

## Detailed Specifications

Subsystem	Item	jetlab 4
Motion	Substrate Size	160 × 120 mm 210 x 260 mm (xl version) Option: custom
	X Stage Travel	200 mm 300 mm (xl version)
	Y Stage Travel	150 mm 300 mm (xl version)
	Z Stage Travel	50 mm manual Option: 100 mm motorized
	X, Y Encoder Resolution	1.5 um
	Positioning Accuracy	±30 um, unidirectional
	Positioning Repeatability	±20 um
	X & Y Stage Travel Speed	50 mm/s
	X & Y Stage Acceleration	1500 mm/s <sup>2</sup>
	X & Y Stage Payload, maximum	10 kg (VLA-ST-60)
	Z Stage Travel Speed	manual
	Z Stage Payload (printhead), maximum	3 kg (VLA-ST-45)
	Theta Stage	not available
	Material Load/Unload	manual
Vision	Downward-looking Camera	Option: for alignment to fiducials and inspection of printed features
	Alignment Method	Program-assisted manual
	Post-printing Visual Inspection	Option: manual survey
	Jet Set-up & Observation Camera	manual; 15° tilt (visualization of printing and rough alignment to substrate features)
	Jet Set-up Method	manual; script automation available
	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
	Pressure Gages	digital
	Number of Pressure Outputs (includes control and display for each)	1
	Pneumatic Control Method	manual
	Pressure Input	60 psig [420 kPa] 20 scfm [2 scmm]
	Vacuum Input	below -20 in Hg
Temperature Controllers	Option: 1-2	

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Mechanical, Electrical & Environ.	Work Surface	flat plate
	Workpiece holder	flat plate with alignment edges Option: heated vacuum platen
	Vibration Isolated Work Surface	elastomeric feet
	Enclosed Work Area	standard
	HEPA Filters Overhead	not available
	HEPA Blower Unit	not available
	Solvent Ventilation	Optional duct connection
	Footprint	25"x22.5" [63 cm x 57 cm] tabletop xl: 30"x27" [75 cm x 67 cm] tabletop
	Safety	CE approval in process
	Power	220-240V, 6A, 50-60Hz Option: 120V, 6A, 50-60Hz
	Clean Room Compatibility	no
Printing Control & Drive Electronics	Stationary Printhead	standard
	Motorized Z-Axis Control of Print Head	Option
	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
	Drive Electronics Multiplexer	no
	TTL control signals	no
	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
Printheads	Select one or more options (see Printhead Specifications for details)	na
		Polymer Jet Printhead Subsystem
		1 Single Channel Printhead
Jetting Devices	Select one or more options	High Temperature Device for polymers
		Low Temperature Devices
		na
		na
Control system	Computing hardware	PC104+ based, 733 MHz Celeron M, 512 MB RAM, 8 MB shared VRAM, 40+ GB HD, CD-ROM, Ethernet port, uncommitted USB 2.0 port; keyboard, monitor, mouse.
	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.