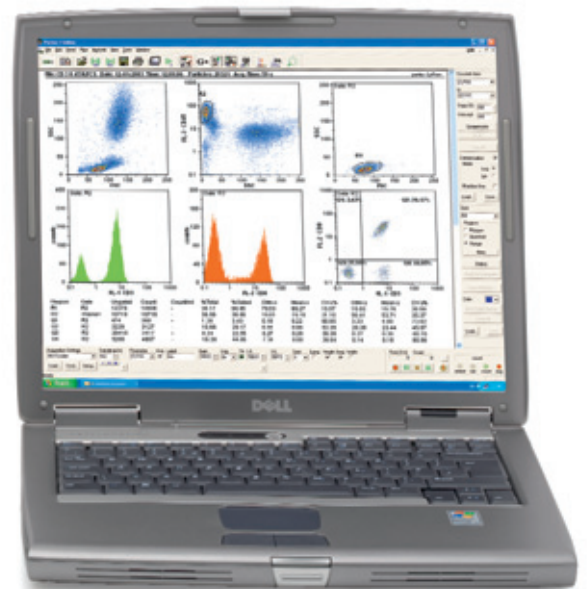


partec

# CyFlow<sup>®</sup> SL

Healthcare | Immunology



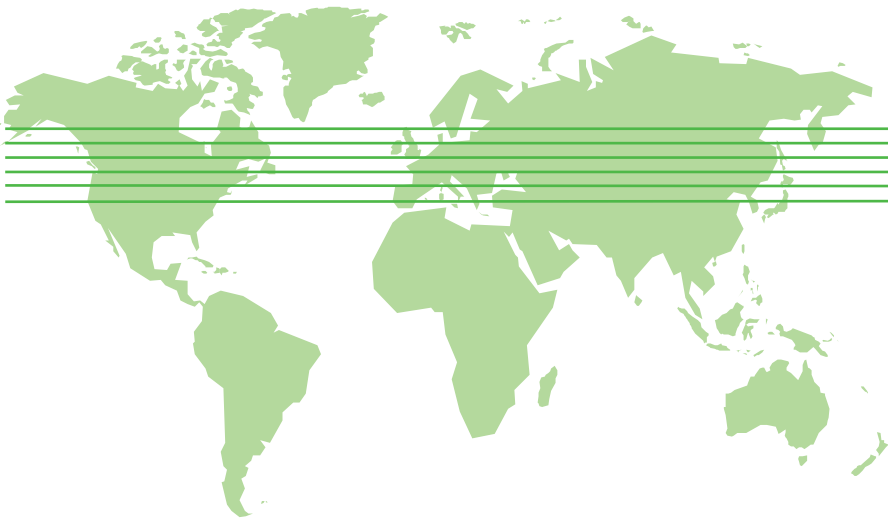
Portable FCM System for 3-colour Immunophenotyping

# 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.de/partec/distributors.html](http://www.partec.de/partec/distributors.html)



### More than 35 Years of Experience and Professional Expertise

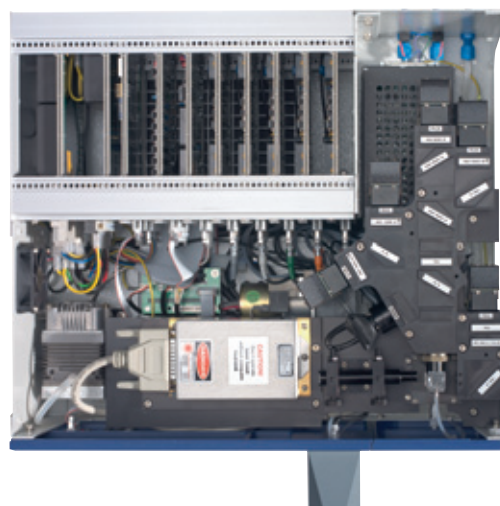
Partec - pioneer in Flow Cytometry since 1968 - responds to these requirements with the new generation of Windows™XP based CyFlow® and PAS™ FCM systems featuring innovative computer controlled flow systems, modular optical systems with advanced PMTs for all optical channels, recently available latest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

## 02 HIGHLIGHTS

### CyFlow® SL 3-Colour FCM System



- \_ 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
- \_ other laser light sources optional (UV, violet, green, 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 (<math><0.2\mu\text{m}</math>) 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 3-Colour FCM System

The ultracompact and portable CyFlow® SL provides most accurate and uniquely affordable 3-colour analysis for use in research and routine applications.

