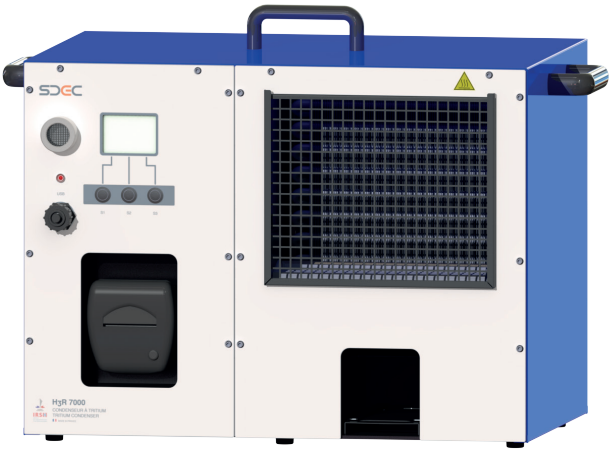
H3R 7000 TRITIUM CONDENSER

Vapour Tritium-in-air sampling by cryogenisation principle - IRSN / MARINE NATIONALE patent

The unit collects samples of Tritium in its vapour form and produces results in less than 40 minutes.



The sample obtained can be measured down to a detection limit of 0.01 Bq/m³ by deferred measurement using liquid scintillation.

The operating principle is based on a french patent which has been deposed at an international level by the French Institute of Radioprotection (I.R.S.N) and the Military School of Atomic Energy of the French Navy (E.A.M.E.A).

OPERATING PRINCIPLE

The H3R 7000 collects the Tritium in its vapour form by a cryogenisation process of the vapour water in ambient air. At the same time, it measures absolute humidity of this air to know with accuracy the water quantity per cubic meter of air. Absolute humidity is expressed in g/m³ or ml/m³.

On average, less than 40 minutes is needed to collect enough quantity of water to carry out a deferred measurement of Tritium activity contained in the water using liquid scintillation counting.

After measurement, the Tritium activity in air is expressed in Bq/m³.

$$\textit{Tritium-in-air activity (Bq/m³)} = \frac{\text{Tritium activity of measured volume (Bq)}}{\text{Measured volume (ml)}} \times \text{Absolute humidity of air (ml/m³)}$$

FEATURES

- Quick start mode.
- Deferred start: programming of date and time of sampling
- Real time measurement and calculation of the absolute humidity in ambient air in g/m³.
- Automatic drying by heating of the trapping circuit in order to avoid cross-contamination.
- USB output: data download on USB key.
- Integrated thermal printer: printing of data on sticker to place on sample flask.

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H3R 7000 TRITIUM CONDENSER

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BENEFITS

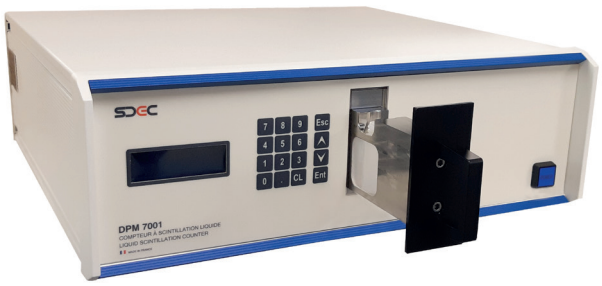
- Trapping yield of 100%: cryogenisation principle of the water vapour
- Trapping of Tritium in its vapour form either indoors or outside
- Fast trapping which allows several samples per day to be taken
- No dilution factor of the sample
- Detection limit which can be reached: 0.01 Bq/m³
- Ease of use and transportable
- Traceability: data recovery on USB key and printing of data on sticker to place on sample flask

TRAPPING EFFICIENCY

- Trapping yield HTO: 100%
- No dilution factor
- Detection limit: 0.01 Bq/m³
- Crossed contamination: 0.1%
- Average time of trapping: 40 minutes

TECHNICAL SPECIFICATIONS

- **Dimensions**: W x H x D = 580 x 390 x 400 mm
- **Weight**: 25 kg
- **Power supply**: 230 Volts / 50 Hz (also available 230 Volts / 60 Hz)
- **Power**: 2050 Watts max.
- **Protection**: differential circuit breaker (30mA) and fuse type delayed (6A).
- **Housing**: aluminium alloy
- **Paint**: EPOXY powder, decontaminable
- **Graphic backlit display 128 x 64 pixels**
- **Supplied with user manual, supply cable, 10 sampling flasks and one paper roller for thermic printer**



*For quick activity measurement on the field check our portable liquid scintillation counter: **DPM 7001** with dual photomultipliers*

REFERENCES

- E.A.M.E.A. (L.Tenailleau, Y.Baron)
- IRSN (D.Maro, D.Hebert)
- Patent IRSN - Marine Nationale N° FR2903490

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