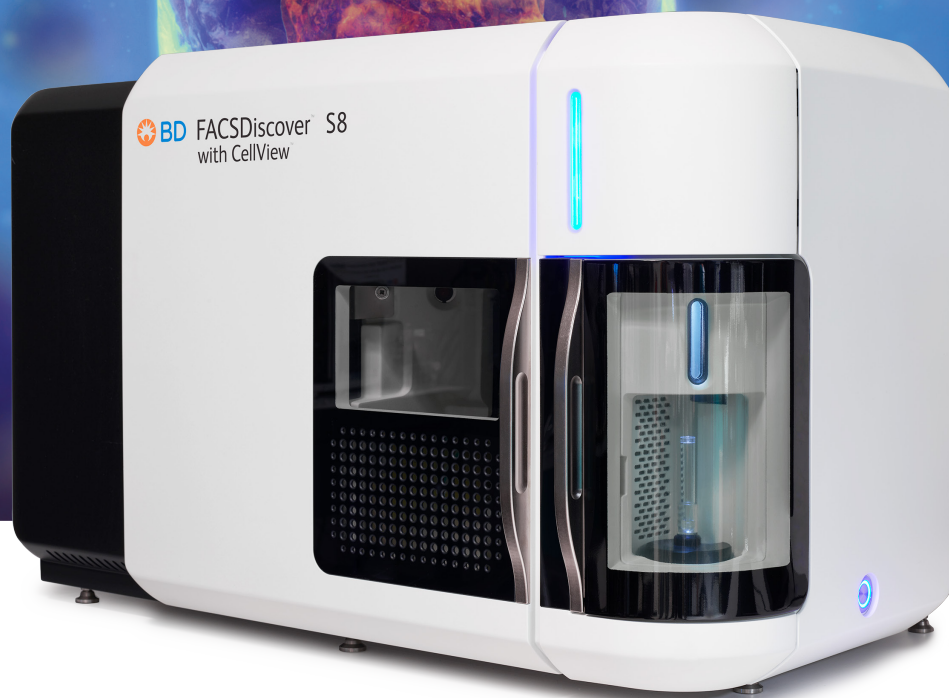




BD FACSDiscover™ S8 Cell Sorter with BD SpectralFX™ Technology and BD CellView™ Image Technology

BD SpectralFX™ Technology and BD CellView™ Image Technology expands the power of cell analysis and sorting by combining flow cytometry data with spatial and morphological insights. Built-in visual inspection capabilities, more flexible panel design and automated features are combined in the BD FACSDiscover™ S8 Cell Sorter to streamline your workflow while maximizing sample utilization.



Technical specifications

Technologies

BD SpectralFX™ Technology

This technology combines full spectrum optics, next-gen QC and system-aware spectral unmixing that manages spread by adapting to instrument performance and sample conditions in real-time.

BD CellView™ Image Technology

This technology leverages an optical multiplexing and signal processing (camera-free) approach to image cells using the electrical and optical components in flow cytometers.

Optics

Lasers

Excitation optics

UV: 349 nm–30 mW
V: 405 nm–50 mW
B: 488 nm–100 mW
YG: 561 nm–50 mW
R: 637 nm–100 mW

Note: The 488 nm laser is optically divided to support signal detection with BD CellView™ Image Technology.

Optical platform

Fixed optical assembly with the capacity to be configured with up to five spatially separated laser beams and six beam spots.

Laser delays are automatically adjusted during instrument QC.

Flow cell

The quartz cuvette flow cell is coupled to the fluorescence objective lens by a refractive index-matching gel for optimal light collection.

Beam geometry

Flat top laser beam profile

Emission optics

Optical coupling

Emitted light from the gel-coupled cuvette is delivered by fiber optics to the detector arrays. The optical pathways use signal reflection to maximize signal detection.

