

# Product Information LB 147

## Personal Contamination Monitor



### Applications

- Radionuclide Laboratories
- Nuclear Facilities
- Environmental Measurement /  
Homeland Security
- Nuclear Medicine
- PET Facilities

### Highlights:

- ZnS(Ag)-scintillation detectors
- High detector efficiencies
- Removable hand probe for frisker measurement (right side)
- Space-saving design
- Simple operation with graphic display and touch panel
- USB, Ethernet, RS 232 and RS 485 interface
- Service functions (plateau, calibration, periodic test, ...)
- Remote Parameter Program
- Permanent data memory for 1750 measuring data
- Extensive nuclide library
- Card reader/transponder for access control
- Double password hierarchy



# Product information

## LB 147 Personal Contamination Monitor

### Equipment Concept

Compact versatile contamination monitor for radiation protection applications for alpha and beta/gamma contamination measurements. Removable hand probe for frisker measurements. Automatic request for back of hand measurement, if configured. Personal ID possible by means of an optional card reader or transponder.

The menu structure is very clearly arranged and easy to operate. The built-in power supply adjusts automatically to the various alternating voltage supplies.

Up to 1750 measuring data can be stored and transferred via USB, Ethernet, RS 232 or RS 485 to an external computer. A simple communication protocol permits the integration into a measuring network. The operation of the LB 147 is done via touch panel on the graphical display. The input of all parameters is password protected. The monitor can be switched easily between different lead nuclides before the measurement. Two optional external signal lights indicate the state of operation and/or an exceeding of an alarm threshold. If requested a gate can be unlocked if no contamination is detected.

The device can be used for simultaneous measurement of alpha-beta/gamma radiation or as pure beta/gamma monitor. The measuring results can be represented in the units Bq/cm<sup>2</sup> or in cps.

Each detector has its own calibration factor for each nuclide and a spillover factor for each alpha nuclide.

The ambient radiation is continuously monitored for each detector and used to compensate the contamination measurement with the long-term average background value. The monitor checks for background fluctuations before the start of each contamination measurement.

The monitor LB 147 complies with the requirements of the international standard IEC 61098. This is true in particular for the detector performance, the manufacturers' calibration procedures and the determination of efficiencies.

Numerous service functions permit easily measurements for necessary periodical tests. This includes automatic plateau measurement, calibration routines for all detectors and a fast system test. All other sensors as well as in- and outputs can be checked very quickly by means of further service functions.

For configuration and documentation there is a remote parameter program available for the monitor. Beside the direct communication the software can also be used to create or edit file settings.

### Technical Data LB 147

#### Measuring Electronics

Compact and energy efficient microprocessor electronics, program in Flash memory allowing easy program update using a Flash Wizard, real-time clock, further connection of 2 additional probes with +5 V supply, standard norm pulse output and control signal for probe high voltage.

Input/Output: 4 digital inputs, 6 control voltages, 2 serial interfaces, 1st as RS 232 or RS 485, the 2nd as RS 232 connection for a card reader/transponder, Ethernet interface, USB interface (slave), 3 relays with change-over contacts for mains switching of external light beacons (e.g. red/green light with horn) or exit barrier

#### Mechanical Data

Necessary standing area 65 cm x 125 cm x 80 cm (W x H x D) (without alarm column)

Weight approx. 25 kg

#### Mains Supply

Wide range input 85 – 264 VAC, 47-65 Hz,  
Power consumption: approx. 7 W, fuse: 2 A

#### Hand Detectors

Radiation detector	ZnS(Ag) Scintillator
Entrance window's material	2 x 3 µm Plastic metallized (0.4 mg/cm <sup>2</sup> )
Entrance window's dimensions	150 mm x 230 mm
Sensitive area	345 cm <sup>2</sup>
Transmission protective grid	80 %
Background	α-channel approx. 0.1 cps β-γ-channel approx. 15 cps

Typical Efficiencies (according to ISO 7503-1):

Am-241	33 %
C-14	20 %
Cl-36	49 %
Sr-90/Y-90	52 %

#### Foot Detectors

Radiation detector	ZnS(Ag) Scintillator
Entrance window's material	2 x 3 µm Plastic metallized (0.4 mg/cm <sup>2</sup> )
Entrance window's dimensions	150 mm x 370 mm
Sensitive area	555 cm <sup>2</sup>
Transmission protective grid	72 %
Background	α-channel approx. 0.2 cps β-γ-channel approx. 40 cps

Typical Efficiencies (according to ISO 7503-1):

Am-241	19 %
C-14	21 %
Cl-36	54 %
Sr-90/Y-90	43 %

#### Ambient Conditions

Operation temperature	-5°C to 40°C
Rel. humidity	0 to 90%, no condensation

#### Accessories optional

	Ident. No.
Mobile Version Kit	for moveable version 52874
Transponder system (RFID)	for personal identification 59496
Chip/card	for transponder 59495/ 59503
Card reader	for personal identification 49052
Magnetic card	for card reader 34481
Alarm column	signalization of device status and contamination 54693
Calibration sources	<sup>36</sup> Cl, approx. 1 kBq 29336 <sup>241</sup> Am, approx. 1 kBq 25509
HFC-Program	acquisition of measured data in Access-Database UMAD HFK

This instrument is not intended to be used for diagnostic and/or therapeutic purposes for human beings and is not a medical device according to the definitions of the European Council Directive 93/42/EEC concerning medical devices.