



MACSQuant® VYB

# Instrument specifications

**Description**

The MACSQuant® VYB is a digital benchtop flow cytometer equipped with three lasers, 10 optical channels and intuitive software to facilitate rapid and simple cellular analysis. Configured with a 561 nm laser for enhanced analysis of fluorescent molecules in the yellow/green excitation range, the MACSQuant VYB is a versatile instrument for both phenotypic and functional

analyses with fluorescent antibodies, dyes, and proteins. The flexible platform of the MACSQuant Instruments allows for analysis of many types of samples. The MACSQuant VYB is an excellent choice for researchers in the fields of immunology, systems biology, cell biology, neuroscience, cancer biology, and many other disciplines that require highly reliable and sensitive flow cytometric analyses.

Optics			
<b>Laser excitation</b>	405 nm, 40 mW diode 488 nm, 50 mW diode 561 nm, 100 mW DPSS (diode pumped solid state)		
<b>Emission detectors</b>	<b>Channel</b>	<b>Filter</b>	<b>Dye</b>
	FSC	561/4 nm	Size
	SSC	561/4 nm	Granularity
	V1	452/45 nm	VioBlue®
	V2	525/50 nm	VioGreen™
	Y1	586/15 nm	PE
	Y2	615/20 nm	mCherry, dsRed, TexasRed
	Y3	661/20 nm	APC, PE-Cy™5
	Y4	740 nm LP	APC-Vio770™, PE-Vio770
	B1	525/50 nm	GFP, FITC, YFP
	B2	593–650 nm LP	PI
<b>Fluorescence sensitivity and resolution</b>	MESFs (CV <5%): FITC <200 PE <100		
<b>Flow cell dimensions</b>	200×250 µm		
<b>Fluorescence detectors</b>	Optimized with spectrally matched PMTs for all channels		
<b>Optical alignment</b>	Fixed tree-like configuration, no user adjustments needed		

Fluidics	
<b>Minimal uptake volume<sup>1</sup></b>	1 µL (25 µL recommended for volumetric counting applications)
<b>Sample flow rate</b>	25, 50, or 100 µL/min, or automated flow rate to maintain 500, 1,000, or 2,000 events/second
<b>Measurement speed<sup>2,3</sup></b>	<25 minutes for 96-well plate (5 µL per well)
<b>Sample uptake</b>	Uptake port (for y/z axis movements) with an automated washing station
<b>Maximal event rate</b>	Up to 15,000 events/second
<b>System maintenance</b>	Automated startup, PMT calibration, cleaning cycles, and shutdown
<b>Sample mixing</b>	Aspiration

Performance	
<b>Absolute counts performance<sup>2,4</sup></b>	Volumetric; reproducibility (CV) <5%
<b>Sample carry-over<sup>2,5</sup></b>	0.01%
<b>Fluorescence performance</b>	5-decade logarithmic scales (10 <sup>-2</sup> to 10 <sup>3</sup> ), display in lin, log, or hlog scales
<b>MACS Cell Enrichment Unit</b>	Rare cell enrichment prior to analysis
<b>Sample tube/plate</b>	96-well plate (V, U, flat well, deep well), FACS tubes (5 mL), Eppendorf tubes

Data management	
<b>Measurement parameters</b>	Area, width, height for all parameters, with time and volume
<b>Signal processing</b>	>18-bit dynamic range in area with 32-bit floating point signal processing
<b>Compensation</b>	Automated or manual with 8×8 matrix, during or post acquisition
<b>Threshold</b>	Threshold can be set for any channel by selecting the trigger value
<b>Data files</b>	.mqd (proprietary file type) .fcs (2.0, 3.0, 3.1 compatible)

Operation details	
<b>Size</b>	
Width×depth (with MACS MiniSampler Plus)	669×500 mm (26.34×19.69 in)
Height (adjustable touchscreen)	394–553.5 mm (15.5×21.79 in)
<b>Weight</b>	50 kg (110 lbs)
<b>Monitor</b>	15.6" touchscreen (internal)
<b>Power requirements</b>	100–240 V~, 50/60 Hz
<b>Power consumption</b>	450 W
<b>Ports</b>	4× USB 2.0 ports, 6× USB 3.0 ports (2 at display), 2× DisplayPort, 2× LAN, DVI, RE-232, Audio
<b>Emission sound pressure level at workstation</b>	<61 dB(A)

