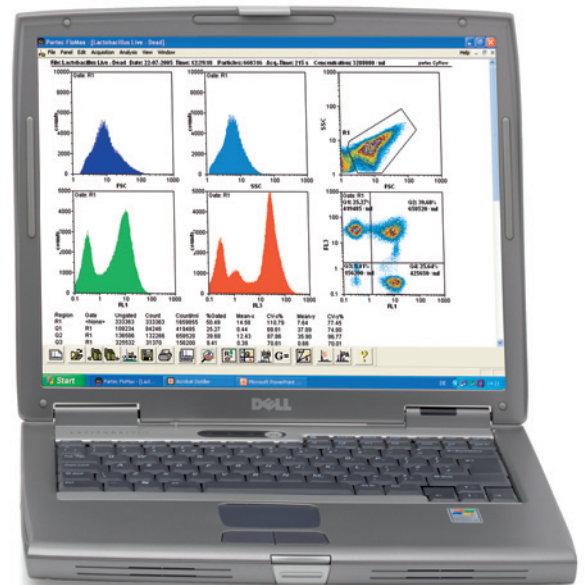


partec

CyFlow[®] SL

Microbiology



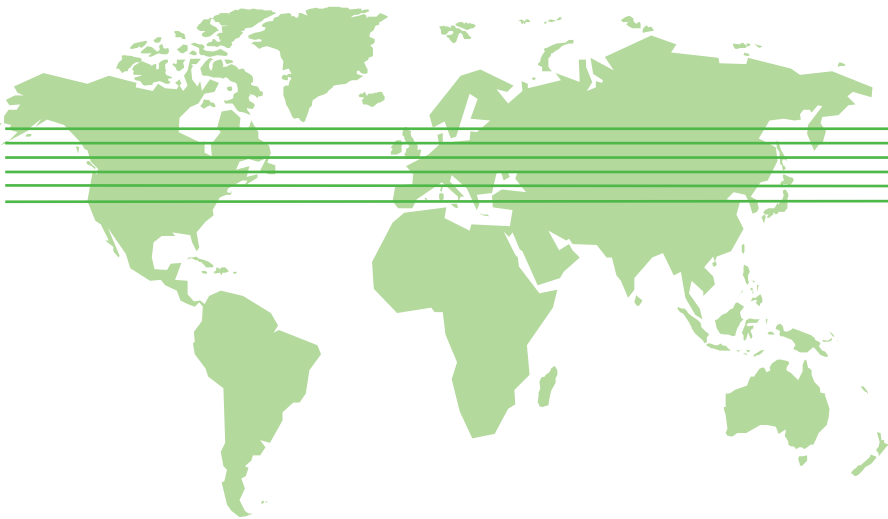
Detection and Analysis of Microorganisms and Small Particles

01 _____ COMPANY

Flow Cytometry made in Germany



New sophisticated applications and increasing requirements for reliable results in research and routine within shortest possible time - The challenge for flow cytometry instrumentation, automation and software.



partec

A well-established network of subsidiaries and distributors in more than 60 countries worldwide characterizes Partec's commitment to the increasing focus and need for global access to Flow Cytometry instrumentation and application support:

www.partec.com/partec/distributors.html

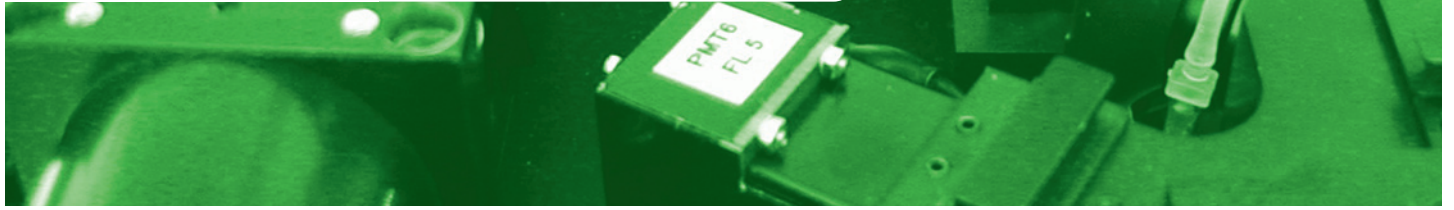


More than 35 Years of Experience and Professional Expertise

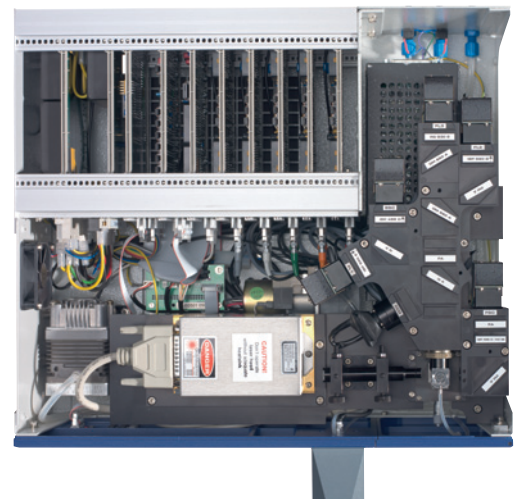
Partec – pioneer in Flow Cytometry since 1968 – responds to these requirements with the new generation of Windows™XP based CyFlow® and PAS™ FCM systems featuring innovative computer controlled flow systems, modular optical systems with advanced PMTs for all optical channels, most modern computer and digital electronic technologies including fast and precise 16 bit ADC converters and realtime data acquisition and display.

02 HIGHLIGHTS

CyFlow® SL for Microbiology



- _ ultracompact and fully equipped mobile/portable instrument
- _ dimensions [cm]: L 43 x H 16 x D 37
- _ highest stability/robustness and highest precision
- _ 5 optical parameters: FSC, SSC, FL-1, FL-2, FL-3
- _ 20mW@488nm blue solid state laser (50mW@488nm optional)
- _ other laser light sources optional (UV, violet, green, yellow, red)
- _ Windows™ XP FloMax® software for realtime data acquisition, data display, and data evaluation
- _ parallel 16 bit digital pulse processing
- _ single platform True Volumetric Absolute Counting (TVAC)
- _ submicron particle detection (< 0.2µm) for scatter
- _ high fluorescence sensitivity < 100 MESF (FITC) < 50 MESF (PE)
- _ power connection: regular 100/240 V AC or car battery (12 V DC)
- _ new level of price / performance ratio



03 TECHNOLOGY

CyFlow® SL for Microbiology

The ultracompact CyFlow® SL offers all features required for detection of small organisms and submicrometric particles: a valuable tool for microbiological analysis.

Compact and Transportable

The CyFlow® SL is a fully equipped 5 parameter (FSC, SSC + 3 color fluorescence) portable / desktop flow cytometer. The standard configuration with a blue solid state laser allows excitation of most of the commonly used fluorochromes like FDA for viability assays or PI for DNA labelling (other lasers on request). The CyFlow® design and the selection of technical features optimized for the analysis of small particles guarantees highest sensitivity for all low-signal applications. The small size and robustness of the CyFlow® SL allows its placement in any laboratory or directly close to the fermentation device. Due to its unique transport stability the instrument is perfectly suitable for frequent transportation and can be used at virtually any location "where the cells are".

High Stability and Precision

The complete optical system of the CyFlow® SL is designed as one solid metal block. Time consuming installation and optical checks, realignments of lasers and readjustments are not required. Modern solid state lasers guarantee highest power stability and an extraordinary long life time – a precondition for high precision analysis of low signal intensity measurements.

