- ***Accurate Radioiodine Measurement System***
- ***Quick Cartridge Exchange***
- ***Unsurpassed detection Limits Through the Optimum Mix of Detector Background, Efficiency and Filter Media***
- ***Fast Indication of Genuine Release Events Through Advanced Alarm Alogorithm***
- ***Designed to Meet the Requirements of IEC60761-4***
- **Stable Long Term Performance**
- **Photopeak Drift Minimised Through Temperature Stabalisation**

The Lab Impex CMS-Iodine has applications in industrial, medical and commercial nuclear facilities. For years the system of choice for many, the CMS-Iodine is used throughout the world to assure safety in the workplace, to offer quick response to accident scenarios and to measure and monitor stack releases.

Operational Benefits

The CMS-Iodine is an advanced system for monitoring airborne concentration of radioiodine in the workplace.

The culmination of many years experience in the field of iodine analysis, the CMS-Iodine has been designed by Lab Impex Systems to offer the user real operational benefits in terms of measurement performance and lifetime maintenance.

The innovative Lab Impex approach to radiometric design has ensured all elements of the measurement chain have been analysed and optimised in order to give the user the best possible performance.

The CMS-Iodine is the only commercial system that offers the very best in **sampling efficiency, filter collection, detector technology, processor electronics and data analysis.** What's more the system is a modular one, a flexible one, a system that allows full expansion and integration into plant monitoring systems.

The CGADC

The detection part of the CMS-Iodine is a patented detector called the CGADC (Continuous Gas Analysis and Detection Chamber). The CGADC is a well-engineered assembly that combines a sensitive scintillation detector with a stainless steel measurement chamber housing the radioiodine filtration cartridge.

In operation, gas is sampled through CGADC and radioiodine cartridge by a vacuum pump located downstream. In addition, an in-line digital flow sensor continually measures the flow through the filter.

Many options exist for mounting and shielding the CGADC. With an inherent background as low as 0.1 cps, the system gives unparalleled limits of detection in most environments. However, a 2-inch shielding assembly that may be skid mounted, panel mounted or floor standing, will offer additional protection from external sources of radiation, a lower detector background and - of course - result quality at all times.

Lab Impex Systems

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Continuous Monitoring

A CMS Continuous Monitoring Station, located either locally or remote from the CGADC acts as the processor and display for the system. As the core of the Lab Impex range, the CMS is a respected, proven, monitoring station. The CMS will display the current iodine result, generate activity / status alarms, enable the user to access parameters and compile a database of result data.

Features of the CMS include:- **high levels of environmental protection; ability to add other sensors (gamma dose rate, particulate, noble gas etc); unique calculation algorithm; fast alarm generation; modular construction; stainless steel housing; high intensity audio-visual alarm; multiple parameter sets.**

For more details on the CMS range, please refer to the Lab Impex Continuous Monitoring Brochure.

The CMS-Iodine is factory configured for the radioiodine species of choice. Versions available include I-123, I-124, I-125, I-129, I-131 and I-133.

The LIS SRA counting system allows measurement and radioiodine cartridges. The SRA supplied with standard 2” x 2” NaI(TI) detector lead castle assembly and suitable drawer unit may be configured to measure mapak, standard TEDA or silver zeolite impregnated cartridges for I-129 or I-131.

Result Quality

The CMS-Iodine was designed from the outset to give the user the best possible performance for each step of the measurement process.

SAMPLING

- Compatibility with TEDA impregnated and silver zeolite filter cartridges
- Stainless steel wetted parts to limit losses / absorption
- Filter collection efficiency 95%

DETECTION

- Low background, high sensitivity scintillator
- High accuracy sample flow sensor
- Optional live background compensation
- Unique half life correction algorithm for count – rate losses of short lived iodine
- Single channel analyser around photopeak with optional temperaturestabilisation to limit spectrum drift

ANALYSIS

- Advanced calculation and alarm generation algorithm
- Display of concentration, integrated dose, stack discharge
- Automatic storage of result data

OPERATION

- Quick Filter Change
- Modular construction
- Automatic calibration
- Fully expandable

