



FEATURES

- Very easy maintenance due to
 - new electronic concept
 - new detector technology
 - new hardware concept
- Fibre detectors
 - much reduced operation and maintenance cost
 - decreased dead-zones
 - gas-free
 - central photomultiplier
- Touch screen
- Mini-UPS (uninterruptable power supply)
 - buffers voltage fluctuations
 - keeps monitor alive after voltage drop
 - indicates charging level on display
- Optimized measurement geometry
- Improved operation in noisy electronic environments and increased gamma background

RADOS TwoStep™-Exit II

Whole Body Contamination Monitor

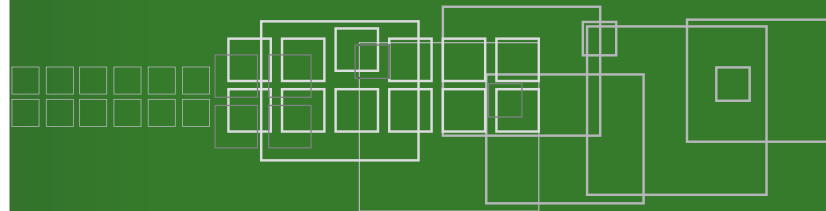
Handling radioactive materials may cause contamination. Our CheckPoint:Body™ monitors are designed to thoroughly check all persons entering or leaving a particular area, building or site. Typically, the monitors are deployed between controlled and clean areas.

The TwoStep™ concept, has been proven in generations of RADOS body monitors to be the optimum method to measure whole body contamination.

The new electronic concept paired with proven fibre detectors provide a highly efficient measurement chain. The light signal produced by the detector will be turned into an electronic signal in the central photomultiplier box and thereafter reach the PC for calculation and subsequent processing.

Benefits are simple & economic operation and maintenance, particularly in comparison to standard monitors.

TwoStep™-Exit II is the product of development at the cutting edge of technology, based on years of experience in developing and building body monitors.



health physics

A Mirion Technologies Division

Featuring:

RADOS

MONITOR DESCRIPTION

- Realtime multitasking operating system QNX
- RADOS industrial PC 2010
- 15" touch screen
- Passageway illumination (LED)
- Service illumination (LED)
- Automatic start of measurement when entering monitor
- P²-accelarator to reduce measuring time
- Service via touch screen with key lock system
- Large detector door with quick fastener to be able to access monitor quickly & easily
- Voice prompts
- Up to 4 languages selectable via touch screen from a whole range
- Stainless steel housing easily decontaminated

FIBRE™-DETECTORS

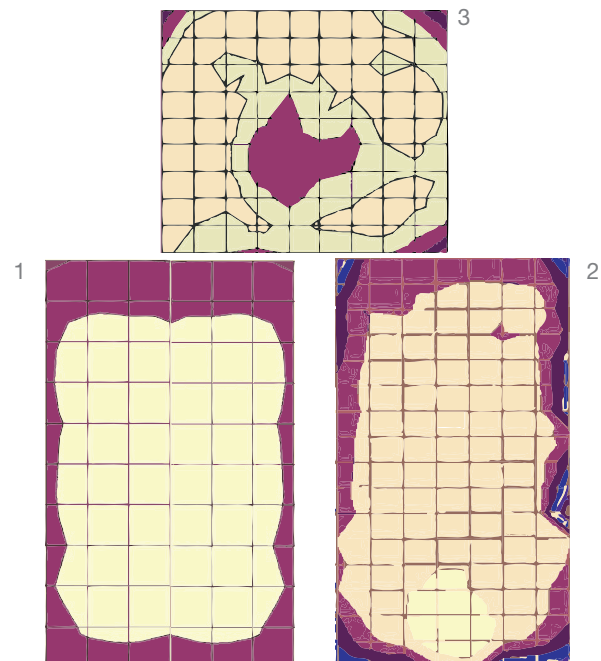
Fibre detectors feature an increasing sensitivity towards the edges. Linked up over the whole length of monitor the detection response will be homogeneous in total. Additionally, dead zones in between detectors are reduced and therefore lead to much improved detection results (see fig. 1-3).

Further features of fibre technology:

- Rugged detector technology without electronics, connected by light fibre, all parts are standardised thoroughly. Benefit: much reduced operation and maintenance costs
- Detector repair by customer's personnel possible
- Plug & Play properties for the detectors
- Improved detector door geometry and positioning leads to a further increased detection probability by decreasing detector to body distance
- BetaFibre™ detectors
 - low sensitivity to increased gamma background
 - low false alarm rates
 - low detection limits
- Option: GammaFibre™ detectors for separate detection of gamma sources for body, hands, feet, and/or small items
- Option: Beta/Gamma Hybrid detector, thyroid and thorax monitoring possible

OPTIONS

- GammaFibre™ Detectors
- Beta/Gamma-Hybrid Detectors
- Various grid transparencies for detector protection
- Extended Mini-UPS by adding batteries
- Reversible walk-through direction
- Additional display at exit side
- Sliding doors and/or barriers
- Head detector
 - manual or
 - automatic or
 - adjustable by telescopic bar
- Small-items box/es
- Link to CeMoSys™ server for central monitoring
- Integrated card, bar code or dosimeter reader
- pdf and network print



Detector sensitivity in comparison

Gas-flow detector (fig. 1): Homogeneous, but large zones with low sensitivity at the edges.