Applications in Research and Routine

The analysis of virtually any fluorophore excitable at 488nm in this multi color detection unit makes the CyFlow® SL to a valuable instrument for research based applications in cell biology, cell culture development, biotechnology (e.g. detection of protein expression), quality control (e.g. strain specific detection and quantification of pathogens) and process optimization (e.g. wood pitch analysis in paper production). Growth control of microbiological cultures at any time point is a prerequisite for maintaining optimized growth conditions. The CyFlow® SL allows usage of the fast and robust flow cytometry technology for routine measurements in process control. The well-established technology minimizes the time delay between sample uptake and sample analysis which cuts down costs dramatically. Optimized for this instrument Partec offers a wide range of detection kits for various measurements of cell physiology (cell count, viability, proliferation, membrane integrity, ...). The CyFlow® SL opens a new era of flow cytometry, it supports all applications as known from traditional large flow cytometers at lower instrument costs.

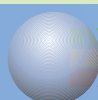
Selection of Fluorochromes for the CyFlow® SL

Type of laser

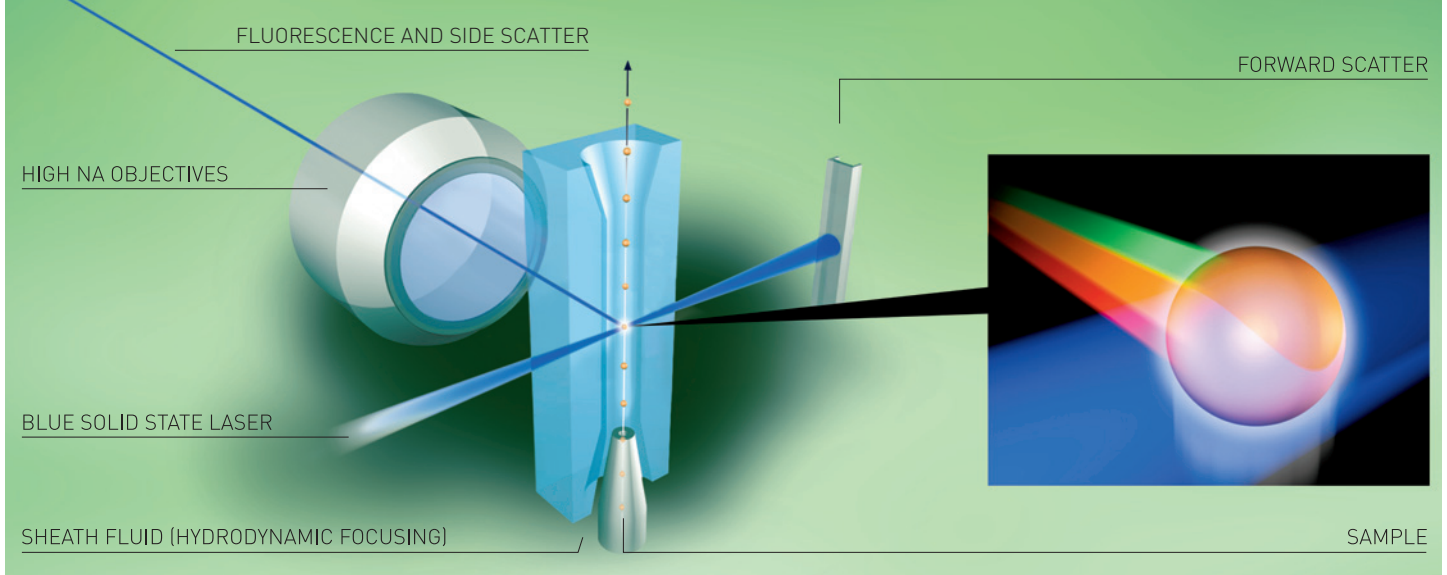
Fluorescence Channel

Fluorochromes

blue solid state laser 488 nm
20 mW or 50 mW



GREEN	FITC	GFP	Alexa Fluor® 488	SYTO 9	FDA
ORANGE	PE	eYFP	PI	PE-Texas Red®	
RED	PE-Cy5	PE-Cy5.5	PerCP	PerCP-Cy5.5	EB Nitred PE-Cy7



The unique Partec quartz flow cuvette is the heart of the CyFlow® SL, ensuring that particles and cells cross the excitation light with best possible precision.

