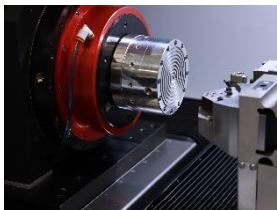


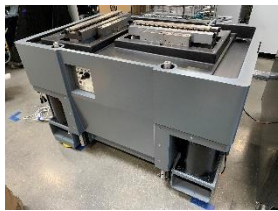
250 UPL MP

Diamond Turning Lathe for Mold Pin Manufacturing

(Available with 2, 3, or 4 axes)



5,000 RPM HD Spindle



Polymer Granite Base



Enhanced Micro-Height
Tool Holder



MP Series - Major Technology Advancements

- **5,000 RPM Impact Resistant** Porous Graphite Air Bearing Work Spindle (with less than 4nm axial motion error up to 3,000 RPM) custom engineered for mold pin manufacturers to minimize spindle star.
- **Composite Polymer Granite Base** with integral coolant troughs and superb thermal stability.
- **Enhanced Vibration Dampening Design** with improved enclosure decoupling and robust isolation system delivers up to 40% following error reduction and improved surface quality.
- **Delta Tau ARM Quad Core Processor** with DAQ data streaming module. Offers 4X increase in computational power compared to single core processor and ability to monitor machine health throughout a cut for process refinement.
- **NanoSMART**[®] - Touch / Swipe Gesture Based Interactive HMI with dual screens attached to utility cabinet using space savings robust industrial swing arm.

Nanotech 250UPL^{MP} Specification Overview

General	Description
System Configuration	Ultra-Precision two, three, or four axis CNC contouring machine with "T" axis orientation
Workpiece Capacity	300mm diameter x 200mm long (150mm diameter swing capability over the optional rotary B-Axis)
Base Structure	Monolithic composite polymer granite base with integral coolant troughs and superb thermal stability
Vibration Isolation	Optimally located Shear Damped Air Isolation system with self-leveling
Computer System Specifications	Intel i5 2.4 GHz processor running Windows 10 Professional 64-bit with 16GB DDR3 1600MHz memory, 10/100/1000 Base-T external customer Ethernet connection, DVD RW Drive, 500GB 7200 RPM removeable Hard Drive. Pendant features a 22" wide projected capacitive multi-touch display. Customer USB ports provided on front of PC.
Control System	Delta Tau 1.2GHz Quadcore ARM based PowerPMAC Embedded Real-time 64-bit Linux Motion Controller with Nanotech's NEW Windows 10 based HMI with a Touch / Swipe Gesture Interactive display.
Programming Resolution	0.01 nanometer linear / 0.000001° rotary
Functional Performance (DT-XZ) (As measured with Zygo Nuviv white light interferometer. Without B-axis.)	Material – High Phosphorous Nickel Plating, 7.75mm diameter convex mold pin with 4.5mm radius sphere Surface Finish (Sa): ≤ 1.0 nanometers (Measurement taken at 50X, 2X magnification and 10 th order fit) (Measurements taken at 0 (with mask to remove center pip caused by tool height / tool center variation), 10, 20 and 30 degrees)

Workholding Spindle	Heavy Duty (Standard)
Type	Exclusive impact resistant porous graphite air bearing with center mounted thrust face
Liquid Cooling (optional)	To maintain thermal stability and tool center repeatability, a closed loop chiller provides recirculating temperature controlled water to cooling channels located around the motor and bearing journals of the air bearing spindle. The chiller has an integral PID controller which maintains temperature control to ± 0.1°C.
Speed Range	50 to 5,000 rpm, bi-directional
Swing Capacity	Up to 300mm diameter (without risers)
Working Load Capacity (Radial) ¹	85 Kg @ 7bar (185 lbs @ 100psi.) / 102 Kg @ 10bar (225 lbs @ 145psi.) @ spindle nose
Working Load Capacity (Axial) ¹	180 Kg @ 7bar (397 lbs @ 100psi.) @ spindle nose
Radial Stiffness (@ spindle nose)	130 N/μm @ 7bar (743,000 lbs/in @ 100psi)
Axial Stiffness	438 N/μm @ 7bar (2,500,000 lbs/in @ 100psi)
Drive System	Frameless, Brushless DC motor
Motion Accuracy (up to 3,000 RPM)	Axial: ≤ 4.0 nanometers (0.16μ") Radial: ≤ 10.0 nanometers (0.39μ") Measurements using 25UPR filtering

Linear Axes	X	Z
Type	Fully constrained oil hydrostatic, box way slide	Fully constrained oil hydrostatic, box way slide
Travel	250mm (10.2")	200mm (8")
Drive System	Brushless DC Linear Motor	Brushless DC Linear Motor
Feedback Type	Laser holographic linear scale	Laser holographic linear scale
Feedback Resolution	0.0084 nanometer	0.0084 nanometer
Feed Rate (maximum)	4500mm/min (upon request)	4500mm/min (upon request)
Straightness in critical direction	0.2μm (8μ") over full travel	0.2μm (8μ") over full travel
Hydrostatic Oil Supply	Compact, low flow, low pressure system with closed loop servo control and pressure accumulator to minimize pump pulsation.	

Optional Rotational Axes	B	C (Work Spindle Option)
Type	Oil Hydrostatic	Porous Graphite Air Bearing (liquid cooled)
Travel	360° (Bi-directional)	360° (Bi-directional)
Drive System	Brushless DC motor	Brushless DC motor
Axial Stiffness	875 N/μm (5,000,000 lbs./in.)	See Workholding Spindle Specifications Listed Above
Radial Stiffness (at nose)	260 N/μm (1,500,000 lbs./in.)	See Workholding Spindle Specifications Listed Above
Positioning Accuracy	± 1.0 arc seconds (compensated)	± 1.0 arc seconds (compensated)
Feedback Resolution	0.005 arc seconds	0.01 arc seconds
Maximum Speed (Positioning Mode)	50 RPM	3,000 rpm
Motion accuracy	Axial: ≤ 0.1μm (4μ") Radial: ≤ 0.1μm (4μ")	Axial: ≤ 4.0nm (0.16μ") Radial: ≤ 10.0nm (0.39μ")

Utility Requirements	Air	Electrical	Machine Footprint (includes utilities cabinet)
For optimal cutting results, facility thermal stability should be held within ±0.5°C (±1.0°F)	7 to 10 bar (100 – 145 psi) 280 liters/min (10 scfm) Dry to 10°C pressure dew point and pre-filtered to 10μm	230 VAC; 1 Phase; 50/60hz; (35 amp) (3 phase available by request)	1.90m L x 1.45m D x 1.70m H; Approx. 2,585 Kg (Enclosure & Utilities Cabinet included, but not control pendant. Contact Nanotech for complete overall detailed layouts.)

Warranty	1 year full parts and labor warranty
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Notes: ¹ Working Load Capacities shown above are defined at 60% of ultimate load capacities.
In an effort to continually improve our product performance, specifications are subject to change without notice.
(Please consult your Sales Representative for our latest specifications).