers are individually accessible to gas flow, and enable measurement discrimination between HTO and elemental tritium; between noble gasses and HTO, and between gamma and beta. The instrument has improved sensitivity because of ion chamber size, and the smallest ion chamber is designed for high tritium values. The challenge has been to contain these chambers in a package that does not compromise the instrument's size and weight.

Improved electronics have enabled Tyne to distinguish and eliminate radon measurements, choose units of measurement, establish set points and alarms, modify scales and times and perform otherwise complex measuring functions while still more than doubling the battery life over that of previously available instruments. Not only does this instrument discriminate against background gamma, but it also measures gamma directly through a built in gamma meter. Consideration has been made for heating, purging, and even ultrasonic cleaning of the instrument. Also due to modern electronics, software, and touch screen technology, this feature-rich package is even easier to use and understand than older, simpler instruments.

This new instrument goes a long way towards answering the concerns and requests of operators, and we believe creates a new generation of portable tritium monitors.