

- **Fast Indication of Genuine Releases through Advanced Alarm Algorithm**
- **Unique Lead Design Facilitates Hassle Free Installation**
- **Nal and Csl Detector Options Allows the Selection of the Right Detector for your Application**
- **Versatile Design for Both Horizontal and Vertical pipe Runs**
- **High Safety Integrity (optional SSM board provides high integrity redundancy circuit)**

*The Lab Impex Systems (LIS) On-line Liquid Effluent Monitor (OLEM) has been developed to continuously measure radioactive gamma emitting isotopes in process lines.*

### **Easy Installation**

The OLEM system includes lead shielding, detector, and electronics. The detector and shield assembly is totally non-invasive to the process line, and there is no need for a pumping system or tap-off points for sample removal and return.

The 'clamp-on' arrangement of the OLEM system also makes it easy to install. The shielding can be mounted horizontally or vertically to accommodate process pipe runs, and a mounting plinth may be supplied to raise the OLEM above the floor line if necessary.

### **High Efficiency**

The OLEM can be configured to measure gross gamma radiation, or isotopic specific radiation in the process line. A high efficiency NaI(Tl) (or CsI) detector (sized depending on the diameter of the process line), is used to take the measurement. The detector is optionally temperature stabilized and can also possess an in-built radioactive pulser that allows the user to perform routine performance checks on the system.

### **CMS Digital Ratemeter**

The standard OLEM shielding solution uses 2 inches of lead around the detector and pipe to minimize interference from background, although alternative shielding assemblies are available, and if required the system may be furnished with an optional cooling jacket for high temperature process applications.

After amplification and pulse shaping, the detector signal is transmitted to a CMS Continuous Monitoring Station. The CMS is an advanced digital ratemeter providing a continuously updating display of result values and generating audible-visual alarm indication in the event of an activity alarm or system fail.

### **Low Detectable Limit**

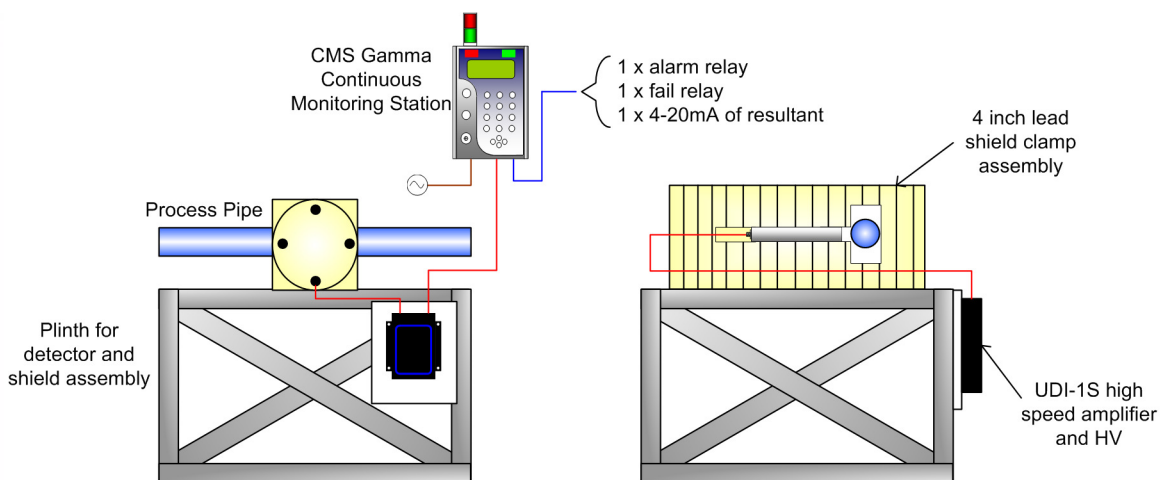
The CMS Continuous Monitoring Station can be configured to report in raw count-rate (cps or cpm) or engineered units (i.e.  $\mu\text{Ci/ml}$ ). Under typical conditions and using a 60 second count time the OLEM offers an MDA of well below  $1 \times 10^{-6} \mu\text{Ci/ml}$ .



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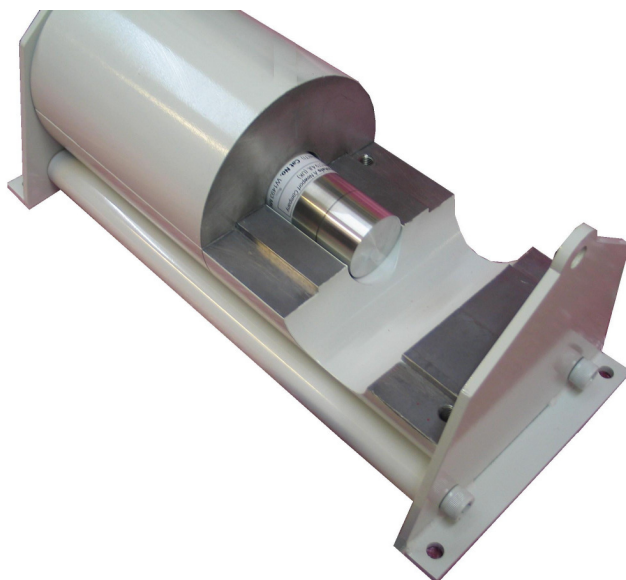


### High Safety Integrity

As an added benefit, the CMS Continuous Monitoring Station can be provided with additional hardware for high safety integrity. This hardware, called the SSM\* (SIL Safety Module) conforms to Safety Integrity Level 2 (SIL2) in accordance with the IEC 61508 standard. The SSM independently monitors the detector output with a simple and separate scaler circuit. Detector counts are evaluated in this way, and the SSM will activate alarms in the event of a high detector count. No software is used with the SSM and each component on the circuit has been evaluated for potential failure mode and effects analysis. Although the SSM is resident within the CMS, the board is fully isolated and possesses its own power supply, power backup and output relays for driving audio and visual alarms and interlocks.

By offering users SIL2, the OLEM gives added protection over conventional systems. The SSM provides a safeguard in the event the main CMS processor fails and reduces the overall risk of 'fail to alarm' scenarios. This is especially important when a failure of the system could indirectly expose people, the process or equipment to radiological or other hazardous conditions.

\* More information on the LIS SSM module available on request



***‘The innovative lead shielding design of the OLEM makes installation and mounting of the system extremely easy’***

## Specification: Detector Assembly

### Detector Type

Nal(tl) or CsI, depending on application. Crystal size selected to suit

### Shielding

2 inch to 4 inch as required.

### Pipe Size

Can accommodate 1 to 12 inch diameter pipework

### Measuring Range

$<1 \times 10^{-6}$   $\mu\text{Ci/ml}$  -  $1 \times 10^{-1}$   $\mu\text{Ci/ml}$

### Temperature Range

0°C to 50°C (32°F - 122°F)

### Shield Dimensions

8" x 8" x 16" (2" shield)

### Calibration / Check Source

Stick mounted for manual check. Optional solenoid operated automatic source

## Specification: CMS Gamma

### Dimensions

18" x 8" x 5½"

### Enclosure

304 Stainless Steel

### Display

Large LCD graphic display with backlight.

### Alarm Indication

- Two layer status light column (Totem Pole, Red + Green LED).
- Audible alarm sounder: 2 tones alternating at 1.2Hz > 100dB

### System Outputs

- Up to four relay outputs (Alarm1, Alarm2, Alarm3 and Fault)
- RS-232
- RS-485
- 2 x analogue outputs
- Ethernet 10baseT

### Electrical

- 85 to 260 VAC
- 47 to 60 Hz