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**Mazak**

**HCN**  
S E R I E S

[4000, 5000, 5000S, 5000/50, 5000/50S, 6000]



# Advanced features of the MAZATROL SmoothG CNC

Touch screen operation similar to your smartphone/tablet

PC with Windows® 8 embedded OS

Fastest CNC in the world with latest hardware and software for unprecedented speed and precision

Easy conversational programming of multiple-surface machining

Smooth graphical user interface and support functions for unsurpassed ease of operation

MTConnect® ready for convenient networking

Easily configure machine parameters for different workpiece materials and application requirements

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

MTConnect is a registered trademark of AMT in the United States and other countries.



# MAZATROL SMOOTHG

The image shows a close-up of a horizontal machining center. On the left, there is a rack of various tool bits. In the center, a large, silver-colored spindle is mounted, holding a drill bit. The machine's construction is robust and industrial, with various components and fasteners visible. The background is a clean, light-colored wall.

High-speed, high-accuracy horizontal machining center

# HCN SERIES

## Designed for unsurpassed productivity

- Wide variety of spindles for optimal cutting conditions
- Rigid machine construction for heavy-duty machining
- Advanced factory automation equipment available for even higher productivity

# HCN SERIES

## Extensive series range to meet



**HCN-4000** No. 40 spindle taper

**High-speed machining of small components**

Max. spindle speeds:  
**from 12000 rpm to 30000 rpm**  
Tool change time (chip-to-chip): **2.4 sec**  
Axis acceleration/deceleration  
(X, Y, Z axis): **1.0 G**



**HCN-5000** No. 40 spindle taper

**High-speed machining of multiple workpieces mounted on large, multiple-surface fixtures**

Max. spindle speeds:  
**from 12000 rpm to 30000 rpm**  
Tool change time (chip-to-chip): **2.6 sec**  
Axis acceleration/deceleration  
(X, Y, Z axis): **1.0 G**  
Max. table load: **500 kg or 700 kg**  
(**1102 lbs or 1543 lbs**)



**HCN-5000S** No. 40 spindle taper

**Single-table machine for large-volume production**

Max. spindle speeds:  
**from 12000 rpm to 30000 rpm**  
Tool change time (chip-to-chip): **2.6 sec**  
Axis acceleration/deceleration  
(X, Y, Z axis): **1.0 G**  
Max. table load: **500 kg or 700 kg**  
(**1102 lbs or 1543 lbs**)  
Gantry loader preparation:  
**optionally available**



**Automotive**



Workpiece: Connecting rod  
Material: SCM 435



**Aerospace**

Workpiece: Pump cover  
Material: SC 450



**Construction machinery**



Workpiece: Housing  
Material: FC 250

# any machining requirement



## HCN-5000/50

No. 50 spindle taper

**Optimal for large-volume production of small to mid-size die cast components**

Max. torque: **216 N·m (159 ft·lbs)**  
**[40% ED (30-min.rating)]**  
 Max. tool diameter: **ø250 mm (ø9.84")\***  
 Spindle acceleration: **1.2 sec**

\* When adjacent pockets are empty and pockets next to them have tools less than 240 mm (9.45"), max. tool diameter is ø260 mm (ø10.24").



## HCN-5000/50S

No. 50 spindle taper

**Single-table machine for convenient integration into a production line**

Max. torque: **216 N·m (159 ft·lbs)**  
**[40% ED (30-min.rating)]**  
 Max. tool diameter: **ø250 mm (ø9.84")\***  
 Spindle acceleration: **1.2 sec**  
 A-axis table: **optionally available**  
 Gantry loader preparation: **optionally available**

\* When adjacent pockets are empty and pockets next to them have tools less than 240 mm (9.45"), max. tool diameter is ø260 mm (ø10.24").



## HCN-6000

No. 50 spindle taper

**High-rigidity machine for heavy-duty machining of steel and cast iron**

Max. torque: **350 N·m (258 ft·lbs)**  
**[10000 rpm, 30-min. rating] to**  
**442 N·m (325 ft·lbs)[30-min.rating]**  
 Max. tool diameter: **ø250 mm (ø9.84")\***  
 Max. tool length: 500 mm (19.69")  
 Max. table load: 1000 kg (2205 lbs)

\* When adjacent pockets are empty and pockets next to them have tools less than 240 mm (9.45"), max. tool diameter is ø260 mm (ø10.24").

Workpiece: Crankcase  
 Material: Aluminum



Workpiece: Cylinder head  
 Material: Aluminum



Workpiece: Frame  
 Material: Aluminum



Workpiece: Rib  
 Material: Aluminum



Workpiece: Gear box  
 Material: SCM 435



# Higher Productivity & Higher Accuracy

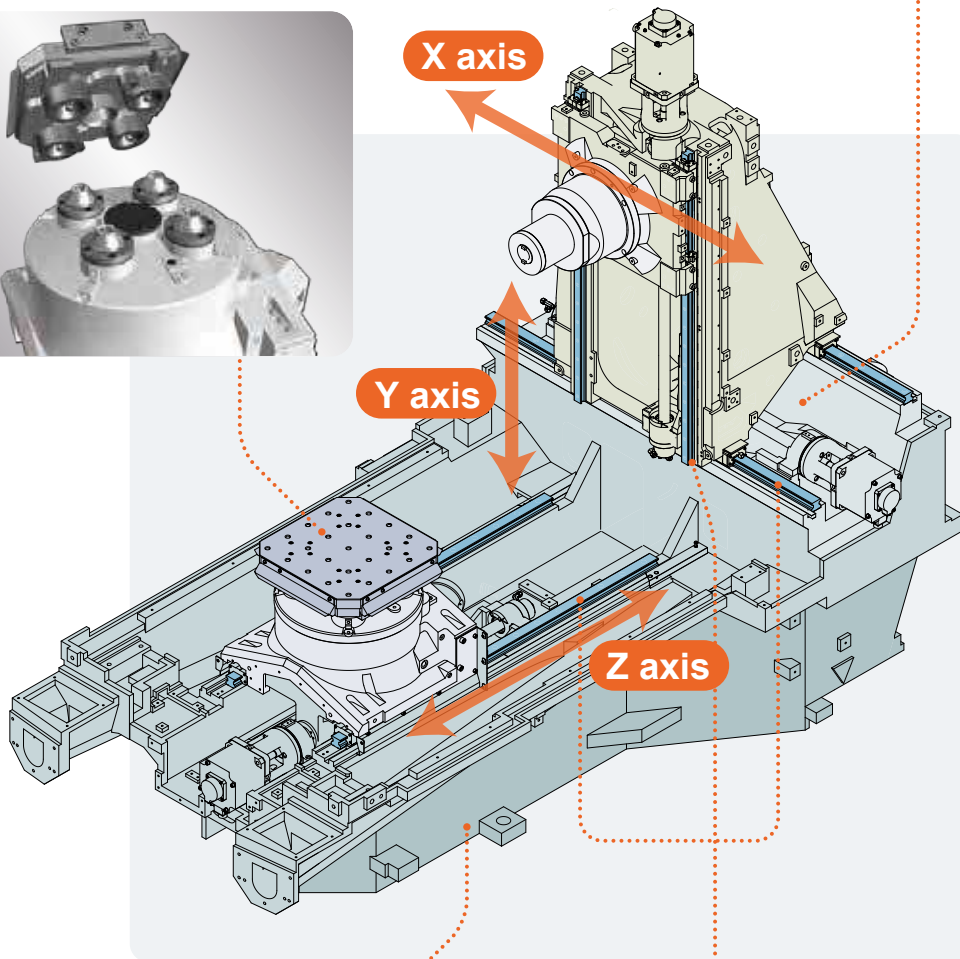
## High-rigidity construction for high-accuracy machining

### Table coupling

The table and pallet are clamped on four taper cones by 73.2 kN (16456 lbs) of force. The index table coupling is clamped by 85.2 kN (19153 lbs) of force for stable operation during heavy-duty machining. (The single pallet of the HCN-5000S and HCN-5000/50S is bolted directly to the machine table).

### X axis slanted design

The mounting surfaces of the X-axis linear guide rails are at different heights to ensure high rigidity for high speed and high-accuracy positioning.



High-speed acceleration/ deceleration on X, Y, Z axis

Rapid traverse rate

**60 m/min**  
(2362 ipm)

Maximum feedrate

**60 m/min**  
(2362 ipm)

Acceleration / deceleration

**1.0 G**  
(HCN-4000 and HCN-5000)

### High-rigidity bed

The high-rigidity bed is reinforced with strategically located ribs to ensure stability during X and Y-axis travel.

### Linear roller guides utilized on the X, Y and Z axes

Linear roller guides on the X, Y, and Z axes are utilized by the HCN series to provide high accuracy and heavy-duty machining.

