MIRION
TECHNOLOGIES

Series 5 XLB™

Automatic Low Background Alpha/Beta Counting System

KEY FEATURES

- Automatic single detector, ultra-low background counting system
- Enhanced low background capability
- Gas Stat digital gas conservation and monitoring system
- Fifty planchet sample changer with 100 sample capacity optional
- Molded low background passive shielding with interlocking design
- Reduced system footprint and integrated cart
- High performance dual anode 5.7 cm (2.25 in.) gas flow detector with ultra-thin gold sputtered window; single anode one inch detector option available
- Advanced electronic diagnostics continuously monitor operating conditions
- Universal auto-sensing power supply
- Coded positive sample carrier identification
- External or sample changer based bar code reader
- CE compliant

DESCRIPTION

Superior Counting Performance, Unparalleled System Features

The Series 5 XLB low background alpha/beta counter offers a completely integrated, computer controlled system for maximum flexibility.

The Series 5 platform is designed to count samples the way they are prepared in a laboratory. Sensible and smart, Series 5 counters provide integrated intelligence to satisfy the most demanding applications and routine analysis.

Enhanced Low Background and Productivity

Due to increasing environmental regulations to reach lower detection limits, sample count times have increased reducing the overall sample throughput in the laboratory. The Series 5 system incorporates enhanced technology to reduce system background and increase sample throughput. Using an improved guard detector, the system sensitivity for high energy, cosmic background is increased, enabling the anti-coincidence circuitry to detect and reject more spurious background events.

The beta background for the Series 5 counter has been reduced by as much as 35% over older systems. Beta backgrounds as low as 0.5 cpm can be achieved. This means that the Series 5 family of low background counters can count twice as many samples for a given detection limit as a counter with a beta background of 1.0 cpm – impressive performance from an impressive system.

Custom Molded Shield

Using a graded shielding system, the Series 5 system counts samples with more accuracy than any other low background counter.

The molded shield system provides 10 cm (4 in.) of custom molded lead surrounding the detector. The shield comprises interlocking modules which weigh no more than 27 kg (60 lb) each for safety and ease of assembly.

Time Proven Reliability

The sample changer of the Series 5 family is time and field proven. The highly reliable design of the automated sample changer transports and counts samples day after day providing worry free operation. When work counts and time is precious, count on a system to deliver results and reliability.

Ultra-Thin Detector Windows

The standard gas flow detector of the Series 5 family of systems incorporates a high performance pancake-style 5.7 cm (2.25 in.) detector. The entrance window of the detector is made with state-of-the-art technology and special materials to provide the highest counting efficiency and the lowest alpha background of any counter.

Positive Sample Identification and Bar Code – The Advantage

Today's changing requirements demand sample identification that is maintained through the counting data. Data defensibility is a priority. The Series 5 system incorporates a unique combination of carrier and sample identification systems to maintain chain-of-custody. Two methods of sample identification are linked to the final data report. The sample carrier is uniquely coded for routine analysis. The Series 5 counter can be configured with an automatic sample bar code reader. When present, the sample bar code is automatically captured by Apex-Alpha/Beta™ software and stored with the sample count data, forming the missing link in sample custody in the count room. Only Mirion sample carriers are washable for easy cleaning and decontamination.

Circuitry So Advanced, It Thinks for Itself

The electronics package of the Series 5 family of counting systems provides the most advanced control and monitoring system available to assure accurate results. The Series 5 incorporates hardware diagnostics which continuously monitor internal and external parameters including gas pressure and flow, system voltage, power distribution, and other system critical parameters. The user is alerted on the front panel if any of these parameters falls below normal operation thresholds.

Human Factor Engineering

Often computer controlled analytical equipment requires additional laboratory space for the computer system and peripherals. The Series 5 counter addresses that problem with an integrated mobile cart that provides all of the support necessary for the computer, monitor, keyboard, and pointing device. The optional S5-ACCKIT includes a monitor support shelf tray, printer support tray, and a gas tank bracket. The retractable printer shelf opens to hold printer and supplies. The Series 5 system is designed to be a completely integrated, self contained counting system with the industry's smallest footprint.

Gas Stat Gas Conservation System

Conventional low background counters have manual gas flow control and use the equivalent of a 1A gas cylinder on the average of once per six weeks. Changing gas supplies usually means re-verification of critical system calibrations which can be an unnecessary time consuming process. Not only time, but the impact on data quality can become significant issues when frequent re-calibrations must be performed, due to a change in gas quality.

The Series 5 system includes Gas Stat, the industry standard for gas management, which eliminates the high frequency of re-calibrations due to counting gas changes. Gas Stat is a microprocessor-controlled gas monitoring and control system that provides worry free operation by eliminating the need to adjust manual flow meters. The normal gas flow rate is set by the operator through software control, and flow rates are digitally displayed in real time on the computer screen.