- At every uptake, an additional excess volume is aspirated by the instrument. The excess volumes are calibration- and process-dependent, and do not exceed 10 µL for Fast, Standard, and Extended modes, and 20 µL for Screen mode.
- Referred value indicates the average of multiple experiments and can differ for individual sample materials.
- The measurement speed is determined by measuring the time between the movement of the robotic arm into the first measured well, and its movement out of the last measured well. The measurements were carried out at high flow rate in fast mode.
- For counting performance, 96-well plates were loaded with 200 µL/well of fixed peripheral blood mononuclear cells (PBMC) suspension at a nominal concentration of 1,000 cells/µL. The uptake volume was set to 50 µL at low flow rate.
- For carry-over, full 96-well plates were loaded with 200 µL/well of PBMC suspension at a nominal concentration of 10,000 cells/µL in every other well ("SRC-wells"). Alternating wells are loaded with an equal volume of MACSQuant® Running Buffer ("CO-wells"). The uptake volume was set to 100 µL and measured at medium flow rate in standard mode. The carry-over is defined by  $\text{sum(CO-singlet count)}/\text{sum(SRC-singlet count)} \times 100\%$ .

Accessories	
<b>MACS Minisampler Plus</b> (# 130-105-745)	For measurement of up to 96 samples in a single run
<b>MACS Chill Racks</b> Chill 5 Rack (# 130-092-951) Chill 15 Rack (# 130-092-952) Chill 50 Rack (# 130-092-953) Chill 96 Rack (# 130-094-459)	Keep samples cool while running multiple 5 mL, 15 mL, 50 mL tubes, or 96-well plates
<b>Reagent Rack 4</b> (# 130-094-574)	For automated addition of up to 4 reagents from 5 mL glass vials
<b>Universal Reagent Rack</b> (# 130-115-722)	For automated addition of up to 4 reagents from both 5 mL glass vials and 2 mL polypropylene vials
<b>Automation</b>	Custom integration into Liquid Handling Systems available

Consumables	
<b>Buffers</b>	MACSQuant Running Buffer (# 130-092-747) MACSQuant Washing Solution (# 130-092-749) MACSQuant Storage Solution (# 130-092-748) MACS Bleach Solution (# 130-093-663)
<b>MACSQuant Calibration Beads</b> (# 130-093-607)	For use with automated calibration program
<b>MACSQuant Columns</b> (# 130-094-458)	For enrichment of rare cell populations with MACS MicroBeads
<b>MACS Comp Bead Kits</b>	For optimal manual or automated compensation of fluorescence spillover of fluorochrome-conjugated antibodies

Reagents	
<b>Antibodies</b>	Works with all flow cytometry reagents. For a complete list visit <b><a href="http://www.macsantibodies.com">www.macsantibodies.com</a></b>
<b>MicroBeads</b>	Enrich rare cell populations with MACS MicroBeads. For further information visit <b><a href="http://www.macscellseparation.com">www.macscellseparation.com</a></b>

Service and Support	
<b>Warranty</b>	1 year warranty
<b>MACSQuant Live Support</b>	24/5 real-time remote support directly from your flow cytometer

Service contracts	MACSQuant VYB Full Service (# 160-001-637)	Planned Maintenance (# 160-001-288)
<b>Maintenance</b>		
Replacement of wearing parts	●	●
Software updates	●	●
Labor, shipment, and product maintenance logistic costs	●	●
Maintenance intervals (visits per year)	2	2
<b>Repairs service</b>		
Unlimited numbers of repairs	●	
Labor and travel expenses	●	
All spare parts included	●	
Service priority response	●	
<b>Additional services</b>		
Technical support services	●	●
Service documentation	●	●
Remote Support service	●	●

## MACSQuant® Instrument configurations at a glance

Channel	Laser	Filter	MACSQuant 10	MACSQuant VYB
FSC	488	488/10	●	
FSC	561	561/4		●
SSC	488	488/10	●	
SSC	561	561/4		●
V1	405	450/50	●	
V1	405	452/45		●
V2	405	525/50	●	●
B1	488	525/50	●	●
B2	488	585/40	●	
B2	488	593-650		●
B3	488	655-730	●	
B4	488	750 LP	●	
R1	638	655-730	●	
R2	638	750 LP	●	
Y1	561	586/15		●
Y2	561	615/20		●
Y3	561	661/20		●
Y4	561	740 LP		●



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