



ELSE
NUCLEAR



LEM

LIQUID EFFLUENT MONITORING SYSTEM



Simple and reliable effluent monitor



Fully customizable sampling cycle



I/O contacts for status and commands

1 liter Marinelli beaker measurement geometry

2"x2" NaI(Tl) scintillator

Lead shielding well

Panel PC and relay contacts for I/O signals

Efficiency calibration function for reference radionuclide

The **LEM** system is designed to sample the liquid effluents and to perform a spectroscopic analysis in Marinelli geometry.

LEM system is composed of the following main parts:

- Stainless steel frame
- Electrical and command board with touch-screen panel PC
- NaI(Tl) detector, 1l Marinelli, 5 cm thick lead shielding well
- Self-priming pump (*)
- Software for system management, data acquisition and processing

The measurements are visualised in real time by the software, expressed in terms of specific/total activity through spectroscopic analysis.

LEM status and parameters are managed by the ELSE NUCLEAR software. The system provides also I/O contacts through dedicated connectors:

- Good functioning status output
- Alarm status output
- Pump activation input from customer PLC (*)
- Spare available I/O contacts (to be defined when necessary)

The software provides a calibration routine, to be used with a Marinelli calibration source (available as accessory).

A test program is also available, separate from the main application, to be used for maintenance or periodical quality controls.

TECHNICAL SPECIFICATIONS

Weight and dimensions

- Stainless steel frame:
 - WxDxH = 80 x 70 x 150 cm
 - max weight = 500 kg

- Lead well:
 - Ø x H = 32 x 30 cm (ext); 22 x 20 cm (int)
 - max weight = 300 kg

Main characteristics

- Detector type: 2" x 2" NaI(Tl) scintillator
- Cylindrical lead well, 5 cm thickness, composed by several rings for easy assembling and installation
- Plexiglass, 1 liter Marinelli beaker, fittings included

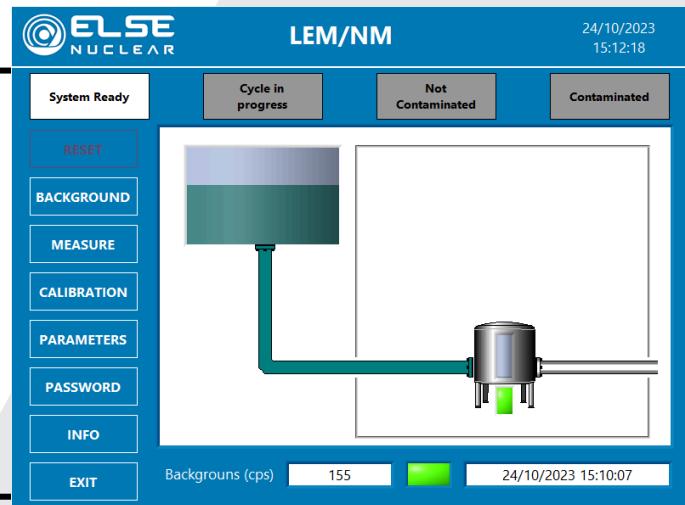
- Electronics for HV and signal processing
- Electric safety, isolation and waterproofing
- Protection grade: IP67 (underwater parts), IP44 (non-underwater parts)

OPTIONS

- 10 cm lead shielding for further lowering of the MDA

ACCESSORIES AVAILABLE UPON REQUEST

- Calibration source (isotopes and activity to be defined): gel matrix in Marinelli beaker
- Cs-137 point source, < 10 kBq, for periodical quality controls
- Warranty extension from 12 months to 24 months



LEM software main panel

Measurement specifications

- Measurement unit: specific activity (Bq/l) or count rate (cps or cpm)
- Gross gamma measurement of the specific activity
- Efficiency in measurement geometry: >1.5% (Cs-137)
- Response in measurement geometry: >12 cps/kBq (Cs-137)
- Energy range: 30 keV – 2 MeV
- Measurement range: 3.7×10^3 – 3.7×10^8 Bq/m³
- “Fail safe”: alarm and interlock activation in case of power supply interruption
- Detector can easily be disassembled for maintenance activities

Sampling circuit (*)

- Flow sensor for malfunctioning detection
- Working pressure of sampling system: 10 bar
- Self-priming pump



LEM Marinelli beaker with fittings

(*) If not available in the sampling/hydraulic equipment which LEM shall be connected to

