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MEDICINE

HF-6

HAND-FOOT CONTAMINATION MONITOR



MAIN ADVANTAGES

- Gas-less smart scintillation detectors with internal processor carrying calibration constants, enabling quick change of detectors and easy calibration
- Excellent tight geometry for alpha contamination measurements with high efficiency
- Robust construction with increased load capacity and resistance to mechanical stress
- Control electronics in separate compartment, minimising chance of contamination
- One or two channel monitor with choice of detectors for different radiation
- High throughput thanks to the advanced measurement time statistical algorithms
- User friendly graphic interface with touchscreen display
- Quick change of measurement parameters (for example alarm levels, nuclides, units) by selection from stored presets using the touchscreen display
- Voice messages available in different languages
- Easy transport due to wheels and a handle
- Ethernet LAN connection as standard
- Export of measured data to USB flash disk
- Web interface for the remote display of status
- Volt-free relay I/O connections, e.g. for automatic door control, etc.

PURPOSE

The HF-6 hand-foot contamination monitors are intended for the measurement of surface contamination by alpha, beta and gamma emitting radionuclides on hands, feet, and clothing.

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 monitor 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** measures 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 gamma background may be 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 monitor 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.

HF-6 monitors use four scintillation detectors to measure hand contamination, two for each hand, for simultaneous measurement of the palm and the back of the hand. Two scintillation detectors are used to measure foot contamination.

The monitor measures the background radiation when not being used, and subtracts this from the user measurements to allow operation in higher background areas. As soon as any sensor detects that a person is present, the background measurement is interrupted. Once the user has achieved the correct measurement position, the measuring process begins. Visual indicators and voice prompts help to achieve the correct position.

The monitor guides the workers during the measurement sequence and informs them of the results by voice and visual display.

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

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	scintillation
Active hand area	4 × 286 cm ²
Active foot area	2 × 525 cm ²
Dimensions (W × H × D)	(784 x 1396 x 815) mm
Weight	approx. 78 kg
Operational load capacity	up to 150 kg
Power supply	100 to 240 VAC
Units	cps, cpm, dpm, Bq, Bq/cm ² , Ci, Ci/cm ² , 1/(cm ² .min)
Operational temperature	0 to +45 °C

OPTIONAL FEATURES

ID card reader
Frisking probe for measuring clothing contamination with holder

OPTIONAL ACCESSORIES

59-A-0010115	Fixture for calibration checks (for 120 x 200 mm sources)
50-A-0011369	Additional protective foil frame for foot detectors (suitable for alpha and alpha/beta monitors)
51-A-0000259	Service cable, USB A – Fischer 5 pin

EXAMPLE OF RADIOMETRIC PARAMETERS

Model	Channel	Radionuclide	Hand detector		Foot detector (foot detector with tread grid)	
			Efficiency [%]	MDA [Bq/cm ²]	Efficiency [%]	MDA [Bq/cm ²]
HF-6A	α	²⁴¹ Am	42	0.01	37 (19)	0.004 (0.01)
HF-6B	α	²⁴¹ Am	45	0.03	38 (18)	0.03 (0.05)
	β	³⁶ Cl	50	0.02	45 (28)	0.02 (0.03)
HF-6C	α	²⁴¹ Am	42	0.01	38 (19)	0.004 (0.01)
	β	³⁶ Cl	31	0.03	40 (22)	0.02 (0.03)
HF-6D	α	²⁴¹ Am	38	0.07	39 (19)	0.06 (0.12)
	β	³⁶ Cl	46	0.05	46 (29)	0.04 (0.06)
	γ	¹³⁷ Cs	39	0.05	44 (27)	0.04 (0.06)
HF-6E	α	²⁴¹ Am	41	0.01	39 (20)	0.004 (0.01)
	β	³⁶ Cl	41	0.05	39 (25)	0.04 (0.07)
	γ	¹³⁷ Cs	34	0.06	36 (21)	0.04 (0.07)

TYPES OF MONITORS

Name	1. channel	2. channel
HF-6A	alpha	-
HF-6B	alpha + beta	-
HF-6C	beta	alpha
HF-6D	alpha + beta + gamma	-
HF-6E	beta + gamma	alpha

RELATED PRODUCTS

HM-4	Hand-Contamination Monitor
HF-4	Hand and Foot Contamination Monitor with 4 detectors
SFP-100	Smart Frisking Probes
FCM-11	Frisking Contamination Monitor
ExitScan-2	Personnel Exit Monitor