LB 124 SCINT SERIES

Portable Contamination Monitors

BERTHOLD

LB 124 SCINT SERIES

Equipment Concept

The Contamination Monitors of the LB 124 SCINT Series are versatile and flexible instruments for practical radiation protection applications. They can be employed wherever contamination caused by radiation substances is encountered and has to be monitored: in nuclear medicine, research, nuclear power plants, in decommissioning of nuclear facilities and disposal of nuclear waste as well as in environmental monitoring. The instruments are used to measure radioactive alpha and beta-gamma contaminations on surfaces such as floors, walls, desks, objects, clothing or skin.

The instruments of the LB 124 SCINT Series are contamination monitors based on scintillation technology. Their benefits are:

- Simultaneous and separate measurement of alpha and beta-gamma contaminations
- Measurement of gamma dose rate (only for LB 124 SCINT-D)
- High sensitivity and uniform response
- No counting gas required
- Lightweight, easy to handle and rugged instrument
- Wide temperature range

The Contamination Monitor LB 124 SCINT is a portable battery-powered instrument. It is comprised of a display unit with microprocessor electronics, a signal processing electronics and a ZnS-scintillator with photomultiplier. The LB 124 SCINT and LB 124 SCINT-D has an active measurement area of 170 cm² and the version LB 124 SCINT-300 of 345 cm². The sophisticated reflector geometry ensures an extremely flat response over the entire sensitive area.

LB 124 SCINT Portable Contamination Monitor

Bottom side of LB 124 SCINT

Functions and accessories

The LB 124 SCINT has an attractive and ergonomic design and due to its low weight it is easy to handle. Even under averse conditions, the measured results can be read easily on large high-resolution display with background lighting. A few directly accessible function keys suffice to operate the instrument. The surfaces of the instrument can easily be decontaminated.

Different user profiles with different levels of complexity and access rights can be selected: Less experienced users may use the instrument as a simple system with basic functionalities. For experienced users the software offers numerous functions and utilities, measurement modes and access to all paramaters. Profiles can be password-protected and are pre-defined as EASY, STANDARD and EXPERT. The instrument has a large data memory and supports bi-directional communication via RS232. Program download and data transfer to a PC or printer are possible.

On the bottom side of the LB 124 SCINT and SCINT-D there is the possibility to insert an additional grid or a protection plate for better detector protection or to use a sample holder with a drawer for activity measurement of small samples.

Sample holder with drawer for LB 124 SCINT and SCINT-D

Transport case for the LB 124 SCINT Series

Versions

LB 124 SCINT-D

The LB 124 SCINT Series consists of LB 124 SCINT, LB 124 SCINT-D and LB 124 SCINT-300.

Through the integration of an additional Geiger-Müller tube it is possible to measure gamma dose rate in ambient dose equivalent H*(10) simultaneous besides regular contamination measurement.

The LB 124 SCINT-300 has an active measurement area of 345 cm². This large area supports faster measurements with lower effort and increase safety.

TECHNICAL SPECIFICATIONS

Contamination Detectors		
Radiation detector	ZnS(Ag) scintillator	
Measurement modes	α- and β-γ measurement simultaneous and separate, only SCINT-D: gamma dose rate; ratemeter, scaler-timer-mode, clearance measurement, survey mode	
Dimensions entrance window	118 mm x 145 mm / 150 mm x 230 mm	
Sensitive area	170 cm² / 345 cm²	
Material entrance window	2 x 3 µm metallized plastic (0.4 mg/cm²)	
Protective grid	80 % transmission	
Typ. background	α-channel β-γ-channel	approx. 0.1 cps approx. 10 cps / 15 cps
Typ. efficiencies (according to ISO 7503-1)	^{239}Pu ^{241}Am ^{14}C ^{36}Cl ^{60}Co ^{137}Cs	approx. 41 % approx. 44 % approx. 29 % approx. 69 % approx. 58 % approx. 71 %
Gamma sensitivity at 1 µSv/h 137Cs	α-channel β-γ-channel	Not detectable < 100 cps
Spillover	α- in β-γ-channel β-γ- in α-channel	< 20 % < 2x10-5
Measuring range	α-channel β-γ-channel	0 to 5000 cps 0 to 50000 cps
Dose Rate Detector (only LB 124 SCINT-D)		
Radiation detector	Geiger-Müller tube	
Dose rate range	0.1 µSv/h to 20 mSv/h	
Energy range	50 keV to 1.3 MeV	
Calibration factor	0.625 µSv/h per cps 137Cs	
Intr. background	about 0.07 cps	
Ambien Conditions		
Temperature range	- 20 °C to + 40 °C (operation)	
Rel. humidity	0 % to 80 %, no condensation	
External pressure	500 hPa to 1300 hPa (operation)	
Protection class	IP 53 (according to IEC 60529)	

Electronics	
Display	Monochrome LCD 192x64 pixels Electro-luminescence-illumination
Interfaces	RS 232, headphone connection
Power supply	3x batteries type „C“, Baby or NiMH batteries, Rechargeable by plug type power supply or alternatively in the wall mounting bracket
Max. operating time (without illumination)	>50 h with alkali batteries 7.8 Ah >25 h with NiMH rechargeable batteries 4.5 Ah
Data memory	1000 measured values with date and time
Alarm	Acoustic with adjustable alarm thresholds
Mechanical Data	
Dimensions LB 124 SCINT/ -D LB 124 SCINT-300	(L x W x H in mm) 240 x 140 x 110 260 x 178 x 150
Weight (with batteries) LB 124 SCINT LB 124 SCINT-D LB 124 SCINT-300	approx. 1300 g approx. 1400 g approx. 1750 g
Accessories (optional)	Ident. No.
LB 124 SCINT	43727-10
LB 124 SCINT-D	60026
LB 124 SCINT-300	48002
Aluminium case	38164 / 49700
Power supply	58067
Wall bracket	38789 / 51374
Add. protection grid	45355 / 49048
Data cable (3 m)	26204
Rechargeable batteries	40650
Test source ^{90}Sr	41872
Test source ^{241}Am	46611

TRANSFORMING SCIENCE INTO SOLUTIONS

BERTHOLD

Experience and expertise are of great importance to be able to ensure safety-relevant measurements properly and reliably. With more than 70 years of experience in planning and design, installation and commissioning, calibration, documentation and service of radiation protection measurement systems, we continue to support our customers in their task to continuously optimize their work processes and to ensure the safety of the environment and personnel.

Berthold Technologies GmbH & Co. KG

Calmbacher Straße 22 · 75323 Bad Wildbad · Germany
+49 7081 1770 · nuclear@berthold.com · www.berthold.com/rp

LB 124 SCINT Series · Id.-Nr. DC00514PR2 · Rev. 01