

# BD FACSCanto™ System

## Technical Specifications

---

Built on more than 30 years of BD experience and leadership in flow cytometry and multicolor analysis, the BD FACSCanto™ flow cytometry system delivers reliable performance, accuracy, and ease of use for today's busy clinical laboratories.

To further expand your lab's best-in-class clinical diagnostic services, the BD FACSCanto system has 10-color capability.\* Optical enhancements and a 4-3-3 configuration deliver high sensitivity and resolution for accurate results.

To keep your lab operating at peak throughput and efficiency, the BD FACSCanto system automates many features to help streamline process and reduce hands-on time for operators. The BD FACS™ Loader, for example, allows operators to walk away from the cytometer after the samples are introduced, to free time for other activities. Features including quality control and single-tube instrument setup help operators rapidly learn to run routine clinical applications to improve

the reliability and consistency of results. To further simplify operation, BD FACSCanto™ clinical software automates setup, compensation analysis, and quality control for predefined clinical applications.

The first BD FACSCanto system was introduced in 2004. Since then there have been many innovations in the product line, reflecting our commitment to reach to ever higher standards. Today's BD FACSCanto system features a fixed-alignment flow cell in the fluidics system that minimizes startup time and improves reproducibility. To increase sensitivity and resolution for each color in a multicolor assay, a patented optical design maximizes signal detection. Together these capabilities make the BD FACSCanto system one of the most powerful and reliable cell analyzers for busy, best-in-class clinical laboratories today.

\*Seven- to ten-color assays are for Research Use Only.



## Optics

### Lasers

Air-cooled:

405-nm solid state, 30-mW fiber power output

488-nm solid state, 20-mW laser output

640-nm solid state, 40-mW fiber power output

### Laser Configuration

Spatially separated beams with 9 x 65- $\mu$ m elliptical spots

### Optical Alignment Procedure

Fixed, no operator alignment required

### Flow Cell

180 x 430- $\mu$ m rectangular quartz flow cell

### Collection Optics

Optical-gel coupled 1.2 NA lens

### FSC Resolution

1.0  $\mu$ m

### SSC Resolution

0.5  $\mu$ m

### Fluorescence Detector Design

Reflective optics with a single transmission filter in front of each PMT

### FSC Detector

Photodiode with 488/10 BP

### SSC Detector

PMT with 488/10 BP

### Fluorescence Detectors

10 PMTs in 4-3-3 standard configuration

### Blue Laser Dyes

FITC,\* PE,\* PerCP\* or PerCP-Cy<sup>TM</sup>5.5,\*

PE-Cy<sup>TM</sup>7\* (525, 575, 678 or 695, 785 nm)

### Red Laser Dyes

APC,\* Alexa Fluor® 700, APC-Cy7\* or APC-H7 (660, 720, 785 nm)

### Violet Laser Dyes

BD Horizon<sup>TM</sup> V450, BD Horizon<sup>TM</sup>

V500-C, BD Horizon<sup>TM</sup> Brilliant

Violet<sup>TM</sup> 605 (450, 500, 602 nm)

### Detector Bands

Violet Laser: 450/50, 525/50, 605/40 nm

Blue Laser: 530/30, 575/25, 695/40, 780/60 nm

Red Laser: 670/30, 712/21, 780/60 nm

### Filter Change Procedure

Keyed filters, no tools required

## Performance

### Fluorescence Threshold Sensitivities

FITC <100 MESF; PE <50 MESF

### Sensitivity Measurement Using BD FACSTM 7-Color Setup Beads

Sensitivity determined with the setup beads measures the ability to resolve a dimly stained population from unstained cells. This sensitivity measure takes into account both the separation of the populations and the broadness of the negative population. Different fluorochromes give different separation of the stained and unstained populations. This is also taken into account in the sensitivity measurement: the higher the reported number, the higher the resolution.

