

Nanotech 350UPM Specification Overview

April 1st, 2011

General	Description
System Configuration	Ultra-Precision three or four axis CNC machining system for micro-milling a variety of geometric configurations
Work Area Volume	350mm Wide x 350mm Long X 150mm High
Base Structure	Monolithic cast epoxy-granite base with embedded carbon fiber reinforcements
Vibration Isolation	Self leveling air isolation system
Control System	Delta Tau PC based CNC motion controller with 240Mhz DSP, operating in a Windows environment, with 19" color flat panel touch screen display. 1 GB memory, AGP video, 10/100 Base T Ethernet, CD-RW / DVD Drive, and 160GB hard drive.
Programming Resolution	0.01 nanometer linear (0.00001° rotary C Optional Accessory)

Milling Spindle	Description
Type	Professional Instruments ISO 2.25 Air Bearing Spindle
Spindle Speed Range	200 - 60,000 RPM
Axial Stiffness	65 N/μm (370,000 lbs./in.)
Radial Stiffness (at nose)	20 N/μm (114,000 lbs./in.)
Drive System	(Frameless) Brushless DC motor
Motion Accuracy	Axial: ≤ 50 nanometers (2μ") Radial: ≤ 50 nanometers (2μ")

Linear Axes	X	Y	Z (Vertical)
Type	Fully constrained oil hydrostatic, box way slide	Fully constrained oil hydrostatic, box way slide	Fully constrained oil hydrostatic box way slide with adaptively controlled air bearing counterbalance
Travel	350mm (14")	350mm (14")	150mm (6")
Drive System	Brushless DC Linear Motor	Brushless DC Linear Motor	Dual Brushless DC Linear Motor
Feedback Type	Laser holographic linear scale	Laser holographic linear scale	Laser holographic linear scale
Feedback Resolution	0.034 nanometer	0.034 nanometer	0.034 nanometer
Feed Rate (maximum)	2000mm/min	2000mm/min	2000mm/min
Straightness	0.2μm Horizontal over full travel 0.75 μm Vertical over full travel	0.2μm Horizontal over full travel 0.75 μm Vertical over full travel	0.2μm Horizontal over full travel 0.75 μm Vertical over full travel
Hydrostatic Oil Supply	Compact, low flow, low pressure system with closed loop servo control and pressure accumulator to minimize pump pulsation.		

Thermal Management Features	Description
Triple Loop Chiller System	Provides simultaneous temperature control of hydrostatic slide oil, milling spindle air supply, and spindle liquid coolant
Ceramic Spindle Mounting Arm	Lightweight design with high structural rigidity and a low thermal expansion coefficient
Thermister Temperature Monitoring System	Imbedded thermisters continually monitor real time temperatures utilizing 1/1000 th degree F resolution
NanoTemp Software	Exclusive thermal charting software tracks machine thermal environmental conditions
Machine Enclosure	Re-Engineered outer enclosure with full access dual sliding doors provides improved controlled air temperature stability

Optional Rotational Axes	Rotary C
Type	Oil Hydrostatic (fully constrained)
Travel	360° (Bi-directional)
Drive System	Brushless DC motor
Axial Stiffness	875 N/μm (5,000,000 lbs./in.)
Radial Stiffness (at nose)	260 N/μm (1,500,000 lbs./in.)
Positioning Accuracy	≤ 1.0 arc seconds
Feedback Resolution	0.02 arc seconds
Motion Accuracy	Axial: ≤ 0.1μm (4μ") Radial: ≤ 0.1μm (4μ")

Utility Requirements	Air	Electrical	Floor Space
For optimal cutting results, facility thermal stability should be held within ±0.5°C (±1.0°F)	7.5 - 10 bars (110 - 150psi) 290 liters/min (10 scfm) Dry to 10°C pressure dew point and pre-filtered to 10μm	11kVA at the customer specified voltage from 208 - 480 VAC; 50 / 60hz; 3 Phase	1.91m wide x 1.90m deep x 2.13m high Approx. 3,180 Kg (Includes enclosure but not including peripheral equipment and control pendant)

Warranty	1 year full parts and labor warranty. Customer must supply a reserve air tank of 60 gallon capacity minimum
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Note: In an effort to continually improve our product performance, specifications are subject to change without notice.