

# Product Information

## BAI 9109-4 Beta-Gasmonitor



### Applications:

- Monitoring of radioactive gases in rooms and discharged air
- Measurement of beta- and beta+ (positrons) nuclides

### Highlights:

- 1 to 4 large area proportional counter tubes, xenon sealed
- Integrated preamplifier and high voltage supply
- Measuring chamber with 11.45 l volume
- Lead shield, all sides with 2 cm thickness in  $4\pi$  geometry
- Different data acquisition systems available depending on the application:

Data Logger LB 112

Data Logger LB 5340

Data Logger LB 9000



# Product Information

## BAI 9109-4 Beta-Gasmonitor

### System conception

The Beta-Gasmonitor BAI 9109-4 provides the opportunity to monitor radioactive gases such as Krypton-85, Argon-41, Xenon-133, Carbon-11 and Fluorine-18 in rooms and discharged air with low minimal detectable activities.

The measuring chamber of the BAI 9109-4 can be equipped with 1 to 4 large area proportional counter tubes, xenon sealed, whereas one detector can be used as a compensation detector.

The sample air being measured will be directed via a prefilter by means of a pump disturbing particles

within the sample air will be removed and the air will be directed to the measuring chamber.

The measuring chamber has a volume of 11.45 l and is equipped with a lead shield all sides with 2 cm thickness in  $4\pi$  geometry to minimize the background as much as possible.

The minimal detectable activities (MDAs) in Bq/m<sup>3</sup> according to ISO 11929 are given in the table below (measuring time 3600s, background approx. 4 cps per detector):

Minimal detectable activities in Bq/m <sup>3</sup> according to ISO 11929 (measuring time 3600s, background 4 cps)	1 Detector	2 Detectors	3 Detectors	4 Detectors
C-11	294	208	169	146
F-18	542	382	312	270
Ar-41	285	201	164	142
Kr-85	552	390	318	275
Xe-133	807	570	465	403

### Technical Data

#### Measuring Chamber BAI 9109-4

Construction material PVC  
Volume 11.45 l  
Pump max. nominal flow rate through the vessel 15 m<sup>3</sup>/h

#### Lead Shield

Type 96 % Pb + 4 % Sb  
Geometry  $4\pi$  – all sided with 2 cm thickness  
Construction 6 plates  
Weight approx. 185 kg (lead only)

#### Detector

Type sealed xenon large area proportional counter tubes LB 6350-11  
Sensitive detector area 230 cm<sup>2</sup>  
Background typical approx. 4 cps per detector in 2 cm lead shield  
Measuring range 1 kBq/m<sup>3</sup> to 100 MBq/m<sup>3</sup>  
Gamma-sensitivity measured in Cs-137 isotropic dose rate field:  
1 Detector: 110 cps per  $\mu$ Sv/h  
2 Detectors: 220 cps per  $\mu$ Sv/h  
3 Detectors: 330 cps per  $\mu$ Sv/h  
4 Detectors: 440 cps per  $\mu$ Sv/h

Protection double protection grid for protection against pressure fluctuations up to 0.2 bar and prefilter

Electronics Integrated preamplifier and high voltage supply LB 2022-22

#### Ambient Conditions

BAI 9109-4 temperature: 0°C to +40°C  
humidity: 10 % to 95 % (non-condensing)

Sample air temperature: -5°C to +50°C  
humidity: 10 % to 95 % (non-condensing)  
max. flow: 15 m<sup>3</sup>/h  
max. differential pressure: 0.2 bar absolute  
sample must be free of caustic and acid vapours and solvents.