Scatter detectors

Blue laser: Forward scatter (FSC), Side scatter (SSC), Axial light loss (ALL)

Violet laser: Axial light loss (ALL), Side scatter (SSC)

Fluorescence detectors for spectral flow cytometry

Fluorescence detectors

Spectral arrays – 78 APD detectors paired with algorithmically optimized filter bandwidths covering the full spectrum:

UV 349 nm laser – 22 UV detectors, covering 365 nm–860 nm

Violet 405 nm laser – 20 Violet detectors, covering 410 nm–860 nm

Blue 488 nm laser – 16 Blue detectors, covering 495 nm–860 nm

Y/G 561 nm laser – 12 Yellow-green detectors, covering 570 nm–860 nm

Red 637 nm laser – 8 Red detectors, covering 645 nm–860 nm

Imaging

Imaging fluorescence detectors

Blue laser scatter detectors

FL1: 534/46

FL2: 600/60

FL3: 788/225

Forward scatter (FSC)

Side scatter (SSC)

Axial light loss (ALL)

Imaging parameters/features

Center of mass X

Center of mass Y

Correlation

Delta center of mass

Diffusivity

Eccentricity

Max intensity

Moment (long)

Moment (short)

Radial moment

Size

Total intensity

Note: All of these parameters are computed from all the imaging detectors with the exception of Correlation and Delta CoM, which is computed between pairs of imaging detectors.

Fluidics

Flow cell

Quartz cuvette

Sample input

12x75-mm (5.0-mL) tubes

Sample agitation

Adjustable through the software to keep the sample constantly suspended.

Sample temperature control

Adjustable through software: 4°C, 22°C, 37°C and 42°C or off.

Nozzle

85-µm nozzle, 100-µm nozzle and 130-µm nozzle that are removable and can be sonicated.

A registered key-fit position at the bottom of the cuvette provides fixed stream alignment.

Bubble detector

An in-line bubble detector detects air bubbles in the sample line. When air is detected the sample line is pinched to prevent air from reaching the nozzle.

Fluidic reservoirs

One autoclavable sheath tank (10-L) that contains sheath fluid

One autoclavable waste tank (11.5-L) that collects waste from the cell sorter, up to 200 autoclaving cycles at 30 PSI and 121.1°C (250°F).

Three cleaning bottles (1.2-L) (DI water, bleach and ethanol)

Sort

Nozzles, pressure and frequency

85-µm nozzle: 35 psi, 57 KHz

100-µm nozzle: 20 psi, 34 KHz

130-µm nozzle: 7 psi, 15 KHz

Up to 6-way sorting for all nozzles

Note: Validate sort streams for your specific application.

Sort collection devices

Tube sorting: 15-mL microtubes, 2.0-mL and 12x75-mm (5.0-mL) tubes, 15-mL and 50-mL centrifuge tubes

Plate sorting: 6-, 24-, 48-, 96- and 384-well plates, microscope slide (optional)

Index sorting

Correlation of imaging features and traditional spectral flow cytometry parameters of sorted events with well location of a multi-well plate.

System – Automation and monitoring

Automated setup, optimization and monitoring of droplet break-off and sort streams.

Automated drop-delay determination with BD FACS™ Accudrop Beads.

Automated clog detection and sort tube protection system using Sweet Spot technology.

Sample flow automatically stops when the sample input tube is empty.

Performance

Fluorescence resolution

Full-peak coefficient of variation (FPCV): <3.0%, G0/G1 peak for propidium iodide (PI)-stained chicken erythrocyte nuclei (CEN).

Scatter sensitivity

Side scatter sensitivity (V-SSC) enables separation of 80 nm polystyrene beads from noise (ApogeeMix #1527).

Forward and side scatter resolution

Resolves lymphocytes, monocytes and granulocytes in lysed whole blood using FSC or Violet Axial light loss (ALL) vs SSC parameters with less than 10% contamination amongst cell populations.

Image sensitivity

Resolves and provides image of 0.2-µm polystyrene beads from noise using at least one SSC parameter.

Fluorescence sensitivity (MESF)

Fluorescence sensitivity was measured using BD Sphero™ Rainbow Calibration Particle according to the manufacturer's specifications:

FITC: <65 molecules of equivalent soluble fluorochrome (MESF-FITC)

PE (488 nm): <25 molecules of equivalent soluble fluorochrome (MESF-PE)

PE (561 nm): <20 molecules of equivalent soluble fluorochrome (MESF-PE)

APC : <15 molecules of equivalent soluble fluorochrome (MESF-APC)

MESF performance is the same for the 3-laser, 4-laser and 5-laser configurations.

Fluorescence linearity

Doublet/singlet ratio: PI-stained CEN: 2.00+/- 0.05

Sort Performance

Sort purity

Using an 85-µm nozzle with an average of 10,000 events per second, a 6-way sort of sample with 3–7% target populations achieved a purity of >96% for all six populations.

