BECKMAN COULTER
Life Sciences

CytoFLEX SRT Cell Sorter

OPTICS

EXCITATION OPTICS

CytoFLEX SRT has the capacity for 17 detection channels, including 15 for fluorescence detection. The fully activated instrument includes five fluorescent channels from the 405 nm (Violet) laser, two from the 488 nm (Blue) laser, five from the 561 nm (Yellow) laser, and three from the 638 nm (Red) laser. Upgradeable configurations starting from two lasers can be chosen based on research requirements.

LASER SPECIFICATIONS
Spatially Separated Laser Options

Laser	Wavelength	Power
Violet	405 nm	90 mW
Blue	488 nm	50 mW
Yellow	561 nm	30 mW
Red	638 nm	100 mW

FLOW CELL

Fixed integrated optics and quartz flow cell design.

FORWARD SCATTER DETECTION

Silicon photodiode with built in 488/8 µm bandpass filter.

BANDPASS FILTERS
Includes 16 repositionable filters

405/10	675/30
450/45	690/50
525/40 (2)	710/50
585/42	712/25
610/20 (2)	780/60(3)
660/10 (2)	

FLUORESCENCE AND SIDE SCATTER DETECTION

Fluorescent and side scatter light is delivered by fiber optics to Avalanche Photodiode detector arrays. Proprietary design ensures high performance, high efficiency, low-noise signal detection. Emission profiles are collected using reflective optics and single transmission bandpass filters.

VIOLET SIDE SCATTER CONFIGURATION

Option to configure Avalanche Photo Diode detector array to collect side scatter signal from Violet (405 nm) laser. The configured channel (VSSC) can be utilized to better resolve nanoparticles.

QUALITY CONTROL

For detection channel off the 405, 488, 561, and 638 nm laser, CytExpert SRT QC automation pass/fail criteria is rCV ≤5.0%.

FLUIDICS

Built-in pump with anti-vibration design provides system pressure and vacuum.

FLUIDIC CAPACITY

Fluidic cart with on-board fluid containers.

4 L steel sheath container, autoclavable.

7 L high-density polyethylene waste container.

1 L high-density polyethylene shutdown fluid container.

SHEATH PRESSURE

Fixed 15 psi

NOZZLE

Plug-and-play nozzle holder with replaceable 100 µm ceramic nozzle, ultrasonically cleanable.

SAMPLE FLOW RATES

Adjustable sample flow rates from approximately 10-100 µL/min.

SAMPLE INPUT FORMATS

5 mL (12 x 75 mm) polystyrene and polypropylene tubes.

Sample Agitation: Eccentric mixing, 3 adjustable mixing speed to suspend the sample

Inline bubble detector can auto detect and stop sampling when tube is empty to avoid bubbles entering the flow cell.

MAINTENANCE

Automated maintenance functions for daily and periodic cleaning operations: System Startup, System Shutdown, Daily Clean, Flow Cell Clean, Aseptic Clean, Long Term Shutdown, Backflush, Sheath Filter De-bubble, Flow Cell De-bubble.

Maintenance reminder can be set up in the software for some regular operations with custom cycle time.

User replaceable fluidic filters and sample line.

ELECTRONICS

NOMINAL ACQUISITION RATE

40,000 events per second with all configured parameters

Software capability to modify window extension parameter.

SIGNAL PROCESSING

Fully digital system with 7 decades data display.

SIGNAL

Pulse area, height for every channel, width for up to two selectable channels.

PERFORMANCE

ANALYSIS

SCATTER RESOLUTION

Blue (488nm) Side Scatter Resolution: 300 nm.

Violet (405 nm) Side Scatter Resolution (VSSC): 200 nm
(available only for configurations containing the violet laser).

Scatter performance is optimized for resolving human lymphocytes, monocytes, and granulocytes as well as nanoparticles.

CARRYOVER

<0.1% (QC Beads).

SENSITIVITY

FITC: <30 molecules of equivalent soluble fluorochrome (MESF-FITC) from the 488 nm laser.

PE: <10 molecules of equivalent soluble fluorochrome (MESF-PE) from the 561 nm laser.

APC: <25 molecules of equivalent soluble fluorochrome (MESF-APC) from the 638 nm laser.

FLUORESCENCE RESOLUTION

The CytoFLEX SRT Cell Sorter can achieve <3% rCV with alignment verification particles capable of rCVs <3%.

SORTING

AUTOMATED SORT SETUP

The system can perform system startup, QC and sort calibration to be ready to sort within 30 minutes. All sort settings can be defined automatically.

New side stream system can automatically define charge parameters, monitor the sides streams and maintain them.

DROPLET FORMATION

Improved Intellisort® technology is used for automatic droplet optimization, monitor and maintain, and drop delay determination.

Droplet frequency: 30,000 Hz to 35,000 Hz automatically optimized, adjustable.