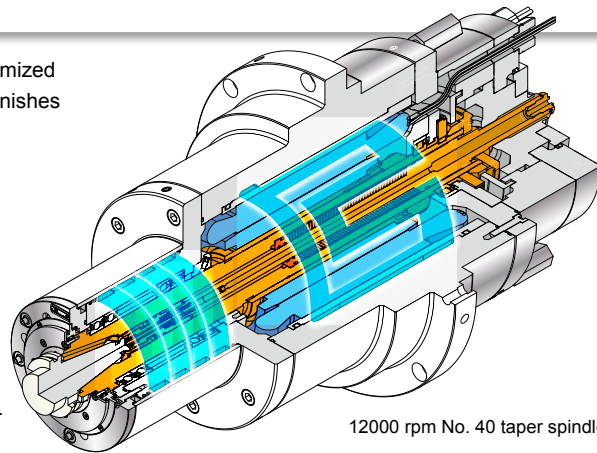
## Designed for high-accuracy machining

### Integral spindle/motor

Thanks to the integral spindle/motor design, vibration is minimized during high-speed operation to ensure exceptional surface finishes and maximum tool life.

### Spindle temperature control

For high-accuracy machining, temperature-controlled cooling oil is circulated around the spindle bearings and headstock to minimize any thermal change to the spindle.



12000 rpm No. 40 taper spindle

### X, Y and Z axis ballscrew core cooling

Temperature-controlled cooling oil circulates through the ballscrew cores to ensure stable machining accuracy over extended periods of high-speed operation.



### X, Y axis cover

Instead of a multi-stage sheet metal cover with wipers, a protective cover is used over the accordion covers. This compact system keeps chips and coolant contained in the machining area.

(Machines: HCN-4000, 5000, 5000S, 5000/50, 5000/50S)



# Higher Productivity

## Spindle specifications for any workpiece material requirement

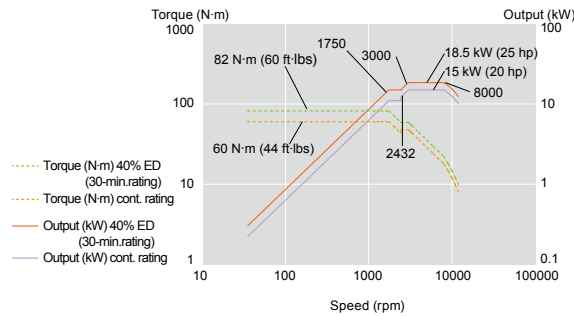
### HCN-4000, HCN-5000, HCN-5000S

#### Standard

High-speed machining of steel, cast iron and aluminum

No. 40	Speed	12000 rpm
Integral spindle/motor	Output	18.5 kW (25 hp) [40% ED (30-min.rating)] 15 kW (20 hp) [cont. rating]
Grease lubrication	Max. torque	82 N·m (60 ft·lbs) [40% ED (30-min.rating)]

#### 12000 rpm Milling spindle output/torque diagram

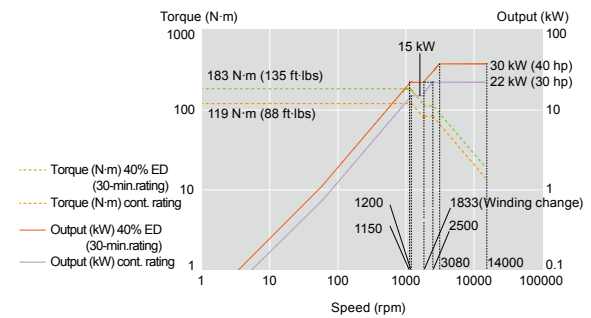


#### High torque OPTION

Heavy-duty machining of difficult-to-cut materials, including steel and cast iron

No. 40	Speed	14000 rpm
Integral spindle/motor	Output	30 kW (40 hp) [40% ED (30-min.rating)] 22 kW (30 hp) [cont. rating]
Oil & air lubrication	Max. torque	183 N·m (135 ft·lbs) [40% ED (30-min.rating)]

#### 14000 rpm Milling spindle output/torque diagram

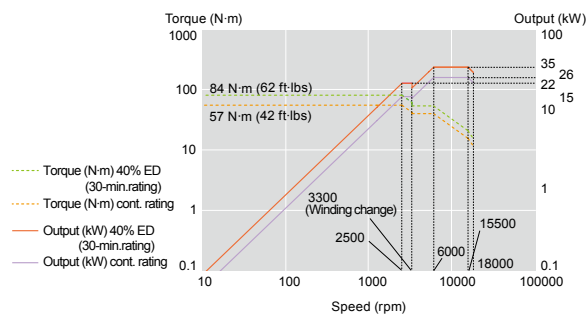


#### General machining OPTION

Designed for versatile performance

No. 40	Speed	18000 rpm
Integral spindle/motor	Output	35 kW (47 hp) [40% ED (30-min.rating)] 26 kW (35 hp) [cont. rating]
Oil & air lubrication	Max. torque	84 N·m (62 ft·lbs) [40% ED (30-min.rating)]

#### 18000 rpm Milling spindle output/torque diagram

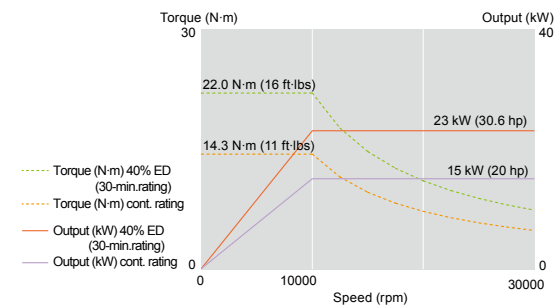


#### High speed OPTION

High-speed machining of precision aerospace components, die-cast components

HSK-F63	Speed	30000 rpm
Integral spindle/motor	Output	23 kW (30.6 hp) [40% ED (30-min.rating)] 15 kW (20 hp) [cont. rating]
Oil & air lubrication	Max. torque	22 N·m (16 ft·lbs) [40% ED (30-min.rating)]

#### 30000 rpm Milling spindle output/torque diagram



Coolant through spindle is not available.  
25000 rpm, HSK-A63, specifications are available as options.

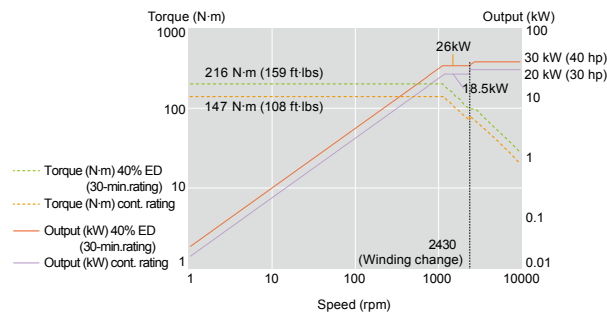
## HCN-5000/50, HCN-5000/50S

### Standard

Large volume production of small/mid-size die-cast components

<b>No. 50</b>	Speed	10000 rpm
Integral spindle/motor	Output	30 kW (40 hp) [40% ED (30-min.rating)]
		22 kW (30 hp) [cont. rating]
Oil & air lubrication	Max. torque	216 N-m (159 ft-lbs) [40% ED (30-min.rating)]

#### 10000 rpm Milling spindle output/torque diagram



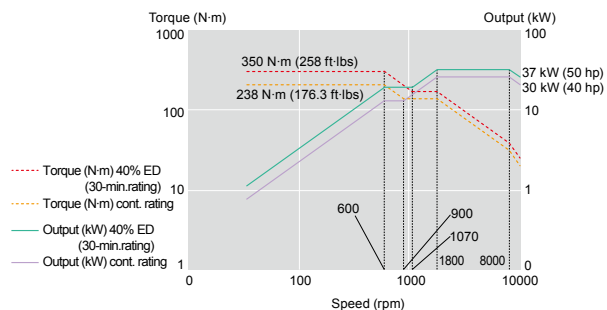
## HCN-6000

### Standard

For general-purpose machining of a variety of materials

<b>No. 50</b>	Speed	10000 rpm
Integral spindle/motor	Output	37 kW (50 hp) [40% ED (30-min.rating)]
		30 kW (40 hp) [cont. rating]
Oil & air lubrication	Max. torque	350 N-m (258 ft-lbs) [40% ED (30-min.rating)]

#### 10000 rpm Milling spindle output/torque diagram

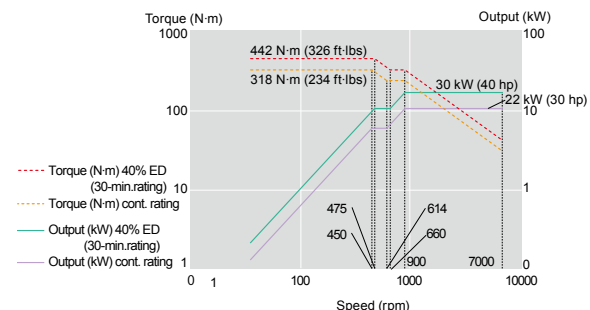


### High torque OPTION

Heavy-duty machining of steel and cast iron

<b>No. 50</b>	Speed	7000 rpm
Integral spindle/motor	Output	30 kW (40 hp) [40% ED (30-min.rating)]
		22 kW (30 hp) [cont. rating]
Oil & air lubrication	Max. torque	442 N-m (326 ft-lbs) [40% ED (30-min.rating)]

#### 7000 rpm Milling spindle output/torque diagram



# Higher Productivity

## Wide variety of tables available

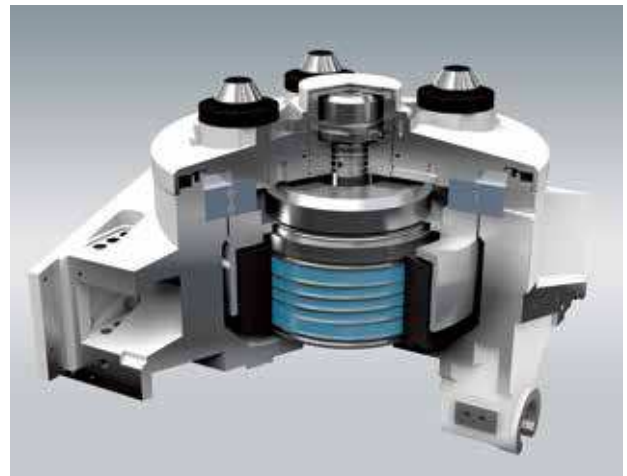
1° × 360 index table is standard equipment.