Minimum values:

See the BD FACSTM 7-Color Setup Beads Sensitivity Specification Update CD for lot-specific minimum sensitivity specification values.

## Fluidics

### General Operation

Integrated fluidics cart and compressor with onboard housekeeping solutions for automated startup, shutdown, and cleaning cycles

### Sheath Consumption

1.10 L/h normal operation; <1 mL/h standby

### Housekeeping Solution Capacities

BD FACFlow<sup>TM</sup> sheath solution (20 L)

BD<sup>TM</sup> FACSClean Solution (5 L)

BD FACSTM Shutdown Solution (5 L)

Waste tank (10 L)

### Carryover

<0.1%

### Sample Injection

Directly into flow cell

### Maximum Particle Size

50  $\mu$ m

### Sample Flow Rate, Min

10  $\mu$ L/min

### Sample Flow Rate, Mid

60  $\mu$ L/min

### Sample Flow Rate, Max

120  $\mu$ L/min

### Sample Acquisition Rate

33,000 events/second with <10% abort rate (10 compensated parameters and 2 scatter parameters) for samples with random arrival time

### Sample Dead Volume

30- $\mu$ L Falcon® polystyrene test tubes (12 x 75-mm)

### System Cleaning

Daily: Automated startup and shutdown procedures

Monthly: Long clean

## Data Management

---

### Parameters

Area (A), Width (W), Height (H) for all channels with up to 2 ratios, and Time (T)

### Signal Processing

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

### Threshold

Single parameter (any channel) or AND/OR logical combinations of multiple parameters (any or all channels)

### Compensation

Full inter-beam matrix, during or post acquisition

### Maximum Logical Gate Regions

Limited only by system memory (4 GB RAM)

### CPU/Monitors

19" or 23" flat screen monitors

### Software

BD FACSDiva™ v7.0 or later,  
BD FACSCanto™ clinical v2.4 or later

### Operating System

Microsoft® Windows® XP Pro

## Options

---

### Sample Input with BD FACS Loader Option

#### Loading

40-tube carousel

#### Sample/Test ID

Indexed carousel, with carousel ID barcode reader

#### Throughput

76 tubes/hour (8 parameters,  
6 fluorescence compensated)

#### Miscellaneous

Multiple clinical applications can be run on the same Loader carousel.

### Barcode Reader with Stand

#### Software Compatibility

BD FACSCanto clinical software and  
BD FACSDiva software

#### 2D Reader

Streamlined input of BD FACS 7-color setup bead target values, input of patient information

## Installation Requirements

---

### Size (W x D x H)

Cytometer: 91.4 x 63.5 x 63.5 cm  
(36 x 25 x 25 in.)

Fluidics cart: 81.3 x 61 x 67.3 cm  
(32 x 24 x 26.5 in.)

### Weight

Cytometer: 104.8 kg (231 lb)

Fluidics cart: 55 kg (121 lb)

### Power

North America and Japan 110 ±10%  
VAC, 50–60 Hz

Outside North America 230 ±10% VAC,  
50–60 Hz

### Operating Environment

16°C–31°C (61°F–88°F), 20%–80%  
noncondensing relative humidity

### Heat Dissipation with BD FACS Loader Installed

<6,200 BTU/h

Class 1 Laser Product.

For In Vitro Diagnostic Use.

APC-Cy7: US Patent 5,714,386

Alexa Fluor® is a registered trademark of Life Technologies Corporation.

Cy™ is a trademark of GE Healthcare. Cy™ dyes are subject to proprietary rights of GE Healthcare and Carnegie Mellon University, and are made and sold under license from GE Healthcare only for research and in vitro diagnostic use. Any other use requires a commercial sublicense from GE Healthcare, 800 Centennial Avenue, Piscataway, NJ 08855-1327, USA.

Falcon is a registered trademark of Corning Incorporated.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

BD, BD Logo and all other trademarks are property of Becton, Dickinson and Company. © 2014 BD

