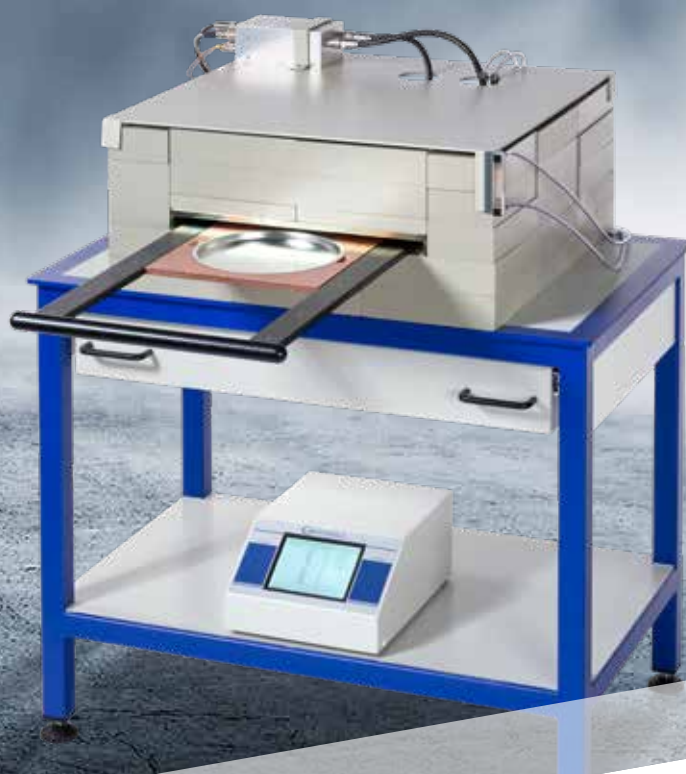


LOW-LEVEL COUNTER SERIES LB 761 & LB 790

Reliable measurement of low α/β activities



BERTHOLD

ALPHA-BETA LOW-LEVEL COUNTERS

High sensitivity for lowest activities

Accurate measurement of radioactivity is of crucial importance in both environmental monitoring and workplace monitoring.

A quick and accurate analysis of activity levels in water or air samples ensures compliance with legal regulations. Reliable results are also essential when conducting wipe tests to check equipment and work tools for even very low levels of radioactive contamination. This is particularly important when tools or other items leave a controlled area.

Berthold low-level counters are the ideal solution because they use techniques to reduce background radiation, specialized detectors, and lead shielding to ensure precise measurements at all times. Our low-level product line consists of various models with up to 20 detectors and samples up to Ø 30–60 mm (LB 790) or Ø 200 mm (LB 761). The detection limits are calculated in accordance with DIN ISO 11929.



LB 790 with 10 samples within a single drawer

Berthold Low-Level Counter Benefits

■ Minimizing the impact of interfering background radiation:

- 10 cm lead shielding from all sides
- Selected low activity materials
- Guard counter to eliminate the influence of cosmic radiation

■ Flexible configurations:

- Systems with one common or with separate drawers for each detector module
- Hybrid-systems with Ø 60 mm and Ø 200 mm sample slides
- TWIN Systems with up to 20 x Ø 60 mm detectors
- Various conversion kits for retrofitting the systems (e.g., from LB 790 to LB 790 TWIN or LB 790 Hybrid)

■ Service & Maintenance:

- Modular detector concept
- Easy access to detectors and other components

MEASURE WITH HIGH SENSITIVITY

Designed to minimise the impact of interfering environmental background

The LB 761 and LB 790 series instruments enable the simultaneous and separate measurement of low alpha and beta activities emitted by radionuclides, while minimizing the effects of interfering ambient radiation. The following features contribute to their sensitivity:

Efficient lead shielding

Samples and counting tubes are surrounded by a 10 cm thick shield made of standard lead bricks to reduce ambient radiation in a 4 π geometry.

