

## Detailed Specifications

Subsystem	Item	jetlab II
Motion	Substrate Size (max)	200 × 200 mm 300 x 300 mm (xl-300 version) Option: custom
	X-Y Stage Travel	300 mm (400 mm xl-300 version)
	Z Stage Travel	40 mm
	X, Y Encoder Resolution	0.1 um
	Positioning Accuracy	±15 um Option: ±3 um with mapping
	Positioning Repeatability	±5 um Option: ±1 um with mapping
	Compensation for Thermal Effects	Option: 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	10 mm/s
	Z Stage Payload, maximum	5 kg at 75 mm from carriage
	Material Load/Unload	manual
Vision	Downward-looking Camera (CCD)	For alignment to fiducials and inspection of printed features; includes coaxial illumination and zoom lens
	Alignment Method	Program-assisted manual Option: teach/semiautomatic
	Post-printing Visual Inspection	Option: manual survey
	Jet Observation Camera (CCD)	Includes zoom lens & synchronized LED strobe
	Jet Set-up Method	Manual Option: semiautomatic measurement / monitoring
	Field of View (horizontal and vertical)	4 mm x 3 mm (typical)
Thermal & Pneumatic	Pneumatics Control Circuit	Three state pneumatic control
	Operating Pressure Control	Manual vacuum / pressure fine adjust to 2 mbar Option: electronic control
	Pressure Gages	digital
	Number of Pressure Outputs (includes control and display for each)	1 Option: up to 4
	Pneumatic State Control Method	Manual Option: electronic
	Pressure Input	60 psig [420 kPa] 20 scfm [0.6 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 (not included in base price)	Options: vacuum platen; heated vacuum platen; fixtures for microscope slides, MALDI plates, microtitre plates, etc.; custom
	Vibration Isolated Work Surface	Newport ND-01A vibration isolators
	Enclosed Work Area	Standard
	HEPA Filters Overhead	Option
	HEPA Blower Unit	Option
	Solvent Ventilation	Optional duct connection
	Footprint	Tabletop, 44"x28" [112 cm x 71 cm] XL-300: floor, 48"x32" [120 cm x 75 cm]
	Safety	CE approved
	Power	220-240V, 6A, 50-60Hz Option: 120V, 6A, 50-60Hz
	Clean Room Compatibility	no
Printing Control & Drive Electronics	Stationary Printhead	Standard (xl-300, moving)
	Motorized Z-Axis Control of Print Head	Standard
	Point-to-Point Operation	Standard
	Print-on-the-Fly Operation	Standard, printing at any angle, all stages moving; curvilinear motion
	Jet Drive Electronics	JetDrive III: bipolar and arb mode Option: multi-channel JetDrive III-(n)
	Drive Electronics Multiplexer	Option: integrated
	TTL control signals	Option: 8 outputs minus number of multiplexed jets; on/off and timed
	Jet On-Line / Off-Line Selection	Through user interface, scripts
	Operating Frequency	Up to 30 kHz
Print Pattern	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, arbitrary printing resolution and direction
Printheads	Select one or more (not included in base price)	Mounts all MicroFab standard printheads; Interchangeable
Jetting Devices	Select one or more (not included in base price)	Standard orifice diameters, 20-80 um in 5 um increments; 10, 15, & 90-120 um specials.
Control system	Computing hardware	Panel PC, 1GHz Atom, 1 GB RAM 160+ GB HD, DVDRW, Ethernet port, USB 2.0 port; RS-232 ports, keyboard, monitor, mouse.
	Operating system	Microsoft Windows 7
	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 <i>all</i> hardware and software options on <i>all</i> jetlab models.