NC rotary table and DDM table with 0.0001° × 3600000 positions are available as options.



## High-speed DDM rotary table OPTION

Efficient, high-speed operation thanks to the direct transmission of driving power to the rotary table axis, eliminating power transmission components such as the worm shaft and the worm gear.



## Table specifications

Machine	HCN-4000			HCN-5000, HCN-5000S		
	Index table	NC rotary table	DDM table	Index table	NC rotary table	DDM table
Table	STANDARD	OPTION	OPTION	STANDARD	OPTION	OPTION
Table load capacity	400 kg (881 lbs)	400 kg (881 lbs)	400 kg (881 lbs)	500 kg (1102 lbs) [700 kg] (1543 lbs)	500 kg (1102 lbs) [700 kg] (1543 lbs)	500 kg (1102 lbs) [700 kg] (1543 lbs)
Minimum indexing angle increment	1°	0.0001°	0.0001°	1°	0.0001°	0.0001°
Indexing time (90°)	1.3 sec.	1.0 sec.	<b>0.8 sec.</b>	1.4 sec.	1.2 sec. [1.3 sec.]	<b>0.9 sec.</b> [1.0 sec.]

[ ] : Option

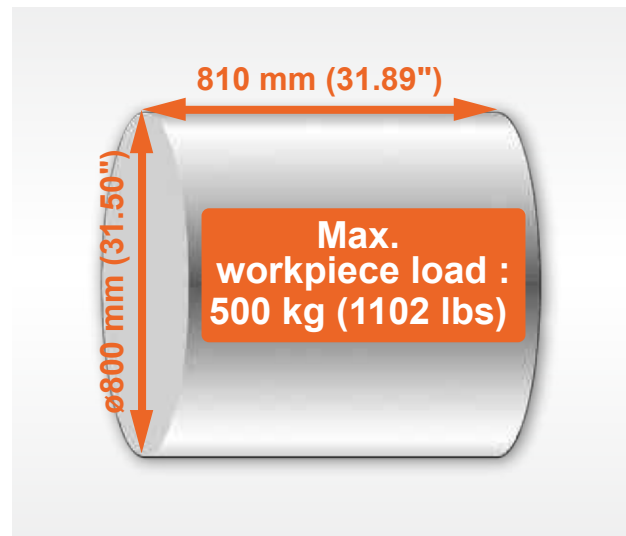


Shown with optional automatic top door for gantry loader

### A-axis NC positioning table OPTION

High-efficiency multiple-surface machining.

#### ◆ Max. workpiece dimension/weight



HCN-5000/50			HCN-5000/50S				HCN-6000		
Index table	NC rotary table	DDM table	Index table	NC rotary table	DDM table	A-axis NC positioning table	Index table	NC positioning table	NC rotary table
<span style="border: 1px solid gray; border-radius: 10px; padding: 2px;">STANDARD</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid gray; border-radius: 10px; padding: 2px;">STANDARD</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid gray; border-radius: 10px; padding: 2px;">STANDARD</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>	<span style="border: 1px solid orange; border-radius: 10px; padding: 2px;">OPTION</span>
500 kg (1102 lbs)	500 kg (1102 lbs)	500 kg (1102 lbs)	500 kg (1102 lbs)	500 kg (1102 lbs)	500 kg (1102 lbs)	500 kg (1102 lbs)	1000 kg (2205 lbs)	1000 kg (2205 lbs)	1000 kg (2205 lbs)
[700 kg] (1543 lbs)	[700 kg] (1543 lbs)	[700 kg] (1543 lbs)	[700 kg] (1543 lbs)	[700 kg] (1543 lbs)	[700 kg] (1543 lbs)				
1°	0.0001°	0.0001°	1°	0.0001°	0.0001°	1°	1°	0.0001°	0.0001°
1.4 sec.	1.2 sec. [1.3 sec.]	<b>0.9 sec.</b> <b>[1.0 sec.]</b>	1.4 sec.	1.2 sec. [1.3 sec.]	<b>0.9 sec.</b> <b>[1.0 sec.]</b>	1.5 sec.	1.9 sec.	2.2 sec.	1.8 sec.

# Higher Productivity

## ATC

Handles long boring bars and large-diameter mills for higher productivity.

### Stable tool changing of heavy and large-diameter tools

The simple, reliable cam-driven automatic tool changer performs fast tool changes over extended periods of operation.



HCN-6000



HCN-4000

### ATC specifications

Machine		HCN-4000	HCN-5000, HCN-5000S	HCN-5000/50, HCN-5000/50S	HCN-6000
Maximum tool size for ATC	Tool length	420 mm (16.54")	510 mm (20.08")	510 mm (20.08") [550 mm (21.65")]	500 mm (19.69")
	Tool weight	12 kg (26 lbs)	12 kg (26 lbs)	30 kg (66.14 lbs)	30 kg (66.14 lbs)
	Tool diameter	with adjacent tools	ø95 mm (ø3.74")	ø95 mm (ø3.74")	ø125 mm ø4.92")
with adjacent pockets empty		ø170 mm (ø6.69")	ø170 mm (ø6.69")	ø250 mm*1 (ø9.84")	ø250 mm*1 (ø9.84")
Tool change time (chip-to-chip)		2.4 sec.	2.6 sec.	3.5 sec.	3.5 sec.
Magazine	Drum-type magazine	40 [60]	40 [60]	43 [60]	—
	Tool-chain magazine	[80, 120, 160]	[80, 120, 160]	[80, 120, 160]	43 [60, 80, 100, 120, 140, 160]
	TOOL HIVE magazine	[180, 240, 348]	[180, 240, 348]	[180, 240, 348]	[180, 240, 348]

\*1 When adjacent pockets are empty and pockets next to them have tools less than 240 mm (9.45"), maximum tool diameter is ø260 mm (ø10.24").

[ ]: Option

## SMOOTH Machining Configuration

Machining time, finished surface smoothness and machining shape can be adjusted for improved productivity.

### VARIABLE ACCELERATION CONTROL

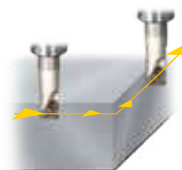
A new function that permits the faster acceleration capabilities of linear axes to be used whenever possible. The slower acceleration of the rotary axes is not used for all program commands, resulting in faster machining cycle times.



### SMOOTH CORNER CONTROL

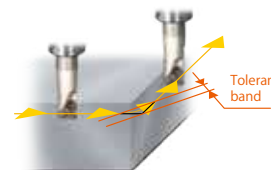
Improved finished surfaces and reduced cycle times with optimized acceleration/deceleration when machining corners.

►Other systems  
Move to next command position after reaching current command position



►SMOOTH CORNER CONTROL

Move to next command position within tolerance band



# Higher Accuracy

## Heat Displacement Control – THERMAL SHIELD

The THERMAL SHIELD is an automatic compensation for room temperature changes, which realizes enhanced continuous machining accuracy. Mazak has performed extensive testing in a variety of temperature-controlled environments and has used the results to develop a control system that automatically compensates for temperature changes in the machining area. Changes in the room temperature and compensation data are shown visually.

Temperature and compensation is displayed on screen. Operator can adjust compensation by looking at the data.



# Ease of Maintenance

## Comprehensive Spindle Monitoring – PERFORMANCE SPINDLE

The PERFORMANCE SPINDLE monitors a variety of properties with sensors housed in the spindle and provides useful information to the operator to minimize downtime.



▲ Condition check  
Temperature as well as motor load can be displayed.



▲ Running recorder  
Operation status of milling spindle (rpm/motor load) can be recorded for up to one year.

## Comprehensive Maintenance Monitor – MAINTENANCE SUPPORT

Useful information for improved preventive maintenance to avoid unexpected machine downtime.



# Automation

## Fast 2-pallet changer

Rotary-type pallet changers shift heavy workpieces in and out of the machining area quickly for higher productivity.

## 6-pallet changer OPTION

Multiple workpieces can be set up on six pallets, enabling unmanned operation over extended periods of time.



HCN-4000 with 6-pallet changer



HCN-6000 with 6-pallet changer

## Pallet changer specifications

Machine	HCN-4000	HCN-5000, HCN-5000/50	HCN-6000
Pallet changer	2-pallet changer	2-pallet changer	2-pallet changer
Pallet load capacity (evenly distributed)	400 kg (881 lbs)	500 kg (1102 lbs) [700 kg (1543 lbs)]	1000 kg (2205 lbs)
Max. workpiece diameter on pallet	ø630 mm (ø24.80")	ø800 mm (ø31.50")	ø900 mm (ø35.43")
Max. workpiece height on pallet	900 mm (35.43")	1000 mm (39.37")	1000 mm (39.37")
Pallet change time	7 sec.	8 sec. [10 sec.]	9 sec.