Thanks to the optical and mechanical precision of the flow cuvette, superior results are guaranteed for all parameters – a prerequisite for all high precision measurements. The sample is transported with help of a computer controlled

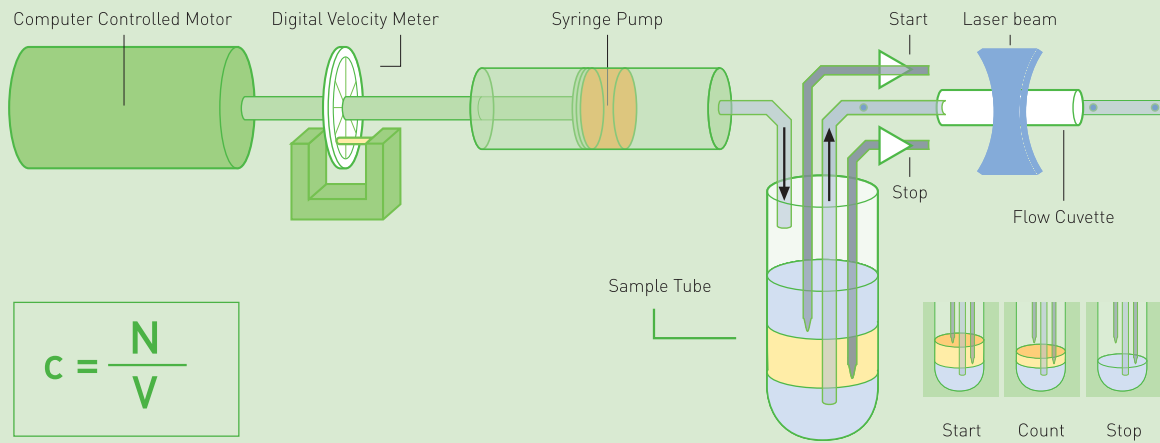
syringe pump, part of a virtually cross contamination-free fluidic system. The design of the flow cuvette incorporates more than 35 years of experience in handling particles and fluids with high precision.

The True Volumetric Absolute Counting (TVAC) is a unique feature of all Partec Flow Cytometers, offering highest absolute counting precision and accuracy.

The CyFlow® SL analyses concentrations of any particle or cell subpopulation of interest using True Volumetric Absolute Counting. This unique method is solely based on the fundamental definition of absolute counting respectively the particle concentration (c) which is equal to the counted number (N) of particles (e.g. cells) in a given volume (V), $c = N / V$. In the CyFlow® SL, the volume is measured directly by mechanical means, rather than by calibration with expensive beads with a—sometimes doubtful—“given” nominal concentration. Thus, the precision of volume measurement is defined by a fixed mechanical design, eliminating any errors related to varying bead concentrations or bead aggregation. The CyFlow® SL allows the analysis of a fixed volume as defined by the distance between two platinum electrodes reaching into the sample tube with a given diameter.

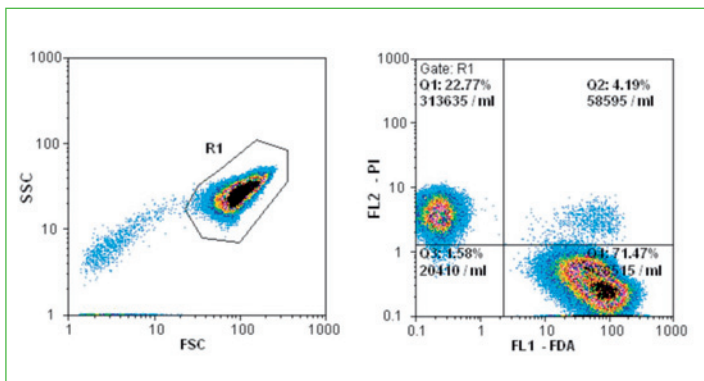
Alternatively, a well defined volume of free choice involving the digital sample speed control can be used. Benefits of True Volumetric Absolute Counting:

- digital volumetric precision by mechanical design: CV < 2 %
- no errors related to calibration
- no additional time and preparation steps for reference beads or haematology reference count
- no expenses for calibration beads
- no separate haematology counter required

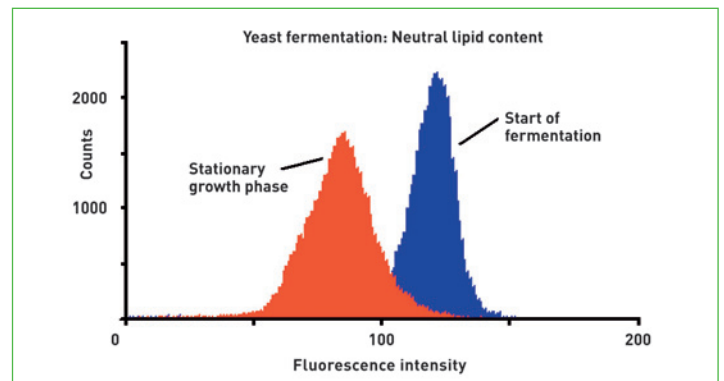


Principle of Partec True Volumetric Absolute Counting

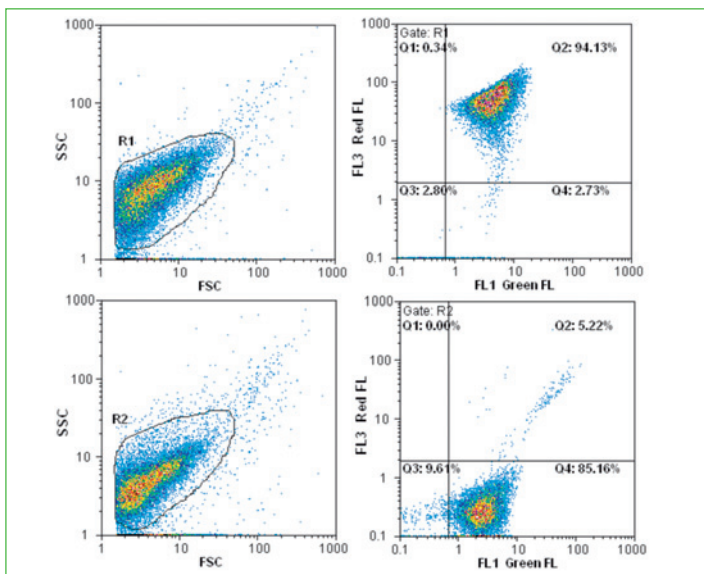
The Partec CyFlow® SL is your complete flow cytometry solution for microbiology and particle analysis.



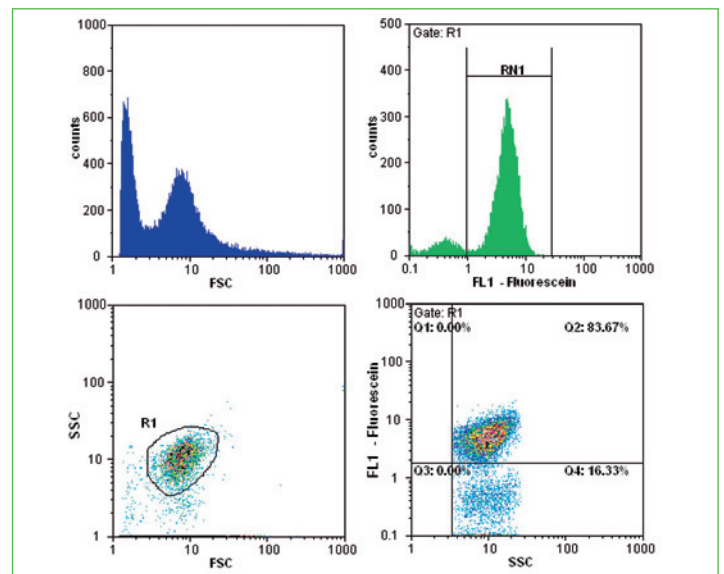
Live – dead analysis of *Saccharomyces cerevisiae* (baker's yeast) after staining with the Partec "Yeast control – Viability" kit (Partec Code no. 05-6000-02). The yeast cell population can be identified in the scatter plot (gated with R1). Living cells exhibiting a strong green fluorescence can be identified in Q4, dead cells labelled with propidium iodide counter stain are visualized in Q1. Data obtained with a CyFlow® SL with a 488 nm blue laser.