PURITY

CytoFLEX SRT is capable of simultaneously bulk sorting up to 4 defined populations of particles >99% purity with 5% target population, sample threshold ≤10,000 events per second, while the yield rate is above 80% theoretic rate.

Purity level could be maintained with higher sorting speed up to 30,000 events per second, while the yield rate would be lower based on Poisson Distribution.

SORT FUNCTIONS

Stream Mode: Deflection mode and straight-down mode (one-way sorting only).

Sort Mode: 4 preset sorting modes for different sorting purity and yield requirements. User defined modes can be added.

Mixed mode sorting: different sorting modes can be applied to different stream ways.

Index sorting for plate or slide sorting: sorted cells are linked with the sorted locations. Index information can be read from the index sorting plots and in sort reports.

COLLECTION DEVICES

Standard all-in-one Cyclone collection module.

4-way sorting devices: four 5ml tubes, the two outer collection tubes can also be 15 mL tubes.

1-way sorting devices: 6-, 24-, 48-, 96- and 384-well plates, 96-deep well plate, slides, custom devices can be calibrated.

SORT RESCUE AND SORT RECOVERY

When a clog happens or droplets are not stable during sorting, sorting will be paused or stopped automatically, and the waste catcher will be extended to protect the sorted sample. The system will also automatically de-bubble the flow cell if the stream is not stable during sorting to recover sorting conditions.

DATA MANAGEMENT

SOFTWARE

The CytExpert SRT software is a full-featured software package that controls the instrument's operation, collection of experiment data, and analysis of the results.

Experiments generated by CytExpert 2.4 or earlier versions can be converted to the format of CytExpert SRT experiments and opened by the software.

If desired, export FCS files for analysis in Kaluza, Cytobank and other platforms.

STANDARDIZATION

Daily QC beads or any other reference material that is relevant for your application may be used as a standardization sample to set target values and calibrate the gain settings automatically.

LANGUAGE

English and Chinese.

OPERATING SYSTEM

Windows® 10 Enterprise LTSC 2019 x64-bit.

FCS FORMAT

FCS 3.0.

MAXIMUM SAMPLE SIZE

30 million event per file with all parameters.

RECOMENDED COMPUTER SPECIFICATIONS

CPU: Intel Core i7 or above.

Memory: 8 GB RAM or higher.

Storage: 1 TB drive or higher.

Ethernet: Integrated 100M GB, Dual Ethernet ports.

USB Port: ≥4 ports, at least one USB 3.0.

Monitor: 32-inch monitor (2560x1440 resolution) or 24-inch monitor (1920x1080 resolution).

COMPENSATION

Automatic full matrix compensation.

Manual full matrix compensation.

Novel Compensation Library: store fluorescent spillover values of dyes to easily determine the correct compensation matrix with new gain settings.

Import/export compensation values between experiments.

Absolute linear gain amplification enables the use of compensation settings between experiments and sample types.

OPTIONS

TEMPERATURE CONTROL

Optional water recirculation system for input sample tube and collection tubes. Two separated circuits for input and collect, which can be adjusted altogether or separately.

AEROSOL EVACUATION SYSTEM

The Aerosol Evacuation System removes aerosols and micro droplets, which may be generated during normal operation or sort failure conditions, from the sort chamber without disturbing sorting. Micro droplets and particulates greater than 0.12 μm are removed under vacuum and trapped in an Ultra-Low Penetration Air (ULPA) filter.

BIOSAFETY CABINET

The BSL-2, Type A2 biosafety cabinet is specially modified for CytoFLEX SRT cell sorter from Baker. Microbiological tests have been conducted to meet International standards.

Standards	
NSF/ANSI 49	
EN12469	
BS EN12469	Cabinet is microbiologically tested with instrument inside work area to validate personnel and product protection for each listed standard. This testing does not constitute actual product listing.
SANS 12469	
NF-095	
SFDA YY-0569	
JIS K 3800	
AS 1807.1	

INSTALLATION REQUIREMENTS

DIMENSIONS (W X D X H)

Sorter

72.5 cm x 47.5 cm x 45 cm.

28.5 in x 18.7 in x 17.7 in.

Fluidics cart

34.5 cm x 60 cm x 48.5 cm.

13.6 in x 23.6 in x19.1 in.

WEIGHT

Sorter 62 kg.

Fluidics cart (without fluid) 13.5 kg.

POWER SPECIFICATIONS

Voltage: AC 100-240V, 50/60Hz

Rated Power: 200VA

OPERATION ENVIRONMENT

Ambient Temperature: 15-27°C within ±2°C temperature variation during operation (15-23°C in biosafety cabinet).

Relative Humidity: 20-80% (noncondensing).

Altitude: 2,000 m (max).

COMPLANCE OF SAFETY STANDARDS

IEC 61010-1:2010, AMD1:2016

IEC 61010-2-081:2019

UL 61010-1:2012

CSA-C22.2 NO. 61010-1-12

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