### Compact

The CyFlow® SL is a fully equipped 5 parameter (FSC, SSC + 3 colour fluorescence) portable / desktop flow cytometer. It contains a solid state/diode laser for UV/violet, blue, green, or red excitation. In the blue laser version it is fully compatible with standard flow cytometers used in clinical and research immunology. Its small size and robustness make the CyFlow® SL easy to place even in laboratories with limited space. It is the perfect device to take over the routine immunology from more expensive and service demanding large flow cytometers; dramatical cut down of running costs is achieved.

### High Stability

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 no longer required.

### High Precision

The solid state lasers of CyFlow® SL show a unique short and long term stability superior over water and air cooled gas

lasers. High precision analysis, as required in various fields of cell biology, pathology and immunology is maintained by the extraordinary long life time of solid state lasers.

### Power Connection

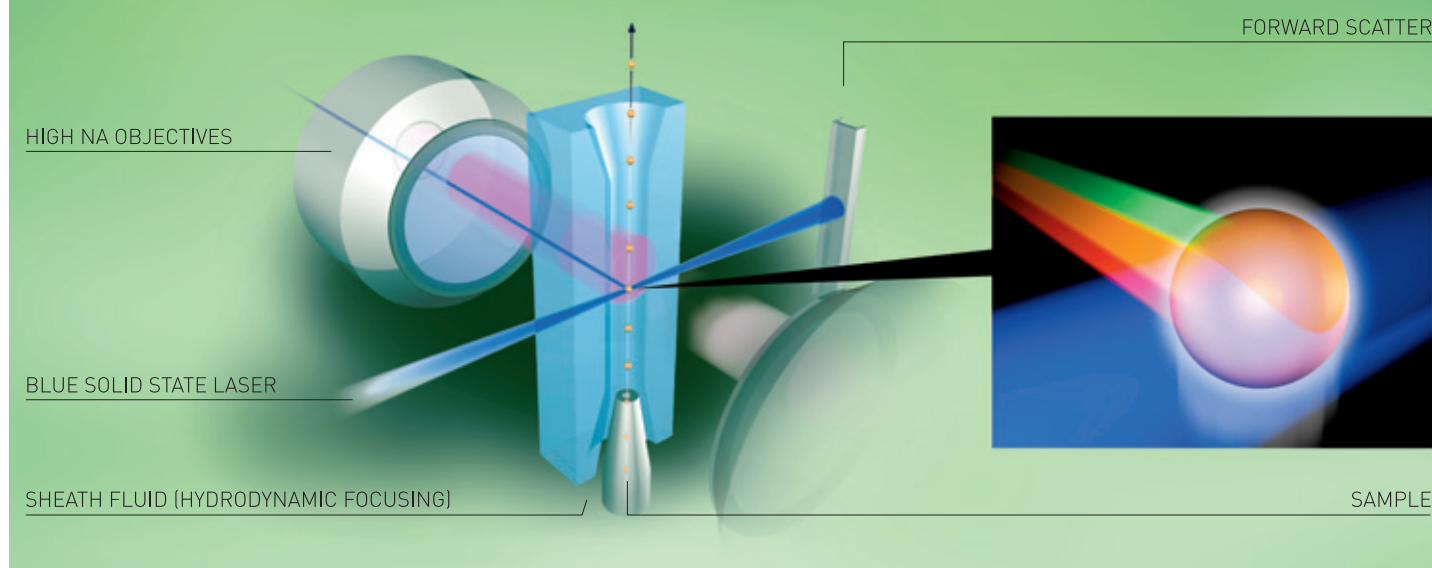
The CyFlow® SL does not need particular power line connections, it runs on regular 100/240 V AC as well as 12 V DC. For field studies, in remote areas, and places with unstable power lines, the CyFlow® SL can easily be connected to a car or boat battery. It is perfectly prepared for scientific expeditions, field studies, and as mobile flow cytometer for decentralized use close to patients in hospitals and small medical service stations.

### Price/Performance Ratio

The CyFlow® SL opens a new era of flow cytometry, it supports all applications as known from traditional large flow cytometers at equipment costs roughly half the price of them. In addition, service and running costs as well as maintenance are reduced to a neglectible minimum near zero.

