SPECIFICATIONS

Radiometric and
Luminescence Detection

MicroBeta^2 and MicroBeta^2 LumiJET Microplate Counters

Description

MicroBeta®^{2} and MicroBeta^2 LumiJET are microplate counters that measure radioactivity, as well as luminescence. These instruments are available in 1-, 2-, 6-, and 12-detector configurations with 16-shelf loading capacity. A robotic loading option allows efficient integration into robotics systems. Each instrument model also supports different plate matrices and is capable of running samples in either "96-well + 384-well plate" format or in "96-well + 24-well plate" format. The samples can be contained on microtiter plates, 4-mL vials, Eppendorf® tubes, or on filtermats.

The MicroBeta^2 LumiJET model is available with a choice of single or dual injectors per detector, and is also available with 1-, 2-, 6-, and 12-detector configurations. Both 96- and 384-well plates can be used. The injector configuration of the MicroBeta^2 LumiJET enables flash luminescence studies.

MicroBeta^2

MicroBeta^2 LumiJET

PerkinElmer®
For the Better

Standard Features for MicroBeta² Plate Counters

Hardware

- 1,2, 6, or 12 detectors
- 1- and 2-detector systems run 24- and 96-well plates, 6- and 12-detector systems run 96- and 384-well plates, 6-detector systems can be configured to count 24- and 96-well plates (optional)
- Sample types for radioactivity:
  - Liquid scintillation counting in microtiter plates
  - Filterplates, e.g. UniFilter® Plates
  - Filtermats
  - FlashPlates®
  - Solid scintillator, e.g. MeltiLex®
  - Scintillation proximity assay
- Sample types for luminescence:
  - Microtiter plates, e.g. OptiPlate™ or CulturPlate™
- Counting modes include single- and dual-label CPM, single- and dual-label DPM, ParaLux™ count mode, and luminescence counting.
- Proprietary Time-Resolved Liquid Scintillation Counting (TR-LSC) mode significantly improves counting capabilities with opaque plates and low-energy isotopes. TR-LSC mode can generate close to dual-PMT coincidence counting performance by using top PMTs only.
- Unique detector design consists of two photomultiplier tubes (PMT). One is located below the sample, the other above the sample. These count the sample simultaneously, in coincidence, which allows the best possible counting geometry, superior counting efficiency, and the most efficient reduction of background.
- PMT positioning for the measurement is automatic. Maximum height of the sample for 16-shelf MicroBeta² is 45 mm, or 20 mm with robotic loading shelf.
- Robust cassette sample-changing mechanism provides a flexible system for varying sample types. Microtiter plates, micro centrifuge tubes, 4-mL liquid scintillation counting (LSC) vials, and Filtermats can be loaded simultaneously into the instrument.
- Standard barcode reader allows recognition of 100 protocols and other counting commands.
- Luminescence option includes a cooling device, which assures a stable temperature for the Upper PMTs, providing superior luminescence sensitivity.

Computer Specifications

- Processor: Intel Core i5-3550s CPU (6M Cache, 3.0 GHz)
- Memory: 4 GB DDR3 1333 Mhz SODIMM RAM
- Video Card: Dual display supported
  1 x VGA (up to 2048 x 1536 @75 Hz)
  1 x HDMI (up to 1920 x 1200 @60 Hz)
  1 x DVI-D (up to 1920 x 1200 @60 Hz)
- Operating System: Win 10 IoT Enterprise LTSB OEM 32Bit OS
- Hard Drive: Seagate 320 GB (ST320LT012)

Manager Software

- Factory preset labels exist in software. User may manually add new isotopes to the library.
- Plate library contains SBS standard plate settings. The user may specify non-standard plate settings in the system.
- Repeat, replicates, and cycles can be programmed into the protocol.
- Delays can be set before the measurement, between cycles, and between plates.
- Plate mapping is used to define the positions of the measurable samples. Protocol-specific "auto-fill" features allow quick and easy set up of sample positions in a plate map.
- Optional Enhanced Security functionality to support 21 CFR Part 11 compatibility. Includes audit trails, access control, and data security features.

Data Collection

- Live display includes instrument status and allows the user to follow the measurement while running the assay.
- Numeric or color intensity display for 96- and 24-well plate formats.
- Counting commands, such as "Next position," "Next assay," and "Stop" are available while the counter is operating.
- Count termination is determined by fixed time or counting precision.
- Up to 100 normalizations can be performed and linked into 100 counting protocols to provide detector efficiency corrections, background corrections, and crosstalk correction for the final data.
- ParaLux count mode for scintillation proximity assays fully utilizes the advantage of twin photomultiplier tubes. Compared to all other methods, counting efficiency is increased by up to 500%. The ultra-sensitive, high dynamic range Asymmetric Quench Parameter AQP(I) provides superior disintegrations per minute (DPM) calculations.
- Easy DPM includes pre-stored quench data that is modified by measuring only two standard samples. This allows quick access to DPM data without quench correction.
- DPM monitor reports samples outside the range of the quench curve.
- Up to 100 quench corrections can be performed and linked into 100 counting protocols. Quench corrections will also include detector efficiency corrections, background corrections, and crosstalk corrections.
- Password protection for counting, normalization, and quench correction protocols are included.

