



Sir Galahad II

AUTOMATED ANALYSIS OF MERCURY IN GASEOUS PRODUCTS

with sensitivity and selectivity of atomic fluorescence



THERE'S MERCURY IN THE AIR...!

PSA developed the Sir Galahad as its first integrated product to measure mercury in ambient air, natural gas and stack emissions – building on the expertise of every stage in the analytical process that its scientists and engineers have acquired since 1983.

The Sir Galahad is the central component in all the products that PSA produces for the determination of mercury in gaseous samples either on-line or off-line.

Its great success is attributable to PSA's unique combination of the Sir Galahad gold-coated Amasil™ adsorption/desorption system and the Merlin atomic fluorescence spectrometry (AFS) system, which allows mercury to be determined at levels down to 0.1 picogram (pg) and over seven orders of magnitude.



PSA 10.525 Sir Galahad

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FEATURES

- **Atomic fluorescence:** Offers greater sensitivity and selectivity
- **Sensitivity:** Detection 0.1 pg absolute
- **Selectivity:** Specific for all mercury species
- **Linearity:** Wide linear dynamic range
- **Remote sample collection**
- **Portability:** Easily transported for use anywhere
- **Ease of use:** Minimal training required

The basic principle of the Sir Galahad is trap and purge utilising Amasil (gold impregnated silica traps) and the highly acclaimed Merlin detector based on atomic fluorescence.

PSA

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PSA continues to invest in its research programme to extend the benefits of its total systems approach to all customer segments in order to provide mercury speciation distribution as well as total mercury concentration. In addition, PSA offers engineered systems that can be tailored to meet client needs and satisfy safety considerations anywhere in the world.



SIR GALAHAD II

AMBIENT AIR

Sir Galahad II can monitor ambient air (for example, land-fill sites) continuously or off-line. It can measure total mercury, reactive gas mercury, or particulate mercury. PSA can draw representative samples using options such as parallel and sequential trapping, and heated traps.

COAL-FIRED UTILITIES

Since 1996 PSA has co-operated with various international partners, including the US EPA, the University of North Dakota Energy and Environmental Center (EERC) and the University of Western Kentucky, in the development of instrumentation able to provide accurate and reliable data for mercury in coal fired utilities. The results of these co-operations are PSA's specific systems for continuous emission monitoring (CEM) methods for stack gases.

NATURAL GAS

PSA's initial cooperation with the Institut Francais du Petrole in 1991 resulted in the application of the PSA 10.525 Sir Galahad to the measurement of mercury in natural gas.

The PSA 10.537 Pressure Letdown system was designed with particular consideration on choosing components able to fulfill essential safety requirements and specifically tolerate mercury. The Sir Galahad meets the requirements for the ISO 6978 & ATSM 6350 Mercury in Natural Gas methods both accurately and reliably, it also offers the advantage of spike recovery, enabling the integrity of measurements to be checked.

PSA's instrumentation for mercury in natural gas, including their sampling systems and speed loops was developed in conjunction with partners chosen specifically for their invaluable experience within the petrochemical industry.

PSA is proud of their ability to tailor systems to the specific on-site requirements of their clients, where our experienced team is able to reliably and effectively resolve issues such as including wet gas streams or sample streams with high H₂S content.



- PSA 10.515 Preconcentrator extends application of the Sir Galahad to liquid hydrocarbons
- Simple, easy-to-use unit involves no sample preparation
- Detection limit of 500pt for condensate samples
- Operates in both stand-alone mode or links direct to Sir Galahad



- PSA 10.534 Mercury Vapour Generator
- Validates Sir Galahad Calibration
- Checks integrity of entire system
- Programmable selection into measurement programme

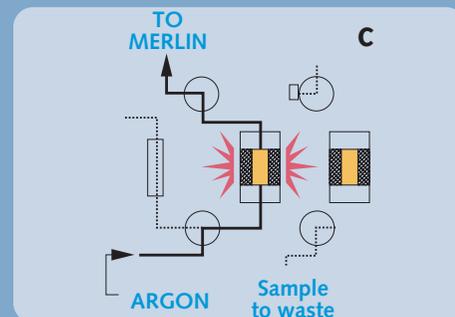
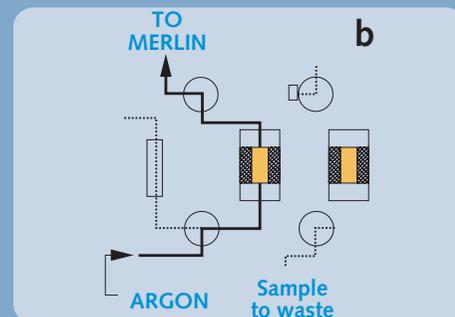
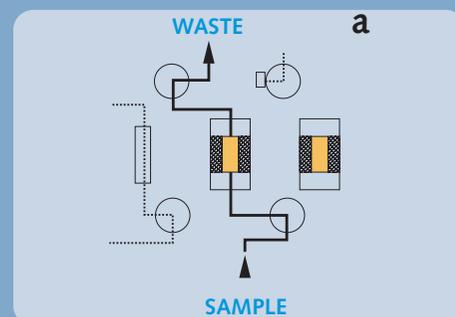


