

poCAMon

Personal Alpha/Beta Continuous Air Monitor (CAM)



The poCAMon personal online continuous air monitor combines a very compact design with a high flow rate and long battery life. The unit measures long living aerosols as well as short living Radon daughters by alpha spectroscopy and beta counting. In a radon atmosphere, the instrument can be used as Working Level monitor. The instrument recognizes if only natural Uranium aerosols have been collected and adjusts the related dose coefficients automatically. The continuous peak shape adaptive results in accurate natural background compensation independent on filter exhaustion and particle size.

A bright alpha numeric display and clear keypad allow the operation even under harsh conditions. The integrated powerful charger recharges the unit within two hours. Optical and acoustic alerts will warn the user immediately in case of dangerous situations. For first responders, an optional wireless interface (Net Monitors by ZigBee) allows the officer-in-charge to receive the data online from the action forces. The instrument can be ordered also with a GPS receiver.

APPLICATIONS:

- For monitoring activity concentrations of airborne radioactive aerosols (LLRD) and measurement the radon / thoron equivalent equilibrium concentration (EECRn & EECTh) and/or the potential alpha energy concentration (PAEC) at workplaces
- In nuclear facilities
- In the NORM industry
- In mining companies
- In nuclear medicine

FEATURES

- Continuous monitoring of breathing air for airborne long-lived radioactive aerosols (LLRD) and short-lived radon decay products
- Assessment and minimization of inhalation hazards for workers
- Warning of workers in case of high levels of airborne activity
- Spectroscopic separation of the nuclides and the complete compensation of the natural radon background for the LLRD measurement
- Battery life of more than 30 hours

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SPECIFICATIONS

Detector	<ul style="list-style-type: none"> • 400mm² ion-implanted silicon detector, open face sampling for minimum collection losses
Energy range	<ul style="list-style-type: none"> • 0.15 ... 3MeV (Beta); 3 ... 10MeV (Alpha)
Counting efficiency	<ul style="list-style-type: none"> • Approx. 20% (4π)
Filter	<ul style="list-style-type: none"> • Membrane filter (PTFE); 3μm pore size; 25mm dia. with neoprene sealing • Deposition rate >99,9% • Active filter test with respect to perforation and exhaustion tool-less replacement of the filter • > than 1 month operation in "normal" environment
Pump	<ul style="list-style-type: none"> • Low noise quality rotary van pump • Nominal air flow 3l/min (adjustable range 1.5 to 3l/min) • Processor controlled air flow for constant deposition conditions • Pressure drop across the filter 5...20mbar (at 3l/min) • Noise emission approx. 48/51dBA (in 1m/30cm distance)
Results	<ul style="list-style-type: none"> • Equilibrium Equivalent Concentration (EEC) for radon and tho- ron daughter products in Bq/m³ • Exposure for alpha and beta emitters (LLRD) in Bqh/m³ • Dose for alpha and beta emitters in μSv or DAC-hrs (dose coef- ficients adjustable by user) • Detection of Natural Uranium with automatic selection of the Unat dose coefficient • Average activity concentration for alpha and beta emitters in Bq/m³ • Separate channel for Alpha gross counting in cps or Bq or Mar- kov Algorithm for Radon daughter product grab sampling • Potential alpha energy concentration (PAEC) in J/m³ • Flow rate, filter exhaustion, battery voltage
Standards	<ul style="list-style-type: none"> • IEC 60761-1 • IEC 60761-2 • IEC 61578 • IEC 61577-3 • IEC 1263 • CE
Compensation	<ul style="list-style-type: none"> • Compensation of natural Radon background by Alpha spectros-copy with dynamic fitting of peak shape with respect to progressive filter exhaustion • Upper alpha energy threshold for LLRD = 5,6MeV • Static compensation of gamma background • Dynamic shock rejection (mechanical shock) by pulse signal shape analysis
LLRD Sensitivity	<ul style="list-style-type: none"> • Approx. 2 cpm/(Bqh/m³)
Measurement range	<ul style="list-style-type: none"> • 0...125 000Bqh/m³ (0...625 000 DACh(Pu)) • 7.5MBq/m³ over 1 minute or 16kBq/m³ over 8 hours
Measurement	<ul style="list-style-type: none"> • Up to 16 user definable sampling cycles (1s to 1year) • Predefined sampling cycles 1 and 30 minutes as well as 12 hours filter analysis (without pump)
Detection limits	<ul style="list-style-type: none"> • See tables below
Alert indication	<ul style="list-style-type: none"> • Configurable alert thresholds for all measured results • Bright alert LED with yellow and red light • 85dB signal buzzer • Alert indication at display • Alert reset is configurable (either with confirmation by the user or automatic reset if the alert condition is no longer present) • Pre-defined alerts for LLRD activity, low/high count rate, filter perforation
Data storage	<ul style="list-style-type: none"> • 2 GB SD-card (> 1 200 000 data records) • Storage of all measured raw data incl. spectra
Display	<ul style="list-style-type: none"> • Large alphanumeric display 4 x 20 characters • High contrast even in direct sunlight • Backlight

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Operation	<ul style="list-style-type: none">• Three buttons, operation with gloves possible Intuitive, straight forward menu structure
Interface	<ul style="list-style-type: none">• USB, Net Monitors wireless (ZigBee optional)
Power supply	<ul style="list-style-type: none">• 12V/3.8Ah Standard NiMH battery pack power adapter 18V/3A
ATEX category	<ul style="list-style-type: none">• No
Housing	<ul style="list-style-type: none">• Ergonomic and smart design easy to decontaminate
Dimensions/Weight	<ul style="list-style-type: none">• 106mm x 56mm x 200mm/1.3 kg
Environmental conditions	<ul style="list-style-type: none">• 0 ... 50 °C• 5 ... 95 % rF. non-condensing• 800 ... 1100 mbar
Software dVISION	<ul style="list-style-type: none">• Remote control• Data transfer, visualization• Data management, export to text files system configuration• Creating/editing of measurement cycles network management
Additional options	<ul style="list-style-type: none">• GPS receiver
Calibration/Test	<ul style="list-style-type: none">• Factory calibration in a radon daughter product atmosphere with aerosol generator• Test sources Am-241 (Alpha), Cs-137 (Beta), Co-60 (Beta); recommended are area sources with 25mm diameter and 185Bq nominal activity such as Eckert & Ziegler AMRB25499,• CDRB25498, CKRB25500 or similar• Flow rate check on top of the filter using adapter dome and low differential pressure air flow meter ($\Delta p < 10\text{mbar}$ @3l/min)
Included	<ul style="list-style-type: none">• USB cable• Charger/power supply adapter• User manual both instrument and SW (on CD as .pdf-file) calibration certificate• Aerosols filter (1+10 pcs.) transport suitcase• Harness for comfortable wearing (optional)

