



VF NUCLEAR



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POWER PLANTS



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INDUSTRY  
& MANUFACTURING

## ExitScan-1, ExitScan-2

# PERSONNEL EXIT MONITORS



### KEY FEATURES

- Scintillation, gasless detectors with integrated processing electronics allowing easy calibration and quick on-site replacement of faulty detectors
- Various detector types available for different types of contamination (alpha, beta, and gamma emitters)
- Excellent coverage of full body front and back, both sides of hands and feet, outsides of legs, and arms.
- Tight hand detector geometry for high efficiency alpha contamination measurement.
- Dynamic algorithm for optimisation of measuring time to ensure highest personnel throughput.
- User friendly interface with several colour displays and voice prompts.
- Wide range of configurations and accessories.
- Various language versions available for displays and voice prompts.
- Option to identify users using an ID card/chip reader
- A standard Ethernet interface for the communication with a host system.
- Quick change of measurement parameters (e.g. alarm levels, nuclides, units) by selection from stored preset values using the touch screen display.
- Output relay contacts for control of technology (e.g. external alarm lights, doors, turnstiles etc.)
- Calibration mode for quick verification of correct operation
- Remote switch (input) to the *emergency* mode (without measurement) or *out of operation* mode
- Possibility to define areas of scanning including multiple detectors with common evaluation
- Extremely easy access to detectors; facilitating their maintenance and replacement.
- Common spare parts with other VF monitors, including the detectors, reduces the stock of spares.

### PURPOSE

The ExitScan is a two-step, full-body contamination monitor, designed to check for radioactive contamination on personnel exiting radiation-controlled areas. The monitor checks for presence of alpha, beta, and gamma emitting radionuclides (depending on detectors fitted).

ExitScan monitor types A, B, and C have suppressed sensitivity to gamma radiation and thus low response to gamma background. This allows setting of lower alarm levels comparing to the D and E types

- **A** measures only alpha contamination and is therefore designed especially for plants for the production and / or processing of nuclear fuel, uranium mining and / or processing.
- **B** measure alpha and beta contamination but cannot discriminate them. It has the highest sensitivity to beta contamination, especially low energies.
- **C** is a two-channel monitor, which can distinguish between alpha and beta contamination.

Monitor types B and C are suitable for nuclear power plants, where the background from gamma radiation is increased or variable.

Monitor types D and E have increased sensitivity to gamma radiation and thus higher response to gamma background. This prevents them from setting as low alarm levels as can be set for the B and C types.

- **D** measures all types of radiation (alpha, beta, gamma) in one channel. It is suitable for nuclear medicine workplaces where Tc-99m radionuclide and possibly others pure gamma emitters are used.
- **E** measures all types of contamination and can discriminate alpha. It is suitable for training or experimental workplaces.

The monitor can also be optionally equipped with a contamination monitor for small objects.

# ExitScan-1, ExitScan-2

## PERSONNEL EXIT MONITORS

There are 2 different types of monitors:

**ExitScan-1** is a lighter and more economical variant with 18 detectors. Unlike ExitScan-2, it does not allow blocking of the passage of contaminated or unmeasured persons by an automatic barrier.

**ExitScan-2** offers a wide range of optional equipment and its design allows maximum contact of the measured person with the detectors. The ExitScan-2 is available in these 2 configurations:

- **FULL** with 26 detectors
- **OPTIMA** with 18 detectors

For both ExitScan-1 and ExitScan-2 are available the same types of detectors.

### MEASUREMENT

The monitor continuously measures the background radiation until a person enters it. Then the first step - measuring of the front of body begins. Once the user has achieved the correct measurement position, which ensures the maximum detection efficiency, the measuring process begins. Visual indicators and voice prompts help to achieve the correct position. After finishing this, the second step begins. The user is asked to turn around, and the process repeats for the back of the body. To ensure the shortest possible measuring time (taking into account the background, alarm levels and probability of errors), a dynamic statistical evaluation algorithm is used.

A movable head contamination monitor (if integrated) will automatically lower towards the user's head, until it is at the right distance, with a range of motion of approximately 500 mm.

The monitor reports measurement results and operating status on several displays.

If a set alarm level is exceeded, a visual display indicates where the contamination is, and an audible alarm is activated.

Measurement results and events are stored and can be exported to a PC for records and analysis via Ethernet (Modbus, TCP/IP).

### SETTINGS

Using the touchscreen, a predefined set of parameters can be selected, language changed and the monitor can be switched to the service mode (basic diagnostics and settings).

