



Product Description

The YD-890 Decay Tank Wastewater Radiation Monitor is a continuous on-line γ radiation measurement and alarm device. The main unit is built around a 32-bit high-speed embedded microprocessor and features a 1024×600 colour touchscreen LCD. The detector probe is designed with an IP68-rated waterproof enclosure, making it suitable for radiation monitoring of decay tank wastewater.

Reliable RS485 communication is employed between the main unit and each probe, ensuring that the main unit displays the real-time dose rate of every connected probe and continuously indicates the current probe status (online / offline / alarm). In addition, the detector may be directly interfaced with a facility's PLC for integration into the decay tank discharge control system. The corresponding communication protocol is provided to facilitate system integration by engineering contractors, helping to reduce overall project costs. The user interface is designed to be clear and intuitive, allowing for straightforward operation. The module is primarily used for γ dose rate measurement and alarm generation, providing real-time trend monitoring of gamma radioactivity levels in decay tank wastewater. It should be noted that this type of detector is intended solely for monitoring γ dose rate trends and must not be used as the basis for clearance or release decisions; such decisions shall be made in accordance with applicable local regulations.

Features

1. Safety Interlock Against Accidental Release

The system is equipped with a waterproof GM probe that serves as a secondary safety interlock. In the event that high-activity liquid (e.g., excreta from patients following ^{131}I administration) is inadvertently introduced into the decay tank prior to scheduled discharge, the interlock prevents accidental release — even where local regulations would otherwise permit time-based release.

2. Verification of the Decay Process (Visualised Decay Curve)

Continuous 24-hour online monitoring is provided, enabling the generation of a complete exponential decay curve on the software platform. This visual evidence is suitable for

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YD-890 Decay Tank Gamma Effluent Monitor

submission to the relevant nuclear safety authority (e.g., AELB, CNEN) to demonstrate regulatory compliance and sound hospital management practice.

3. Maintenance-Free Industrial-Grade UPVC (CPVC) Enclosure

The detector housing is constructed of industrial-grade waterproof PVC (or CPVC), which exhibits significantly lower adsorption of radioactive iodine compared with stainless steel. The material is resistant to chemical corrosion from pharmaceutical waste and is designed for long-term immersion, minimising background buildup and eliminating the need for frequent decontamination.

Applications

- Liquid waste from radioisotope production
- Radiological laboratory wastewater
- Decay tanks in nuclear medicine departments

Specifications

Parameter	Specification
Detector	GM counter tube (or scintillator)
Measurement range	0.01 $\mu\text{Sv/h}$ – 3500 $\mu\text{Sv/h}$ (150mSv/h)
Display units	CPM, $\mu\text{Sv/h}$
Sensitivity	>5 CPS at 1 $\mu\text{Sv/h}$
Response time	≤ 2 s
Relative intrinsic error	$\leq \pm 15\%$
Energy response	48 keV – 3 MeV, $\leq \pm 30\%$
Communication protocol	Modbus / RS485
Power supply	220 V AC mains
Operating environment	Temperature -10°C to +50°C; acid-resistant, corrosion-resistant
Probe waterproof rating	IP68
Dimensions	Main unit: 260 × 160 × 68 mm (excluding base); Detector probe: $\varnothing 57 \times 162$ mm

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