[ ]: Option

# Automation

Wide variety of factory automation equipment available, for single machines to production lines

## Gantry loader

Multiple machines can be integrated in a compact production line. An automatic door for the gantry loader on top of the machining area is available as an option for the HCN-5000S and HCN-5000/50S.



## Robot system

Interface for connecting an external robot for workpiece loading/unloading to/from automatic hydraulic fixtures is available as an option.

- Field network available
- Includes cycle start, door open/close, work loading confirmation and hydraulic fixtures (2).



## PALLETECH SYSTEM

The modular design of the PALLETECH allows more machines and increased pallet storage capacity to be added to the system after the initial installation in response to changing production requirements. The pallet stocker is available with one, two or three levels for large pallet storage capacity with small floor-space requirements.

		Minimum	Maximum
Machine(s)		1	15
Number of pallets	1 level	6	240
	2 levels	12	240
	3 levels	18	240
Loading station(s)		1	8
Loading robot		1	1



**SMOOTH**  
PMC

FMS control/management software provides unsurpassed ease of system operation to help meet sudden schedule changes.



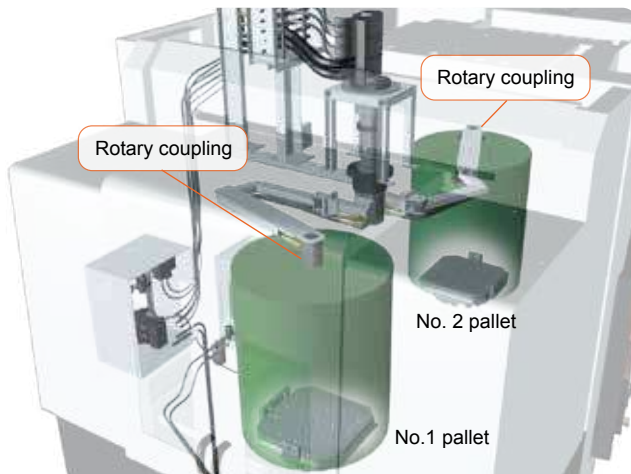
## Optional factory automation equipment

### Hydraulic fixtures OPTION

#### Type A (supply from machine top, eight-port maximum)

Hydraulic power is supplied from the top part of the pallet changer through hydraulic hoses to fixtures mounted on each pallet.

#### Hydraulic power supply from top



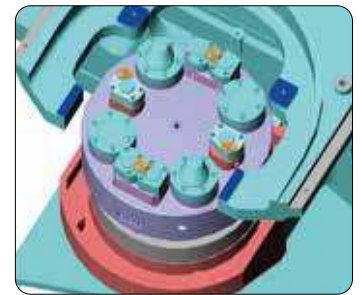
#### Type B (supply through pallet, six-port maximum)

Hydraulic power is supplied to the supply port on the pallet bottom with leak-free coupling.

#### Hydraulic power supply through pallet



Reference (table side)  
Maximum: 2 ports



Reference (setup station side)  
Maximum: 6 ports  
(including 2P internal machine connection)

HCN-4000, 5000, 5000/50, 5000/50S.  
Max. 3 ports for HCN-6000

### TOOL HIVE OPTION

The TOOL HIVE can store more than 180 tools in a small space. Operation and tool data editing can be performed on the TOOL HIVE TERMINAL control panel to reduce the time required for tool setup. The TOOL HIVE tool storage capacity can be expanded after the initial installation.

Tool storage	180 tools	240 tools	348 tools
Magazine	Rack type	Rack type	Rack type
Tool selection method	Fixed pocket number, shortest path	Fixed pocket number, shortest path	Fixed pocket number, shortest path



240-tool TOOL HIVE magazine

### Tool ID

Tool ID allows automatic input and update of tool data into the CNC for machines in a network. It eliminates mistakes when loading tools into the magazine and inputting tool data, further reducing setup time. (Requires retention bolt with tool ID and tool presetter.)



# Ergonomics

## Design focus on ergonomics provides unsurpassed ease of operation

### Large window (2-pallet changer)

The large windows on the 2-pallet changer cover door allow the operator to easily see the status of the workpiece in the setup station.



### Convenient workpiece loading/unloading

An overhead crane can be easily used for the loading/unloading of heavy workpieces and fixtures.



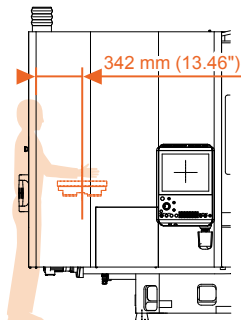
### Large operation window

The large operation window allows the operator to easily monitor workpiece machining.

### Convenient setup

The short distance from the pallet center to the front cover enables convenient setup. The setup station can be indexed by 90° for easy workpiece loading/unloading and setup.

Distance between pallet center to machine cover (HCN-4000)



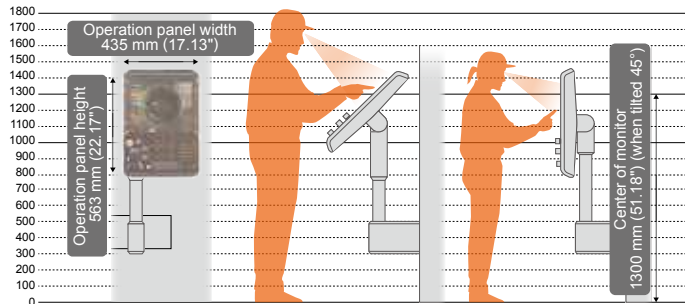
### Maintenance area

Items requiring frequent access for machine maintenance, such as hydraulic and air pressure inlets, are conveniently arranged in a central location on the back side of the machine (located on tool magazine side on the HCN-6000).



### Adjustable CNC touch panel

Operating touch panel can be tilted to the optimal position for any operator's height to ensure ease of operation.



### Tool magazine operation panel/Tool ID

Designed for increased ease of operation, the tool magazine operation panel has more than just a forward/reverse button for indexing the tool magazine and manually positioning the desired tool pocket. In addition, the pocket number or tool number can be input into the operation panel's numeric keyboard and the desired pocket will be brought into position automatically. Tool data is displayed on this panel, eliminating trips back to the machine CNC. By touching the tool data, the tool magazine will be indexed to the selected tool. The sort key quickly shows which tool pockets are empty.



### Remote manual pulse generator OPTION

The remote manual pulse generator provides convenient operation when the operator is not close to the CNC operation panel. It shows the position display and the machine coordinate values. Four different positions can be registered in memory by the remote manual pulse generator.



# MAZATROL CNC System

## MAZATROL *SMOOTHG*

### 4 axes simultaneous CNC



### Fastest CNC in the world

Latest hardware and software for unprecedented speed and precision

### Smooth graphical user interface

PC with Windows® 8 embedded OS

MAZATROL Smooth graphical user interface offers unsurpassed ease of operation  
Touch screen operation similar to your smartphone/tablet

### Ease of operation

Designed for unsurpassed ease of operation with advanced functions

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

## Programming screen links tool path, workpiece shape and program to reduce programming time.

### QUICK MAZATROL

MAZATROL program, unit list and 3D workpiece shape are linked to each other. After defining a machining unit in a MAZATROL program, the 3D shape is displayed immediately to check for any programming error easily and quickly.

Quickly move to the corresponding section in the MAZATROL program by touching a feature in the 3D model.

3D model in the process list is displayed with updated programming in real time.



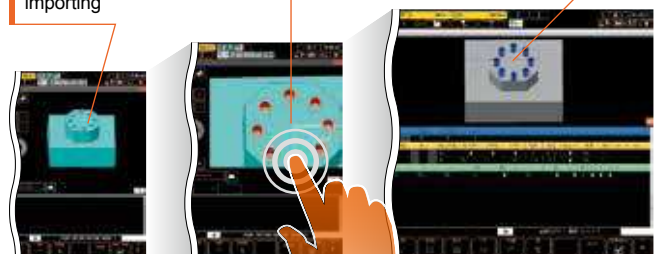
### 3D ASSIST

Workpiece and coordinate data can be imported from 3D CAD data to a MAZATROL program. No coordinate value inputs are required. This can reduce input errors and the time for program checking.

CAD model importing

Shape selection

Automatically input to MAZATROL program



## Process home screens

Five different home screens display the appropriate data in an easy-to-understand manner. Touch icons in each process display for additional screen displays.



Programming



Tool data



Setup



Machining



Maintenance

## QUICK EIA

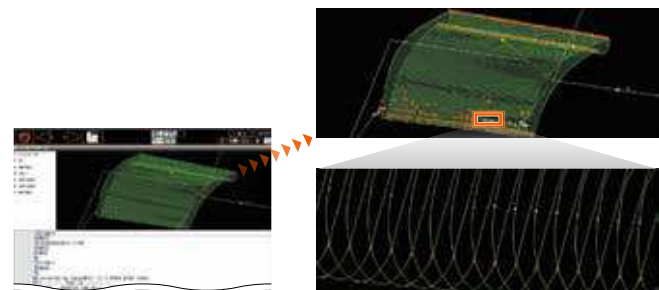
Program, process list and 3D tool path display are linked to each other. Visible search on touch screen can reduce the time for program checking.