Characterization of metabolic processes of growing *Saccharomyces cerevisiae* (baker's yeast) cells by applying the Partec "Yeast control - Neutral lipid" kit (Partec Code no. 05-6000-05). A clear development dependent shift of the intracellular neutral lipid content can be observed. Data obtained with a CyFlow® SL with a 488 nm blue laser.



Live – dead analysis of a *Staphylococcus aureus* culture by applying the fluorescent membrane potential sensor DiOC2 (Molecular Probes, Invitrogen). Upper panel: scatter plot with *S. aureus* cells (R1) from a growing culture (left); most of the cells show an intensive red fluorescence (Q2) indicative of an existing membrane potential (right). Lower panel: scatter plot of *S. aureus* cells (R2) treated with the ionophore CCCP (Molecular Probes, Invitrogen). Most of the cells exhibit a green fluorescence only, indicative of a destroyed membrane potential (Q4). Data obtained with a CyFlow® SL with a 488 nm blue laser. (Data kindly provided by Dr. Hänscheid, Lisboa, Portugal).



In situ hybridization of *E. coli* cells. Cells were incubated with a strain specific, labeled oligonucleotide probe. Bacteria populations in R1, positive labeled cells (RN1) exhibit a strong fluorescence signal in the green channel. Data obtained with a CyFlow® SL with a 488 nm blue laser.

04 ANALYZE

CyFlow® SL for Microbiology

The Windows™ XP FloMax® software integrates instrument control including acquisition, on- and offline data analysis, on- and offline compensation into a complete software package.

Predefined and freely adaptable instrument settings and panels facilitate switching between different applications. FloMax® is optimized for immunophenotyping, microbiology analysis, cell cycle, DNA ploidy, and other scientific flow cytometric analysis. Data are stored in FCS flow cytometry standard file format for easy exchange with other analysis software. One of the unique features is the digital on- and offline color crosstalk compensation of the spectral overlap of fluorescence from simultaneously analysed dyes. The N-color compensation algorithm allows a correction of the crosstalk between any parameter without the need to rerun a sample. FloMax® optimally supports the True Volumetric

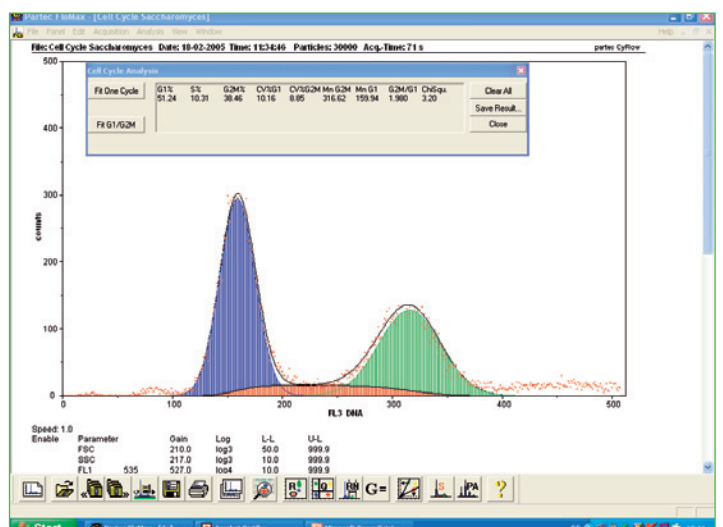
Absolute Counting feature of the CyFlow® SL, displaying particle concentrations for any subset of cells, even if defined by a gate at a later time after the acquisition.



