

## LAM-544

# LIQUID ACTIVITY MONITOR



## KEY FEATURES

- Measurement of the volumetric activity of gamma-emitting radionuclides in process liquids at nuclear facilities.
- In-line monitor type: the detector is mounted inside the measured pipeline.
- High sensitivity, low detection limits.
- Built-in LED check source for automatic spectrum stabilization and functional testing.
- Optional safety-classified function, Category C according to IEC 61226.

## DESCRIPTION

The monitor is designed to measure the volumetric activity of gamma-emitting radionuclides in process liquids at nuclear facilities under routine operating conditions. The measurements are primarily intended for the detection of fission and activation products.

The LAM-544 monitor assembly consists of:

- LAD-44 detector assembly, comprising:
  - GD-52 gamma detector with a NaI(Tl) crystal,
  - fixture for the positioning of the detector within the process pipeline,
  - LED check and stabilization source.
- RPU-06 radiation processing unit equipped with a DIM-15 digital multichannel analyser configurable to 1K, 2K, 4K, or 8K channels.

The detector is typically installed in a dedicated watertight measurement sump located within the process pipeline.

By default, the DIM-15 analyser determines the total volumetric gamma activity with respect to the selected reference radionuclide.

Optional spectrometric functionality enables the identification and quantification of up to sixteen gamma-emitting radionuclides.

The RPU-06 locally displays measurement results and operating states, stores measured values and other monitor parameters, and visually and audibly indicates when preset alarm levels are exceeded.

The delivery package includes the RadSpec software for configuration and calibration of the device's spectrometric parameters.

If local data display is not required, the RPU-06 can optionally be replaced by the RPU-04 unit, which does not feature an integrated display.



RPU-04

Remote indication of measurement results can be provided by:

- RDU-12 Remote Display Unit
- ASU-50 Alarm Signal Unit

The monitor can communicate with one or two independent host systems via:

- RS-485 serial interface (ModBUS RTU)
- Ethernet 10 Mbit/s (ModBUS TCP)
- optional analogue inputs/outputs (4-20 mA)
- optional digital (relay) inputs/outputs

The monitor can transmit data simultaneously to both non-safety-classified and safety-classified host systems.

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## SPECIFICATION

Detector	Nal(Tl) Ø2,5"×2,5" LED
Detector location	Measurement sump inside the pipeline
Measurement range	Dependent on the process pipeline and measurement sump geometry (2E3 to 1.3E8 Bq/m <sup>3</sup> for water, sump Ø 9 cm, pipeline Ø 90 cm)
Reference radionuclide	Cs-137 (total gamma activity) Up to 16 gamma radionuclides for spectrometric measurement
Check source	LED
Sample temperature	+5 to +40 °C
Detector weight	approx. 3kg
RPU-06 weight	approx. 13 kg
Dimensions	
• GD-52 (w × h × d)	Ø 90 x 250 mm
• RPU-06 (w × h × d)	330 × 360 × 366 mm
Ingress protection	
Detector	IP 65
RPU-06	IP 44
Power supply	+ 24 V DC/ max. 2 A
Communication Interfaces	Ethernet 10 Mbit/s (Modbus TCP) RS-485 (Modbus RTU)



LAD-44 detector installed in the measurement sump within the process pipeline

## OPTIONAL ACCESSORIES

RDU-12	Radiation Display Unit
ASU-50	Alarm Signal Unit
CIM-05	RPU module: isolator between safety-classified and non-safety-classified systems
ICIM-01	RPU module: eight relay outputs and two current loop outputs (4–20 mA)
ICIM-02	RPU module: eight digital inputs and eight digital outputs
ICIM-03	RPU module: four current loop outputs (4-20 mA)
ICIM-04	RPU module: four current loop inputs (4-20 mA)

## RELATED PRODUCTS

LAM-502	Liquid gamma activity monitor for routine, emergency, and post-emergency conditions, medium range, ATL type
LAM-503	Gamma activity monitor for steam-air mixture from the vacuum pump sump; medium and high range; ATL type
LAM-504	Liquid gamma activity monitor for normal operation; standard range; ATL type
N16M-504	N-16 activity monitor for primary-circuit leakage monitoring; ATL type
LAM-541	Gamma activity monitor for steam-air mixture from the vacuum pump sump; standard range; in-line type
LAM-561	Gamma activity monitor for high-temperature liquids under normal, emergency, and post-emergency conditions; medium and high range; off-line type
LAM-564	Liquid gamma activity monitor for normal operation; standard range; off-line type with shielded measurement chamber



RadSpec spectroscopy software