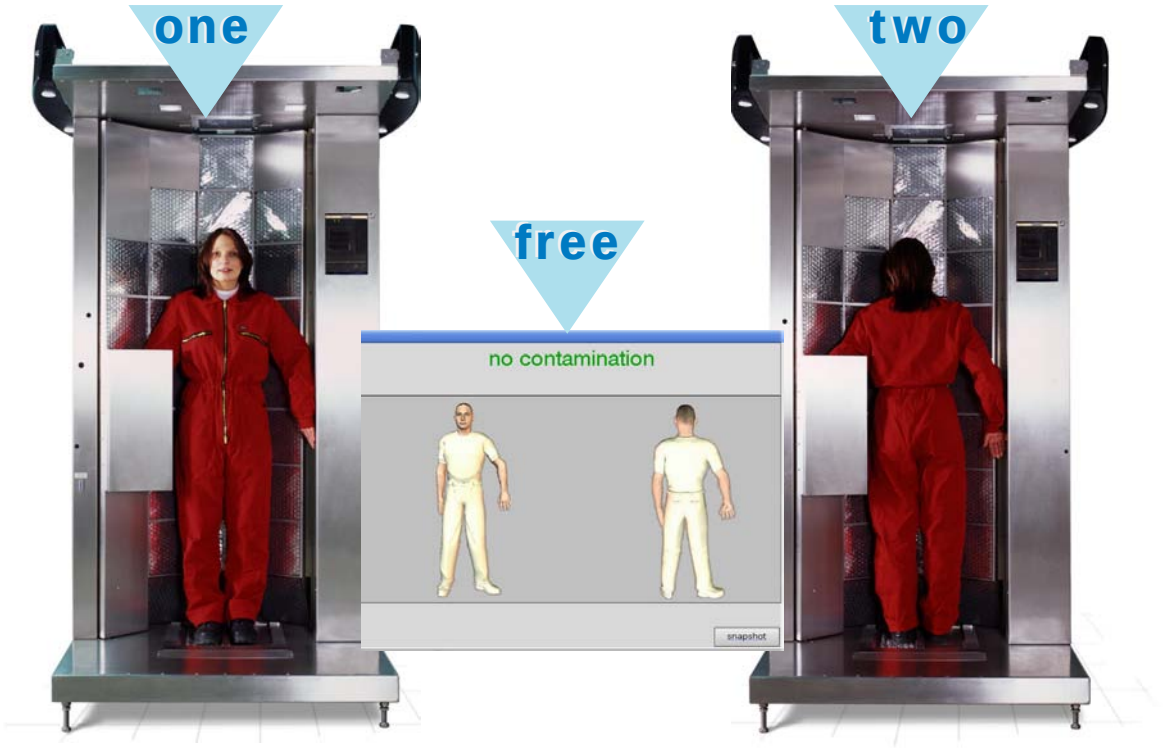




CheckPoint:Body™ TwoStep™ - Exit

A breakthrough in technology for gas free body monitors - Setting new standards for measurement performance with economic and robust operation

- **Superior performance due to radically improved geometry and advanced measurement chain**
- **Reduced operation and maintenance cost compared to standard body monitors**
- **Increased detector robustness**
- **Improved operation in noisy electronic environments and increased gamma background**

The TwoStep™ - Exit is a new breed of body monitor to check for beta contamination on personnel leaving the controlled areas of nuclear facilities.The TwoStep™- Exit is the product of development at the cutting edge of technology, based on years of experience in building body monitors. It utilises advances in BetaFibre™ detector technology paired with a radical redesign of monitor geometry.

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www.rados.com

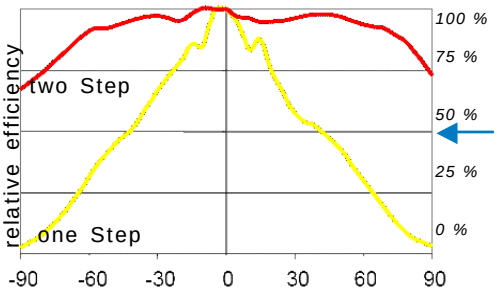
Technical and Hardware description

Features overview

- **Improved Geometry**
  Detectors shaped around the body while at the same time systematically decreasing dead zones
- **Radically new BetaFibre™ scintillation detector design**
  Durable, low gamma sensitivity, improved light collection properties
- **TwoStep™ methodology**
  Proven in generations of Rados body monitors to present the best coverage around the entire body
- **Real time multitasking operating system QNX**
  Graphical user interface, calibration tool, detector test programme and P² accelerator
- **Designed for performance in nuclear environments**
  Stainless steel housing, easily decontaminated, easy maintenance

