

DynaPath 

# A-SERIES BED MILLS

3-Axis CNC for Job Shops, Tool Rooms, and Production Operations

Featuring Semi-Automatic + Conversational Programming + G-Code



DynaPath 

# A-Series Bed Mills are offered in two styles:

## NC HEAD

*The standard milling center for production*



- 10 HP Spindle up to 8000 RPM
- Automatic Tool Changer, up to 20 tools
- Spindle Orientation and Rigid Tapping

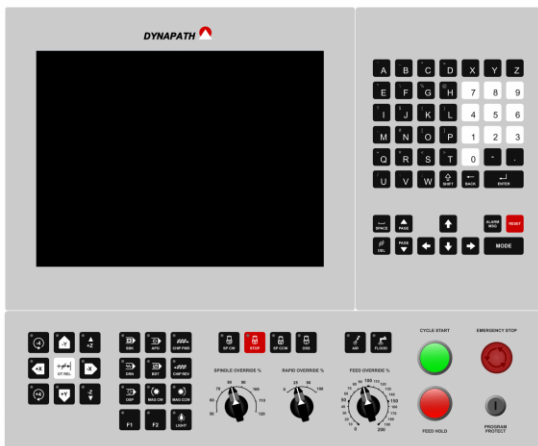
## QUILL HEAD

*For manual work, tool rooms, and small lot jobs*



- 5 HP Spindle up to 5000 RPM with High/Low Gear
- Manual Quill with linear encoder, up to 127mm (5") of travel, in addition to z-axis