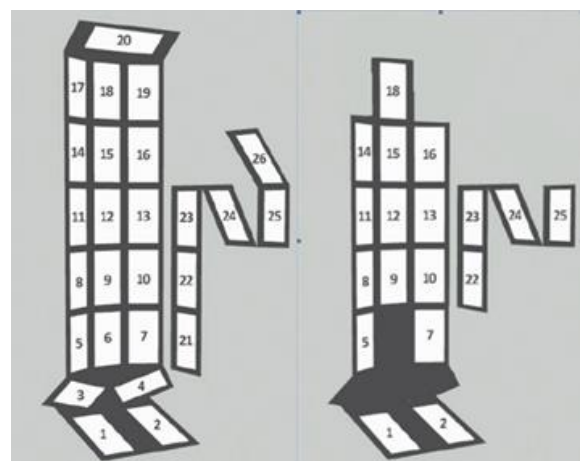
A PC with service software is used for full diagnostics and settings.

### SPECIFICATIONS

Detector type	scintillator
Typical efficiency <sup>*)</sup>	
Am-241 (alpha)	40%
Cl-36 (beta)	40%
Typical decision threshold <sup>*)</sup>	
Am-241 (alpha)	0.01 Bq/cm <sup>2</sup>
Cl-36 (beta)	0.04 Bq/cm <sup>2</sup>
Dimensions (W×H×D)	
- ExitScan-2	(1000 × 2400 × 1300) mm
- ExitScan-1	(990 × 2180 × 820) mm
Typical weight <sup>**)</sup>	
- ExitScan-2	450 kg ± 10 %
- ExitScan-1	250 kg ± 10 %
Power supply	110/240 VAC, max. 125 W
Ingress protection	IP 20
Communication interface	Ethernet (Modbus TCP/IP)
Displayed units	cps, cpm, dpm, Bq, Bq/cm <sup>2</sup> , Ci, Ci/cm <sup>2</sup> , 1/(cm <sup>2</sup> .min)

<sup>\*)</sup> Efficiencies, decision thresholds and detection limits values for individual radionuclides can be requested from our sales representative.

<sup>\*\*)</sup> Depend on configuration and optional accessories.



The difference in detectors placement for models ExitScan-2 FULL (left) and ExitScan-2 OPTIMA and ExitScan-1 (right)



**OPTIONAL FEATURES <sup>1</sup>**

Name	ExitScan-2 FULL	ExitScan-2 OPTIMA	ExitScan-1
Left and/or right door	Available	Available	Not available
Left and/or right half-door	Available	Available	Not available
Automatic barrier left and / or right	Available	Available	Not available
Movable head detector	Available	Available	Not available
<b>Small items contamination detector</b>			
- Gama	Available	Available	Available
- Alpha/Beta (2 channel)			
- Alpha + Beta + Gamma (1 channel)			
<b>Additional gamma detectors</b>	Available	Available	Not available
<b>Additional lead shielding of 1 cm, 2.5 cm or 5 cm</b>	Available	Available	Available
<b>ID card reader</b>	Available	Available	Available
<b>Uninterruptible power supply</b>	Available	Available	Available
<b>Robust protective grid for SCD-525 detectors with 3 mm cell size</b>	Available	Available	Available

*ExitScan-1 with 18 detectors*<sup>1</sup> Optional features must be specified before ordering

# PERSONNEL EXIT MONITORS

## TYPES

Name	Channel 1	Channel 2
ExitScan-1A ExitScan-2A	alpha	-
ExitScan-1B ExitScan-2B	alpha + beta	-
ExitScan-1C ExitScan-2C	beta	alpha
ExitScan-1D ExitScan-2D	alpha + beta + gamma	-
ExitScan-1E ExitScan-2E	beta + gamma	alpha

## RELATED PRODUCTS

ASU-50	Alarm Slave Unit
HF	Hand-Foot Contamination Monitor with 6 detectors
HF-4	Hand-Foot Contamination Monitor with 4 detectors
HM-4	Hand Contamination Monitor
FCM-11	Frisking Contamination Monitor
SIM	Small Items Monitors

## OPTIONAL ACCESSORIES

50-A-0011369	Cardboard frame with protective foil for foot detectors
59-A-0010008	165 cm <sup>2</sup> calibration source holder
59-A-0010006	100 cm <sup>2</sup> calibration source holder
50-P-0010894	Mounting tool for SCD-525 detectors
50-P-0010893	Mounting tool for SCD-286 detectors



HM-4



HF series

