



# BD FACSymphony™ S6 Cell Sorter

Special Order Research Product



# Technical Specifications

## Optics

### Excitation optics

#### Optical platform

Fixed optical alignment of all Class 3B and Class 4 lasers with the cuvette flow cell.

Beam shaping: elliptical

Air-launched and focused on the cuvette flow cell

Support for up to nine lasers

### Emission optics

#### Optical coupling

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

Numerical aperture: 1.2

### Forward scatter detector and filters

Photodiode with 488/10 bandpass filter for the 488-nm laser.

### Side scatter detector

Photomultiplier with a 488/10 bandpass filter for the 488-nm laser.

### Fluorescence detectors and filters

Flexible detector array technology enables user-defined detection configurations with up to 20 detectors per laser line. Filters and mirrors are user changeable.

## Fluidics

### General operation

Sheath and cleaning fluid tanks, as well as waste collection, are located in an easy-to-reach drawer at the base of the system. An auxiliary air input is designed to connect the cytometer to a lab's air filtration and drying system. If needed, a third-party compressor is available as an option.

Sheath pressure is adjustable from 5 to 75 psi.

### Fluidic reservoirs

Autoclavable 10-L sheath and waste containers and 5-L cleaning reservoirs are provided.

### Sample flow rates

Adjustable dynamic range of sample flow rates

### Fluidic cleaning modes included (software)

Automated startup and shutdown

Clean flow cell

Prepare for aseptic sort

### Nozzles

70, 85 and 100 standard. 130  $\mu$ m optional. All nozzles are removable and can be sonicated.

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

### Bubble detector

A bubble detector in the sample line detects air bubbles from the sample tube and stops sample flow when the sample tube is empty to prevent air bubbles from reaching the nozzle. The bubbles are then purged when unloading the sample tube.

### Automatic cell deposition unit

Sorts into slides and 6, 24, 48, 96, 384 and 1536\*-well plates. Index sorting can be enabled when sorting single cells. This capability indexes the cell surface phenotype to the well containing that cell

\*with StepSort option

## Performance

### Fluorescence sensitivity

Measurements performed at 70 psi and 90 kHz using SPHERO™ Rainbow Calibration Particles (RCP-30-5A) on three systems.†

†MESF can vary lot to lot.

**FITC**†: <87 molecules of equivalent soluble fluorochrome (MESF-FITC) using a 525/50 filter and 150-mW 488-nm laser.

**PE**†: <29 molecules of equivalent soluble fluorochrome (MESF-PE) using a 586/15 filter and a 150-mW 561-nm laser.

### Fluorescence resolution

Coefficient of variation (CV)

PI: Area, <3.0%, full G0/G1 peak for PI-stained chicken erythrocyte nuclei (CEN)

Hoechst: Area, <3.5%, full G0/G1 peak for Hoechst-stained CEN

### Fluorescence linearity

Doublet/singlet ratio

CEN stained with PI: 1.95–2.05 (488-nm laser) or Hoechst: 1.95–2.05 (405-nm laser)

### Forward and side scatter sensitivity

Sensitivity enables separation of fixed platelets from noise, identification of bacteria.

### Forward and side scatter resolution

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

### Drop drive frequency

Range 1–100,000 Hz

### Purity and yield

Both four-way and six-way sorting methods at 70 psi and 87 kHz with an average threshold rate of 25,000 events per second, achieved a purity of >98% and a yield >80% of Poisson's expected yield. Higher threshold rates up to 70,000 events per second can be achieved without affecting purity. However, yield will decrease based on Poisson's statistics

## Sort collection devices

Two-way sorting: 12 x 75-mm and 15-mL tubes

Four-way sorting: 1.5-mL microtubes, 15-mL tubes, and 12 x 75-mm tubes

Six-way sorting: 1.5-mL microtubes, 5-mL tubes, and 12 x 75-mm tubes

## Sort collection cooling/heating

Water recirculator for refrigeration or heating (optional) compatible with collection into tubes, multiwell plates or slides.