## VIEW SURF

Analyze the tool path to visualize any predictable failure on the finished surface. Perform program modification before machining to minimize the time for test cutting.

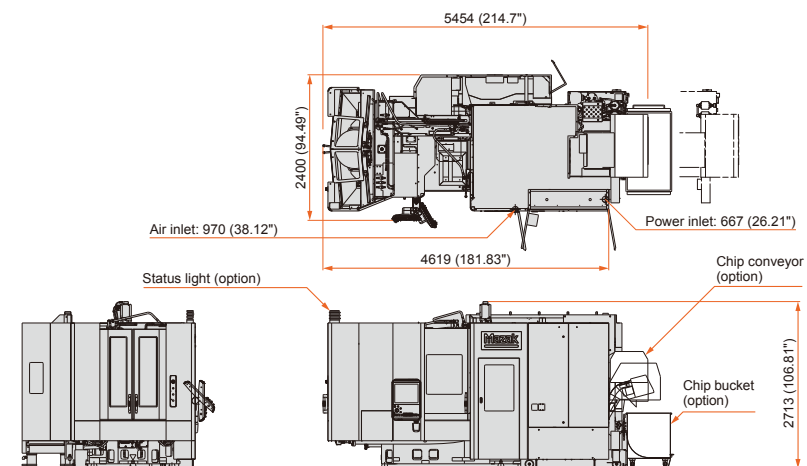
Selecting tool path by touching the screen.

Moving to the corresponding EIA program line.

