

## Aerosol Monitoring Tape Filter System

Profile: Measuring of radioactive aerosols, especially artificial nuclides

The **AMS02T** is a step-band filter device with simple maintenance-free mechanics and high nuclear: Low limit of detections for the measurement of alpha, beta, gamma-aerosol and elemental iodine (optional) - in just one unit. The AMS02T has a one- or two-detector-system. By using the one detector system, a PIPS detector is always used for alpha and beta (radon) measurements with a glass fibre filter.

In a two-detector system, an additional NaI(Tl) scintillation detector or LaBr<sub>3</sub>(Ce) scintillation detector for aerosol gamma and elementary Iodine measurement is installed.

The unit can use two filter belts. The upper one is a 60mm wide glass fibre band for collecting aerosol, the lower one is a 60mm wide activated carbon impregnated (charcoal) filter band for storage of elementary iodine. The lower band for iodine will only be supplied when ordering this option.

The system offers online communication, electronic recording of measurement data and network capability.

An external gamma probe for measuring the ambient dose rate can be offered as an option.



The NaI or LaBr<sub>3</sub> detector is continuously automatic energy calibrated. Checking the efficiency calibration is possible by an optional Cs137 and Pu239+Sr90/Y90 source.

### Filter-band and driver

The filter belt drive switches the filter on every 1 to 3 days (adjustable) in the normal measuring mode. In case of an incident (e.g. irregular spectrum or alarm situation), one step is taken each hour to use fresh filter paper. Normally, a filter roll will last for about a year.

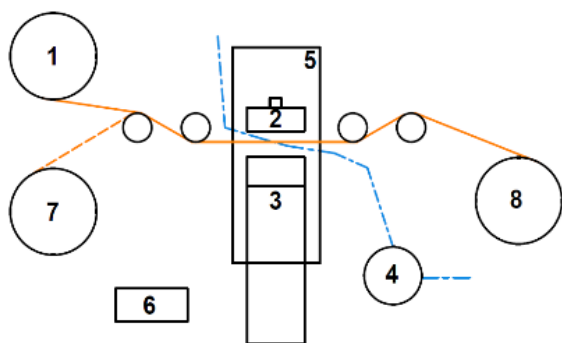
### Lead shielding

The sampling and measuring chamber are located in a lead shielding (Bleiburg). This dampens the natural background radiation by at least an order of magnitude.

### Air flow pump

The nominal volume rate of the maintenance-free pump is 3.5 m<sup>3</sup>/h. The flow-rate is measured indirectly by pressure sensors and a temperature sensor.

All detectors are autonomously working intelligent detectors with continuously automatic energy calibration through built-in MCA (multi-channel analyser) controlled by a microcontroller. All these intelligent detectors communicate via an RS422 communications bus connected to a PC or notebook via a single USB cable.



The equipment consists of the following units (fig. at left):

1. Aerosol filter-tape
2. PIPS-detector
3. NaI(Tl) or LaBr3 detector
4. Air flow pump
5. Lead shielding
6. Control unit
7. Carbon tape

## Description

This AMS02-T unit placed in a 19" rack and can be used as a fixed housing or a wall mounted version. Likewise, the installation in a vehicle is possible.

Optionally a meteorology station can be connected to the system (Temperature, Humidity, Air pressure, wind speed, wind direction, solar radiation, and precipitation).

## Sensitivity

Unique evaluation algorithms that have been used and developed for more than 20 years provide accurate results - every measurement sequence. The smallest detectable radioactivity was calculated and determined for all detectors in the system, taking only realistic sampling and measurement situations into account.

The table below is given in Bq/m<sup>3</sup>. They relate to the detector types, source-to detector geometry and - last but not least - to the data processing subroutines applied in the AMS02 system only.

## Technical Data:

**Size:** 700mm x 700mm x 1950mm

**Weight:** < 100 kg

**Power:** 230 V AC / 50 Hz / < 200 VA

### Environment:

Temperature -10°C + 40°C

Relative humidity: 0 - 90 % non condensing

### Units:

#### Detectors:

- PIPS 1700 mm<sup>2</sup>  
resolution  $\cong$  55 keV ( $\alpha$  241Am)
- 2" x 2" NaI(Tl)  
resolution < 8 % (137Cs 662 keV)  
background ~ 4 cps
- 1.5" x 1.5" LaBr3(Ce)  
resolution < 3 % (137Cs 662 keV)  
background ~ 40 cps

#### Pump:

Nominal flow rate > 3,5 (normal) m<sup>3</sup>/h  
for optional order 8 m<sup>3</sup>/h external one

#### Filters:

60 mm wide glass fibre filter tape  
60 mm wide iodine filter tape