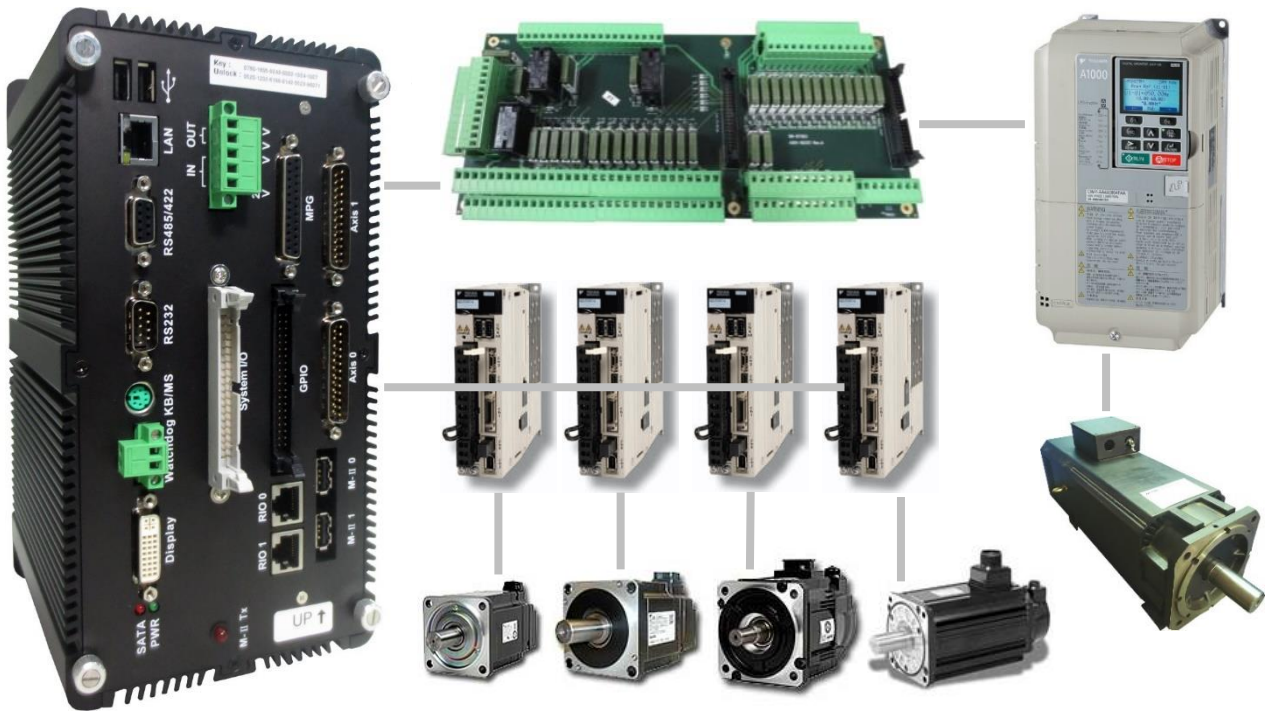
## D5 CONSOLE



## D1 CONSOLE



# DynaPath WinDelta Control System



## CNC Hardware Specifications

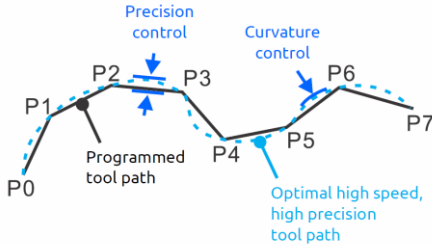
<b>CPU</b>	• Intel Atom D2550	<b>Handwheel</b>	• 8-Function Remote Jog Unit (MPG)
<b>Memory</b>	• 2 GB DDR3	<b>Axis Control</b>	• 5 axis at 0.5 ms servo update rate
<b>Storage</b>	• 16 GB SSD/*64 GB SSD	• 13 axes at 1 ms servo update rate	• 59 DI/33 DO
<b>Serial Ports</b>	• RS232, RS422/RS485	<b>Standard I/O</b>	• 6-channel D/A
<b>Networking</b>	• T10/T100 Ethernet Port	• *5 Channel A/D Optional	<b>Expansion I/O</b>
<b>Device Inputs</b>	• 1x PS/2, 2x USB 2.0	• 2x Remote I/O ports (64I/64O each)	<b>Power Input</b>
<b>Display</b>	• 10.4"/12.1" TFT LCD	• 24 VDC	
<b>Operating Panel</b>	• Touch Display		
	• 400 cd/m <sup>2</sup> Luminance		
	• MDI 1 <sup>st</sup> Panel + 2 <sup>nd</sup> Panel		

## Environmental Specifications

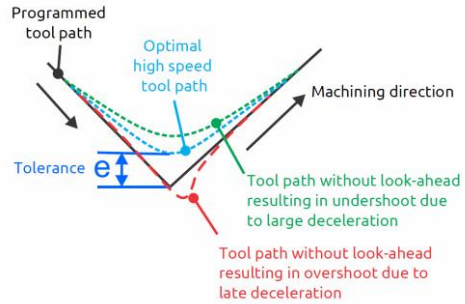
<b>Operating Temp</b>	• 0 to 50 °C (0 to 122 °F)	<b>Vibration</b>	• 16.7 Hz: acceleration of 1.5G
<b>Storage Temp</b>	• -20 to 60 °C (-4 to 140 °F)	• 10 to 57 Hz: amplitude of 0.075 mm	• 57 to 150 Hz: acceleration of 1G
<b>Operating Humidity</b>	• 5% to 85% RH, non-condensing	<b>EMI/EMS</b>	• 1.5 kV CE certified

# Advanced Path Planning with Look Ahead and Feed Forward

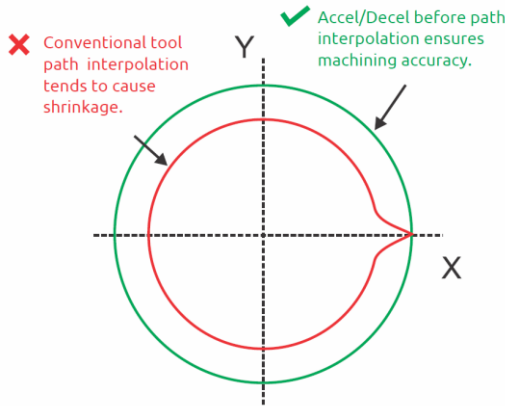
**Path Smoothing** algorithms provide precision control and curvature control. The result is the optimal tool path for speed and precision.



