

## LAM-503

# LIQUID ACTIVITY MONITOR



## KEY FEATURES

- Measurement of the volumetric activity of a steam-air mixture in the ventilation line of vacuum-pump sumps at nuclear power plants.
- ATL monitor type: the detector is mounted directly on the measured pipeline.
- Medium and high measurement range.
- Built-in Am-241 check source for automatic stabilization and functional testing.
- Optional safety-classified function, Category C according to IEC 61226.
- Meets the requirements of NRC RG 1.97 for accident and post-accident monitoring of light-water reactors.

## DESCRIPTION

The monitor is designed to measure the total volumetric activity of noble gases emitting gamma radiation in the ventilation line from the turbine condenser vacuum-pump sump under accident and post-accident conditions.

The LAM-503 monitor assembly consists of:

- NGD-15 detector assembly, comprising:
  - two CdTe semiconductor detectors,
  - two collimators,
  - a check and stabilization source of ionizing radiation;
- PU-06 BOX unit for local signal processing at the measurement point;
- RPU-06 radiation processing unit.

The detector assembly is installed at an appropriate distance from the pipeline through which the measured liquid flows.

Two detectors with two collimators ensure a sufficiently wide measurement range.

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.

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	2x CdTe, 5 x 5 x 5 mm
Detector collimator	Thin-walled collimators with aperture diameters of 40 mm and 2 mm
Measurement range	depends on the measured pipeline (1,4E08 to 5,3E15 Bq/m <sup>3</sup> for a pipeline ø32cm and wall thickness 8 mm, distance 5 mm)
Reference radionuclide	<sup>133</sup> Xe (total gamma activity)
Check source	LED <sup>241</sup> Am, 450 kBq
Temperature range	+5 to +50 °C
Detector weight with PU-06	approx. 16 kg
RPU-06 weight	approx. 13 kg
Dimensions	
• detector (w × h × d)	485 × 780 × 555 mm
• RPU-06 (w × h × d)	330 × 360 × 366 mm
Ingress protection	
Detector	IP 67
RPU-06	IP 44
Power supply	+ 24 V DC/ max. 2 A
Communication Interfaces	Ethernet Modbus TCP RS-485 Modbus RTU



NGD-15 detector installed on the pipeline

## OPTIONAL ACCESSORIES

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

## RELATED PRODUCTS

<b>LAM-502</b>	Liquid gamma activity monitor for routine, emergency, and post-emergency conditions, medium range, ATL type
<b>LAM-504</b>	Liquid gamma activity monitor for normal operation; standard range; ATL type
<b>N16M-504</b>	N-16 activity monitor for primary-circuit leakage monitoring; ATL type
<b>MSLM-504</b>	Main-steam-line liquid activity monitor; ATL type
<b>LAM-544</b>	Liquid gamma activity monitor for normal operation; standard range; in-line type
<b>LAM-561</b>	Gamma activity monitor for high-temperature liquids under normal, emergency, and post-emergency conditions; medium and high range; off-line type
<b>LAM-564</b>	Liquid gamma activity monitor for normal operation; standard range; off-line type with shielded measurement chamber