## BD FACS™ Accudrop Technology

Red diode laser provided for fully automated drop-delay determination

Automated drop breakoff monitoring

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

## Signal processing

### Converter

Pulse sampling is precisely matched to the particle flow rate in the cuvette. Particles travel slowly through the cuvette to increase the light collection and sensitivity. High-speed sorting is achieved by accelerating the stream through the nozzle, supporting fast drop generation. The flow cell design and electronics are matched to maximize signal while maintaining maximum sort speed, purity and yield.

## Data acquisition channels

Configurable up to 50 parameters (48 fluorescent and 2 scatter detectors)

## Fluorescent compensation

No limit to inter- and intra-beam compensation

## Pulse processing

Height, area and width measurements available for any parameter. Ratio measurements are also available.

## Time

Time can be correlated to any parameter for kinetic experiments or other applications.

## Channel threshold

Available for any parameter from any laser, with the ability to use multiple thresholds from different lasers simultaneously.

## Loading

### Sample input sizes

Microtubes, 12 x 75-mm and 15-mL tubes.

Polystyrene or polypropylene tubes can be used.

### Sample input agitation

Adjustable through the software to keep the sample constantly suspended

### Temperature control

Sample input: 4 °C, 20 °C, 37 °C and 42 °C (adjusted in the software)

## Data management

### Data file structure

Flow Cytometry Standard (FCS) 3.1, 3.0 or 2.0

### Software

BD FACSDiva™ Software v9.1.2 or later

Compatible with FACSDiva Experiment Import and Export in FlowJo™ Software v10.6.2 or greater

## Installation requirements

### Instrument Dimensions (H x W x D)

BD FACSymphony™ S6 Cell Sorter without BSC:

142 x 128 x 87 cm (56 x 50 x 34 in.)

Weight: 475 kg (1,047 lb)

BD FACSymphony™ S6 Cell Sorter with BSC:

220 x 128 x 89 cm (87 x 50 x 35 in.)

Weight: 726 kg (1,600 lb)

See Site Preparation Guide for space and clearance requirement.

### Temperature operating range

Without BSC: 17.5 °C–25.5 °C (63.5 °F–81.5 °F)

With BSC: 17.5 °C–22.5 °C (63.5 °F–72.5 °F)

Less than 1/2 2.5 degree variation from the alignment temperature

### Workspace table (optional)

81.3 x 92.7 x 83.8 cm (32 x 36.5 x 33 in.)

### Heat dissipation

Without BSC: 1,965 BTU/hour (maximum, depends on the choice and number of lasers)

With BSC: 5122.5 BTU/hour (5-laser system)

### Power

Using power conditioner operation at 100/115/230 VAC and 50 or 60 Hz

Maximum power consumption: 1,500 watts (5-laser system) without BSC

3,225 watts (5-laser system) with BSC

### Water supply

None required

### Air supply

95–100 psi, regulated air, clean (<5 ppm) and free of oil

Approximately 0.52 standard cubic meters

## Options

### StepSort option

The BD FACSymphony™ S6 Cell Sorter can be equipped either at time of purchase or as a field upgrade. The StepSort option includes enhanced plate sorting hardware and StepSort software to enable more accurate and faster sorting on 96, 384 and 1536-well plates.

### Integrated biosafety cabinet (BSC) option

The BD FACSymphony™ S6 Cell Sorter can be equipped either at the time of purchase or as a 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 option

The BD FACSymphony™ S6 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.

### Temperature control option

This option can be used for both sort tube and plate temperature regulation during a sort and includes:

Recirculating water bath

Specially designed collection tube holders with ports for recirculating water

### Compliance with safety standards

IEC/EN 61010-01, IEC/EN 61010-02,  
IEC/EN 60825-01, and IEC/EN 61326-01  
Class 1 Laser Product IEC/EN 60825-01

#### Class 1 Laser Product.

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