Two-Step Measurement

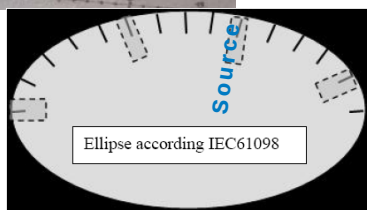
- **FIRST STEP**
  Front of body
  Left hand and arm
  Left foot
  Front and top of head
- **SECOND STEP**
  Back of body
  Right hand and arm
  Right foot
  Back of head



Performance of TwoStep™ - Exit versus One Step contamination monitor (Ellipse test) acc. to IEC61098

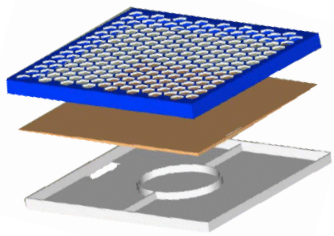
Variation of the horizontal response with source position (around the body)

Source position on th ellipse in ° [DEG]



BetaFibre™ detectors

- Low sensitivity to increased or fluctuating gamma background leads to improved measurement results and low false alarm rates
- Improved detector geometry and positioning leads to a further increased detection probability while decreasing detector to body distance
- Plug & play properties for the detectors
- Maintenance-free detectors
- Much improved overall detection probability due to homogeneous detection response over the length of the monitor
- Optional separate detection of gamma incorporation



BetaFibre™ detector

Service features

- Large detector door for quick and easy access to all parts of the monitor
- No tools required for detector replacement
- Rigorous standardisation of parts
- Simple detector design allows the repair by customer technicans, resulting in lower maintenance costs
- Spare detectors can be stored inside the monitor

Options

- Manually or automatically adjustable head detector
- Sliding doors or barriers
- Small-items box
- Integrated card, bar code or dosimeter reader
- UPS - Uninterruptible Power Supply
- Gamma incorporation measurement
- Language selection for available languages:
  Dutch, English, Finnish, French, German, Italian, Lithuanian, Mandarin, Portuguese, Romanian, Russian, Spanish, Swedish, Taiwanese.
  Further languages on request.

Electronics and Software

Measurement Mode

Background Measurement

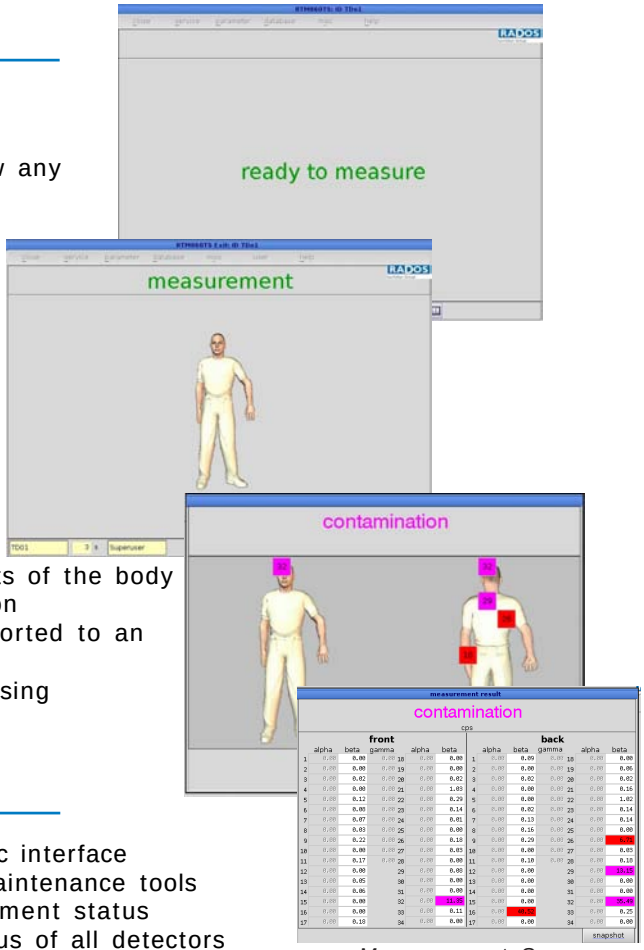
- Automatic background subtraction
- Background updated every second for each detector
- Measurement algorithm using two median filters to follow any background change in real time
- Monitor permanently ready to measure

Measurement Time

- Automatic calculation of the shortest possible measurement time
- P² accelerator to shorten measurement time for non-contaminated personnel up to 25 % to 30 %
- Usage of a preset fixed measurement time possible