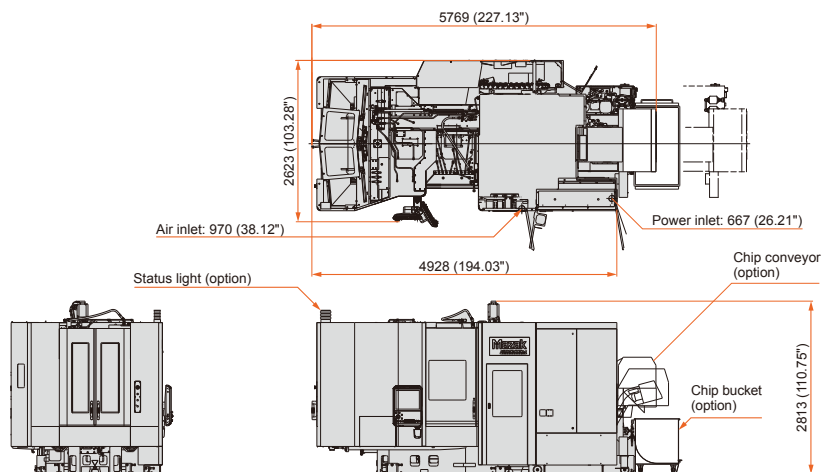


# Machine Dimensions

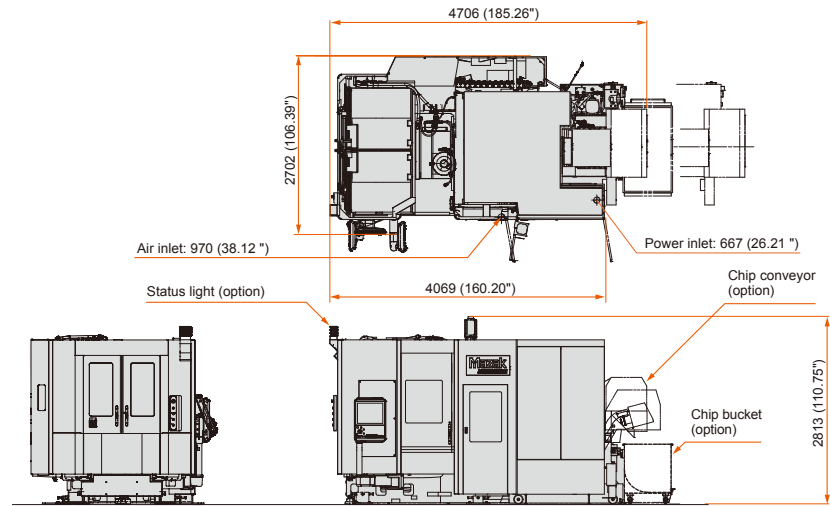
## HCN-4000



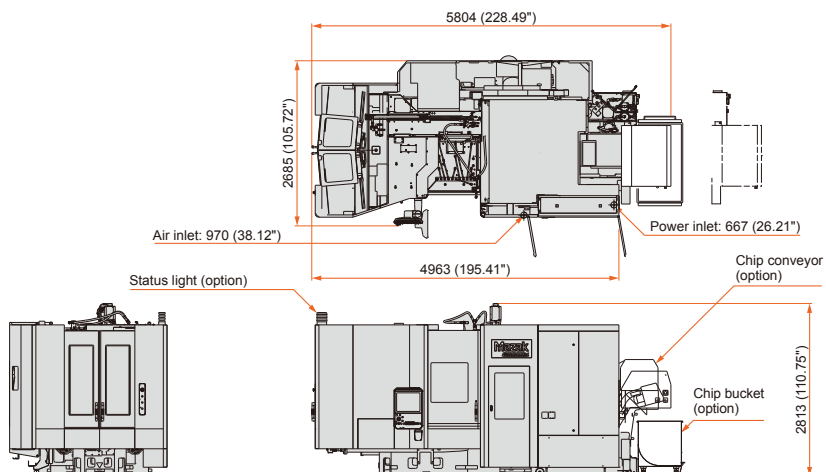
## HCN-5000



HCN-5000S

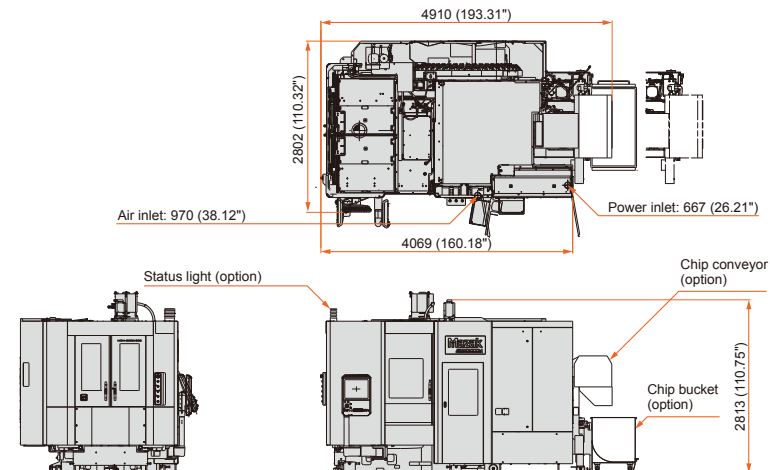


HCN-5000/50

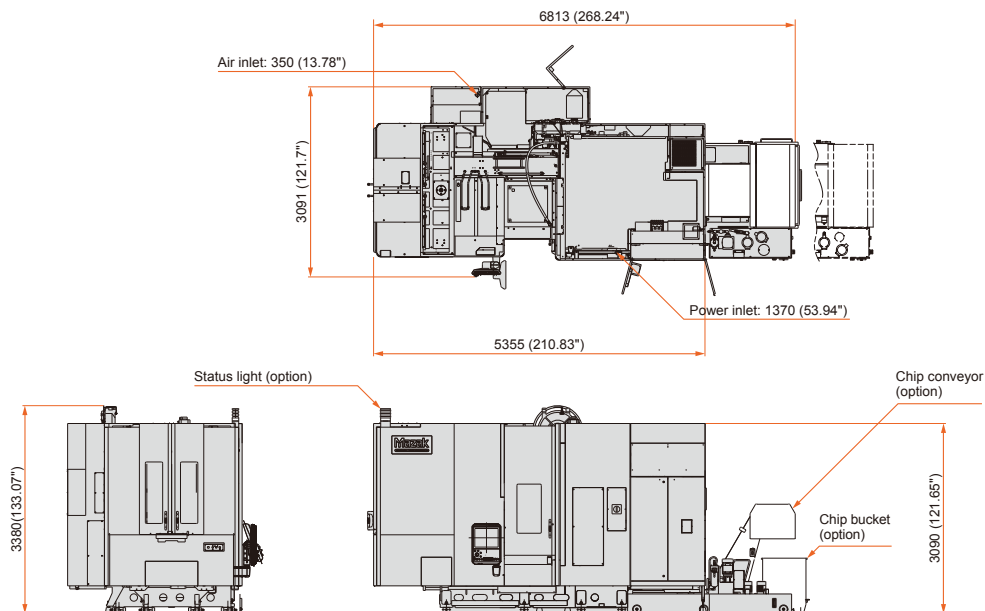


# Machine Dimensions

## HCN-5000/50S

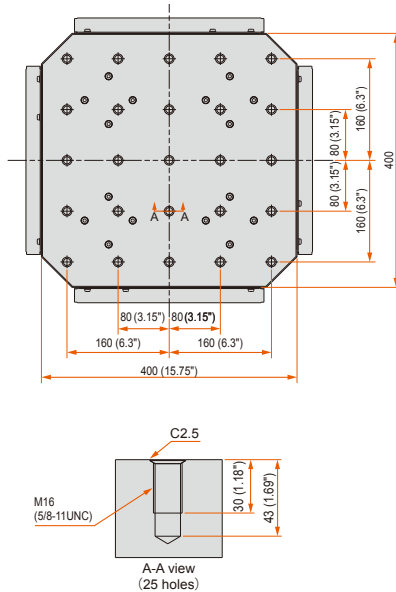


## HCN-6000

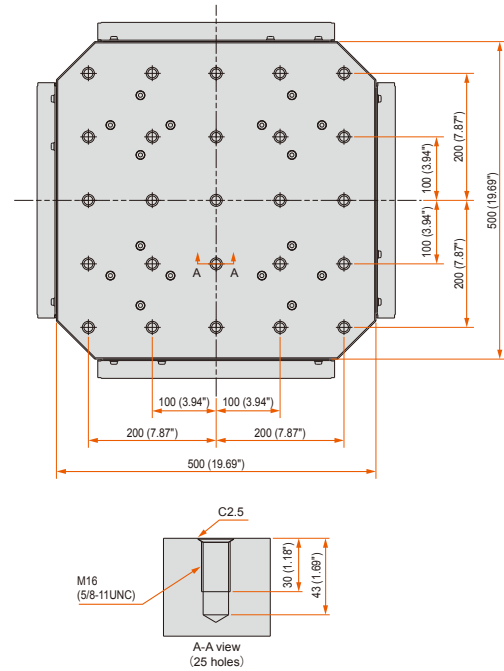


Unit: mm (inch)

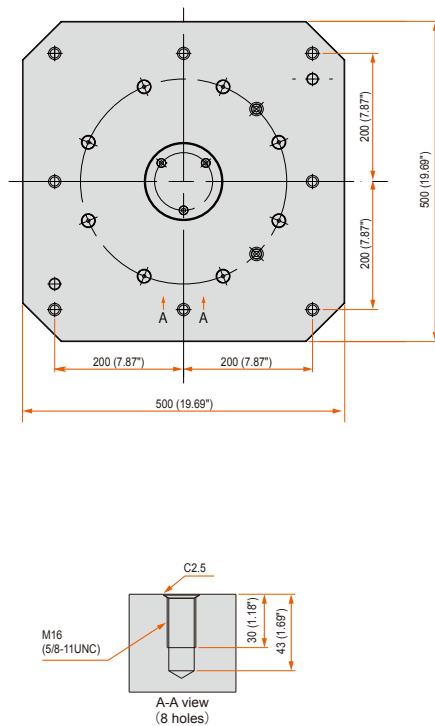
HCN-4000  
400 mm × 400 mm (15.75" × 15.75") tapped pallet



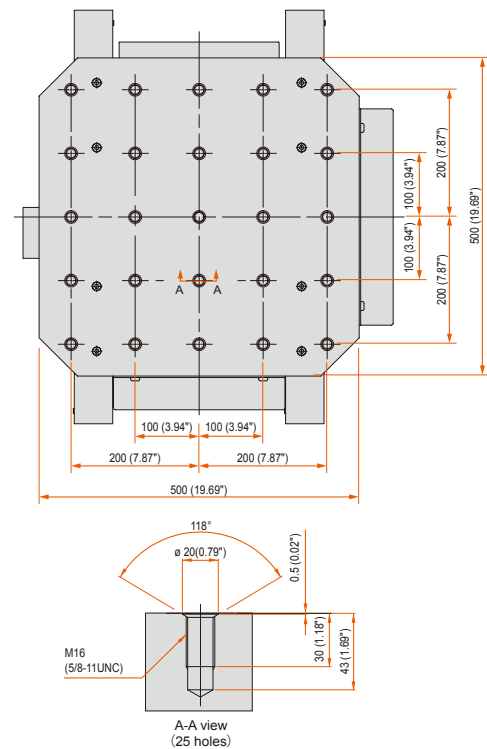
HCN-5000, 5000/50  
500 mm × 500 mm (19.69" × 19.69") tapped pallet



HCN-5000S, 5000/50S  
500 mm × 500 mm (19.69" × 19.69") tapped pallet



HCN-6000  
500 mm × 500 mm (19.69" × 19.69") tapped pallet



# Standard Machine Specifications

		<b>HCN-4000</b>
Stroke	X axis (column right/left)	560 mm (22.05")
	Y axis (spindle up/down)	640 mm (25.20")
	Z axis (table back/forth)	640 mm (25.20")
	Distance between table top to spindle nose	70 mm ~ 710 mm (2.76" ~ 27.95")
	Distance between pallet to spindle center	80 mm ~ 720 mm (3.15" ~ 28.35")
Table	Table size	400 mm × 400 mm (15.75" × 15.75")
	Max. workpiece dimensions	ø630 mm × 900 mm (ø24.80" × 35.43")
	Pallet load capacity (evenly distributed)	400 kg (881 lbs)
	Pallet top surface	5/8-11 UNC tapped holes 25 places 80 mm (3.15") pitch
	Minimum indexing angle increment	1°
	Indexing time	1.3 sec/90°
Spindle	Max. spindle speed	12000 rpm
	Spindle speed range	2-step (electric)
	Spindle taper	No.40
	Spindle bearing ID	ø70 mm (ø 2.76")
	Spindle acceleration	1.48 sec (0 → 12000 rpm)
Feedrate	Rapid traverse rate (X, Y, Z axis)*1	60000 mm/min (2362 ipm)
	Cutting feedrate (X, Y, Z axis)*1	1 mm ~ 60000 mm/min (0.04 ~ 2362 ipm)
	Axis acceleration/deceleration	1.0 G
Automatic tool changer	Tool shank	No. 40
	Tool storage capacity	40
	Max. tool diameter/length (from gauge line)/weight	ø95 mm/420 mm/12 kg (ø3.74"/16.54"/26 lbs) (max. moment: 5.9 N·m (4.35 ft·lbs))
	Max. tool diameter with adjacent pockets empty	ø170 mm (ø6.69")
	Tool selection method	Random selection/shortest path
	Tool change time (chip-to-chip)	2.4 sec
Automatic pallet changer	Number of pallets	2
	Changing system	Rotary type
	Pallet change time	7.0 sec
Motors	Spindle motor (40% ED (30-min. rating)/cont. rating)	18.5 kW/15 kW (25 hp/20 hp)
	Flood coolant pump motor	730 W/1210 W (50 Hz /60 Hz)
Power requirement	Electrical power supply (40% ED (30-min. rating)/cont. rating)	47.4 kVA/42.4 kVA (50 Hz), 49.2 kVA/44.2 kVA (60 Hz)
	Air supply (pressure/flow rate)	0.5 MPa ~ 0.9 MPa (70 ~ 130 psi) / 210 L/min (7.42 ft <sup>3</sup> /min)*2
Machine size	Machine height	2713 mm (106.81")
	Width × length*2	2400 mm × 5454 mm (94.49" × 214.7")
	Machine weight	10720 kg (23633 lbs)

\*1 Limited feedrate with continuous axis movement

\*2 Including rear coolant tank and chip conveyor (ConSep2000)

		HCN-5000	HCN-5000S
Stroke	X axis (column right/left)	730 mm (28.74")	
	Y axis (spindle up/down)	730 mm (28.74")	
	Z axis (table back/forth)	800 mm (31.50")	
	Distance between table top to spindle nose	70 mm ~ 870 mm (2.76" ~ 34.25")	
	Distance between pallet to spindle center	100 mm ~ 830 mm (3.94" ~ 32.68")	
Table	Table size	500 mm × 500 mm (19.69" × 19.69")	
	Max. workpiece dimensions	ø800 mm × 1000 mm (ø31.5" × 39.37")	
	Pallet load capacity (evenly distributed)	500 kg (1102 lbs)	
	Pallet top surface	5/8-11 UNC tapped holes 25 places 100 mm (3.94") pitch	5/8-11 UNC tapped holes 8 places 200 mm (7.87") pitch
	Minimum indexing angle increment	1°	
	Indexing time	1.4 sec/ 90°	
Spindle	Max. spindle speed	12000 rpm	
	Spindle speed range	2-step (electric)	
	Spindle taper	No. 40	
	Spindle bearing ID	ø70 mm (ø2.76")	
	Spindle acceleration	1.48 sec. (0 → 12000 rpm)	
Feedrate	Rapid traverse rate (X, Y, Z axis)*1	60000 mm/min (2362 ipm)	
	Cutting feedrate (X, Y, Z axis)*1	1 mm ~ 60000 mm/min (0.04 ~ 2362 ipm)	
	Axis acceleration/deceleration	1.0 G	
Automatic tool changer	Tool shank	No. 40	
	Tool storage capacity	40	
	Max. tool diameter/length (from gauge line)/weight	ø95 mm/510 mm/12 kg (ø3.74"/ 20.08"/ 26 lbs) (max. moment: 5.9 N·m (4.35 ft·lbs))	
	Max. tool diameter with adjacent pockets empty	ø170 mm (ø6.69")	
	Tool selection method	Random selection/shortest path	
	Tool change time (chip-to-chip)	2.6 sec	
Automatic pallet changer	Number of pallets	2	1
	Changing system	Rotary type	—
	Pallet change time	8.0 sec	—
Motors	Spindle motor (40% ED (30-min. rating)/cont. rating)	18.5 kW/15 kW (25 hp/20 hp)	
	Flood coolant pump motor	730 W / 1210 W (50 Hz/60 Hz)	
Power requirement	Electrical power supply (40% ED (30-min. rating)/cont. rating)	48.4 kVA/43.4 kVA (50 Hz), 50.2 kVA/45.2 kVA (60 Hz)	
	Air supply (pressure/flow rate)	0.5 MPa ~ 0.9 MPa (70 ~ 130 psi) /85 L/min (3 ft³/min) *2	
Machine size	Machine height	2813 mm (110.75")	
	Width × length*2	2623 mm × 5769 mm (103.28" × 227.13")	2702 mm × 4706 mm (106.38" × 185.28")
	Machine weight	11430 kg (25198 lbs)	10750kg (23699 lbs)

