

Aerosol Monitoring System AMS02

Profile: Measuring of radioactive aerosols, especially artificial nuclides

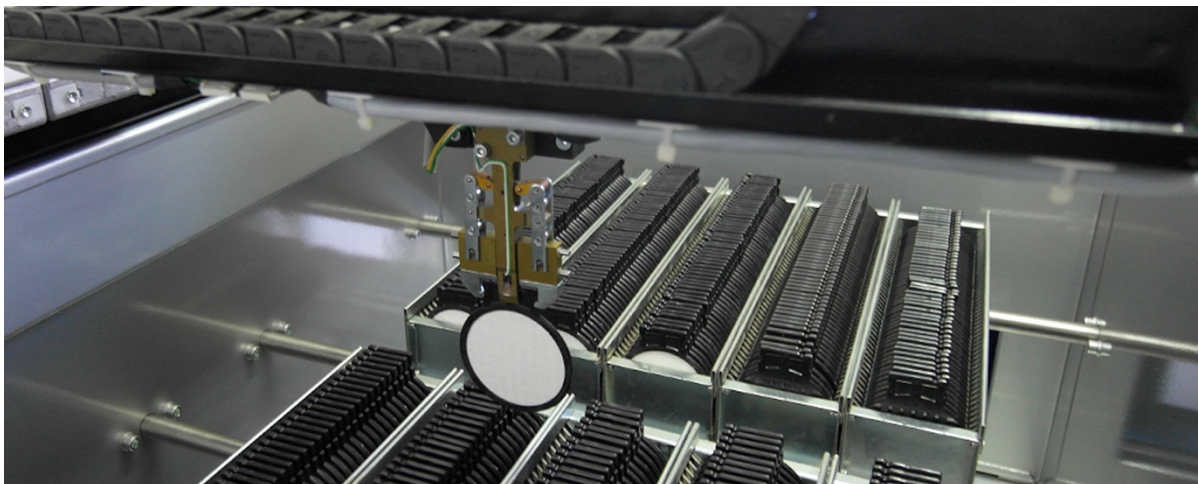
The aerosol measuring system applies two consecutive static filters, the first one for aerosol particles and a second planar filter for molecular iodine. The presence of non-natural radioactivity on either of the filters is detected by means of alpha-, beta- and/or gamma-counting. If a warning or alarm signal is generated, a third consecutive sampling and measuring unit is connected, as the air leaving the molecular iodine filter enters an appropriate canister filled with a specific absorber in order to separate organic iodine species which would escape the first two sampling devices. Activity of this unit, configured in Marinelli geometry, is measured by gamma counting. The static filter equipment is served by a manipulator from a stock of 500 filters.



MAIN TECHNICAL PARAMETERS

Size: 730 x 920 x 1520 (2100) mm
Weight: approx. 415 kg
Power: 230 V AC / 50 Hz / 950 VA
Environment: Temperature -15°C + 25°C
 Relative humidity: 0 - 70 %
Accumulated air: Temperature -30°C + 40°C
 Relative humidity: 0 - 99 %
Detectors:
 - 2" x 2" Na(Tl) (2 pieces)
 resolution 8 % (137Cs 662 keV)
 - PIPS 1700 mm²
 resolution 55 keV (α 241Am) < 30 keV (β)
 - Coaxial germanium detector (HP Ge) with electric cooling - No liquid nitrogen required
 resolution 2.0 keV FWHM at 1.33 MeV
 relative efficiency 33% at 1.33 MeV

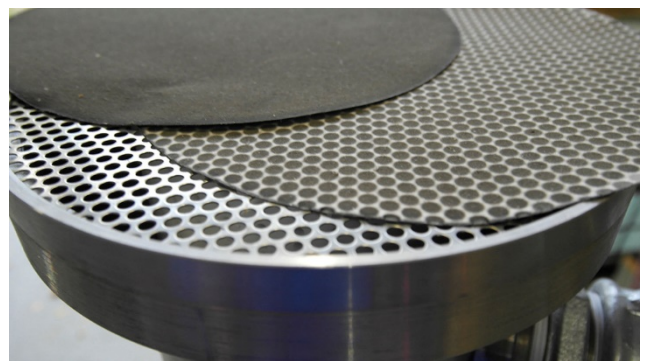
Isotop filter/Detector	Limit of detection (LD) [Bq/m ³]		
	duration of air filtering		
	5 min	1 hour	24 hours
Normal Mode			
131I aerosol/NaI(Tl)	5.4	0.8	0.066
131I iodine/NaI(Tl)	6.4	0.53	0.044
137Cs aerosol/NaI(Tl)	4.1	0.67	0.056
α-Activity (²³⁹ Pu) aerosol/PIPS	1.5	0.5	0.042
β-Activity (⁹⁰ Sr) aerosol/PIPS	2.5	0.7	0.052
137Cs aerosol/HPGe	6.7	0.77	0.006
Off-Normal-Mode (organic iodine filter)			
131I iodine/NaI(Tl)	8.7	0.72	0.058





The most important task of an air monitoring system is to give an alarm signal in the shortest time possible, when the radioactivity in the monitored area exceeds the natural level. Resulting from nuclear accidents or explosions, artificial radionuclides of various elements can be released into the atmosphere. Warning levels can be established on either the measurement of external dose rate, primarily due to gamma-radiation from a radioactive plume ("skyshine radiation") or from contaminated ground surface or on the measurement of radiocontamination adhered to floating aerosol particulates. In special cases, the first warning signal may also be based on monitoring radioactivity of surface waters.

As aerosol filters coupled to air pumps are capable of accumulating particles from large volumes of air onto a small surface, their radioactive content can be determined with good measuring



efficiency thus allowing advantageously low detection and warning levels. The **ASU** contains two consecutive static filters, the first one is for aerosol particles and the second filter is for molecular iodine.

Container for AMS02 with attachments

The insulated container has no windows and is equipped with a door with a safety-lock and with a door-handle. Furthermore, the roof is prepared for the installation of the meteorological mast. On the frame of the roof a CEE-plug with 32A is installed, used for the power supply (3 x 400 V AC/50 Hz). Inside of the container is an insulating-protection and automatic cut-out, as well as a light with an on/off switch and some sockets (220 V).

The floor is strengthened and enables a loading capacity of 800 kg/qm.

The container stands on a ground work of concrete and is fixed with a corresponding anchoring in the ground work.

On the roof is a lightning protection installed.



Technical data:

Outside dimensions: approx. length 3.000 x width 2.450 x height 2.630 mm

Air-conditioning system: split air-conditioner

V.4.0