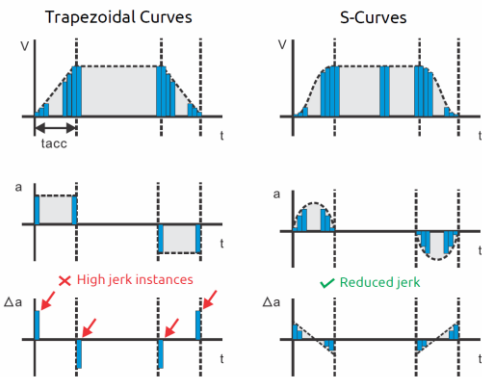
**Look Ahead** anticipates upcoming programmed motion, and plans the optimal trajectory in real time up to 1000 blocks.



**Smart Interpolation** ensures machining accuracy by performing acceleration and deceleration before path interpolation.

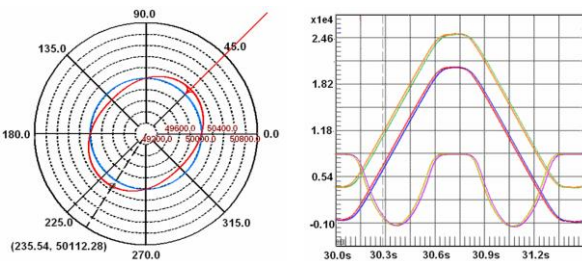


**Jerk Reduction** is performed by using trapezoidal or S-curve acceleration and deceleration, allowing smoother motion, higher machining speeds, and helps protect against machine wear.



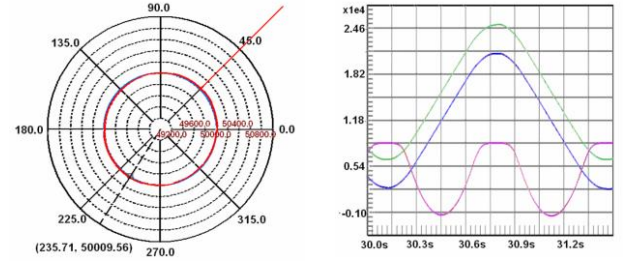
## Without Feed Forward and Friction Compensation

XY and Z axes motion accuracy is prone to in correctable position errors, as demonstrated in the following plots on a circular tool path of 28.3mm diameter, at 8 m/min feed rate. In this case the final trajectory has a maximum position error exceeding 20 μm and more than 6 μm reversal spikes are presented.



## With Feed Forward and Friction Compensation

XY and Z axes motion accuracy is greatly increased, as demonstrated in the following plots on a circular tool path of 28.3 mm diameter, at 8 m/min feed rate. The final trajectory has a maximum position error within 5 μm and the reversal spikes are less than 2μm.



WinDelta® CNC is the most versatile control for all your many operations:

## Semi-Automatic + Conversational Programming + G-Code

### SEMI-AUTOMATIC OPERATION

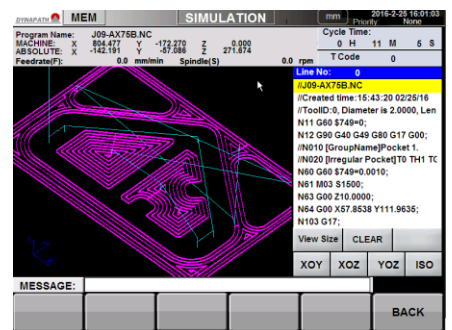
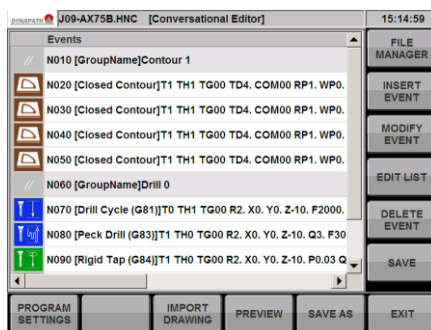
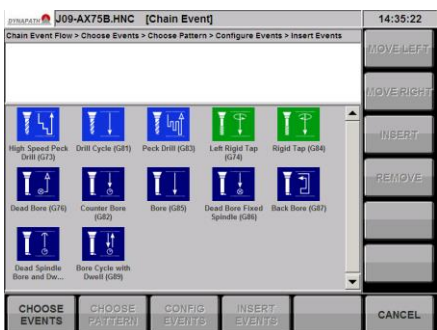
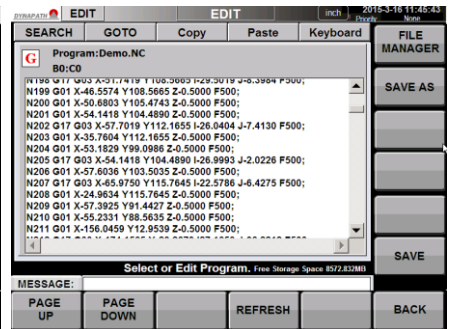
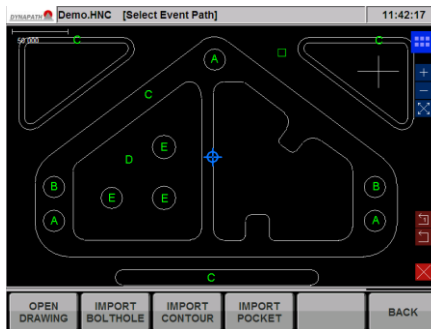
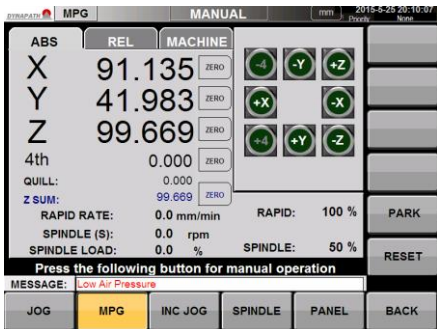
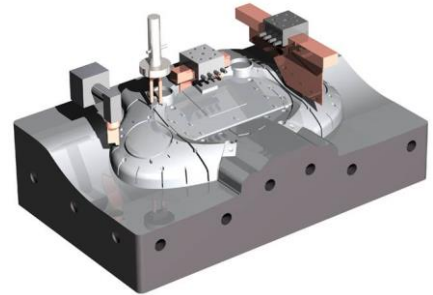
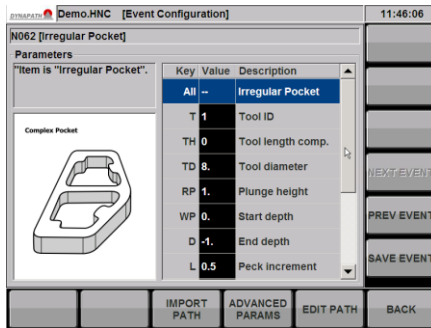
For quick and simple jobs, or work requiring the skilled hands of an experienced machinist, **Semi-Automatic Operation** functionality offers operators the most **friendly and familiar** way to do the job.

### CONVERSATIONAL PROGRAMMING

For general parts and jobs, the **Conversational Editor with DXF Import** enables any operator to generate part programs without writing G-Code, oftentimes faster than it takes to set up for the part.

### CAD/CAM G-CODE

For CAD/CAM users, simply post-process to standard **ISO/EIA G-Code**, then send the program via **USB or networked file transfer** to the control, and fully leverage the power of CNC production.