\*1 Limited feedrate with continuous axis movement

\*2 210 L/min (7.42 ft³/min) for optional 14000, 18000 and 30000 rpm spindle

\*3 Including rear coolant tank and chip conveyor (ConSep2000)

# Standard Machine Specifications

		HCN-5000/50	HCN-5000/50S
Stroke	X axis (column right/left)	730 mm (28.74")	
	Y axis (spindle up/down)	730 mm (28.74")	
	Z axis (table back/forth)	800 mm (31.5")	
	Distance between table top to spindle nose	70 mm ~ 870 mm (2.76" ~ 34.25")	
	Distance between pallet to spindle center	100 mm ~ 830 mm (3.94" ~ 32.68")	
Table	Table size	500 mm × 500 mm (19.69" × 19.69")	
	Max. workpiece dimensions	ø800 mm × 1000 mm (ø31.5" × 39.37")	
	Pallet load capacity (evenly distributed)	500 kg (1102 lbs)	
	Pallet top surface	5/8-11 UNC tapped holes 25 places 100 mm (3.94") pitch	5/8-11 UNC tapped holes 8 places 200 mm (7.87") pitch
	Minimum indexing angle increment	1°	
	Indexing time	1.4 sec/90°	
Spindle	Max. spindle speed	10000 rpm	
	Spindle speed range	2-step (electric)	
	Spindle taper	No.50	
	Spindle bearing ID	ø90 mm (3.54")	
	Spindle acceleration	1.2 sec (0 → 10000 rpm)	
Feedrate	Rapid traverse rate (X, Y, Z axis)*1	60000 mm/min (2362 ipm)	
	Cutting feedrate (X, Y, Z axis)*1	1 mm ~ 60000 mm/min (0.04 ~ 2362 ipm)	
	Axis acceleration/deceleration	0.9 G/1.0 G	
Automatic tool changer	Tool shank	No. 50	
	Tool storage capacity	43	
	Max. tool diameter/length (from gauge line)/weight	ø125 mm/510 mm/30 kg (ø4.92"/20.08"/66.14 lbs) (max. moment: 29.4 N·m) (22 ft·lbs)	
	Max. tool diameter with adjacent pockets empty	ø250 mm (ø9.84")	
	Tool selection method	Random selection/shortest path	
	Tool change time (chip-to-chip)	3.5 sec	
Automatic pallet changer	Number of pallets	2	1
	Changing system	Rotary type	—
	Pallet change time	8.0 sec	—
Motors	Spindle motor (40% ED (30-min. rating)/cont. rating)	30 kW/22 kW (40 hp/30 hp)	
	Flood coolant pump motor	730 W/1210 W (50 Hz/60 Hz)	
Power requirement	Electrical power supply (40% ED (30-min. rating)/cont. rating)	65.7 kVA/54.2 kVA (50 Hz), 67.6 kVA/56.0 kVA (60 Hz)	
	Air supply (pressure/flow rate)	0.5 MPa ~ 0.9 MPa (70 ~ 130 psi)/210 L/min (7.42 ft³/min)	
Machine size	Machine height	2813 mm (110.75")	
	Width × length*2	2685 mm × 5804 mm (105.72" × 228.49")	2802 mm × 4910 mm (110.32" × 193.31")
	Machine weight	12830 kg (28285 lbs)	12150 kg (26786 lbs)

\*1 Limited feedrate with continuous axis movement

\*2 Including rear coolant tank and chip conveyor (ConSep2000)

		HCN-6000
Stroke	X axis (column right/left)	800 mm (31.50")
	Y axis (spindle up/down)	800 mm (31.50")
	Z axis (table back/forth)	800 mm (31.50")
	Distance between table top to spindle nose	150 mm ~ 950 mm (5.91" ~ 37.4")
	Distance between pallet to spindle center	100 mm ~ 900 mm (3.94" ~ 35.43")
Table	Table size	500 mm × 500 mm (19.69" × 19.69")
	Max. workpiece dimensions	ø900 mm × 1000 mm (ø35.43" × 39.37")
	Pallet load capacity (evenly distributed)	1000 kg (2205 lbs)
	Pallet top surface	5/8-11 UNC tapped holes 25 places at 100 mm (3.94") pitch
	Minimum indexing angle increment	1°
	Indexing time	1.9 sec/90°
Spindle	Max. spindle speed	10000 rpm
	Spindle speed range	2-step (electric)
	Spindle taper	No. 50
	Spindle bearing ID	ø100 mm (ø3.94")
	Spindle acceleration	3.0 sec (0 → 10000 rpm)
Feedrate	Rapid traverse rate (X, Y, Z axis)*1	60000 mm/min (2362 ipm)
	Cutting feedrate (X, Y, Z axis)*1	1 mm × 60000 mm/min (0.04 ~ 2362 ipm)
	Axis acceleration/deceleration	0.7 G
Automatic tool changer	Tool shank	No. 50
	Tool storage capacity	43
	Max. tool diameter/length (from gauge line)/weight	ø125 mm/500 mm/30 kg (ø4.92"/19.69"/66 lbs) (max. moment: 29.4 N·m (22 ft·lbs))
	Max. tool diameter with adjacent pockets empty	ø250 mm*2(ø9.84")
	Tool selection method	Random selection, shortest path
	Tool change time (chip-to-chip)	3.5 sec
Automatic pallet changer	Number of pallets	2
	Changing system	Rotary type
	Pallet change time	9.0 sec
Motors	Spindle motor (40% ED (30-min. rating)/cont. rating)	37 kW/30 kW (50 hp/40 hp)
	Flood coolant pump motor	720 W/1180 W (50 Hz/60 Hz)
Power requirement	Electrical power supply (40% ED (30-min. rating)/cont. rating)	87.90 kVA/77.97 kVA (50 Hz), 89.30 kVA/79.38 kVA (60 Hz)
	Air supply (pressure/flow rate)	0.5 MPa ~ 0.9 MPa (70 ~ 130 psi)/350 L /min (12.36 ft <sup>3</sup> /min)
Machine size	Machine height	3380 mm (133.07")
	Width × length*3	3091 mm × 6813 mm (121.70" × 268.24")
	Machine weight	15800 kg (34833 lbs)

\*1 Limited feedrate with continuous axis movement

\*2 When adjacent pockets are empty and pockets next to them have tools less than Φ240 mm (Φ9.45"), maximum tool diameter is Φ260 mm (Φ10.24")

\*3 Including rear coolant tank and chip conveyor (ConSep2000 II)

# Standard and Optional Equipment

		●: Standard ○: Option -: N/A
		<b>HCN-4000</b>
Spindle	12000 rpm (No. 40)	●
	12000 rpm (BBT-40, HSK-A63)	○
	14000 rpm (No. 40, BBT-40, HSK-A63)	○
	18000 rpm (No. 40, BBT-40, HSK-A63)	○
	25000 rpm (BBT-40, HSK-A63)	○
	30000 rpm (HSK-F63)	○
Table	1° indexing table	●
	0.0001° × 3600000 NC rotary table	○
	0.0001° × 3600000 NC rotary table (with scale)	○
	0.0001° × 3600000 DDM table	○
Pallet	400 mm × 400 mm (15.75" × 15.75") tapped pallet without edge locator	●
	400 mm × 400 mm (15.75" × 15.75") tapped pallet with edge locator	○
	400 mm × 400 mm (15.75" × 15.75") tapped pallet with edge locator and center bore	○
	500 mm × 500 mm (19.69" × 19.69") tapped pallet without edge locator	○
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator	○
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator and center bore	○
	500 mm × 400 mm (19.69" × 15.75") tapped pallet with edge locator	○
	500 mm × 400 mm (19.69" × 15.75") tapped pallet with edge locator and center bore	○
Pallet changer	2-pallet changer	●
	6-pallet changer	○
Tool magazine	40-tool drum-type magazine	●
	60-tool drum-type magazine	○
	80-tool chain-type magazine	○
	120-tool chain-type magazine	○
	160-tool chain-type magazine	○
	180-tool rack magazine (TOOL HIVE)	○
	204-tool rack magazine (TOOL HIVE)	○
	240-tool rack magazine (TOOL HIVE)	○
	288-tool rack magazine (TOOL HIVE)	○
	312-tool rack magazine (TOOL HIVE)	○
348-tool rack magazine (TOOL HIVE)	○	
Set up	Automatic tool length measurement & tool breakage detection	●
	Laser milling tool measurement system (RENISHAW/NC4)	○
	Tool breakage detection (detection in ATC area)	○
	Magazine operation panel for tool ID	●
	Mazak monitoring system B (OMP60)	○
Automation	Remote manual pulse generator	○
	Mist collector	○
	Hydraulic power supply through pallet for fixtures [(NC rotary table, NC rotary table (with scale), DDM table)]	○
	Hydraulic power supply from top of machine for fixtures (2 ports/2 pallets)	○
	Preparation for PALLETECH	○
Coolant/ chip disposal	Automatic power ON/OFF + warm up operation	●
	Flood coolant	●
	Coolant through spindle [(0.8 MPa) (116 psi)]	●
	Coolant through spindle [(1.5 MPa, 3.5 MPa) (218 psi, 508 psi)]	○
	Preparation for coolant through spindle [(7.0 MPa) (1015 psi)]	○
	Niagara coolant	●
	Secondary coolant filter for aluminum	○
	Hand held coolant nozzle (for workpiece washing on pallet changer)	○
	Oil skimmer (RB-200)	○
	Magnetic separator for cast iron	○
	Preparation for chip conveyor (rear discharge ConSep 2000)	●
Chip conveyor (rear discharge, ConSep 2000)	○	
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●
	Chiller unit	●
	Hydraulic unit temperature control	○
	Coolant temperature control	○
	Scale feedback (X, Y, Z axis)	○

