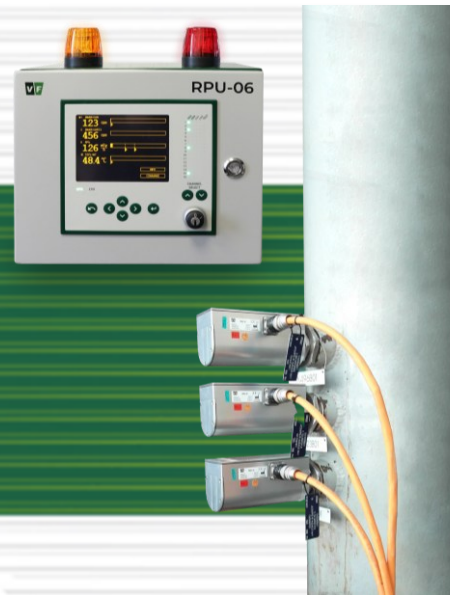


LAM-541

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.
- In-Line monitor type: the detector is mounted inside the measured pipeline.
- 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 total volumetric activity of noble gases emitting gamma radiation in the ventilation line from the turbine condenser vacuum-pump sump under routine operating conditions.

The LAM-541 monitor assembly consists of:

- **NGD-41** detector assembly, comprising:
 - a temperature-resistant scintillation detector with a YAP crystal,
 - electronics for pulse processing and evaluation at the measurement point,
 - a LED-based check and stabilization source.
- **RPU-06** radiation processing unit.

The detector is installed directly inside the process pipeline through which the monitored medium flows.

If measurement redundancy is required, the monitored pipeline can be equipped with multiple detector assemblies connected to a single RPU-06 unit.

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

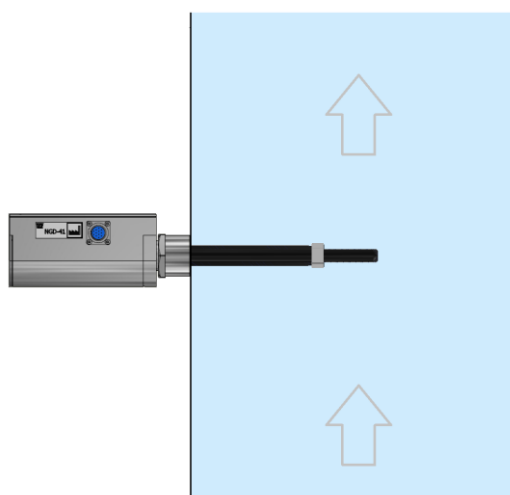
The monitor can communicate with one or two independent host systems via:

- 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.

SPECIFICATION

Detector	YAP:Ce scintillation detector, crystal dimensions 2 x 2 x 45 mm
Detector collimator	geometric centre of the measured pipeline
Measurement range	depends on the measured pipeline ($2.3\text{E}5 - 3.1\text{E}11 \text{ Bq/m}^3$ for a pipeline $\varnothing 32 \text{ cm}$ and wall thickness 8 mm)
Reference radionuclide	Kr-85
Check source	LED
Operating temperature	-10 to +60 °C
Measured medium temperature	+5 to +95 °C
Detector weight	approx 1.7 kg
RPU-06 weight	approx. 13 kg
Dimensions	
• detector (w x h x d)	84 x 74 x 421 mm
• RPU-06 (w x h x d)	330 x 360 x 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



Measuring geometry of the LAM-541 monitor

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
MSLM-504	Main-steam-line liquid activity monitor; ATL type
LAM-544	Liquid gamma activity monitor for normal operation; 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



NGD-41 detector