TECHNICAL SPECIFICATION

- Weight:** Approximately 20 kilos
- Height:** 185mm
- Width:** 445mm
- Depth:** 320mm
- Voltage:** 240 V AC at 50 Hz
120 V AC at 60 Hz
- Power:** 192 VA
- Class:** II

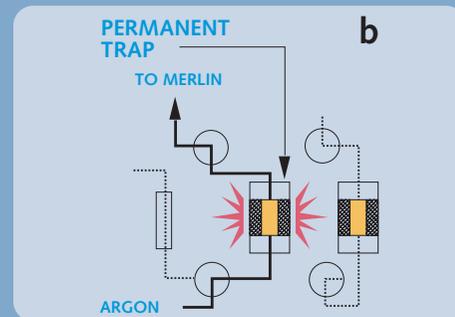
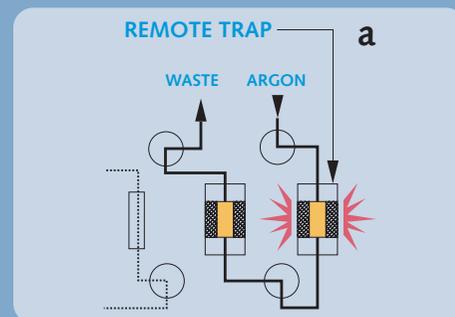
MODES OF ANALYSIS

CONTINUOUS MODE



Valve configurations for the collection, flushing and analysis cycles in continuous mode.

STATIC MODE



Valve configurations for analysing a remote sample.



- PSA 10.537 Pressure Letdown System
- Meets EExDIICT3
- Minimal carry over of mercury between samples.
- Specifically designed to sample gases at high level pressure
- Other specifications available on request

TYPICAL CONFIGURATION FOR THE DETERMINATION OF MERCURY IN GASEOUS MEDIA

AIR

Remote: 10.525 Sir Galahad
Online: 10.525 Sir Galahad
 10.534 Mercury Vapour Generator
 Switching Box
 Process Control Software

NATURAL GAS

Remote: 10.525 Sir Galahad
 10.537 Pressure Letdown System
 S235P012 Sampling Probe
Online: 10.670 Online Natural Gas System
 10.541 1-Stream Sampling System
 10.542 2-Stream Sampling System
 10.543 3-Stream Sampling System
 10.544 4-Stream Sampling System

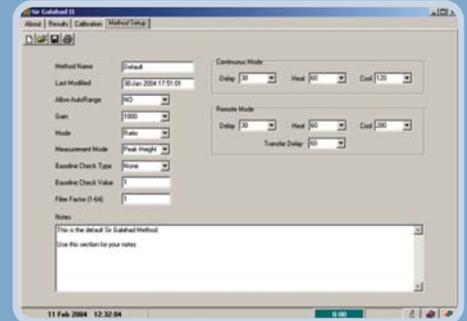
STACK GAS/CEM

Online: 10.680 Online Stack Gas System (mini-system)
 10.665 Online Stack Gas System
 50.036 Sample Conditioning System
 50.026 Inertial Probe

SIR GALAHAD SOFTWARE

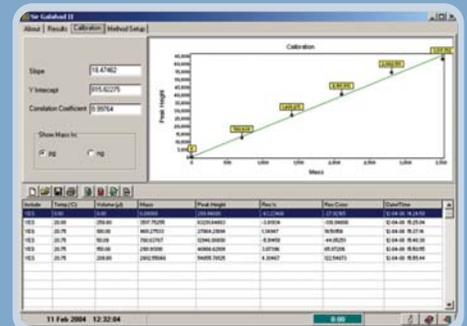
The Sir Galahad software operates under MS Windows® and provides the following facilities:

Methods page



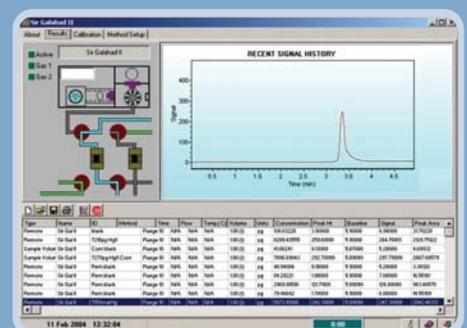
Complete control of instrument parameters

Calibration page



Multi-point calibrations by either vapour injection or mercury vapour generator

Analysis page



Visual representation of analysis or peak

FEATURES:

- Fully multi-tasking
- User definable results display
- Export to LIMS
- Complete saving of all information about a particular sample
- Analyse samples and add calibration points at the click of a button



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