

Portable
Contamination Monitor
LB 122



The Contamination Monitor LB 122

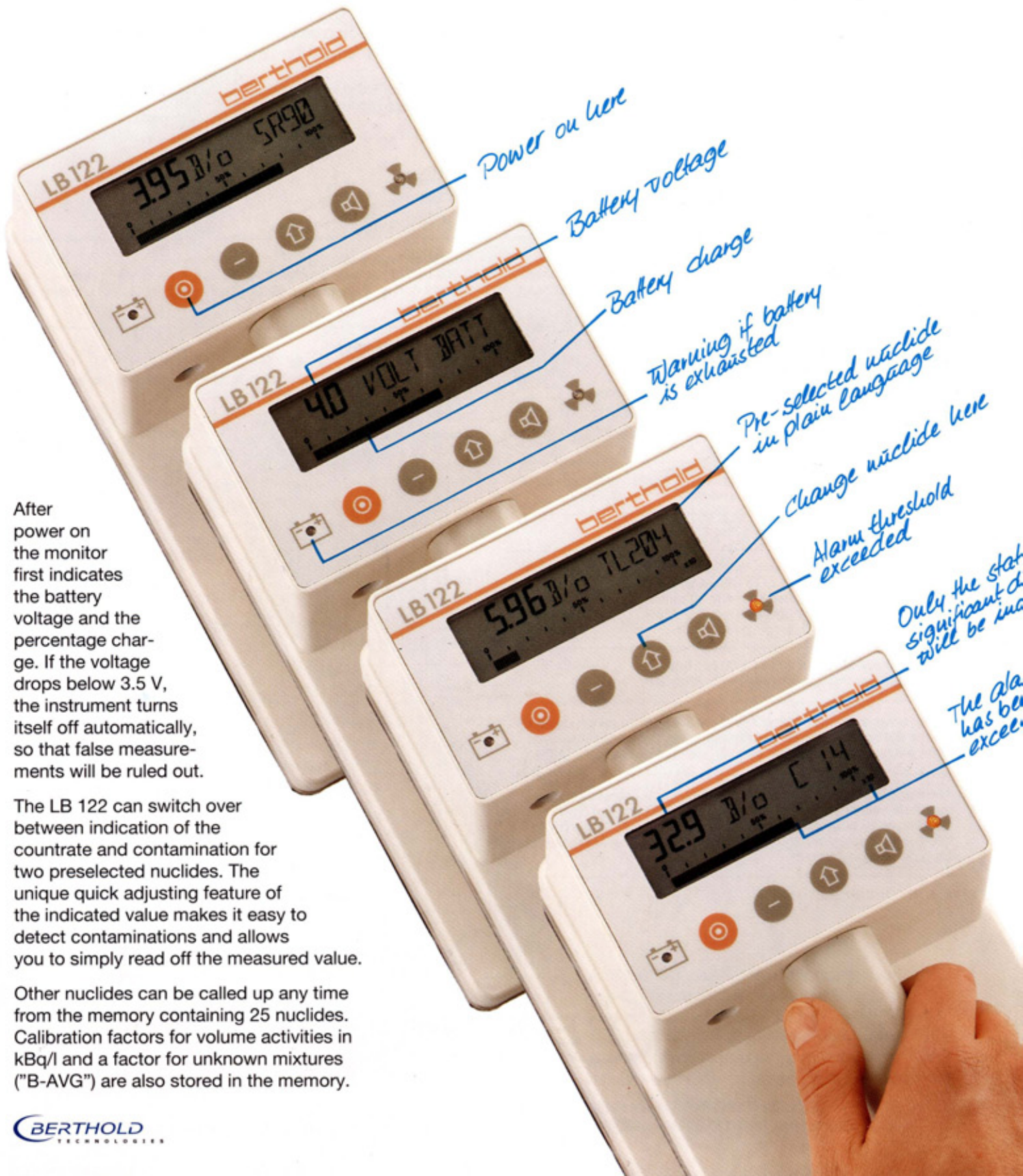


The basic unit including a Beta-Gamma-Xenon detector is used in medical radionuclide laboratories to measure the contamination on surfaces and objects with a very high sensitivity.