## Selection of Fluorochromes for the CyFlow® SL Light Source System

Type of laser	Fluorescence Channel	Fluorochromes
blue solid state laser 20 mW 488 nm	GREEN	FITC GFP Alexa Fluor® 488 SYTO 9
	ORANGE	PE eYFP
	ORANGE RED	PE-Texas Red® PI
	RED	PE-Cy5 PE-Cy5.5 PerCP PerCP-Cy5.5 ECD EB
	INFRA RED	PE-Cy7



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

The design of the flow cuvette incorporates more than 35 years of experience in handling fluids with sub-micrometer and nanoliter precision. Thanks to the optical and mechanical precision of the flow cuvette, superior results are guaranteed for all parameters, e.g. coefficients of variation (CVs) of better

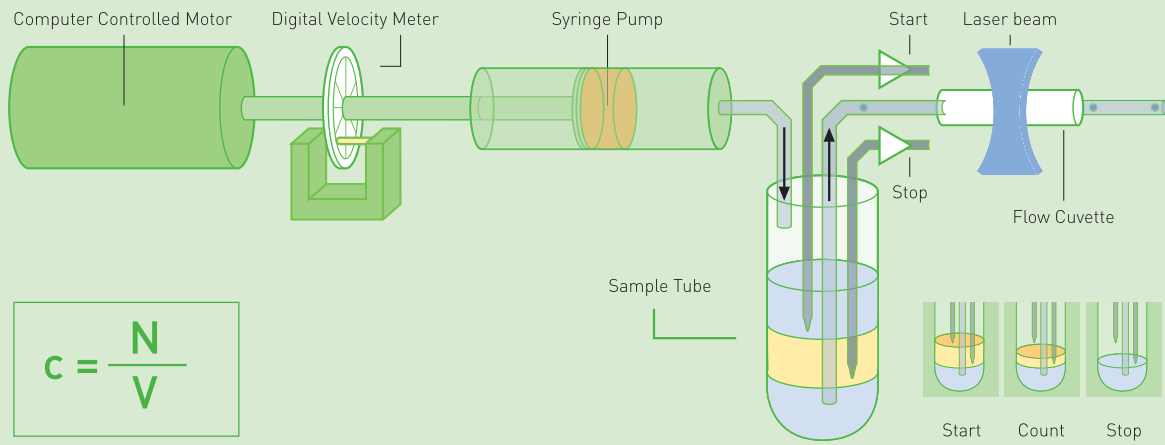
than 1% with PI staining - a prerequisite for high precision DNA measurements for tumor or chromosome analysis. The sample is transported with help of a computer controlled digital syringe pump, part of a virtually cross-contamination-free fluid system.

## 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 subpopulations of interest using True Volumetric Absolute Counting. This unique method is solely based on the fundamental scientific definition of absolute counting resp. the particle concentration  $c$ , namely the counted number  $N$  of particles (events) 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 analysis of a fixed volume as defined by the distance between

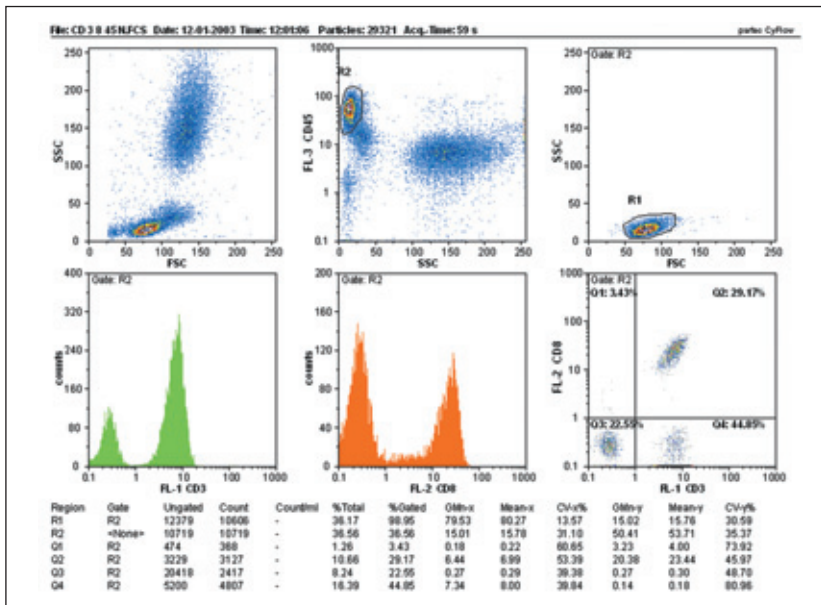
two platinum electrodes reaching into the sample tube with a given diameter. Alternatively, a well defined volume of free choice involving the digital sample speed control can be used. Benefits of True Volumetric Absolute Counting:

- 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

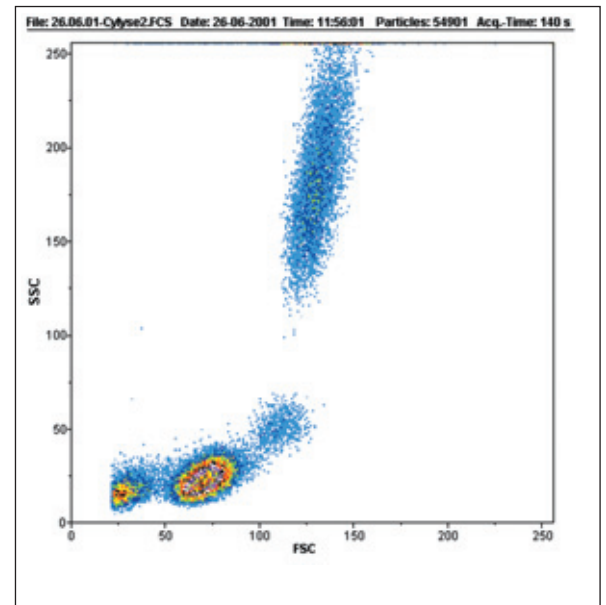


Principle of Partec True Volumetric Absolute Counting

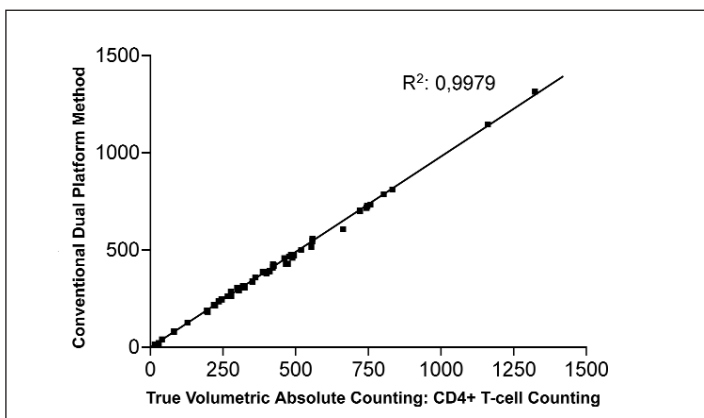
## The Partec CyFlow® SL is your complete solution for routine immunophenotyping.



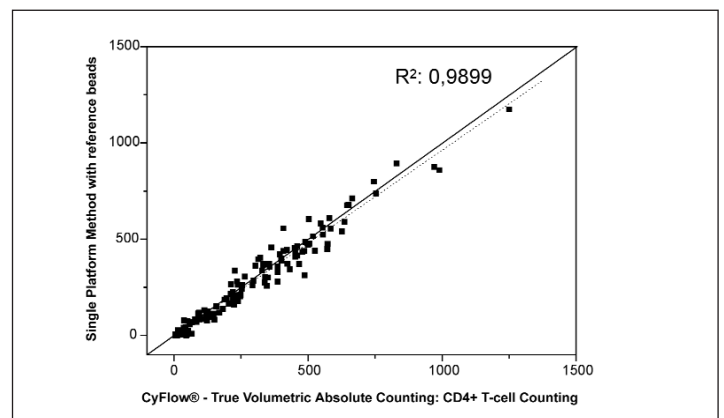
3-color analysis of CD3/CD4/CD45 with CyFlow® SL.



CyLyse® lyse / no-wash scatterplot showing the good scatter resolution.



CD4+ counting: Comparison to conventional dual platform results (Data kindly provided by Prof. A. Cossarizza, University of Modena and Reggio Emilia, Italy).