Beta-Plast detector (fig. 2): Steeply decreasing sensitivity at the edges, ie extensive dead zones in between detectors.

Fibre detector (fig. 3): sensitivity increases towards the edges, which leads to homogeneous sensitivity in total and only marginal dead zones in between detectors.

MEASUREMENT

Background Measurement

- Automatic background subtraction
- Background updated every second for each detector
- Measurement algorithm using two median filters to follow any background change in real time
- Quickly fluctuating background doesn't lead to measurement abort
- After background change automatic return to status «ready»

Measurement

- Automatic calculation of shortest possible measurement time
- P² accelerator to shorten measurement time for non-contaminated personnel by up to 30%
- Using preset fixed measurement time possible
- Positioning by voice prompts

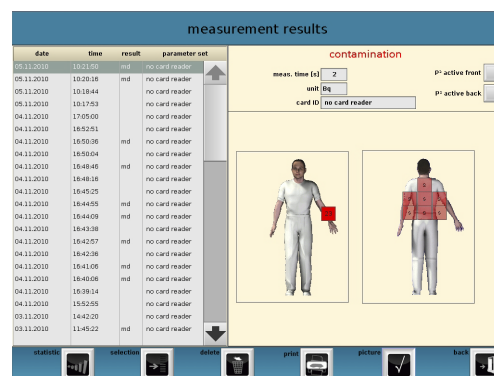
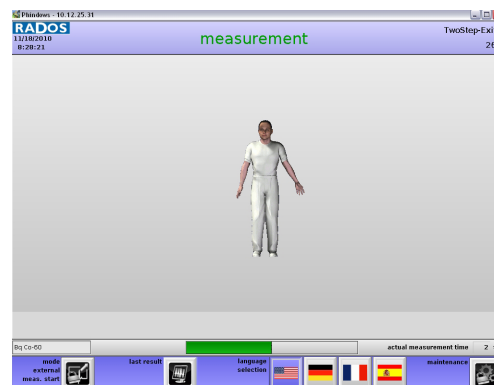
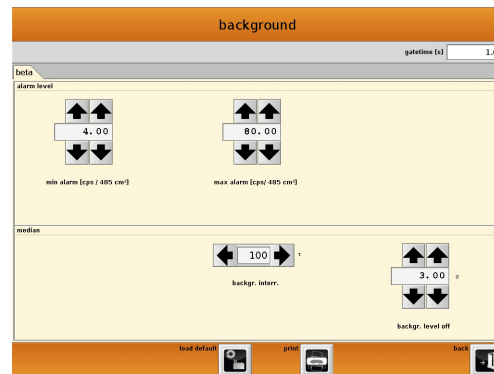
Results

- Results announced by voice prompts
- Graphic display helps to identify the contaminated parts of the body
- Individual results of all detectors available via push button
- Measurement results are stored in a database and can be exported
- Full intranet access to database using CeMoSys™ (Option)

SERVICE

Maintenance

- Standardised components for quick & easy service
- All parameters and maintenance tools available via graphic user interface
- Information on current detector and measurement status available
- Check of all binary inputs and outputs
- Light leak test to identify damaged detectors
- Quick test for single detectors with calibration sources (option)
- Detector replacement in less than 60 sec due to hardware simplification and «ready» in 7 min (required for reestablishing background)



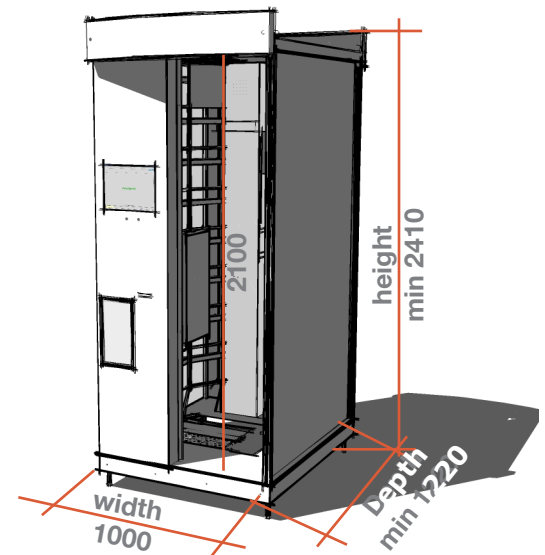
Self Diagnostic

- Background count rate with minimum and maximum alarm thresholds, special algorithm to early identify light leakage
- Monitoring of communication between electronics and PC, reporting error information

Calibration Tool

- Single and multiple source calibration
- Calibration of one, several or all channels
- Simple recalibration after detector change
- Database for calibration sources, automatic calculation of current activity
- Reference calibrations automatically transferred to measurement software
- Comparison of detector efficiencies with reference database for monitoring calibration results possible
- Results can be printed and exported to USB device