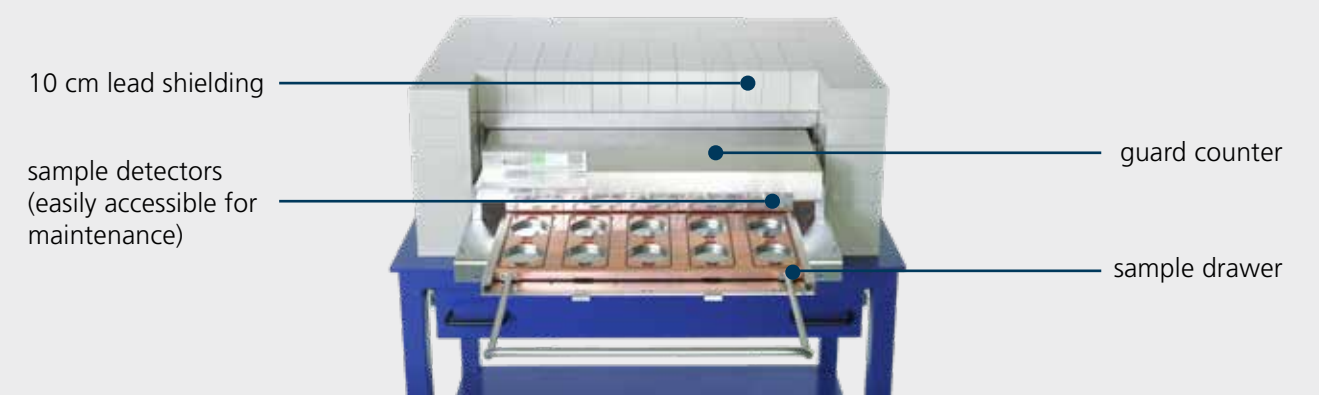
Guard counter

To eliminate the influence of cosmic radiation on the measurement, a large surface proportional counter covers the Low-Level detectors from above. This detector works in anticoincidence with the sample detectors.

Counting tube

The counting tube is made of low active copper.

By efficiently reducing ambient radiation, Berthold's Low-Level Series achieves extremely low detection limits and, as a result, short measurement times.



The special design of the Berthold Low-Level Counters eliminates not only the ambient radiation, but also the influence of cosmic radiation.

DIFFERENT VERSIONS

Various models for different applications

The LB 790 Series is a 2- to 20-channel low-level counter designed for high-throughput measurement of wipe tests or samples with similar geometries. Depending on the sample throughput and sample type, the number of samples in a measurement series can be varied and adjusted as needed. The LB 790 is ideal for samples with a diameter of up to 60 mm.

Up to five separate flow counter tubes, each with two low-level detectors, allow for the simultaneous measurement of 10 samples. With an LB 790 TWIN or LB 790-5L TWIN, you can even upgrade to a system with 20 low-level detectors.

LB 790 / LB 790 TWIN

The LB 790 features a drawer with a total of 10 detectors for simultaneous measurement. A version with two drawers, each containing 10 detectors, is available as an option (LB 790 TWIN). An existing LB 790 system can also be upgraded with a second drawer.

LB 790-5L / LB 790-3L

Equipped with 5 or 3 individual drawers for 2 samples each, the LB 790-5L or LB 790-3L offers a high degree of flexibility. Each drawer can be loaded individually, enabling up to five independent measuring routines for diverse samples. The LB 790-3L (for up to 6 samples) can be upgraded to a LB 790-5L (for up to 10 samples) later on.



The LB 790-5L Low-Level Counter provide five individual sample drawers for measuring up to two planchets each with Ø 60 mm with independently configurable measurement routines.

EFFICIENT SOLUTIONS FOR SMALL TO LARGE SAMPLES

LB 761 for Ø 200 mm samples

The LB 761 low-level measurement system for Ø 200 mm samples enables the measurement of alpha and beta radiation from airborne particles collected on a glass fiber filter or from vaporized environmental samples.



The LB 761 Low-Level Counter provides a single sample drawer for measuring planchets up to Ø 200 mm.

LB 790 Hybrid systems

Our LB 790 hybrid systems combine the LB 790 with the LB 761 and allow for the simultaneous, independent measurement of up to ten Ø 60 mm samples and one Ø 200 mm sample within the same device. Compared to using two separate systems, this not only reduces costs but also minimizes space requirements and weight.

COMPREHENSIVE EVALUATION SOFTWARE

Easy-to-use and optimising your productivity

The entire LB 761 and LB 790 series is operated using the AMS analysis software. This enables not only user-friendly device control but also simple data analysis.