Measurement Results

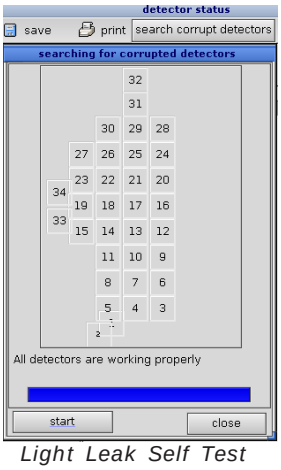
- Positioning guided by voice
- Results announced by voice
- Displayed graphics help to identify the contaminated parts of the body
- individual results of all detectors available via push button
- measurement results stored in database and can be exported to an ASCII log file
- Full intranet access to database with explorer browser using CeMoSys (Central Monitoring System) (option)



Measurement Sequence

Maintenance

- All functions available via graphic interface
- Set-up of all parameters and maintenance tools
- Information on current measurement status
- Detailed information on the status of all detectors
- Plug and play accessibillity for the whole monitor to ease maintenance
- Check of all binary inputs and outputs
- Database with export to USB device
- Light leak test to check function of all detectors, interfaces and connections
- Test of each detector with the optional detector alarm test to guarantee an optimized secure performance
- Detector replacement time: <60 sec

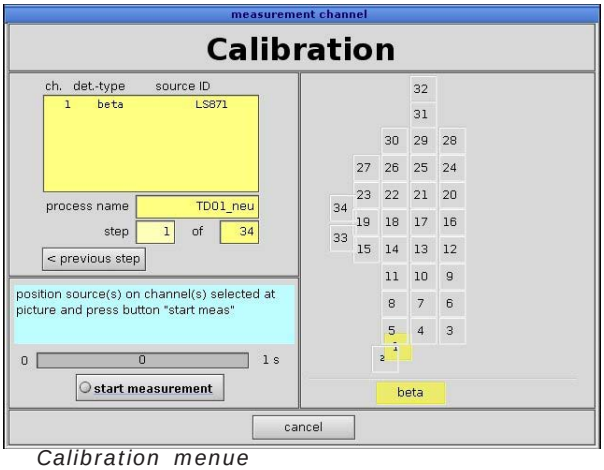


Light Leak Self Test

Self Diagnostics

- Background count rate monitoring with minimum and maximum alarm thresholds
- Automatic return to “ready to measure” status
- Special algorithm for early detection of light leaks
- Monitoring of detector HV and communication

Calibration tool “System Check”



Calibration menue

- single and multiple source calibration
- calibration of one, several or all channels
- database for calibration sources, automatic calculation of current activities
- reference calibrations automatically transferred to measurement software
- comparison of detector efficiencies with reference database for storage of calibration results
- Results can be printed and exported to USB device

Technical data — CheckPoint:Body™ TwoStep™ - Exit

Detector		Type		Window surface area
	body	RFD485	one detector type fits all	485 cm² each
	hands	RFD485		485 cm² each
	head	RFD485		485 cm² each
	foot	RFD485		485 cm² each
	small item (optional)	RFD485		485 cm² each
	34 +			
Protection Grille	3 transparencies available:		plastic grid , stainless steel grids: 68 %, 80%	

Detection Limit (MDA) (in contact, per side)	plastic grid	80% transparent	68% transparent
^{241}Am	20 Bq (alpha)	25 Bq	30 Bq
^{14}C	250 Bq	300 Bq	350 Bq
^{60}Co	50 Bq	70 Bq	80 Bq
^{36}Cl	25 Bq	30 Bq	40 Bq
^{90}Sr	15 Bq	20 Bq	25 Bq
^{137}Cs	35 Bq	45 Bq	50 Bq

Sigma (1.65 + 1.65); 0.1 µSv/h, 10 s

Electronics	industrial PC, hard disc, CD-RW disc drive, LC-display, IR-keyboard with mouse, printer interface, USB device, speech processor
Software	real time multi-tasking operating system QNX 6 (UNIX like, POSIX compliant), user software with P² accelerator, ''System Check'' calibration tool (formerly WKP)
Relay Outputs	standard: system fault, ready to measure, contamination optional: on request
Mains	100 V - 240 V 1.0 A - 2.0 A 50Hz – 60 Hz

Dimensions, Weight (see also figure)	
height	from 2490 mm to 3099 mm
width	1000 mm
depth	from 1220 mm to 1584 mm
weight	approx. 290 kg

Environmental Conditions	
temperature	0 °C - 45 °C
relative humidity	< 75 %, max. 95 % on yearly average, no condensation

EMC

compliant with European Electromagnetic Compatibility Directives:

EN61326 (1997)	EN61000-4-2 (2001)
EN61000-4-3 (2003)	EN61000-4-4 (2005)
EN61000-4-5 (2001)	EN61000-4-6 (2001)
EN61000-4-8 (2001)	EN61000-4-11 (2005)

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Y013/003

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

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