BD FACSLyric™ Flow Cytometry System Technical Specifications

The BD FACSLyric™ System includes the BD FACSLyric™ Flow Cytometer, the optional BD FACS™ Universal Loader and workstation that runs the software. All these components combine to create an integrated system with a compact footprint.

The BD FACSLyric™ Flow Cytometer is available in 4, 6, 8, 10 or 12 colors and equipped with a blue, red and violet laser depending on the configuration. The BD FACSLyric™ Flow Cytometer is upgradeable up to 12 colors.

Sample acquisition can be manual or automated via the BD FACS™ Universal Loader. The Loader provides walkaway operation with samples loaded in either microtiter plates or 12 x 75-mm tube racks.

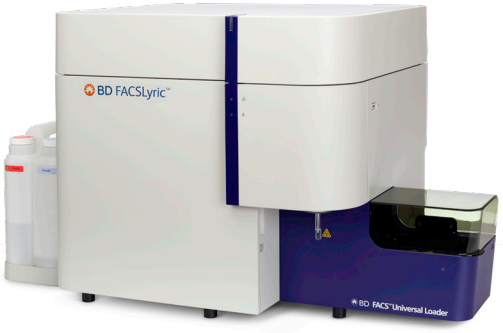
The BD FACSLyric™ Flow Cytometer integrated with the BD FACSDuet™ Sample Preparation System provides consistency and workflow efficiency support for pre-analytical sample preparation.

The software that controls the BD FACSLyric™ Flow Cytometry System is comprised of two applications:

- The BD FACSuite™ Clinical Application supporting BD IVD Assays with assay templates:

BD Multitest™ CD3/CD8/CD45/CD4 Kit
BD Multitest™ CD3/CD16+CD56/CD45/CD19 Kit
BD Multitest™ IMK Kit
BD Multitest™ 6-color TBNK Kit
BD Leucount™ Kit and BD™ Stem Cell Enumeration Kit.

All of the above is also available with absolute counting when using BD Trucount™ Tubes.



- The BD FACSuite™ Application supports the creation of user-defined assays for research and tools that facilitate instrument-to instrument and site-to-site standardization.

BD

BD FACSLyric™ Flow Cytometry System

Technical Specifications

Optics

Available system configurations
4-color: 2-laser (blue, red) (3-1)
6-color: 2-laser (blue, red) (4-2)
8-color: 3-laser (blue, red, violet) (4-2-2)
10-color: 3-laser (blue, red, violet) (4-3-3)
12-color: 3-laser (blue, red, violet) (4-3-5)

Solid-state laser specifications
Blue laser: 488 nm, 20 mw
Red laser: 640 nm, 40 mw
Violet laser: 405 nm, 40 mw

Beam spot size (all lasers)
9 µm x 63 µm

Optical alignment
Auto alignment on demand

Flow-cell lens
1.2 NA

FSC detector
Photodiode

SSC and FL detectors
PMT
See filter guide for optical configurations.

Fluidics

Flow cell
Stainless steel with low coefficient of thermal expansion for predictable, stable performance

Cuvette internal cross-section
430 µm x 180 µm

Sample flow rates
Low: 12 µL/min
Medium: 60 µL/min
High: 120 µL/min
High sensitivity: 50 µL/min

Fluid capacity
Standard 5-L tanks
Optional 10-L tanks
Adapter available for 20-L BD FACSFlow™ Cubitainer

Sheath core stream fluid velocity
Normal: 5.4 m/s
High sensitivity: 2.7 m/s

Sheath fluid consumption
Normal: 13.6 mL/min
High sensitivity: 6.6 mL/min

Supported tubes, plates and tube racks

• With BD FACS™ Universal Loader
Tubes
30-tube rack (12 x 75-mm tubes)
40-tube rack (12 x 75-mm tubes)

Plates
96 Falcon™ standard height, round, polystyrene

96 Falcon™ standard height, flat, polystyrene

96 Falcon™ standard height, round, polypropylene

96 Falcon™ standard height, conical, polypropylene

384 Greiner standard height, flat, polystyrene

96 Falcon™, half deep, conical, polypropylene

96 Falcon™, deep, conical, polypropylene

96 Milipore, filter bottom, polypropylene

• With manual tube port
Falcon™ 5 mL (12 x 75-mm) polystyrene and polypropylene
BD Trucount™ Tubes 5 mL (12 x 75 mm)
Falcon 15 mL
Falcon 50 mL
Microcentrifuge 2 mL

Sample dead volume
30 µL (12 x 75 mm tubes)

Cytometer schedule settings
Pre-programmed startup and idle shutdown

Software

• Integrated bi-directional LIS interface using BD FACSLink™ Software
• Support for 21 CFR Part 11 workflow with audit trail and e-signature
• Universal setup for fast and convenient instrument setup and standardization
• Single-tube QC with BD™ CS&T Beads
• QC module with Levey-Jennings plots
• Two applications

BD FACSuite Application
• User-defined assays
• User-defined plots
• User-defined worksheets and reports
• User-defined tube/reference settings
• Expression editing

BD FACSuite™ Clinical Application
Pre-configured workflow and pre-set templates for the following BD IVD assays:
• BD Multitest™ 4-Color Reagents
• BD Multitest™ 6-Color TBNK Reagents