The Series 5 hardware senses when the system is not counting samples, and automatically reduces the gas flow rate to a low quiescent flow to maintain detector gas quality. This prevents atmospheric impurities from diffusing into the detector and causing questionable results. When the user starts a count, Gas Stat automatically purges the detector and resets the flow rate to normal. Gas Stat uses a preset maximum flow rate for the detector purging; so, it is virtually impossible to cause window damage due to over pressurization.

Gas Stat effectively increases the useful life of the gas supply, thereby reducing the frequency of instrument re-verification, saving time and improving the quality of counting data.
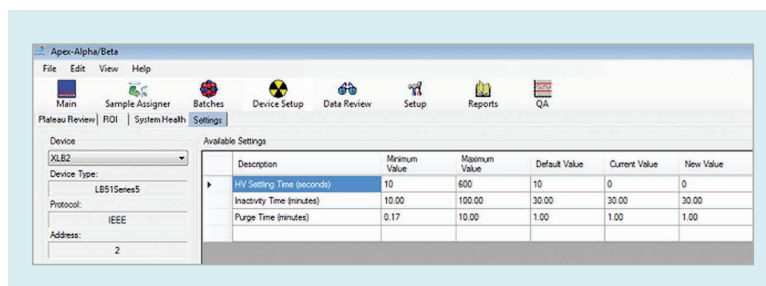
Software – Powerful and Flexible

The Series 5 counter has been designed to take full advantage of computer-based system integration. Series 5 XLB system can be operated with the legacy Eclipse™ software, or can use the state-of-the-art Apex-Alpha/Beta software to provide the optimum combination of power and ease of use for a low background system.

Apex-Alpha/Beta software includes a Microsoft SQL Server Express database for fast and efficient data storage. Custom reports can be easily developed for your application or presentation using an integrated reporting tool without the need for any third-party software. See the Apex-Alpha/Beta specification sheet for more detail on its advanced features.

Final activity results can be viewed on-screen for each sample as it is counted. An intuitive, symbolic icon tool bar provides access to functions at the push of a button.

No other counter can match the advanced automation capabilities and features of the Series 5 XLB counter and Apex-Alpha/Beta Software.

Software – Powerful and Flexible

SPECIFICATIONS

*All specifications are based on measurements performed at a Mirion manufacturing facility with 5.7 cm (2.25 in.) detector with ultra-thin window, unless noted otherwise.

To achieve lower Beta background, the Gamma detector can be replaced with a Lead Plug (7081577).

PERFORMANCE

Background:

	WARRANTY	
	Standard system or Gamma system with lead plug installed	Gamma system with NaI detector installed
Gross (alpha+beta)	≤0.80 cpm	≤1.1 cpm
Alpha	≤0.1 cpm	≤0.1 cpm
Beta	≤0.75 cpm	≤1.0 cpm

Efficiency:

- 4π efficiency measured with a NIST traceable standard point source 5.08 x 0.3 cm (2 in. x 1/8 in.) planchet in 0.3 cm (1/8 in.) insert.

	Warranty
Alpha (^{210}Po)	≥38%
Beta (^{90}Sr/^{90}Y)	≥45%

- Counting efficiency is dependent on operating voltage, source thickness and distance from detector. Backscattering of high energy emitters produces higher than expected efficiency.

Spillover:

- ≤1.0% ^{210}Po alpha into beta channel with the system adjusted for a ≤0.1% spillover of ^{90}Sr beta into the alpha channel.

Detector Plateau:

- Alpha (^{210}Po) – ≤2.5% slope/100 V: ≥800 V plateau.
- Beta (^{90}Sr) – ≤2.5% slope/100 V: ≥200 V plateau.

Sample Count Rate:

- 500000 cpm with ≤1.5% deadtime loss.

Counting Time Preset:

- Adjustable between 0.2 and 9999 minutes.

PHYSICAL

Sample Changer Capacity:

- Standard – 50 samples.
- Optional – 100 samples.

Weight:

- Net weight less cart – standard system 324 kg (716 lb).
- Net weight cart with casters 54 kg (120 lb).

Dimensions:

(Height x Width x Depth)

- Table Top Model – 37 x 58 x 76 cm (14.5 x 23 x 30 in.).
- With 50 Sample Capacity – 75 x 58 x 76 cm (29.5 x 23 x 30 in.).
- With 100 Sample Capacity – 124 x 58 x 76 cm (49 x 23 x 30 in.).
- Cart With Casters – 76 x 58 x 76 cm (30 x 23 x 30 in.).

POWER REQUIREMENTS

The Series 5 counter is equipped with a universal power supply and automatically adapts to voltage and frequency.

- 100–240 V ac at 50/60 Hz.
- 100 W maximum.

