

COPAS FP™ Large Particle Flow Cytometers SYSTEM SPECIFICATIONS

1. INTRODUCTION

The COPAS™ FP (Complex Object Parametric Analyzer and Sorter) Large Particle Flow Cytometers are a family of four instruments for analyzing and sorting objects from 10-1500 microns in diameter. The “FP” in the name denotes the latest generation COPAS systems equipped with FlowPilot™ control and analysis software. Applications include model organisms, large/fragile cells/clusters, beads, seeds, plant tissue and fungi models.

These continuous flow systems are capable of analyzing small and large quantities of objects using five parameters: size, optical density and up to three channels of fluorescence. Objects are passed axially, one by one, through the focus of one, two or three lasers; the resulting signals are then detected and recorded by an optical light-loss detector and by three fluorescence emission detectors. Relative size is measured by the time that the light blockage signal remains above a pre-set threshold level; this parameter corresponds to the time of flight (TOF). The optical density of the object is determined by the intensity of light blocked by the object; this parameter is the object’s extinction (EXT). The intensity of the object’s fluorescence emissions (FLU) can be simultaneously detected at three different wavelengths using selectable optical band-pass filters. TOF is related to an object’s axial length, EXT is related to how dark or transparent an object is, and FLU is related to the amount of fluorescing compound that is present. Sorting and dispensing decisions are based on user-selectable ranges of EXT, TOF, and FLU that are entered through our FlowPilot™ (FP) software. Objects can be dispensed into multiwell plates or stationary receptacles.

Using a patented, pneumatic sorting mechanism, COPAS FP systems are gentle enough to sort and dispense live organisms and fragile cell clusters without affecting their viability.

2. CHOOSING A MODEL (FLOW CELLS & OBJECT SIZE RANGE)

<i>Instrument Model</i>	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
<i>Flow cell details (inner bore)</i>	Quartz flow cell with 250 micron square cross-section	Quartz flow cell with 500 micron square cross-section	Quartz flow cell with 1000 micron square cross-section	Quartz flow cell with 2000 micron square cross-section
<i>Recommended Object Size Range (diameter)</i>	~10-150 microns	~40-300 microns	~200-700 microns	~500-1500 microns
<i>Typical Applications</i>	Nematodes all stages Cells & Cell Clusters Sea Urchin Embryos Beads 10-200 microns Pollen Kidney Duct Cells	Drosophila Embryos and L1 Mosquito L1 and L2 Nematodes all stages Beads 20-350 microns Large cells and cell clusters Mouse Pancreatic Islets Embryoid Bodies	Drosophila Embryo, L1 and L2 Pancreatic Islets Arabidopsis Seeds Beads 30-700 microns Cell Clusters Mosquito L1, L2 and L3 Zebrafish larvae 3-7 dpf	Zebrafish/Medaka Embryos and larvae Drosophila L2 and L3 Beads 100-1500 microns Daphnia Xenopus (eggs to early larvae) Arabidopsis Seeds and Seedlings

3. OPTICAL ASSEMBLY DESIGN SPECIFICATIONS

	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
Standard Laser	488 nm Solid State -- can be used to measure the axial length and optical density of objects and can also be used to excite fluorescence.			
Optional 2nd & 3rd Laser	375, 405, 445, 561, 640 & 660 nm -- Inquire about other wavelengths.			
Detectors	PIN Photodiode for measuring extinction (EXT) and time of flight (TOF). Three Photomultiplier tubes (PMTs) for measuring fluorescence (FLU).			
Optical Filters	Standard optical filters allow for simultaneous detection of the Green, Yellow and Red regions of the spectrum. Other filters available upon request.			