Innovative approaches to analyse your data

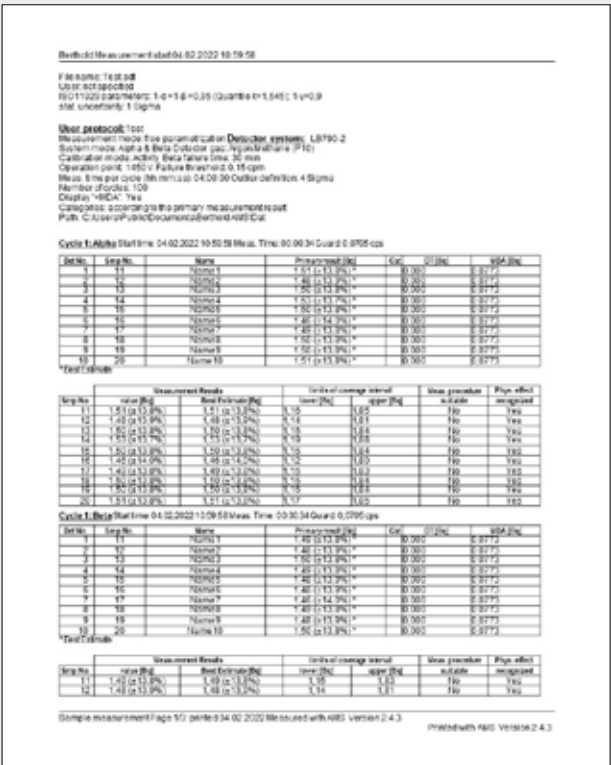
- With the help of user protocols, measurement parameters for different applications can be stored in the AMS software.
- Data analysis (ISO 11929 compliance).
- Statistical screening of the measured data for outliers.
- Automatic half-life correction separately for alpha and beta channels.

Powerful productivity features

- Control up to four systems operating with individual system parameters.
- Monitoring in real-time: live display of activities, cpm values, statistical uncertainties for alpha and beta channels during the measurement, and the different measuring range categories.
- Integrated service functions like background measurement, calibration, system tests with reports.
- Simple generation of measurement protocols with the possibility to configure them individually.



LB 790 AMS display of measurement values for all 10 detectors and both channels



Example of a measurement report

PERFECTLY EQUIPPED - FOR ANY SITUATION

Accessories & spare parts

The Berthold Low-Level Series offers a wide range of accessories:

Sample dishes made of aluminum or stainless steel in sizes Ø 30, 50, and 60 mm are available in packs of 100, while the Ø 200 mm size is available in individual packages.

Adapter rings are also available as needed to ensure optimal measurement geometry.

Reference sources for calibrating the units are available on request (excerpt):

ID No.	Product	Nuclide	Activity	Diameter
26873	LB 790	²⁴¹ Am	185 Bq	60 mm
26874	LB 790	⁹⁰ Sr/ ⁹⁰ Y	185 Bq	60 mm
28703	LB 761/ LB 790 Hybrid	²⁴¹ Am	1 kBq	200 mm
33959	LB 761/ LB 790 Hybrid	⁹⁰ Sr/ ⁹⁰ Y	1 kBq	200 mm