QC
Automated single-tube QC with BD™ CS&T Beads

Performance

Acquisition rate

Up to 35,000 events per second. No limit on number of events acquired in a single FCS file

Carryover*

≤0.1% with default SIT flush**
<0.05% with 3 or more SIT flushes with 500 ul of sample.**

Sensitivity

FITC: <85 MESF
PE: <20 MESF

Channel Qr (x1,000)

FITC	20
PE	133
PerCP-Cy 5.5	13
PE-Cy7	17
APC	10
BD Horizon™ APC-R700	8
APC-Cy7	7
BD Horizon™ V450	47
BD Horizon™ V500-C	17
BD Horizon™ BV605	133
BD Horizon™ BV711	43
BD Horizon™ BV786	16

Fluorescence precision
<3% CV for chicken erythrocyte nuclei (CEN)

Fluorescence linearity
2 ±0.05% for CEN

Data resolution
Uncompensated data has a range of 0–262,143

SSC and FSC resolution
Enables separation of 0.2-µm beads from noise

System throughput
≤50 minutes for a 40-tube rack with a standard BD Tritest™ Assay stopping rule on samples with normal CD4 counts (approximately 1190 cells/µl).
≤40 minutes for a 96-well plate, using default mix settings, a two-second asquisition, and a SIT flush in between each well and no preview before acquiring or report review delay.

Parameters

Area (A), Width (W), Height (H) for all channels and Time (T). Total of 43 parameters available.

3 scales:
- Linear (A, W, H)
- Logarithmic (A, H)
- Biexponential (A, W, H)

Compensation
Full inter-beam matrix, during or post acquisition

Threshold
Any single parameter or logical combination of multiple parameters

Data management

Workstation specifications (minimum required)
- Clock speed of 3.2 GHz
- 16 GB RAM

Hard drive and data storage
1 TB Solid State HD

Operating system
Microsoft™ Windows™ 10 IoT 64-bit OS

Peripheral devices
- At least 3 USB ports
- HP™ USB Keyboard US
- HP™ USB Optical Mouse

Networking
Ethernet LA 10/ 100 /1000

Signal Processing
- 18-bit dynamic range with IEEE
- 32 bit floating-point resolution

Monitor
LCD flat panel, 23 in.
LCD flat panel, 27 in. (recommended)

Data management options
BD FACSLink™ Software for LIS connectivity.

BD Remote Support Services for remote troubleshooting capability

Installation requirements

Operating temperature
15°C (59°F) to 30°C (86°F)
Maximum of ±2.5°C/day fluctuation recommended

Humidity
15% to 85% relative humidity (noncondensing)

Dimensions (W x D x H)
Cytometer
63.3 x 57.9 x 57.9 cm
24.9 x 22.8 x 22.8 in.

With standard tanks
85.2 x 57.9 x 57.9 cm
33.5 x 22.8 x 22.8 in.

With standard tanks and loader
107.2 x 57.9 x 57.9 cm
42.2 x 22.8 x 22.8 in.

Weight
Cytometer: 56.0 kg (123.5 lb)
Loader: 13.2 kg (29 lb)

Power specifications
Voltage: 100–240 ±10% VAC
Frequency: 50–60 ±10% Hz
Current: 2 A
Power: 200 W

Operational heat dissipation
<498 BTU/hour

Noise under normal operating conditions
<55 dBA over 8 hours under normal operating conditions

Altitude
≥0.8 atm (approximately 2,000 meters)

*Carryover may vary based on the application and population of interest. ** Determined for CD45 population using CD45 PerCP.

BD FACSLyric™ Flow Cytometry System

Specifications for System Options

BD FACS™ Universal Loader

Compatible with 30 (barcoded) or 40 (non-barcoded) tubes (12 x 75 mm). Equipped with an orbital shaker for in place mixing and resuspension of cells. Optimized for all supported plate and tube formats. Includes internal barcode reader for positive sample identification.

Supported barcode formats
Codabar
Code 128
Code 3 of 9
Interleaved 2 of 5

Handheld barcode scanner

Handheld barcode scanner with stand supporting GS-1 standard 1-D and 2-D formats

Extended-use fluidics

Optional tanks and connectors to allow for use with 10-L waste tanks and BD FACSFlow™ Cubitainers

BD FACSDuet™ Sample Preparation System

Integrated with the BD FACSLyric™ Flow Cytometer provides pre-analytical automation.

The BD FACSDuet™ Sample Preparation System is a Class 1 Laser Product.

The BD FACSDuet™ Sample Preparation System is for In Vitro Diagnostic Use. Sample preparation for user-defined protocols and cocktailing functions are for Research Use Only, not for use in diagnostic or therapeutic procedures.

BD FACSLyric™ Flow Cytometers are Class 1 Laser Products.

The BD FACSLyric™ Flow Cytometer is for In Vitro Diagnostic Use with BD FACSuite™ Clinical Application for up to six colors.
The BD FACSLyric™ Flow Cytometer is for Research Use Only with BD FACSuite™ Application for up to 12 colors. Not for use in diagnostic or therapeutic procedures.

BD Biosciences, Milpitas, CA 95035

bdbiosciences.com