Full flexibility and automation with the Partec FloMax® software.



The FloMax® panel system allows automated analysis of repeating sample series employing different dyes or instrument settings. The FloMax® software generates data fits for automated analysis of the results (e.g. growing yeast: cell cycle distribution, picture on the right). Comprehensive and user-designed reports of the results can be created as Microsoft Word or Excel files.



05_SPECIFICATIONS

CyFlow® SL for Microbiology

GENERAL

The CyFlow® SL is a fully-equipped portable/desktop flow cytometer. It analyses up to five optical parameters (FSC and SSC and 3 fluorescences) plus time parameter. It performs both fluorescence analysis and absolute cell counting without the need for reference beads.

LIGHT SOURCES

The instrument is equipped with a solid state laser featuring blue excitation at 488 nm (UV, violet, green, yellow or red lasers optionally available).

OPTICS

Modular optical system with 1 to 5 optical parameters. Each parameter is equipped with a photomultiplier tube (PMT) and integrated electronic preamplifier. Color CCD camera for video flow monitoring.

FLOW SYSTEM

Synthetic quartz flow cuvette (channel dimensions: 200 µm x 350 µm) for laminar sample flow. True Volumetric Absolute Counting based on precise counting and fluid volume measurement. Computer controlled precision syringe pump for contamination-free sample transport and volumetric absolute counting, pump speed continuously adjustable up to 1200 µl/min, sheath fluid pressure continuously adjustable from 0-500 mbar. Fluid level indicators for full waste and low sheath fluid.

ELECTRONICS

- parallel signal processing for each of the optical channels with selectable linear, 3- or 4-decade logarithmic scale
- pulse height, area and width analysis for doublet discrimination
- 16 bit analog-to-digital converters, trigger on any parameter or parameter combinations

COMPUTER

Processor ≥ Pentium 3.2 GHz, ≥ 512 MB RAM
Harddisk ≥ 160 GB
17" TFT, (19" and others optionally available)
Floppy disk drive 1.44 MB and DVD/CD-RW combo drive
Monitor, keyboard and mouse
Microsoft Windows™, Office®
Notebook optional

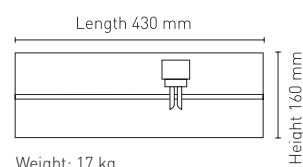
SOFTWARE

Partec FloMax® software based on the Windows™ operating system for multi-parametric data acquisition, display, data analysis, and instrument control. Simultaneous representation in single parameter histograms or correlated dual parameter plots during data acquisition. True Volumetric Absolute Counting with determination of cell concentration, concentration of subpopulations for each region or gate, reselection of subpopulations for absolute counting. Realtime acquisition, multi-parameter N-color compensation, multi-parameter gating, multi-color gating. Real time software gating: 32 regions can be combined to 32 gates in free logical combinations. Individual instrument setups and

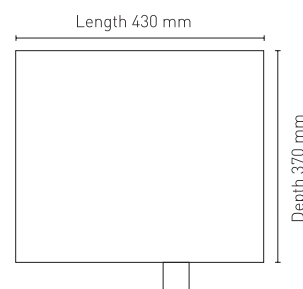
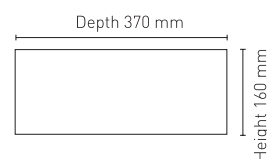
acquisition displays can be saved in setup files. Multi-tube analysis can be predefined in panels. Automated panel acquisition. Report module: automated multi-tube report generation as MS Word or MS Excel document. FCS flow cytometry file standard. Network connection to laboratory information systems (LIS), PCs, and Apple Macintosh.

POWER REQUIREMENTS

100-240 V AC, 60 VA, 50/60 Hz or 12 V DC, 5A



Weight: 17 kg



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Partec GmbH · Otto-Hahn-Straße 32 · 48161 Münster · Germany
Fon +49 2534 8008-0 · Fax +49 2534 8008-90
Mail: info@partec.com · Web: www.partec.com