Analysis

- Three counting windows allow the analysis of the signal in three independent counting regions.
- Background subtraction enables fixed samples or values obtained from detector normalization to be used for calculations.
- Half-life correction is a correction facility for CPM and DPM values. The zero time may be the start time of the assay or a specified date and time.
- Freely selectable data output options include quench parameters (SQP(I)), spectrum plot, date and time, CPM and DPM monitors, and statistical analyses. Output data format can be customized to either plate or list format.
- Instrument Performance Assessment (IPA) allows the user to monitor the performance of the instrument with the standard samples. The user may store the data for later analyses.
- Results output:
  - Samples in either column or plate format, or both
  - Result file may be saved as ASCII or CSV file
  - Automatic file run numbers are generated to avoid the loss of data by overwriting
  - File names can combine several identifiers, such as counter name, protocol owner, protocol name, protocol number, or plate index

Additional Features for MicroBeta² LumiJET

Hardware

In addition to all features in the above MicroBeta² section, MicroBeta² LumiJET has additional features:

- Standard 1- and 2-detector systems inject into 24- and 96-well plate formats.
- Standard 6- and 12-detector systems inject into 96- and 384-well plates. For 6-detector model, additional option converts plate format into 24- and 96-well formats.
- Depending upon the dispenser model, up to two reagents can be dispensed into a single well. Injection volume and speed are user-selectable.

Available Configurations

MicroBeta²

Model	Number of Detectors	Plate Capacity	Plate Format
2450-0010	1	16	24/96
2450-0020	2	16	24/96
2450-0060	6	16	96/384
2450-0120	12	16	96/384

**Optional robotic loading system available.*

MicroBeta² LumiJET

Model	Number of Detectors	Plate Capacity	Plate Format
2460-0010	1	16	24/96
2460-0020	2	16	24/96
2460-0060	6	16	96/384
2460-0120	12	16	96/384

To complete LumiJET system a dispensing device needs to be ordered separately.

Typical Performance Data

Liquid Scintillation Counting

Unquenched sample with a volume of 150 µL of cocktail unpurged, in a flexible 96-well microtiter plate:

Counting efficiency:	^{3}H Typically 57 %
	^{14}C Typically 94 %
Maximum count rate:	3,000,000 CPM

Dispensing Performance (LumiJET models)

Adjustable dispensing speed and volume

Dispensing volume:	5-250 µL
Dispensing accuracy:	1 µL or 5 % (whichever is larger)
Dispensing precision (CV%):	5 µL – 2 %
	25 µL – 1 %
	250 µL – 0.5 %

Luminescence Counting

Luminescence samples in a white 96-well OptiPlate, 200-µL sample volume

Background:	100 CPS
Maximum count rate:	24,000,000 CPS
Crosstalk:	0.002 %

Physical Data

Dimensions for MicroBeta²:

Height:	609 mm (24.0 in), except 2450-0320 which is 1207 mm (47.5 in)
Width:	433 mm (17.0 in)
Depth:	645 mm (25.4 in)
Weight:	85 kg (187.4 lb) model 2450-0010 – 90 kg (198.2 lb)

Dimensions for MicroBeta² LumiJET

Height:	630 mm (24.8 in)
Width:	700 mm (27.56 in)
Depth:	660 mm (25.7 in)
Weight:	90 kg (198.4 lb)

Electrical requirements (both models):

Main voltage selectable	100, 115, 120, 240 V +/- 10 %
Frequency	50/60 Hz
Power consumption	360 VA max

Safety, Radiated Emissions, and Immunity:

MicroBeta^2 and MicroBeta^2 LumiJET have been tested and approved for electrical safety, radiated emissions, and electromagnetic compatibility. In the USA, the CSA approval also satisfies the requirements of 29CFR 1910.399.

MicroBeta^2 and MicroBeta^2 LumiJET fulfill the requirements of the following standards:

- IEC 61010-1:2001 (Second Edition)
- CAN/CSA-C22.2 61010-1:2004
- UL 61010-1:2004 R7.05

MicroBeta^2 and MicroBeta^2 LumiJET conform to the following EU directives:

CE marking:

- 2004/108/EC Electromagnetic compatibility
- 73/23/EEC (as amended by 2006/95/EC) Low Voltage

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