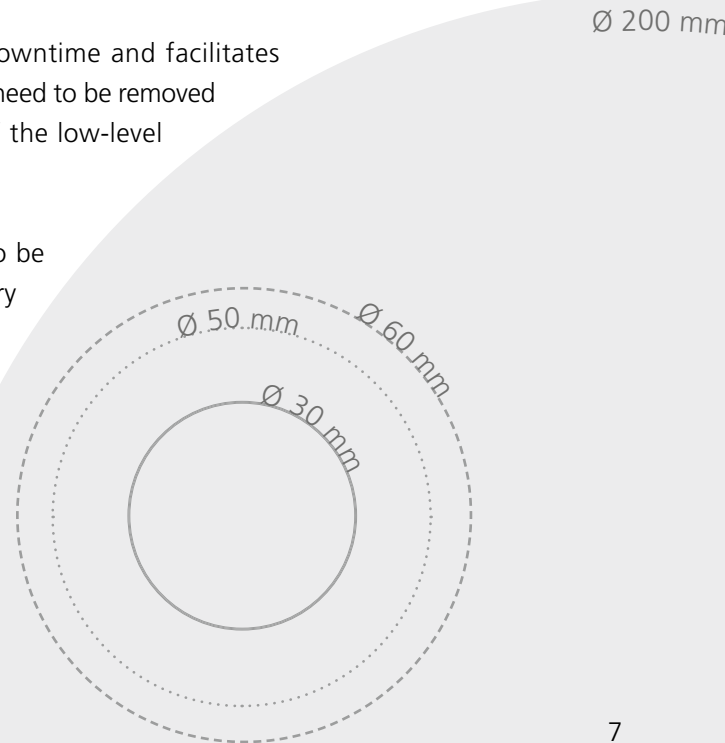
Service and maintenance-friendly design

The detector modules and the sample drawer of the LB 790/-5L/-3L form a single unit that can be easily removed from the lead shielding for repairs.

The modular detector design reduces the device's downtime and facilitates maintenance. Only a metal bracket and nine lead bricks need to be removed for replacement. This allows for easy maintenance of the low-level system.

If a detector module fails, the system can continue to be used for measurements until it is repaired. As a temporary solution, a special dummy detector can be used to ensure gas flow.

Double detector module (as spare part available).



TECHNICAL SPECIFICATIONS

Measurement Data				
	LB 790		LB 761	
	warranted	typical	warranted	typical
Alpha background [cpm]	0.08	0.05	1.2	0.9
Beta background [cpm]	0.9	0.7	8.0	5.0
Typical alpha efficiency (²⁴¹ Am)	33 %		33 %	
Typical beta efficiency (¹⁴ C)	23 %		18 %	

Note: All information is based on measurements taken at our production facility. Local conditions may vary, which could result in different measurement results.

Mechanical Data		
Counting gas	P10 ArCO ₂ (82/18) / (90/10)	
Dimensions (L x W x H)	LB 790/-5L/-3L LB 761 LB 790 TWIN	850 x 545 x 320 mm 600 x 600 x 270 mm 850 x 555 x 480 mm
Sample size	LB 790 LB 761	Planchet with Ø 60 mm, with adapter rings Ø 50 mm and Ø 30 mm Planchet with Ø 200 mm
Detector size	LB 790 LB 761	Ø 60 mm Ø 200 mm
Weight	LB 790/-5L/-3L LB 761 LB 790 TWIN	approx. 1200 kg approx. 1000 kg ca. 1500 kg

Ambient Conditions	
Temperature range	0 °C to 50 °C
Relative humidity	10 to 80 % not condensating
Protection class	IP 50 (According to DIN IEC 60529)

Ordering Information	
LB 790	42182-10
LB 790-5L	65082
LB 790-3L	69079
LB 761	45946-10
LB 790 TWIN	65729
LB 790-5L TWIN	67067
LB 790 Hybrid	91231
Extension Kit LB 790 to LB 790 Hybrid	72502

Ordering Information/ Accessoires			
Replacement detector module			42389
Dummy detector			55024
Sample planchets aluminium (100 pcs.):	50 mm x 3 mm 50 mm x 8 mm 60 mm x 3 mm 60 mm x 8 mm		6061 6059 6067 6063
Sample planchets stainless steel (100 pcs.):	30 mm x 8 mm 50 mm x 3 mm 50 mm x 8 mm 60 mm x 3 mm 60 mm x 8 mm		6066 6062 6060 6065 6064
Sample planchets for LB 761 (1 piece):	rolled rim flat rim	Ø 199 mm Ø 201 mm	50107 68014
Adapter rings (10 pcs.):	For 30 x 8 mm / 50 x 3 mm For 50 x 8 mm / 60 x 3 mm		6654 6655
Steel support table	880 x 630 x 745-765 mm		51582

Subject changes without prior notice.

TRANSFORMING SCIENCE INTO SOLUTIONS



Experience and expertise are of great importance to be able to ensure safety-relevant measurements properly and reliably. With more than 70 years of experience in planning and design, installation and commissioning, calibration, documentation and service of radiation protection measurement systems, we continue to support our customers in their task to continuously optimize their work processes and to ensure the safety of the environment and personnel.

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