



Tritium monitoring has become increasingly prevalent in the nuclear industry with the regulators scrutinising the effective and accurate monitoring of all stack emissions.

The Lab Impex (LIS) HTO Gas Sampling System (HTO-GSS) uses a traditional method to determine activity levels being released into the atmosphere. The emission is passed through a bubbler system to allow collection of the gas in a liquid. The level of activity in the liquid (of specific volume) is then monitored at regular intervals and counted using a scintillation counter. This sample measurement is an indication of the activity released up the stack.

With the option of stack flow monitoring or totaliser, the system can be tailored for customer requirements and offers re-settable and cumulative flow totalisers.

The bubbler is housed in a glass fronted cabinet. All sample pipes are 6mm stainless steel, supplemented by PVC where necessary. The stack sample pipes are connected into the enclosure are normally via 10mm-10mm bulkhead fittings.

Four collection borosilicate glass bottles are used as a safeguard to ensure that moisture does not escape into the system.

The bottles are of narrow diameter to minimise surface evaporation and maximise sample exposure to the collection medium.

The operator determines the volume of air sampled and flow alarm outputs are provided and the collection bottles have capacity of up to 500ml but the system has the option of retro fitting other, smaller sized bottles via the same mounting hardware.

For further information regarding the performance characteristics and application of the Gas Sampling Systems please contact LIS directly.

- ***Cost effective monitoring of tritium emissions as required by current regulations.***
- ***Collection efficiencies of near 100%***
- ***System available for tritium carbon/carbon dioxide and sulphur monitoring (using different collecting media as appropriate)***
- ***Dual vacuum pump arrangement***
- ***Easy calibration system***

Information and specification contained within this publication may change without notice.



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General Specifications

Sampling
Specifically for HTO Sampling

Flow Rate

Sample air flow is adjustable 300 – 800 cc/min
Flow meters, are used to set up flow rate at 500cc/min producing a signal proportional to flow which in turn converts into the totaliser signal.

Totalised flow

The totalised flow signal is displayed in two formats (i.e. re-settable and non re-settable). A counter is incorporated to indicate the time period between sample changes.

Accuracy (Airflow) +/- 1%

Collecting Efficiency – 99%

Other Radioactive Gas Response
- No influence from other gases for each GSS#

Enclosure Characteristics

Dimensions– 100cm x 80cm x 30cm

Glass fronted cabinet

Weight - TBC

Enclosure Contents

2 Vacuum pumps (1 run and 1 spare)

Electrical control box which not only contains the main electrical isolation pump selection switch but also power supply for flow meters and terminations for alarm contacts.

Electrical Specifications

Signal
- 4 – 20 mA stack flow input (optional)

Voltage Requirement

- 230V external power supply
- 110V (available on request)

Power consumption

- 5A at 230V

Voltage Frequency

- 50Hz

Outputs

Alarms for high/low flow rate

Simultaneous Display

The system simultaneously displays the following to the operator.

Door open warning

Instantaneous air flow and volume accrued

- i.e
- i) *Sample flow*
 - ii) *Stack flow (optional)*
 - iii) *Accumulated sample flow (optional)*
 - iv) *Accumulated stack flow (optional)*

Calibration

The system has been designed to enable routine calibration in situ.

Other Information

Consumables

Bottles – Part No 4214/003 Item 10

Filters – Part No. BTS 493

Bubbler GSS additional versions available: -

GSS1 – Tritium

GSS2 – Carbon14

GSS3 – Sulphur