Abstract

The new Beckman Coulter LS 13 320 XR has arrived. It features a significantly improved particle analysis range that stretches from 10 nm – 3,500 µm a smaller hardware footprint, and the new “ADAPT” (Automatic Distribution Analyzing Particle Technology) software. The new User Interface experience is both simple and intuitive in its navigation and is supported by the latest Windows 10 OS. Integrated into the ADAPT software is a QA/QC statistics analysis tool to quickly and visually distinguish a pass/fail result, yet has the sophistication necessary to support and facilitate a research and development requirement. Let’s take a look under the hood. The improved electronics and optical detection system extends the analysis range providing actual measurement capability from 10 nm – 3,500 µm while improving individual peak discrimination. Now you can have it all: accuracy, versatility, and the dependability you’ve come to expect with Beckman Coulter Instruments, in addition to the exciting new ADAPT software and measurement capability from 10 nm – 3,500 µm.

Introduction

At Beckman Coulter Life Sciences we have learned an incredibly valuable lesson in instrument design. We need to listen to the customer first and foremost. Designing a new instrument with all the latest bells and whistles is useless if it doesn’t serve the customer’s needs. Further, one of our primary goals is for the instrument to both be easy to operate and provide a useful measurement result. We want the sophistication hidden under the hood and behind the scenes where it belongs and not providing any impediments to an excellent user’s experience. The new LS 13 320 XR comes equipped new software (ADAPT), a completely new and intuitive User Interface, and an updated look and feel of the measurement bench and the sample modules. The expanded particle size measurement ranges of the ULM and DPS (Tornado) extend the overall measurement range of the system from 10 nm all the way up to 3,500 µm. The important differentiator is that the new LS 13 320 XR provides actual physical measurement capability as opposed to extrapolated data that is the norm. The following are examples featuring the extreme measurement capability of both the ULM and DPS (Tornado) modules.
### Run 1 – 20 nm sample runs

<table>
<thead>
<tr>
<th></th>
<th>Run 1 (µm)</th>
<th>Run 2 (µm)</th>
<th>Run 3 (µm)</th>
<th>Avg (µm)</th>
<th>CV (%)</th>
</tr>
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<tbody>
<tr>
<td>D10</td>
<td>0.007958</td>
<td>0.007747</td>
<td>0.007925</td>
<td>0.007877</td>
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<tr>
<td>D50</td>
<td>0.01383</td>
<td>0.01305</td>
<td>0.01370</td>
<td>0.01353</td>
<td>3.089</td>
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<tr>
<td>D90</td>
<td>0.02366</td>
<td>0.02183</td>
<td>0.02338</td>
<td>0.02296</td>
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<tr>
<td>Mean</td>
<td>0.01488</td>
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<td>0.01473</td>
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<tr>
<td>Mode</td>
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<td>0.01313</td>
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<td>0.01383</td>
<td>8.767</td>
</tr>
<tr>
<td>StDev</td>
<td>0.005973</td>
<td>0.005466</td>
<td>0.005895</td>
<td>0.005778</td>
<td>4.725</td>
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### Run 1 – 3,500 µm beads sample runs

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<th>Run 1 (µm)</th>
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<th>Run 3 (µm)</th>
<th>Avg (µm)</th>
<th>CV (%)</th>
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<td>3409</td>
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<tr>
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<tr>
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<tr>
<td>Mode</td>
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<td>3364</td>
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<td>0.0000</td>
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<tr>
<td>StDev</td>
<td>384.5</td>
<td>405.2</td>
<td>389.8</td>
<td>393.2</td>
<td>2.735</td>
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<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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## Specifications

<table>
<thead>
<tr>
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<th>Description</th>
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| **Technology**| Characterized by ingenuity

Technology: Analysis of vertical and horizontal polarized light at six different angles using three additional wavelengths. Full implementation of both Fraunhofer and Mie Theories. |
| **Light source**| Diffraction: Laser diode (785 nm)

PIDS: Tungsten lamp with high-quality band-pass filters (475, 613 and 900 nm) |
| **Particle size analysis range**| Measurement range: 10 nm – 3,500 µm

Dry Powder System (Tornado) Module: 400 nm – 3,000 µm

Universal Liquid Module: 10 nm – 2,000 µm |
| **Electrical interface**| USB |
| **Power consumption**| ≤ 6amps @ 90 – 125 VAC

≤ 3 amps @ 220 – 240 VAC |
| **Temperature range**| 10 – 40°C (50 – 104°F) |
| **Humidity**| 0 – 90% without condensation |
| **Compliance**| Facilitates 21 CFR Part 11 compliance

RoHS

Certifications:

- EU EMC Directive 2014/30/EU
- Australia and New Zealand RCM Mark |
| **Data export file formats**| XLSX, TSV, PDF |
| **File import capability**| From all LS 13 320 and LS 13 320 XR systems |
| **Software operating system**| Requires Microsoft Windows 10, 64-bit environment (U.S. English regional settings only) |
| **Dimensions**| Height: 19.5” (49.53 cm)

Width: 37” (93.98 cm)

Depth: 10” (25.4 cm) |
| **Weight**| 52 lbs (23.5 kg) |
| **Part Numbers** |**Description** |
| B98100 | LS 13 320 XR Optical Bench Multi-Wavelength |
| B98103 | Dry Powder System Module |
| B98105 | Universal Liquid Module |
| B95435 | Upgrade Kit, Sonicator for ULM |
| C06826 | HiCap HEPA Vacuum |
| C20930 | Workstation (incl. OS W10 and preinstalled LS 13 320 XR Control Software) |
Author

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Bill F. Bars is a Sr. Applications Scientist for the Beckman Coulter Particle Counting and Characterization organization. He has created and developed many of the liquid systems production processes for the BEC Particle products. These include but are not limited to the: 8011+, PODS+, ROC, and HRLD Sensors. He has been in the Particle Counting Industry for 22+ years in a multitude of engineering and technical capacities ranging from Metrology to Customer Service, Technical Training and Applications Support. He is a member of the NFPA U.S. TAG to ISO/TC 131/SC 6 – Contamination control group.