

H3R 7000

Tritium Condenser



► The *H3R 7000* is an innovative instrument in the field of Tritium in air sampling. It 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 deposited 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).

Advantages

Trapping of Tritium in its vapour form either indoors or outside

Trapping yield of 100 % : cryogenisation principle of the water vapour

Fast trapping which allows several samples/day to be taken

No dilution factor of the samples

Detection limit : 0,01 Bq/m³

Easy of use and transport



► Operating principle of the H3R 7000

This equipment 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 is expressed in Becquerels, the algorithm to obtain a tritium activity given in Becquerels per cubic meter (Bq/m3) is as follows :

$$\text{Tritium activity of air (Bq/m}^3\text{)} = \frac{\text{Absolute humidity of air (ml/m}^3\text{)}}{\text{Sampled water volume (ml)}} \times \text{Tritium activity of sampled water volume (Bq)}$$

General Characteristics

► Technical datas

Weight : 25 kg

Power supply : 230 Volts / 50 Hz

Supply cable IEC

Dimensions : L x H x W = 580 x 390 x 400 mm

Protection : Differential circuit breaker (30mA)

Fuse type delayed (6,3 A)

Housing : Alliage Aluminium

Paint : EPOXY powder decontaminable

Front panel : Scratch proof

Graphic backlit display (128 x 64 pixels)

Operated by microprocessor & pilot software

Menu of use and navigation integrated

Vial holder with drawer

Delivered with user guide, supply cable and sampling vials.

► Functions integrated

- Quick start mode
- Measurement and calculation in real time of the absolute humidity in ambient air in g/m3
- Automatic calculation of trapping time depending on the required water quantity
- Automatic drying under high temperature of the trapping circuit to avoid a crossed contamination
- Selection of the drying time
- USB output : data recuperation on USB key
- Thermic printer integrated : printing of data on sticker to place on to sample vial

► Trapping efficiency

- Trapping efficiency HTO : 100%
- No dilution factor
- Detection limit : 0,01 Bq/m3
- Crossed contamination : 0,1%
- Average time of trapping : 30 to 40 minutes to obtain 10 ml of sample.

► Scientific references

- E.A.M.E.A (L.Tenailleau, Y.Baron)
- IRSN (D.Maro, D.Hebert)
- Patent deposited IRSN - French Navy
Patent n° : FR2903490