The BD FACS™ Sorter offers a simplified and streamlined approach to cell sorting. With a combination of high-quality BD hardware, software and reagents, the BD FACS Melody System allows fast, consistent results regardless of operator skill level. A streamlined workflow helps improve lab efficiency and throughput.

With its high sensitivity and resolution, the BD FACS Melody Sorter can identify and isolate target cells for up to nine colors, a significant extension of color capability compared to similar cell sorters. This extended multicolor capability allows dim or rare subpopulations to be identified and produces more data with less sample.

The automated software package, BD FACS Chorus Software, is designed to regulate the sorting droplets and steer the sorted cells into collection devices. This intuitive software enables researchers at all skill levels to achieve high-purity sorting.

Instrument configurations have been optimized to use our brightest BD Horizon Brilliant™ Reagents with minimal fluorochrome spillover, taking the guesswork out of panel design and thus lowering the barriers for beginners. Reliability is achieved through the use of BD quality control beads to automatically check the cytometer’s performance and the adjustment of settings to ensure consistent values.
Technical specifications

**Optics**

**Excitation laser**
The 488-nm laser is standard. 488-nm blue direct diode laser, output power: 20 mW, nominal power: 16 mW
640-nm red direct diode laser, output power: 40 mW, nominal power: 36 mW (optional)
405-nm violet direct diode laser, output power: 40 mW, nominal power: 36 mW (optional)
561-nm yellow-green optically pumped semiconductor laser, output power 50 mW, nominal power: 40 mW (optional)

**Beam size**
9 ± 3 x 67 ± 5 µm

**Laser beam alignment**
Fixed and spatially separated alignment of all lasers with the cuvette flow cell

**Optical coupling**
The quartz cuvette flow cell is gel-coupled by refractive index-matching optical gel to the fluorescence objective lens for optimal light collection efficiency. Numerical aperture: 1.2.

**Detection channels**
Forward scatter (FSC), side scatter (SSC) and up to nine fluorescence channels. See the BD FACSMelody Filter Guide for laser and detection configurations and optical filter specifications.

**Fluidics**

**Sample input**
5.0-mL polystyrene or polypropylene tubes can be used.
Temperature control: Adjustable through software: 4°C, 22°C, 37°C and 42°C or off
Sample agitation: Adjustable through the software to keep the sample constantly suspended
Sample flow automatically stops when the sample input tube is empty.

**Flow cell**
Quartz cuvette

**Nozzle**
100-µm nozzle is removable and can be sonicated.
A registered key-fit position at the bottom of the cuvette provides fixed stream alignment.

**Fluidic tanks**
Autoclavable 10-L stainless steel sheath container
10-L polypropylene waste container

**Performance**

**System operation**
Time from system powerup to running sample, including powerup, fluidic startup, stream optimization and optional performance checks (instrument and drop delay QC): <20 minutes; excluding optional performance checks: <10 minutes
Sorting nozzle tip can be removed during operation, replaced and stream optimized: <3 minutes

**Fluorescence sensitivity**
Fluorescence sensitivity was measured using SPHERO™ Rainbow Calibration Particles according to the manufacturer’s specifications:
FITC: <110 molecules of equivalent soluble fluorochrome (MESF-FITC)
PE: <30 molecules of equivalent soluble fluorochrome (MESF-PE)

**Fluorescence detection efficiency**
Qr is the relative fluorescence detection efficiency, used for describing the detection efficiency of a detector for a specific fluorochrome. The units for Qr are photoelectrons generated per assigned BD unit (ABD unit). One ABD unit, for a given fluorochrome, is defined as the fluorescence of one antibody (fluorochrome to protein 1:1) bound to a cell. The higher the Qr value, the better the relative fluorescence detection efficiency per molecule reference fluorochrome measured in that detector.
FITC Qr (x1,000): 40 photoelectrons/ABD
PE Qr (x1,000): 325 photoelectrons/ABD
CD4 FITC: 1,600 photoelectrons*
CD4 PE: 13,000 photoelectrons*
*CD4 antibodies bound = 40,000
Qr values from the same lot of beads were taken from one BD FACSMelody Instrument. Qr values can vary between instruments and instrument configurations.

