LB 9150-C

Transportable alpha-beta fixed filter monitor

BERTHOLD

ALPHA-BETA FIXED FILTER MONITOR

Compact and transportable aerosol monitor

The aerosol monitor LB 9150-C is used to measure airborne alpha/beta particles under the influence of natural radioactivity (radon) and fluctuating gamma background.

The Si-CAM detector unit enables precise and simultaneously separated alpha/beta measurements on a flat round dusting surface of 600 mm². The radon compensation method from Berthold Technologies ensures the direct measurement of artificial alpha/beta radioactivity with radon progeny compensation, even with fluctuating radon levels.

Very easy filter change on the side.
The external pump unit makes the monitor compact and easy to handle.

Applications

The field of application is wherever airborne alpha and beta aerosol activities are to be monitored in order to prevent exposures and to control the activity in the exhaust air.

- Decommissioning
- Nuclear energy
- Radiator production
- Safety and security
- Research

Calculation

Calculation of the characteristic values according to DIN EN ISO 11929-1.

Highlights and functions

- Si-CAM detector unit for simultaneous separate alpha/beta measurement on a flat round dusting surface of 600 mm².
- Direct measurement of artificial alpha/beta radioactivity using Berthold Radon Compensation method.
- Optional gamma compensation detector with same measurement geometry as alpha/beta detector within the same shielding.
- Fixed filter operation with simple filter change.
- Transportable monitor with small footprint.
- Data logger Mini PC with 7" color touch panel, intelligent Digital In / Out module.
- Optional:
  - analog output of differential values or specific activities
  - other external pump unit up to 4 m³/h Air flow rate
  - analog flow meter
- Low-noise and low-maintenance external pump unit, air flow rate of approx. 2 to 3 m³/h.

MEASUREMENT WITH REAL-TIME MONITORING

Precise and simultaneously separated alpha/beta measurements

The transportable monitor consists the following components:

- Dusting unit: Direct measurement of radioactive alpha/beta particles using a Si-CAM detector.
- Alpha/beta detector: Measures directly above the dusting surface to ensure real-time monitoring.
- Detector unit: Made of stainless steel with degree of protection IP40, includes the dust extraction unit, fixed filter and quick filter changing device. Optional use of a screen detector (Si-CAM).
- External pump unit: The system is quiet and vibration-free. It has the advantage that it is maintenance-free and has a long service life. The nominal flow rate is approx. 2.5 m³/h with a maximum noise level of 60 dB(A) at a distance of 1m.

Failure message:

- if the flow rate is too low
- in the event of a pump error, e.g. pump failure

Optional:

- Air flow meter
- Stack flow meter

Continuous monitoring of the functionality

The monitor features self-monitoring functions that continuously track its performance and alarm status:

- **Pre-alarm threshold alpha or beta:**
  If the alpha or beta pre-alarm threshold, defined by the user, is exceeded, an alarm message is generated.

- **Alarm threshold alpha or beta:**
  If an alpha or beta alarm threshold is defined by the user, an alarm message is generated, as soon as this threshold is exceeded. Alarms can be set on activity concentrations, emission rates and integral values (Bq/m³ - Bq/h - Bq per day, week, month).

- **Detector failure threshold alpha and beta (and gamma if installed):**
  If the count rate falls below a preset value, an error message (detector failure) is generated.

- **Lamp test:**
  If the „Lamp test" switch is pressed, a digital input in the electronics is closed, which in turn triggers and activates all output relays.

TECHNICAL SPECIFICATIONS

Technical data transportable fixed filter monitor LB 9150-C

Filter holder	
Design	Stainless steel cylinder with 70 mm diameter, filter change with screw cap, easy filter change, stainless steel door with plastic front foil
Dusting area	approx. 600 mm², circular
Material of parts in contact with media	Stainless steel, aluminum inside
Pressure	Surroundings: 650 - 1100 hPa Sample air: max. -150 hPa/ +25 hPa relative to atm. pressure
Temperature	Surroundings: -15 / +40 °C Sample air: -20 / +40 °C
Filter	
Filter change	manually
Autonomy	Filter change approx. 1 x per week
Pump unit	
Pump	Low maintenance (> 10.000 h) Low-noise operation (< 60 dB(A))
Typical flow rate	2 bis 3 m³/h for standard condition
Alpha-Beta Detector	
Type	Si-CAM 600 mm² lightproof
Energy range (threshold values pre-amplifier)	Beta: 100 keV – 2.5 MeV Alpha: 2.5 MeV – 5.8 MeV (artificial area) Alpha: 5.8 MeV-10 MeV (natural area)
Background (system)	Alpha typ. 0.002 cps Beta typ. 0.2 cps
Shielding	> 2 cm all-round stainless steel
Shield detector (optional)	
Type	Si-CAM 600 mm² lightproof
Background (system)	Beta window typ. 0.2 cps

Electronic Unit	
Material Housing	Stainless steel
Dimensions	300 x 300 x 210 mm³ (H x W x D)
Protection class	IP 40 (to IEC 60529)
Weight	approx. 14 kg without ext. pump and trolley
Complete System	
Transport trolley	Aluminum profiles, 2 wheels
Dimensions with alarm column	ca. 1100 x 460 x 300 mm³ (H x W x D)
Weight	approx. 34 kg with xt. pump and trolley
Alarm unit	
Acoustic and optical signals	green light (normal status), yellow light and red flashing light, resettable horn 60 dB(A) at 1 m distance
Functions	Reset button Horn, lamp test push-button
General electrical specifications	
Net	95-240 VAC / 50 Hz / 60 Hz, 2 fuses 1.6 A T
Security	EN 60601 conform
Radiological	IEC 61172 (in parts) IEC 60761 part 2
Ports	Ethernet, 2x USB-A
Relais	5 potential-free, freely programmable relay-outputs with double changer
Analog output (optional)	2 × galvanically isolated, 0 (4) - 20 mA
Analog input (optional)	2 × galvanically isolated, 0 (4) - 20 mA
Subject changes without prior notice.	

TRANSFORMING SCIENCE INTO SOLUTIONS

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.

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