

## Detailed Specifications

Subsystem	Item	jetlab
Motion	Substrate Size	200 × 150 mm 400 x 300 mm (xl version) Option: custom
	X Stage Travel	300 mm 500 mm (xl version)
	Y Stage Travel	200 mm 300 mm (xl version)
	Z Stage Travel	80 mm
	X, Y Encoder Resolution	0.1 $\mu$ m
	Positioning Accuracy	$\pm$ 15 $\mu$ m Option: $\pm$ 3 $\mu$ m with mapping
	Positioning Repeatability	$\pm$ 5 $\mu$ m Option: $\pm$ 1 $\mu$ m with mapping
	X & Y Stage Travel Speed	100 mm/s
	X & Y Stage Acceleration	400 mm/s <sup>2</sup>
	X & Y Stage Payload, maximum	20 kg
	Z Stage Travel Speed	manual; option 10 mm/s
	Z Stage Payload (printhead), maximum	5 kg at 75 mm from carriage
	Theta Stage	Optional configurations: stent, tissue scaffold, and array printhead
	Material Load/Unload	manual
Vision	Downward-looking Camera	For alignment to fiducials and inspection of printed features, includes through-the-lens illumination
	Alignment Method	Program-assisted manual Option: teach/semiautomatic
	Post-printing Visual Inspection	Option: manual survey
	Jet Set-up & Observation Camera	Manual; option: semiautomatic measurement / monitoring (available 07)
	Jet Set-up Method	Manual; option semiautomatic measurement / monitoring (available 07)
	Synchronized Strobe	standard
	Field of View (horizontal and vertical)	4 mm x 3 mm (typical)
Thermal & Pneumatic	Pneumatics Control Circuit	three state pneumatic control
	Operating Pressure Control	vacuum / pressure fine adjust to 2 mbar Option: digital control
	Pressure Gages	digital
	Number of Pressure Outputs (includes control and display for each)	1 Option up to 4
	Pneumatic Control Method	Manual: option automated
	Pressure Input	60 psig [420 kPa] 20 scfm [2 scmm]
	Vacuum Input	below -20 in Hg
	Temperature Controllers	Option: 1-4

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Mechanical, Electrical & Environ.	Work Surface	honeycomb with threaded holes		
	Workpiece holder	User specified: options include heated vacuum platen, fixtures for: microscope slides, MALDI plates, microtitre plates ...		
	Vibration Isolated Work Surface	Pneumatic, self leveling		
	Enclosed Work Area	standard		
	HEPA Filters Overhead	Option		
	HEPA Blower Unit	Option		
	Solvent Ventilation	Integrated duct connection		
	Footprint	70"x36" [178 cm x 9 cm] floor standing		
	Safety	CE approved in 07		
	Power	220-240V, 6A, 50-60Hz Option: 120V, 6A, 50-60Hz		
	Clean Room Compatibility	Class 1000		
Printing Control & Drive Electronics	Stationary Printhead	standard		
	Motorized Z-Axis Control of Print Head	standard		
	Point-to-Point Operation	standard		
	Print-on-the-Fly Operation	standard, printing at any angle allowed (i.e. both stages moving)		
	Jet Drive Electronics	JetDrive III: bipolar and arb mode Option: multi-channel JetDrive III-(n)		
	Drive Electronics Multiplexer	integrated		
	TTL control signals	16 outputs - # of multiplexed jets on/off and timed		
	Jet On-Line / Off-Line Selection	through user interface, scripts		
Print Pattern	Operating Frequency	up to 30 kHz		
	Built in Patterns	line, rectangular border, array, array-of-arrays (arbitrary angle)		
	Rotation Correction	standard		
	Multiple Fluid Control	standard		
	Print Pattern Import	GDS II converter; monochrome BMP		
Complex Print Jobs	script file: nesting, repetition with offsets, wait states, maintenance, & TTL controls			
	Printheads	Select one or more options (see Printhead Specifications)	Solder Jet Printhead Subsystem Polymer Jet Printhead Subsystem 1 Single Channel Printhead	
		Jetting Devices	Select one or more options	High Temperature Device Low Temperature Devices Integrated Array: 10 jets, 10 fluid inputs Integrated Array: 16 jets, 1 fluid input
			Control system	Computing hardware
Operating system	Microsoft Windows XP SP2			
Machine control program	Integrated control program for (multiple) jet setup and selection, positioning calibrations, pattern printing and surveying, TTL-controllable auxiliary equipment, depending on and supporting all hardware and software options on all jetlab models.			