A-SERIES BED MILLS - SIZE AND SPECIFICATIONS					
MODEL	A1	A2	A2-T	A3	A3-T
TYPE	Bed Mill	Bed Mill		Bed Mill	
SPINDLE TAPER	NT40/CAT40	NT40/CAT40		NT40/CAT40	
SPINDLE RPM	50-5000 RPM	50-5000 RPM	60-8000 RPM	50-5000 RPM	60-8000 RPM
SPINDLE MOTOR	5 HP	5 HP	11kW (7.5 HP)	5 HP	11kW (7.5 HP)
TOOL CHANGER	---	---	20-Tool Carousel	---	20-Tool Carousel
TRAVEL X	710 mm (28")	830 mm (33")		1000 mm (39")	
TRAVEL Y	400 mm (15")	500 mm (19")		500 mm (19")	
TRAVEL Z	500 mm (19")	640 mm (25")	520 mm (20")	640 mm (25")	520 mm (20")
QUILL TRAVEL	127 mm (5")	127 mm (5")	---	127 mm (5")	---
QUILL DIAMETER	85.725 mm (3.37")	85.725 mm (3.37")	---	85.725 mm (3.37")	---
TABLE LENGTH	1244 mm (49")	1370 mm (54")		1524 mm (60")	
TABLE WIDTH	254 mm (10")	254 mm (10")		330 mm (13")	
TABLE SLOTS	3	3		3	
TABLE SLOT OFFSET	65 mm (2.56")	65 mm (2.56")		65 mm (2.56")	
TABLE SLOT WIDTH	16 mm (5/8")	16 mm (5/8")		16 mm (5/8")	
AXIS X TYPE	Dovetail	Dovetail		Dovetail	
AXIS Y TYPE	Square	Square		Square	
AXIS Z TYPE	Square	Square		Square	
MAX TABLE LOAD	400 kg (880 lbs)	500 kg (1100 lbs)		500 kg (1100 lbs)	
MACHINE WEIGHT	1710 kg (3770 lbs)	2070 kg (4550 lbs)		2100 kg (4620 lbs)	
DIMENSIONS L x W x H	229 x 173 x 226 cm (90" x 68" x 89")	294 x 210 x 258 cm (116" x 83" x 102")		294 x 210 x 258 cm (116" x 83" x 102")	
FOOTPRINT L x W x H	252 x 259 x 249 cm (99" x 102" x 98")	345 x 284 x 258 cm (136" x 112" x 102")		345 x 284 x 258 cm (136" x 112" x 102")	
POWER REQUIREMENTS	4 kVA, 3 Phase, 208V to 230V	4 kVA, 3 Phase, 208V to 230V		4 kVA, 3 Phase, 208V to 230V	

CONTROL SPECIFICATIONS	MACHINE FEATURES	ADDITIONAL OPTIONS
<ul style="list-style-type: none"> <li>12.1" Touchscreen LCD Display</li> <li>4 GB Program Storage</li> <li>2 USB, 1 LAN</li> <li>3-Axis Synchronous</li> <li>4th Axis Rotary Table Optional</li> <li>DRO Operation</li> <li>ISO G-Code Motion Interpreter Core</li> <li>Shop Floor Conversational Programming</li> <li>DXF Drawing Import via Touch</li> <li>File Send / Receive thru LAN / USB</li> <li>FTP Networked File Transfer</li> <li>Remote Diagnosis &amp; Support</li> <li>Remote Monitoring and Reporting</li> <li>500 Block Look Ahead</li> <li>Program Retrace, MPG Run</li> </ul>	<ul style="list-style-type: none"> <li>Z-Axis CNC Controlled Quill</li> <li>Handheld MPG Jog Unit</li> <li>Auto Lubrication System</li> <li>Air/Flood Coolant System</li> <li>X, Y, Z Axes Ball Screw</li> <li>Table Guard</li> <li>Splash Guard</li> <li>Way Covers</li> <li>Halogen Work Light</li> <li>Rigid Tapping (non-Quill head only)</li> <li>Spindle Orientation (non-Quill head only)</li> </ul>	<ul style="list-style-type: none"> <li>X,Y,Z Electronic Handwheels</li> <li>Clamping Kits</li> <li>4th Axis Rotary Table</li> </ul>





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