Multipurpose Personal Radiation Monitor

Simultaneous alpha-, beta- and gamma detection

The MS-PRM is a compact, versatile all-in-one detector model designed for simultaneous search for surface contamination by alpha-, beta- and gamma-active radionuclides. Depending on the model, it may also be used as a Personal Radiation Detector (PRD) in applications involving search of gamma, and optionally neutron, radioactive sources in compliance with ANSI N42.32 and IEC 62401, or used as a gamma radiation dose ratemeter of up to 10 Sv/h value.

The distinguishing feature of the MS-PRM is completely independent detection channels providing one-pass scanning for alpha-, beta- and gamma radiation. This significantly decreases time-to-scan of the object for contamination and eases measurement procedures. The user can set up adjustable alarm thresholds to respond to various application scenarios. The detector's rugged design ensures reliable performance in demanding environmental conditions, both indoors and outdoors, with minimal maintenance and servicing requirements.

The MS-PRM is applicable in various sectors, including the nuclear industry, nuclear fuel cycle processes, and operational areas of nuclear power plants (NPPs), where it can be utilised for the simultaneous detection and measurement of alpha- and beta-contamination on personnel and equipment exiting controlled and supervised zones. It is also suitable for radioactive waste management and environmental monitoring applications. Furthermore, the device can be employed to identify elevated concentrations of naturally occurring radioactive materials (NORMs) in by-product waste resulting from oil and gas exploration and production activities.

FUNCTIONAL HIGHLIGHTS

- One-pass scanning for alpha-, beta- and gamma-radiation
- 45×45 mm phoswich alpha-beta detector insensitive to gamma
- IEC 60325 alpha- beta- compliant
- Sensitivity of MS-PRM and MS-PRM-02 models compliant to ANSI N42.32 for PRDs
- Minimum of training and supervision required
- Weatherproof storage and transportation case
- Rechargeable battery and USB interface

POTENTIAL APPLICATIONS

- As emergency monitor in case of accidents and large area contamination
- As hand-held frisker for radiation workers to monitor themselves
- As a versatile detector for First Responders to monitor all types of radiation
- As scale and sludge measurement of offshore oil and mining activities

MS-PRM — Multipurpose Personal Radiation Monitor

Types of Monitors

Model	alpha-channel	beta-channel	gamma-channel	neutron-channel
MS-PRM	+	+	CsI(Tl)	–
MS-PRM-01	+	+	Plastic Scintillator	–
MS-PRM-N	+	+	CLYC	CLYC

Specifications

Alpha/beta detector	
Type	Phoswich α- and β-detector
Window area	20 cm² (45×45 mm)
Surface activity (contamination) measurement range — alpha (^{239}Pu)	from 0,02 to 1.5·10⁴ Bq/cm²
Surface activity (contamination) measurement range — beta (^{90}Sr-^{90}Y)	from 0,3 to 2·10⁴ Bq/cm²
Surface emission rate measurement range — alpha (^{239}Pu)	from 0,6 to 5·10⁵ cpm/cm²
Surface emission rate measurement range — beta (^{90}Sr-^{90}Y)	from 6 to 5·10⁵ cpm/cm²
Energy range — alpha	from 4 MeV to 7 MeV
Energy range — beta	from 150 keV to 3 MeV

Gamma detector: MS-PRM	
Type	CsI(Tl)+SiPM
Energy range	from 50 keV to 3 MeV
Gamma sensitivity	100 cps/µSv/h (Cs-137); 800 cps/µSv/h (Am-241)
Response time	< 2 sec (ANSI N42.32 compliant)
Dose Rate range	0,1 - 100 µSv/h
Accuracy	±20%

Gamma detector: MS-PRM-01	
Type	Plastic scintillator
Energy range	from 50 keV to 7 MeV
Dose Rate range	from 0,1 µSv/h to 10 Sv/h
Accuracy	±20%

Gamma-neutron detector: MS-PRM-N	
Type	CLYC
Energy range	50 keV - 3 MeV (gamma); thermal - 14 MeV (neutron)
Neutron indication range	1.0 - 999 cps
Neutron sensitivity	0.1 cps·cm²/neutron (Pu-α-Be); 3 cps·cm²/neutron (thermal)
Gamma Dose Rate range	0,1 - 100 µSv/h
Gamma sensitivity	100 cps/µSv/h (Cs-137); 800 cps/µSv/h (Am-241)
Accuracy (gamma)	±20%

Operating modes	
	Simultaneous alpha-, beta- and gamma- search mode
	Simultaneous α- and β- surface contamination measurement
	Gamma dose rate measurement mode
	Gamma-search mode

Functional	
Power supply	3.7V Li-ion rechargeable battery
Operation time from one battery charge, not less	150 hours
Display units	cps, Bq/cm², cpm/cm², µSv/h
Data interfaces	USB, RS-485
Internal memory	up to 1000 events
Type of alarms	sound, light
Cleaning	housing easy to decontaminate
Accessories (optional)	protective holster, dock/charger station, spare protective aluminized mylar

Environmental and mechanical	
Temperature	from -10 to +45 °C
Humidity	up to 85% at +35 °C
Atmospheric pressure	from 84 to 106,7 kPa
Ingress protection	IP54
Size, mm	42×80×128
Weight, g	350

Specifications are subject to change without notice.

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