Yield is based on various conditions such as event rate, sample type, sort modes, etc.

Sort viability

Jurkat cells were sorted using a 100-µm nozzle at 20 psi, resulting in >80% viability based on proliferation 3 days post sort.

Plate sorting

Deposit a single event into each well of a 96-well plate in less than 80 seconds using optimal sample setup.

Quality Control (QC)

BD FACSDiscover™ Setup Beads adjusts experiment gains automatically to ensure longitudinal consistency.

Biweekly image calibration QC with BD CellView™ Calibration Beads.

Options

Sample temperature control

This option can be used for sort tube and plate temperature regulation during a sort. It includes a coolant/liquid recirculation unit with specifically designed collection tube holders with ports for coolant circulation for heating or cooling tubes or multi-well plates during sorting.

Class II Type A2 biological safety cabinet (BSC)

The BD FACSDiscover™ S8 Cell Sorter can be equipped either at the time of purchase or as field upgrade with a fully integrated custom-tailored BSC designed in collaboration with the Baker Company.

Aerosol Management Option (AMO) for systems without the BSC

The BD FACSDiscover™ S8 Cell Sorter features an enclosed pathway from the sample injection chamber to the sort collection tubes. For an added level of aerosol management, the BD® Aerosol Management Option (AMO) evacuates the sort collection chamber and traps aerosolized particles during sorting. It is equipped with a 0.01-µm size ultra-low penetrating air (ULPA) filter to trap aerosolized particles.

Instrument table (W x D x H)

Instrument table designed to accommodate cell sorter, collection device temperature control, computer, monitor and keyboard.

191.4 x 84.7 x 83.8 cm
(75.4 x 33.4 x 33.0 in)

Installation Requirements

Dimensions (W x D x H)

Cell sorter: 91.2 x 52.1 x 55.9 cm
(35.9 x 20.5 x 22.0 in)

Electronics box: 67.0 x 51.4 x 55.5 cm
(26.4 x 20.24 x 21.9 in)

Fluid storage cart: 49.4 x 65.9 x 53.1 cm
(19.5 x 25.95 x 20.91 in)

Biosafety cabinet: 135.6 x 91.18 x 204.0 cm
(53.37 x 35.9 x 80.3 in)

Weight

Cell sorter: 88.45 kg (195 lb)

Electronics box: 45.35 kg (100 lb)

Air supply

5.5–5.9 bar (80–85 psi), regulated.

The source of the compressed air must deliver clean (<5 ppm) dry-filtered (oil-free) air at stable pressures (+/-0.1 psi).

The worst-case air consumption, based on 100 tubes per hour, is approximately 0.5 m³/h standard cubic meters per hour (SCMH).

Power

Operation at 100/115/230 VAC and 50 or 60 Hz

Operating temperature range

Between 17.5°C and 27.5°C (63.5°F and 81.5°F) +/-2.5°C variation in the same day

Between 17.5°C and 22.5°C (63.5°F and 72.5°F) +/-2.5°C variation in the same day when installed in a BSC

Operating humidity

40–60% relative humidity
(noncondensing)

Audible noise

<65dB

System/Software/Support

Workstation

HP Z2 G9 Workstation Desktop PC

CPU: Intel™ Core™ i7-12700 Chipset

Operating system

Microsoft® Windows® 10 IoT Enterprise LTSC (Long-term Servicing Channel) Version 21H2

Monitor

32-in with 3840 x 2160 resolution (4K UHD)

Memory

64 GB RAM

Storage

OS Drive: 500 GB NVMe SSD

2nd Drive: 4.0 TB NVMe SSD

Software

BD FACSCorus™ Software guides researchers throughout the entire cell sorting process.

Exported file types

FCS 3.2, CSV, TIFF, CVW

BD® Remote Support Services (RSS)

BD® RSS is designed to log instrument and software diagnostic data from compatible BD flow cytometers so that they can be accessed remotely by BD technical support personnel.

Offline data analysis

Supported by FlowJo™ Software with the BD CellView™ Lens plugin, which enables offline analysis of image and flow parameters.

BD flow cytometers are Class 1 Laser Products.

For Research Use Only. Not for use in diagnostic or therapeutic procedures.

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