Features of the LB 122

Operation is simplicity itself using only 4 buttons. Untrained personnel will be able to handle this instrument easily.

The calibration factors for the nuclides displayed have been entered into the memory by the manufacturer and cannot be changed by the user. As of January 1992, however, a new program is available, allowing the free setting of the calibration factors for two beta sources and for the alpha position Alpha-Average.



After power on the monitor first indicates the battery voltage and the percentage charge. If the voltage drops below 3.5 V, the instrument turns itself off automatically, so that false measurements will be ruled out.

The LB 122 can switch over between indication of the countrate and contamination for two preselected nuclides. The unique quick adjusting feature of the indicated value makes it easy to detect contaminations and allows you to simply read off the measured value.

Other nuclides can be called up any time from the memory containing 25 nuclides. Calibration factors for volume activities in kBq/l and a factor for unknown mixtures ("B-AVG") are also stored in the memory.

Stored Radionuclides

	β - γ -Detector LB 6357	α - β -Detector LB 6358 G	
Display in Bq/cm ²	¹⁴ C	¹⁴ C	Operation Range Beta
	²² Na		
	³² P	³² P	
	³⁵ S	³⁵ S	
	⁴⁵ Ca	⁴⁵ Ca	
	⁵¹ Cr		
	⁵⁵ Fe		
	⁵⁷ Co		
	⁵⁹ Fe		
	⁶⁰ Co	⁶⁰ Co	
	⁶³ Ni		
	⁹⁰ Sr		
	⁷⁵ Se		
	⁸⁵ Sr		
	⁹⁰ Sr		
	^{99m} Tc		
	¹²³ I		