4. GENERAL PERFORMANCE SPECIFICATIONS

	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
Analysis & Counting Rate when not sorting	Maximum 1000 objects per second	Maximum 1000 objects per second	Maximum 500 objects per second	Maximum 300 objects per second
Analysis & Counting Rate when sorting	Maximum 50 objects per second	Maximum 50 objects per second	Maximum 10 objects per second	Maximum 5 objects per second
Dispensing Fill Time for 96-well plate (1 / well)	Minimum 1.5 – 2 minutes per plate			
Dispensing Fill Time for 96-well plate	Minimum 2 – 3 minutes per plate (20 / well)	Minimum 2 – 3 minutes per plate (10 / well)	Minimum 2 – 3 minutes per plate (5 / well)	Minimum 2 – 3 minutes per plate (2 / well)
Automated Dispensing Accuracy (1 / well)	Greater than 98% of wells filled have one or more objects. Of the filled wells, less than 5% may have 2 or more objects.	Greater than 98% of wells filled have one or more objects. Of the filled wells, less than 5% may have 2 or more objects.	Greater than 98% of wells filled have one or more objects. Of the filled wells, less than 5% may have 2 or more objects.	Greater than 95% of wells filled have one or more objects. Of the filled wells, less than 5% may have 2 or more objects.
Collection types	Stationary Bulk Receptacle 24, 48, 96, 384 well plates	Stationary Bulk Receptacle 24, 48, 96, 384 well plates	Stationary Bulk Receptacle 24, 48, 96, 384 well plates	Stationary Bulk Receptacle 24, 48, 96 well plates
Minimum Drop Size	0.4 µl	2 µl	4 µl	30 µl
# Drops per well (96 well standard SBS plate)	up to 570 / well	up to 400 / well	up to 40 / well	up to 10 / well

5. FLUIDIC / MECHANICAL SPECIFICATIONS

	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
Sample Cup Capacity	Standard: 50 ml (40 ml working volume). Optional 750 ml and 1500 ml stirred cups available.			
Sample Mixing Mechanism	Suspended mechanical stirrer			
Sheath Fluid	Proprietary Union Biometrica sheath reagent. Contains non-toxic, non-ionic surfactant.			
Sorting Mechanism	Patented gentle air-jet fluid diverter			

6. INSTALLATION SPECIFICATIONS

	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
<i>Instrument Dimensions</i>	74 cm [29 in] Wide x 61cm [24 in] Deep x 61cm [24 in] High (120cm [48 in] with the lid up)			
<i>Recommended Work Space</i>	150 cm [60 in] Wide x 61 cm [24 in] Deep			
<i>System Weight (approx. depending on options)</i>	45 Kg [100 lbs.]			
<i>Power Requirements</i>	Dedicated circuit: 100-240 VAC, 15-20 Amp, 50/60 HZ, single phase with protective earth ground. Optional Air Compressor requires a second dedicated circuit: 100-240 VAC, 15-20 Amp, 50/60 HZ, single phase with protective earth ground.			
<i>Pressurized Air Requirement</i>	The input air pressure should be at least 2.7 bar [40 PSI] but no more than 6.9 bar [100 PSI] of filtered, at 60 lpm [2 CFM], of non-condensing, water and oil free air. The optional Air Compressor is available for laboratories that cannot meet these requirements.			
<i>Environmental Requirements</i>	Ambient operating temperature is 15° C to 30° C [60° F to 85° F] with a relative humidity of 0% to 85% non-condensing. Temperature should not fluctuate more than +/- 1.5 °C from the time of experimental setup through completion or adjustments will need to be made. The system generates approximately 3800 BTU/Hr.			
<i>Certifications</i>	CE Mark & CSA (for Canada)			

7. OPTIONS

	COPAS FP-250	COPAS FP- 500	COPAS FP-1000	COPAS FP-2000
	<ul style="list-style-type: none"> - LP Sampler™ -- gentle handling for 10-1500 micron objects from multiwell plates and petri dishes. - FlowPilot-Pro -- The Profiler II feature analyzes optical density and fluorescence patterns along the axial length of objects. - Integration package for plate handlers and large automated systems - Sterility Filters - Sample Recovery Module - Additional Sample Cups: 50 ml cup is standard. Optional 750 ml & 1500 ml stirred cups available. 			

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