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

**Fluorescence linearity**
Doublet/singlet ratio: PI-stained CEN: 1.95–2.05

**Forward and side scatter sensitivity**
Sensitivity enables separation of 0.5-µm beads from noise.

**Forward and side scatter resolution**
Scatter performance is optimized for resolving lymphocytes, monocytes and granulocytes.
Sort performance

**Droplet sorting**
34,000 drops per second

Automated setup, optimization and monitoring of droplet breakoff and sort streams

Automated drop-delay determination with BD FACS™ Accudrop beads

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

**Purity and yield**
At 23 psi and 34 kHz with an average of 10,000 events per second, a 4-way sort of 5% target populations achieved a purity of 98% and a yield of >80% of Poisson’s expected yield for all four populations. No limitation is imposed on the event rate. However, yield decreases with higher event rates based on Poisson distribution principles. Similar results are observed for 2-way sorts.

**Sort collection**
- 4-way sorting: 1.5-, 2.0-, and 5.0-mL tubes
- 2-way sorting: 1.5-, 2.0- and 5.0-mL tubes
- 1-way sorting: 6-, 24-, 48-, 96- and 384-well plates, 96-well PCR tray, microscope slide (optional)

Temperature control: water recirculation unit to provide heating or cooling for collection into tube holders, multiwell plates and slides (optional)

**Index Sorting**
Correlation of flow cytometry parameters of sorted events with well location of a multiwell plate, tray or slide (standard feature enabled with optional plate sorting).

**Signal processing**

**Pulse measurement**
Height, area, width

**Acquisition rate**
The maximum throughput rate is 40,000 events per second, independent of the number of parameters.

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

**Channel threshold**
Available for any single parameter from any laser

Data management

**Software**
BD FACSChorus Software version 1.0 or later

**Data file format**
FCS 3.1

**Computer**
Business PC with at minimum: Intel® 2.8G CPU Quad Core™ i7, Microsoft® Windows® 10 64-bit operating system

**Monitor**
23-inch LCD with a minimum 1920 x 1080 resolution

**Memory**
8-GB RAM

**Storage**
500-GB hard drive

Options

**Lasers**
- 640-nm red laser, output power: 40 mW, nominal power: 36 mW
- 405-nm violet laser, output power: 40 mW, nominal power: 36 mW
- 561-nm yellow-green laser, output power: 50 mW, nominal power: 40 mW

See the *BD FACSMelody Filter Guide* for laser and detector configuration and mirror options.

**Plate sorting**
Software controlled single or multiple cell deposition, one-way sorting:
- Plates: 6-, 24-, 48-, 96- and 384-well plates
- PCR tray: 96 well
- Microscope slide: 3 x 9 grid

**Sample temperature control**
Water recirculation unit and sort collection devices to provide heating or cooling of tubes, multiwell plates and slides during sorting

**Class II Type A2 biological safety cabinet**
Specially modified Baker SteriGARD® e3 Class II, Type A2 biological safety cabinet (BSC) verified to meet personnel and product protection standards for Class II Type A2 with a BD FACSMelody Cell Sorter installed in the work area.

**Aerosol Management Option (AMO) for systems without the BSC**
The BD FACSMelody 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 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.
**System table**

**Computer cart**

**Air compressor**

**Installation requirements**

**Dimensions (W x D x H)**
- Cell sorter: 49.5 x 55.9 x 48.3 cm (19.5 x 22 x 19 in.)
- Electronics box: 50.8 x 55.9 x 48.3 cm (20 x 22 x 19 in.)

**Weight**
- Cell sorter: 40.75 kg (89.8 lb)
- Electronics box: 36.25 kg (79.9 lb)

**Air supply**
- 80–90 psi, regulated, filtered (<5 ppm), dry, oil free
- An optional air compressor is available.

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

**Operating temperature range**
- Between 17.5°C (63.5°F) and 27.5°C (81.5°F)
- Between 17.5°C (63.5°F) and 22.5°C (72.5°F) when installed in a BSC
- ±2.5°C variation in the same day

**Operating humidity**
- 40–60% relative humidity (noncondensing)

**Compliance with safety standards**
- UL 61010 (US)
- IEC 61010 and IEC 60825 (Europe)
- CAN/CSA – C22.2 No. 61010 (Canada)