CD4+ counting: Comparison to conventional single platform results employing reference beads. (Data kindly provided by Dr. L.G. Lehman, University of Douala, Cameroon; Measured with CyFlow® SL\_3)

### References:

- Cassens, U. et al.: A novel true volumetric method for the determination of residual leucocytes in blood components", Vox Sanguinis 2002; 82, 198-206
- Greve, B. et al.: A New No-Lyse, No Wash Flow-Cytometric Method for the Determination of CD4 T Cells in Blood Samples", Transfus Med Hemother 2003; 30:8-13
- Cassens, U. et al.: "Simplified True Volumetric Flow Cytometry Allows Worldwide Feasible and Accurate Determination of CD4 T-Lymphocytes in Patients with AIDS", Antiviral Therapy 2004; 9:395-405
- Imade, G.E. et al.: "Comparison of a New, Affordable Flow Cytometric Method and the Manual Magnetic Bead Technique for CD4 T-Lymphocyte Counting in a Northern Nigerian Setting", Clinical and Diagnostic Laboratory Immunology, Jan. 2005, pp. 224-227
- Greve, B. et al.: "New Protocols to Follow Up HIV-induced Immune Impairment in Paediatric Samples", Busines Briefing: Long-Term Healthcare:2005, pp. 32-35

# 04 ANALYZE

## Partec CyFlow® SL FCM System



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

Ready prepared and freely adaptable instrument settings and panels facilitate switching between different applications. FloMax® is optimized for immunophenotyping, microbiology analysis, cell cycle, DNA ploidy, and scientific flow cytometric analysis. Data is 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 colour cross-talk compensation of the spectral overlap of fluorescence from simultaneously analysed dyes. The N-colour compensation algorithm allows a correction of the crosstalk between any parameters 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 subsets of cells, even if defined by a gate at a later time after the acquisition.

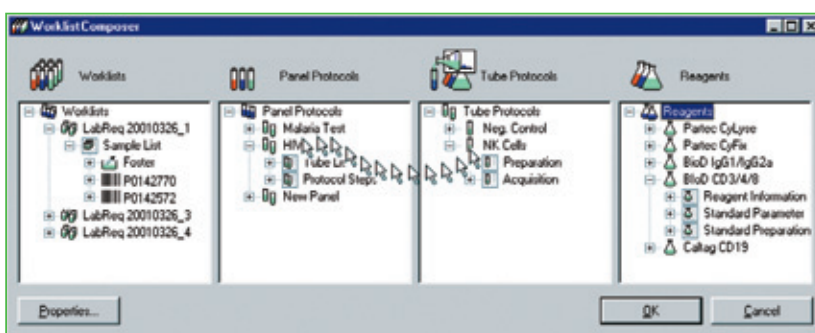


Full flexibility and automation by the multi-tube FloMax® panel system and the FloMax® Report system within the FloMax® software package.



The flexible FloMax® panel system allows automated analysis of repeating sample series employing different dyes or instrument settings. The FloMax® Report system generates

easy-to-adapt automated single or multi-tube panel results. Reports are based on Microsoft Word or Excel written in Visual Basic.



Region	Gate	Ungated	Count
Lymphs	<None>	6729	6729
Monoc	<None>	1338	1338
Granuloc	<None>	25505	25505

Granuloc: 71.24% Monoc: 3.74%

# 05\_SPECIFICATIONS

## Partec CyFlow® SL FCM System

### GENERAL

The CyFlow® SL is a fully-equipped portable / desktop flow cytometer with excitation in UV/violet, blue, green, or red. 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 laser light source of your choice among: red diode laser, green solid state laser, blue solid state laser, UV/violet diode laser.

### OPTICS

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

### FLOW SYSTEM

Synthetic quartz flow cuvette (channel dimensions: 250 µm x 250 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 from 0-1200 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  
15" TFT (17", 19" optionally available)  
Floppy disk drive 1.44 MB and DVD/CD-RW combo drive  
Monitor, keyboard and mouse  
Microsoft Windows™, Office®  
Notebook optional

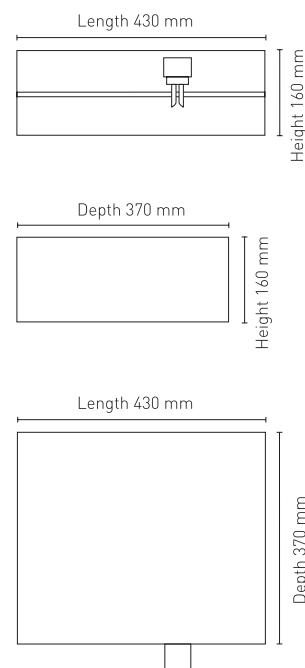
### SOFTWARE

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-colour compensation, multi-parameter gating, multi-colour 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

43 x 37 x 16 cm + sheath fluid/waste rack 100/240 V AC, 60 VA, 50/60 Hz or 12 Volts DC/5A



For in vitro diagnostic use.

partec

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