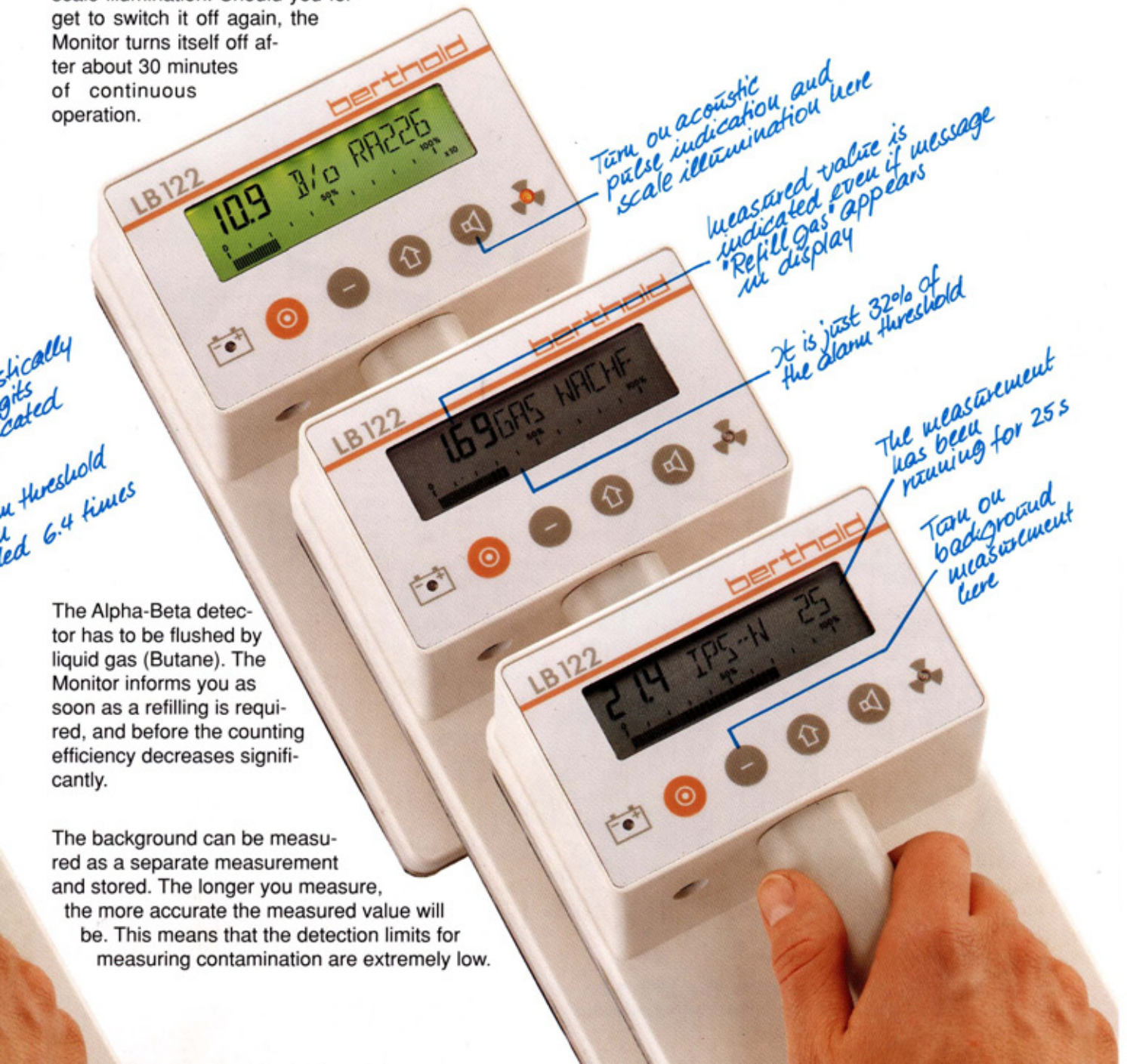
	β - γ -Detector LB 6357	α - β -Detector LB 6358 G	
Display in Bq/cm ²	¹²⁵ I		Operation Range Beta
	¹³¹ I	¹³¹ I	
	¹³⁷ Cs	¹³⁷ Cs	
	¹⁹⁸ Au		
	²⁰¹ Tl		
	²⁰⁴ Tl	²⁰⁴ Tl	
	²²⁶ Ra	²²⁶ Ra	
	²³⁸ U	²³⁸ U	
	²⁴¹ Am	²⁴¹ Am	
	Beta-AVG B-1, B-2*)	Beta-AVG B-1, B-2*)	
Bq/l	¹³¹ I	¹³¹ I	
	¹³⁷ Cs	¹³⁷ Cs	
Bq/cm ²		Alpha-AVG*)	Alpha

*) Calibration factor can be set by the user

The LB 122 Monitor indicates - in addition to cps Alpha and cps Beta - the area activity of 25 radionuclides and the average values of two nuclide mixtures via stored calibration factors, and also the volume activity of 2 radionuclides.

The calibration factors relate to 100 x 100 mm area sources. Since the conversion into Bq/cm² is rather questionable for alpha emitters, due to the unknown high self-absorption of the source, the LB 122 does not include any calibration factors in the alpha range for alpha emitters - except for the average value of Alpha-AVG.

If the visibility is bad, just turn on the scale illumination. Should you forget to switch it off again, the Monitor turns itself off after about 30 minutes of continuous operation.



*stically
gits
ated*

*Threshold
led 6.4 times*

Turn on acoustic pulse indication and scale illumination here

measured value is indicated even if message "Refill Gas" appears in display

It is just 32% of the alarm threshold

The measurement has been running for 25 s

Turn on background measurement here

The Alpha-Beta detector has to be flushed by liquid gas (Butane). The Monitor informs you as soon as a refilling is required, and before the counting efficiency decreases significantly.

The background can be measured as a separate measurement and stored. The longer you measure, the more accurate the measured value will be. This means that the detection limits for measuring contamination are extremely low.

