

# 1400

precitech

## Nanoform® Drum Roll Lathe 1400 Ultra Precision Machining System

*Large capacity, multi-axes ultra precision machining system designed specifically for diamond turning optical microstructures on drum roll surfaces.*



### Overview

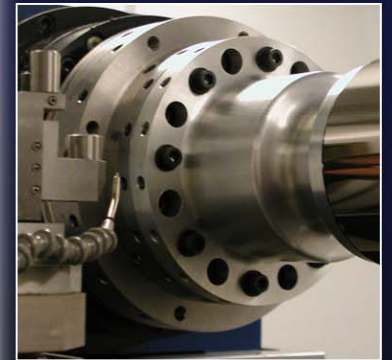
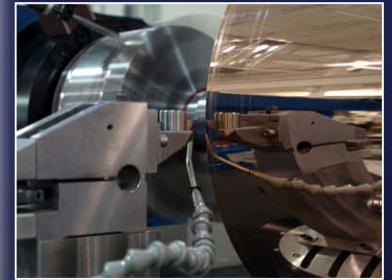
Slide Travel: X 250mm (9.8") Z 1480mm (58")  
Max Feedrate: 7000mm/min. (275"/min.)  
Swing Capacity: 485mm (19")  
Load Capacity:  
Headstock: 820Kg (1800lbs.)  
Tailstock: 820Kg (1800lbs.)  
Total: 1640 Kg (3600lbs.)

### Process Capabilities

Diamond Turning: X, Z  
Cylindrical Grooving: X, Z, B / X, Z, B, C / X, Z, C  
Fast Tool Servo: X, Z, C, FTS / X, Z, B, C, FTS

### Machine Options

Advanced temperature control system  
Fast Tool Servo  
HydroRound Rotary B-axis  
On machine gage & amplifier  
Optical tool setting systems  
Positioning C-axis (Spindle)  
Spraymist coolant system



### Design Features

QNx® real time Operating System with industry leading 0.01 nanometer programming resolution  
Sealed natural granite base providing exceptional long term machine tool stability  
Self leveling isolation system minimizing vibration influences during machine operation  
Hydrostatic oil bearing slideways with optimized stiffness and damping characteristics  
10.0 nanometer feedback resolution for improved velocity control  
Heavy-duty oil bearing spindle with industry leading temperature controls and low Asynchronous error motion  
Optional B & C rotational axis and Fast Tool Servo system available for advanced capabilities

**AMETEK®**  
ULTRA PRECISION TECHNOLOGIES

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Machine Base and Control	Description
Machine Base	Natural sealed granite with a fabricated steel frame
Machine Type	Ultra precision, two to four axis contouring system
Vibration isolation	Low frequency air bag self-leveling system
Control System	UPx™ Control System
Operating system	QNX-real time OS utilizing non proprietary motion control boards for advanced capability and performance
Programming resolution	1.0nm
Axis interface cards	PMDI

Linear Hydrostatic Slideways	Description
Type	Hydrostatic oil bearing slideways manufactured in house with symmetrical linear motor placement
Material	Durabar cast iron
Travel	<b>X:</b> 250mm (9.8") <b>Z:</b> 1480mm (58")
Maximum feedrate	7000mm/min. (275/min)
Drive system	AC linear motor
Motor location	Located centrally & mounted vertically eliminating offset drive forces & minimizing thermal distortions
Position Feedback Resolution	<b>X:</b> 10nm <b>Z:</b> 10nm
X-Axis straightness	<b>Horizontal:</b> 0.50µm (20µ") over full travel
Z-Axis straightness	<b>Horizontal:</b> 1.0µm (40µ") over any 450mm (18")

Headstock and Tailstock	HeadStock	Tailstock
Type	Oil Hydrostatic (1500psi)	
Material	Steel shaft/Steel journal	
Standard swing capacity	485mm (19") Diameter, (82") drum length, 1400mm (55") optical zone	
Motor	Integral DC brushless motor	No Motor
Load capacity	<b>Headstock:</b> 820Kg (1800 lbs.)	<b>Tailstock:</b> 820Kg (1800 lbs.) <b>Total capacity:</b> 1640Kg (3600 lbs.)
Motion accuracy	0.2µm (8µ") Radial/Axial	
Thermal control	Liquid chiller for bearing oil supply	

Rotary C-Axis Option	Positioning C-Axis on Headstock
C-axis feedback resolution	0.72 or 0.36 arc-seconds
C-axis position accuracy	4 arc-sec
C-axis max speed	250 or 125 RPM
Work holding spindle max speed	500 RPM

Rotary B-Axis Option	HydroRound Rotary B-axis (Small)
Type	Bi-conical, self compensated, Oil hydrostatic bearing. DC Brushless direct drive motor.
Tabletop size	190mm (7.5")
Standard swing capacity	485mm (19") diameter
Travel	unlimited
Load Capacity	225 Kg (500 lbs.)
Maximum Speed	10 RPM
Position Resolution	0.0001 degree
Radial Error Motion	0.10µm (4µ") @ 1" above table
Axial Error Motion	0.10µm (4µ")
Coning Error	1.0nm/mm (1.0µ"/in.)
Radial Stiffness	175N/µm (1,000,000 lbs./in.)
Axial Stiffness	525N/µm (3,000,000 lbs./in.)
Moment Stiffness	10.8N-m/arc-sec (20 lbs-in/µrad.)

Facility Requirements	Nanoform® DRL1270
Power	208 or 230VAC - 7.0 KVA 3 phase - 50/60Hz
Air supply	Typical: 12 SCFM @100PSIG
Floor space	4060mm x 2540mm x 1753mm (160 x 100 x 69") (17.275 KG) shipping weight 38000 lbs

Optional Equipment for Nanoform® DRL1270
Thermal enclosure / Temperature Control
HydroRound Rotary B-Axis
Positioning C-Axis
Fast Tool Servo
Optical Tool Setter