

BD FACSCelesta™ Flow Cytometer

Technical specifications



The **BD FACSCelesta™ flow cytometer** is designed to simplify the use of multicolor flow cytometry and allow researchers to benefit from innovations in instrument and reagent technology. As the number of lasers and detectors has increased, so has the availability of new fluorophores—expanding the options available for cell analysis. The BD FACSCelesta platform offers multiple configurations delivering the performance required for multicolor applications.

Each configuration has been optimized to enable the use of legacy as well as innovative BD Horizon Brilliant™ dyes that minimize spectral overlap and simplify experimental design and analysis for experienced as well as new flow cytometry researchers. The system is designed to fit on the benchtop and runs BD FACSDiva™ software, which streamlines workflow from system setup to data acquisition to data analysis.



Optics

Excitation Optics

Excitation Optical Platform

The BD FACSCelesta optics layout accommodates two or three lasers in one of four configurations.

BV10: 4 Blue (488 nm)/ 6 Violet (405 nm)

BVR12: 4 Blue (488 nm)/ 3 Red (640 nm)/ 5 Violet (405 nm)

BYV12: 2 Blue (488 nm)/ 4 Yellow-Green (561 nm)/
6 Violet (405 nm)

BUV12: 4 Blue (488 nm)/ 2 UV (355 nm)/ 6 Violet (405 nm)

Laser Power

355 nm: 15 mW

405 nm: 50 mW

488 nm: 20 mW

561 nm: 50 mW

640 nm: 40 mW

Flow Cell Design

Rectangular quartz cuvette:

Internal cross-section, 430 x 180 μ m

External quartz cuvette surfaces are anti-reflective coated for optimal transmission of laser light.

Fixed optical assembly with spatially separated laser beams

Emission Optics

Forward Scatter Detection

Photodiode detector with a 488/10 bandpass (BP) filter

Side Scatter Detector

Photomultiplier tube (PMT) with a 488/10 BP filter

Emission Optical Design

Emitted light from the gel-coupled cuvette is delivered by fiber optics to the detector arrays. The BD FACSCelesta optical pathways use signal reflection to maximize signal detection. Please see the filter guide at bdbiosciences.com for information on dye and filter options.

Performance

Fluorescence Sensitivity

FITC: 25 molecules of equivalent soluble fluorochrome (MESF)

PE: 15 MESF

FITC and PE measurements were performed using SPHERO™ Rainbow Calibration Particles (RCP-30-5A).

Fluorescence Resolution

Coefficient of variation: Area of <3%, full G_0/G_1 peak for propidium iodide (PI)-stained chicken erythrocyte nuclei (CEN)

Fluorescence Linearity

Doublet/singlet ratio of 1.95–2.05 for CEN stained with PI and excited with the 488-nm blue laser

Forward and Side Scatter Sensitivity

Enables separation of fixed platelets from noise

Forward and Side Scatter Resolution

Scatter performance is optimized for resolving lymphocytes, monocytes, and granulocytes.

Side Scatter Resolution

Enables separation of 0.3- μ m beads from noise

Data Acquisition Rate

25,000 events/s with beads*

*See the *BD FACSCelesta Users Guide* for event rate optimization.

Fluidics

Operating Modes

Front button panel provides three modes: RUN, STANDBY, and PRIME.

Sample Flow Rates

Continuously adjustable flow rate, plus three preset flow rates:

LO: 12 µL/min

MED: 35 µL/min

HI: 60 µL/min

Standard Fluidic Reservoirs

One 10-L sheath container and one 10-L waste container provided

Sample Carryover

<0.3% when acquiring from 12 x 75-mm tubes and running a wash tube between samples

Data Management

Software: BD FACSDiva v8.0.1.1

Workstation

HP EliteDesk 800 G1 Mini PC

Operating System

Microsoft® Windows® 7 Professional (32-bit) OS

Processor

Intel® Core™ i5-4590T 2.0G 6M HD 4600 CPU

RAM

4 GB RAM

Hard Drives

500 GB SATA 6G 2.5 8G SSHD

Networking

Intel 7260 802.11 a/b/g/n M.2 NIC

Monitor Option

One 19-in. LCD 1,280 x 1,024 maximum resolution

Printer Options

Vary by region; please check with your local Sales Representative

Options

Fluidics Options

The BD™ High Throughput Sampler (HTS) option is available to increase your lab productivity by acquiring samples from a 96- or 384-well microtiter plate.

The HTS can be side mounted on the BD FACSCelesta system.

HTS Throughput

Acquisition: Less than 15 minutes per microtiter plate in high-throughput mode using a 2-second acquisition, less than 44 minutes in standard mode using a 10-second acquisition

Carryover

<0.5% high-throughput mode

<0.75% standard mode

Recommended Fluidics Option

BD FACSTFlow™ supply system: automated fluidics system, which includes a rolling cart and two 20-L Cubitainer® packages

Installation Requirements

Dimensions (H x W x D)

59 x 58 x 61 cm (23 x 23 x 24 in.)

Weight

52.2 kg (115 lb) depending on configuration

Temperature Operating Range

17.5°C–27.5°C (±2.5°C variation in the same day)

Heat Dissipation

~860 BTU per hour depending on configuration

Power

Operation at 100–240 VAC and 50 or 60 Hz

Maximum power: 250 watts

Air Supply

None required

Electrical Requirements

One dedicated circuit for the cytometer and the computer system (including the printer) with a dedicated AC source not shared with any other equipment

Compliance with Safety Standards

UL 61010 (US)

IEC 61010 and IEC 60825 (Europe)

CAN/CSA - C22.2 No. 61010 (Canada)

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