

# 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 DIN 25482-1 are given in the table below (measuring time 3600s, background 6 cps):

Minimal detectable activities in Bq/m <sup>3</sup> according to DIN 25482-1 (measuring time 3600s, background 6 cps)	1 Detector	2 Detectors	3 Detectors	4 Detectors
C-11	3.20E+2	2.27E+2	1.85E+2	1.60E+2
F-18	5.91E+2	4.18E+2	3.42E+2	2.95E+2
Ar-41	3.10E+2	2.20E+2	1.79E+2	1.55E+2
Kr-85	6.02E+2	4.31E+2	3.53E+2	3.39E+2
Xe-133	8.80E+2	6.57E+2	5.23E+2	4.52E+2

### 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 6350-1  
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.