Technical Specifications:	CheckPoint:Body™	TwoStep™-Exit II																								
BetaFibre™ detectors	Type	Window Surface Area																								
Body	RFD485	485 cm ² each																								
Hands	RFD485																									
Head	RFD485																									
Feet	RFD485																									
Small Items (optional)	RFD485																									
GammaFibre™ detectors	Typ	Sensitive Volume																								
Body	RFD13/67 (up to 6 detectors)	6675 cm ³																								
Feet/Hands	RFD6/18 (1 detector)	1800 cm ³																								
Small Items (optional)	RFD4.8/3.8 (1 detektor or more)	388 cm ³																								
Grids	3 transparencies available: steels grids T66 oder T81 (standard) or honey comb 5																									
Detection Limit (MDA) parameters: sigma (1,65 + 1,65); background 0,1 µSv/h; measuring time: 10 s	BetaFibre™ Detector (in contact, per side) <table border="1"> <thead> <tr> <th></th> <th>T81 grid</th> <th>T66 mesh</th> </tr> </thead> <tbody> <tr> <td>²⁴¹Am</td> <td>25 Bq</td> <td>35 Bq</td> </tr> <tr> <td>¹⁴C</td> <td>255 Bq</td> <td>315 Bq</td> </tr> <tr> <td>⁶⁰Co</td> <td>55 Bq</td> <td>60 Bq</td> </tr> <tr> <td>³⁶Cl</td> <td>25 Bq</td> <td>35 Bq</td> </tr> <tr> <td>⁹⁰Sr/⁹⁰Y</td> <td>12 Bq</td> <td>15 Bq</td> </tr> <tr> <td>¹³⁷Cs</td> <td>30 Bq</td> <td>35 Bq</td> </tr> <tr> <td>⁹⁹Tc</td> <td>60 Bq</td> <td>70 Bq</td> </tr> </tbody> </table>		T81 grid	T66 mesh	²⁴¹ Am	25 Bq	35 Bq	¹⁴ C	255 Bq	315 Bq	⁶⁰ Co	55 Bq	60 Bq	³⁶ Cl	25 Bq	35 Bq	⁹⁰ Sr/ ⁹⁰ Y	12 Bq	15 Bq	¹³⁷ Cs	30 Bq	35 Bq	⁹⁹ Tc	60 Bq	70 Bq	GammaFibre™ detector (optional) (5 cm distance to detector door: 6 x RFD13/67) ⁶⁰ Co < 450 Bq ¹³⁷ Cs < 1500 Bq source in middle of sum channel
	T81 grid	T66 mesh																								
²⁴¹ Am	25 Bq	35 Bq																								
¹⁴ C	255 Bq	315 Bq																								
⁶⁰ Co	55 Bq	60 Bq																								
³⁶ Cl	25 Bq	35 Bq																								
⁹⁰ Sr/ ⁹⁰ Y	12 Bq	15 Bq																								
¹³⁷ Cs	30 Bq	35 Bq																								
⁹⁹ Tc	60 Bq	70 Bq																								
Elektronics	Industrial-PC, Hard disc, Touch screen, USB device, speech processor, illumination (LED), Mini-UPS																									
Software	realtime multi-tasking operating system QNX 6 (UNIX like, POSIX compliant), user software mit P ² -accelerator, calibration tool																									
Relay Outputs	5 user selectable																									
Mains	100 - 240 V	1.0 - 2.0 A 50 - 60 Hz																								
Dimensions	Height	ca. 2410 mm - ca. 3100 mm																								
	Width	ca. 1000 mm																								
	Depth	ca. 1220 mm - 1335 mm																								
	Weight	ca. 350 - 750 kg																								
Environmental Conditions	Temperature	0°C - 45°C																								
	Relative humidity	< 75%, max. 95% in yearly average, no condensation																								



Since norms, specifications and designs are subject to occasional change, please ask for confirmation of the information given in this publication.

© Copyright 2011, All rights reserved. For trademark and registered trademark information. The copyright in this work is the exclusive property of Mirion Technologies (RADOS) GmbH and is protected under the laws of Germany and other countries worldwide.



www.mirion.com
 7NUC_TSEII_Y018-004E_PDB

Mirion Technologies (MGPI) Inc
 5000 Highlands Parkway
 Suite 150
 Smyrna Georgia 30082
 USA
 T +1.770.432.2744
 F +1.770.432.9179

Mirion Technologies (MGPI) SA
 BP 1
 F-13113 Lamanon
 Frankreich
 T +33 (0) 4 90 59 59 59
 F +33 (0) 4 90 59 55 18

Mirion Technologies (RADOS) Oy
 P.O. Box 506
 FIN-20101 Turku
 Finnland
 T +358 2 4684 600
 F +358 2 4684 601

Mirion Technologies (RADOS) GmbH
 Ruhrstrasse 49
 D-22761 Hamburg
 Deutschland
 T +49 40 85193 0
 F +49 40 85193 256