ENVIRONMENTAL

- Operating Temperature – 0 to 50 °C (32 to 122 °F).
- Operating Humidity – 0 to 80% relative, non-condensing.
- Meets the environmental conditions specified by EN 61010, Installation Category I, Pollution Degree 2.
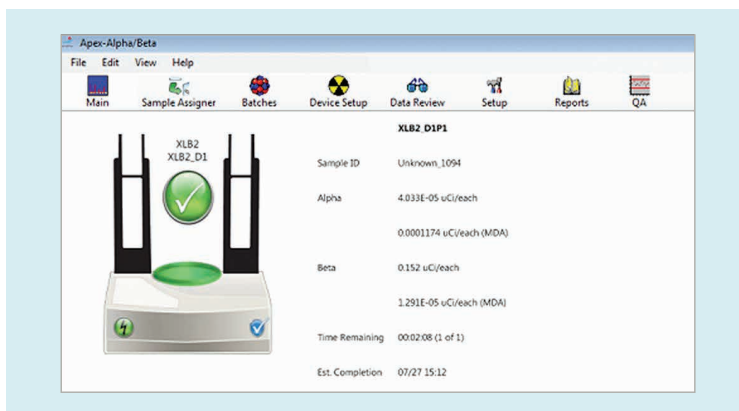
ORDERING INFORMATION

5XLB Models:

These models include on-site installation and one year on-site warranty. Requires computer, monitor, printer and Apex-Alpha/Beta (S556C) Software.

- S5X2050 – Includes basic S5XLB counter, 2.25 in. detector, 50 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.
- S5X2100 – Includes basic S5XLB counter, 2.25 in. detector, 100 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.
- S5XG2050 – Includes S5XLB counter with gamma option, 2.25 in. gas flow detector, 2X2 NAI, 50 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.
- S5XG2100 – Includes S5XLB counter with gamma option, 2.25 in. gas flow detector, 2X2 NAI, 100 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.

Export 5XLB Models:

Models with "E" do not include on-site installation. Requires computer, monitor, printer and Apex-Alpha/Beta Software.

- S5X2050E – Includes basic S5XLB counter, 2.25 in. detector, 50 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.
- S5X2100E – Includes basic S5XLB counter, 2.25 in. detector, 100 sample towers, carrier plates, carrier inserts (5/16 & 1/8 deep), planchets and cart.
- S5XG2050E – Includes S5XLB counter with gamma option, 5.7 cm gas flow detector, 50.8 x 50.8 mm NAI, 50 sample towers, carrier plates, carrier inserts (7.9 & 3.2 mm deep), planchets and cart.
- SXG2100E – Includes S5XLB counter with gamma option, 5.7 in. gas flow detector, 50.8 x 50.8 mm NAI, 100 sample towers, carrier plates, carrier inserts (7.9 & 3.2 mm deep), planchets and cart.

MISCELLANEOUS

- AB-CPU7 – Windows 7 PC with LCD monitor.
- AB-CPU10 – Windows 10 PC with LCD monitor.
- S556C – Apex-Alpha/Beta Software.
- S550C – Eclipse Software (Existing Eclipse Users Only).
- LB-Integ – Integration of customer supplied computer.

- 488PCI – IEEE-488 Card and Cable (PCI Bus).
- 488USB – IEEE-488 Interface (USB).
- S5-ACCKIT – S5 Mobile Cart Accessory Kit including Monitor Tray, Printer Tray, and Gas Tank Bracket.
- XLB-GR – Single Stage Gas Regulator.

ACCESSORIES

- 6200-12 – Carrier Inserts 2 x 1/16 in.
- 6200-13 – Carrier Inserts 2 x 1/8 in.
- 6200-14 – Carrier Inserts 2 x 1/4 in.
- 6200-09 – Carrier Inserts 2 x 5/16 in.
- 6200-21 – Carrier Inserts 1 x 1/16 in.
- 6200-22 – Carrier Inserts 1 x 1/8 in.
- 6200-23 – Carrier Inserts 1 x 1/4 in.
- 6200-24 – Carrier Inserts 1 x 5/16 in.
- 6200-137 – Plastic Carrier Inserts 2 x 1/4 in.
- 6200-96 – Carrier Plates Coded 1–50
- 6200-97 – Carrier Plates Coded 51–100
- 6200-88 – Carrier Plates Coded 101–150
- 1750-06 – Group Plates A – E
- 1750-07 – Group Plates F – J
- 1400-156 – Uncoded Carrier Plates
- 1750-475 – End Carrier Plates
- 1750-23 – Carrier Plate Cassette
- 6200-476 – 60 mm Carrier Insert Disk
- 6200-477 – 60 mm Carrier Insert Ring

Replacement Detectors and Windows

- S5-F2 – 2.25 in. detector for XLB, S5E and Solo
- WIND280 – Replacement premium 2.25 in. ultra-thin window
- WIND280AL – Replacement standard 2.25 in. thin window

CE

TÜV SÜD C US

ISO 9001 SYSTEM CERTIFIED

MERIDEN CT
SMYRNA GA
OAK RIDGE TN
CONCORD ON

CANBERRA