What you can do with the LB 122



In combination with a wall mounting device and a power supply unit, the portable monitor becomes a semi-stationary instrument which can be employed, for example, to monitor personal contamination at the exit of controlled areas.

You need not touch the monitor to measure the contamination on hands

The simple replacement of the Xenon detector by an Alpha-Beta detector enables you to extend the range of applications to include, for example, nuclear power facilities working with alpha emitters.



The monitor recognizes the detector and sets the program accordingly



This case includes the monitor plus one spare detector, test source, gas cartridge and accessories.

A universally applicable instrument for the mobile application in environmental and disaster protection is available including a complete set of accessories in a sturdy aluminum transport case.

Special Features:

- Additional positions in the nuclide library with freely selectable calibration factor
- Display option for the numerical values of the permanently stored calibration factors
- Alpha-Beta counter tube LB 6358 GP for P-10 operation with plug-in valves and wall station for flushing/filling.

The P-10 counter tube with automatic flushing has been developed as an alternative to the Butane-filled counter tube.

When "parking" the instrument in the wall station, the gas flow is released and the instrument is ready for use in the stationary mode, e.g. as an exit monitor.

When taking the instrument off the wall station, the valves will automatically close on both sides and the monitor may be employed for local contamination measurements. One gas filling suffices for up to 8 hours, depending on the temperature and pressure conditions in the field.

The counter tube is also suitable for already delivered LB 122 instruments.

Important Technical Data of the LB 122

Detector:

Standard: sealed Xenon detector LB 6357 for Beta-Gamma measurement, window area 120 mm × 190 mm, incorporated in the base plate of the housing

Option: replaceable gas-fill detector (Butane) LB 6358 G for Alpha-Beta measurement, window area 120 mm × 190 mm.

Option: replaceable gas-flush detector (P-10) LB 6358 GP for alpha-beta measurement, window area 120 mm × 190 mm. Operational only with wall console serving as refill station.

Superior protection of the counter tube window against mechanical damage by special construction of the cover grid, degree of covering 32%

Housing: Splash-proof in accordance with the requirements for the use of the instrument by fire departments.

Operation: Foil keypad with 4 buttons

Display: LCD, trans-reflective, multiplexrate 2
Additional illumination by LED's with stray disc
Elements: 4 digits with decimal point, 10 mm high, 9 alphanumeric characters, analog bar chart with scale 0-100% or × 10, × 100, × 1000, respectively.

Indicated numerical range: 0.000 to 9999
with dimension change × 1000 (kcps, kBq/cm²)

Digits after decimal point: Only the statistically relevant decimal places will be indicated. When changing the decade, the decimal point will remain in the same position, as far as possible.

Alarms: LED signals for battery voltage too low, exceeding of threshold value Plain language on display for "Rate too high" (starting at 20.000 cps, corresponding to approx. 1000 Bq/cm²), "No counts" (detector failure), "Refill gas" (only if the Alpha detector LB 6358 G is connected)

Threshold values:

0.001 to 9999 adjustable digit-by-digit, separate for each radionuclide or cps, respectively. Battery buffered by separate Lithium battery

Acoustic indication:

Piëzo oscillator 2.5 – 3 kHz
Alarm as interrupted continuous tone, single pulse (can be switched on) as sound burst approx. 4 ms

Energy supply:

3 „C-size" (baby) primary cells located in the handle
Power consumption approx. 0.06 A, with illumination turned on 0.17 A

Operational life:

> 72 h with alkali manganese cells, without illumination

Battery indication:

Digital indication of the total voltage in the range from 2.7 to 4.8 V, resolution 0.1 V
Analog reading battery charge from 100% at 4.3 V to 0% at 3.3 V; below 3.3 V LED alarm signal

Temperature range:

with Xenon detector from –15 °C to +50 °C
with Butane detector from approx. 0° C to +50 °C

Humidity: 0–98% humidity without dew

Dimensions: 140 mm × 234 mm × 126 mm

Weight: 2175 g (including batteries)

