



NUCLEAR NUCLEAR NUCLEAR NUCLEAR NO.

WASTE MANAGEMENT

CENTRES & MANUFACTURING

LAD-08 LIQUID ACTIVITY DETECTOR

MAIN ADVANTAGES

- Monitoring of fuel integrity through I-132 detection in the primary circuit of a nuclear reactor
- Attached to line (ATL) monitor
- Detector shielding reducing the response to increased background
- Water cooled monitor
- Checking of the detector function by means of LED check source (without using radioactive source)

PURPOSE

The detector is designed to measure the Kr-88 radionuclide in the primary circuit of a nuclear reactor.

Kr-88 is present in the coolant water only in case of fuel cladding leakage.

I-132 emits two gamma photons of 667 and 772 keV when decayed. These photons are detected simultaneously by two opposite GD-52 detectors, between which the measured liquid is flowing in the tube.

The detector consists of:

- Two GD-52 gamma detectors with 2.5 "× 2.5" Nal(TI) crystal (correct functioning of the detector can be checked by a built-in LED),
- Sandwich shielding of the GD-52 detector (lead, tin, copper) near the pipeline with the measured liquid
- Stainless steel cooler of the GD-52, through which the coolant permanently flows (ensuring that the maximum working temperature of the detector is not exceeded),

LAD-08 can be optionally connected to processing and display unit RPU-12 or RPU-04 with two 1024 channel analyzers (MCA) to evaluate data from detectors. RPU-12, comparing to the RPU-04, contains in addition:

- Monochrome display with 86 × 115 mm area
- Optical indication of alarms

The following cards are always installed in the RPU unit of the LAD-08 detector:

- DIM-09 1024 channel analyzer MCA
- CIM-03 RS-485 interface to a host system.

Remote data presentation and status indication can be provided by:

- RDU-12 remote display unit, which communicates with the local RPU-12 (or RPU-04) via the RS-422 interface
- The ASU-50 alarm unit connected to the local RPU unit by digital outputs.



RPU-04

LAD-08 LIQUID ACTIVITY DETECTOR

SPECIFICATION

Measurement range	from 1E08 to 1E14 Bq/m ³
Reference radionuclide	132
Sensitivity	1,3E-10 cps/(Bq/m ³)
Temperature range	from 5 to 40 °C
Weight (shielding including)	470 kg
IP protection	IP 65
Power supply	+24 V DC/ max. 2 A
Interface	RS-485 Modbus RTU

OPTIONAL ACCESSORIES

RPU-04	Data acquisition and processing unit (without display)
RDU-12	Radiation Display Unit
ICIM-01	Instrumentation and Control System interface with 2 outputs to PAMS, type 4 - 20 mA and 4 digital outputs for signaling of operation, errors, exceeding of 1st and 2nd alarm levels
ASU-50	Alarm Slave Unit
CIM-05	Modbus/TCP (Ethernet) Card

RELATED PRODUCTS

LAD-07	Device for measuring the tightness of fuel cladding in the primary circuit of a nuclear reactor based on the detection of I-132 in liquid
	in inquia



RPU-12



RDU-12



GD-52



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Specification subject to change without prior written notice.