Radio Iodine Filter Cartridges

SPECIFICATIONS

Weights and Dimensions of Detector (Examples)

I-131 Detector
- Length: 350mm (approx 15”)
- Width: 100mm (approx 18 1/2”)
- Depth: 110mm (approx 4 1/3”)
- Weight: 4.6kg (approx 10lbs)

I-129 Detector
- Length: 300mm (approx 12”)
- Width: 110mm (approx 4 1/3”)
- Depth: 110mm (approx 4 1/3”)
- Weight: 4.5kg (approx 10lbs)

Filter

TEDA Filter Cartridge Charcoal OR Silver Zeolite (available from LIS)

Sample Humidity

Up to 95% RH

Sample Temperature

2° to 60°C (36°F – 140°F)

Sample Flow

Optimised at 37 litres per minute (1.3ft^3/min)

Sample Chamber

200ml volume

Detector

45mm diameter NaI (Tl) crystal, optically coupled with 50 mm (2”) photomultiplier tube complete with dynode chain, PET-100 I/O

Detector Power Requirements

1000 to 1500VDC 200mA (supplied by UDI-1S via HV coaxial cable)

Detector Background

Typically of the order of 1cps

M.D.L.

Better than 10Bq/m^3 (2.7 x 10^{-10} mCi/ml) I-131 at 15 minute differential time (unshielded)

CMS 1 Iodine Dimensions

Stainless steel enclosure
- Height: 530mm (approx. 21”) including strobe
- Width: 256mm (approx 10”)
- Depth: 170mm (approx 6 1/2”)
- Weight: 8kg (typical depending on configuration

System Power

- AC single phase mains connection
- Supply Voltage: 90 – 264V
- Frequency: 47 – 370Hz
- Power Consumption (typical): 25W
- Maximum Current: 500mA
- Mains Plug: 3A Fuse
- Main Input: 1A anti-surge fuse

Outputs (optional)
- RS485 data link to master CMS/communications controller.
- RS232 port for data logging to a PC.
- RS422
- TCP/IP
- Analogue (4-20mA) or digital output
- Four way volt free relay contacts

Operating Environment (Indoor Use)
- Operating temperature range of the complete unit is 10 - 40ºC (14ºF - 104ºF)
- Maximum relative humidity 95% (up to 30ºC/84ºF)
- Only non conductive air pollution present

CE Marking
The CMS - 1 iodine is CE marked indicating conformity with:
- EMC directive 89/336/EEC. 92/31/EEC
- Low voltage Directive 93/23/EEC, 93/68/EEC
- EMC Standards BS EN50082-1 and BS EN50081-1

Alarm Facilities
- Fast, accurate warning of high activity or faults.
- Traffic light configuration: 3 multi-element 20mm (approx. 1”) diameter flashing LEDs
  Green = NORMAL
  Yellow = ALERT
  Red = ALARM
- Clearly visible from 9m (30ft)
- Optional relay outputs for remote audio/visual alarms
- Alarm thresholds and other parameters can be set by the user and pass-code protection available

Audible Alarm Output
1800Hz, 80dBA

Visual Display
- Alpha - numeric display: 2 rows x 20 characters, 8.5mm (1/3”) character height
- Status indicators
- Large clear 20 x 142mm (51/2”) digital display with 4 colour function key indicators
- High intensity alarm - An additional alarm Red xenon strobe module warning

Keypad
24 soft keys keypad with tactile feedback with four special function keys

Data Buffer (Optional)
Cyclic FIFO (first in first out) buffer which retains historical data. Provides 1 week data retention with historical review on display. Results stored every 10 minutes in Normal (LED green) mode and every 2 minutes in Alert (LED yellow) and Alarm (LED red) modes. Contents of the data buffer are retained without mains power providing the internal battery is in place

Self Test Facilities
The CMS1 Iodine continuously self-tests. Conditions checked include:
- Detector failure
- Power failure
- Over range
- Excessive air flow
- Low air flow
- CMS1- Iodine case is designed to IP–65 (NEMA type 13 equivalent)