		●: Standard ○: Option -: N/A	
		HCN-5000	HCN-5000S
Spindle	12000 rpm (No. 40)	●	●
	12000 rpm (BBT-40, HSK-A63)	○	○
	14000 rpm (No. 40, BBT-40, HSK-A63)	○	○
	18000 rpm (No. 40, BBT-40, HSK-A63)	○	○
	25000 rpm (BBT-40, HSK-A63)	○	○
	30000 rpm (HSK-F63)	○	○
Table	1° indexing table	●	●
	0.0001° × 3600000 NC rotary table	○	○
	0.0001° × 3600000 NC rotary table (with scale)	○	○
	0.0001° × 3600000 DDM table	○	○
	Table load capacity 500 kg (1102 lbs)*	●	●
	Table load capacity 700 kg (1543 lbs)*	○	○
Pallet	500 mm × 500 mm (19.69" × 19.69") tapped pallet without edge locator	●	●
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator	○	○
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator and center bore	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet with edge locator	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet with edge locator and center bore	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet with edge locator	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet with edge locator and center bore	○	○
Pallet changer	2-pallet changer	●	-
	6-pallet changer	○	-
Tool magazine	40-tool drum-type magazine	●	●
	60-tool drum-type magazine	○	○
	80-tool chain-type magazine	○	○
	120-tool chain-type magazine	○	○
	160-tool chain-type magazine	○	○
	180-tool rack magazine (TOOL HIVE)	○	○
	204-tool rack magazine (TOOL HIVE)	○	○
	240-tool rack magazine (TOOL HIVE)	○	○
	288-tool rack magazine (TOOL HIVE)	○	○
	312-tool rack magazine (TOOL HIVE)	○	○
	348-tool rack magazine (TOOL HIVE)	○	○
Set up	Automatic tool length measurement & tool breakage detection	●	●
	Laser milling tool measurement system (RENISHAW/NC4)	○	○
	Tool breakage detection (detection in ATC area)	○	○
	Magazine operation panel for tool ID	●	●
	Mazak monitoring system B (OMP60)	○	○
	Remote manual pulse generator	○	○
Automation	Mist collector	○	○
	Hydraulic power supply through pallet for fixtures [(NC rotary table, NC rotary table (with scale), DDM table)]	○	○
	Hydraulic power supply from top of machine for fixtures (2 ports/2 pallets)	○	-
	Preparation for PALLETECH	○	-
	Automatic power ON/OFF + warm up operation	●	●
Coolant/ chip disposal	Flood coolant	●	●
	Coolant through spindle [(0.8 MPa) (116 psi)]	●	●
	Coolant through spindle [(1.5 MPa, 3.5 MPa) (218 psi, 508 psi)]	○	○
	Preparation for coolant through spindle [(7.0 MPa) (1015 psi)]	○	○
	Niagara coolant	●	●
	Secondary coolant filter for aluminum	○	○
	Hand-held coolant nozzle (for workpiece washing on pallet changer)	○	○
	Oil skimmer (RB-200)	○	○
	Magnetic separator for cast iron	○	○
	Preparation for chip conveyor (rear discharge ConSep 2000)	●	●
	Chip conveyor (rear discharge , ConSep 2000)	○	○
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●	●
	Chiller unit	●	●
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
	Scale feedback (X, Y, Z axis)	○	○

\*Without pallet weight

# Standard and Optional Equipment

		●: Standard ○: Option -: N/A	
		HCN-5000/50	HCN-5000/50S
Spindle	10000 rpm (No. 50)	●	●
	10000 rpm (BBT-50, HSK-A100)	○	○
Table	1° indexing table	●	●
	0.0001°× 3600000 NC rotary table	○	○
	0.0001°× 3600000 NC rotary table (with scale)	○	○
	0.0001°× 3600000 DDM table	○	○
	Table load capacity 500 kg (1102 lbs)*	●	●
	Table load capacity 700 kg (1543 lbs)*	○	○
	A-axis table	-	○
Pallet	500 mm × 500 mm (19.69" × 19.69") tapped pallet without edge locator	●	●
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator and center bore	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet without edge locator	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet with edge locator and center bore	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet without edge locator	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet with edge locator and center bore	○	○
Pallet changer	2-Pallet changer	●	-
	6-Pallet changer	○	-
Tool magazine	43-tool drum-type magazine	●	●
	60-tool drum-type magazine	○	○
	80-tool chain-type magazine	○	○
	120-tool chain-type magazine	○	○
	160-tool chain-type magazine	○	○
	180-tool rack magazine (TOOL HIVE)	○	○
	204-tool rack magazine (TOOL HIVE)	○	○
	240-tool rack magazine (TOOL HIVE)	○	○
	288-tool rack magazine (TOOL HIVE)	○	○
	312-tool rack magazine (TOOL HIVE)	○	○
348-tool rack magazine (TOOL HIVE)	○	○	
Set up	Automatic tool length measurement & tool breakage detection	●	●
	Laser milling tool measurement system (RENISHAW/NC4)	○	○
	Tool breakage detection (detection in ATC area)	○	○
	Magazine operation panel for tool ID	●	●
	Mazak monitoring system B (OMP60)	○	○
	Remote manual pulse generator	○	○
Automation	Mist collector	○	○
	Hydraulic power supply through pallet for fixtures (NC rotary table, NC rotary table (with scale), DDM table)	○	○
	Hydraulic power supply from top of machine for fixtures (2 ports/2 pallets)	○	-
	Preparation for PALLETECH	○	-
	Automatic power ON/OFF + warm up operation	●	●
Coolant/chip disposal	Flood coolant	●	●
	Coolant through spindle (0.8 MPa) (116 psi)	●	●
	Coolant through spindle (1.5 MPa, 3.5 MPa) (218 psi, 508 psi)	○	○
	Preparation for coolant through spindle (7.0 MPa) (1015 psi)	○	○
	Niagara coolant	●	●
	Secondary coolant filter for aluminum	○	○
	Hand held coolant nozzle (for workpiece washing on pallet changer)	○	○
	Oil skimmer (RB-200)	○	○
	Magnetic separator for cast iron	○	○
	Preparation for chip conveyor (rear discharge, ConSep2000)	●	●
	Chip conveyor (rear discharge, ConSep2000)	○	○
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●	●
	Chiller unit	●	●
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
	Scale feedback (X, Y, Z axis)	○	○

\* Without pallet weight

		●: Standard ○: Option -: N/A	
		HCN-5000	HCN-5000S
Spindle	12000 rpm (No. 40)	●	●
	12000 rpm (BBT-40, HSK-A63)	○	○
	14000 rpm (No. 40, BBT-40, HSK-A63)	○	○
	18000 rpm (No. 40, BBT-40, HSK-A63)	○	○
	25000 rpm (BBT-40, HSK-A63)	○	○
	30000 rpm (HSK-F63)	○	○
Table	1° indexing table	●	●
	0.0001° × 3600000 NC rotary table	○	○
	0.0001° × 3600000 NC rotary table (with scale)	○	○
	0.0001° × 3600000 DDM table	○	○
	Table load capacity 500 kg (1102 lbs)*	●	●
	Table load capacity 700 kg (1543 lbs)*	○	○
Pallet	500 mm × 500 mm (19.69" × 19.69") tapped pallet without edge locator	●	●
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator	○	○
	500 mm × 500 mm (19.69" × 19.69") tapped pallet with edge locator and center bore	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet with edge locator	○	○
	630 mm × 630 mm (24.80" × 24.80") tapped pallet with edge locator and center bore	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet with edge locator	○	○
	630 mm × 500 mm (24.80" × 19.69") tapped pallet with edge locator and center bore	○	○
Pallet changer	2-pallet changer	●	-
	6-pallet changer	○	-
Tool magazine	40-tool drum-type magazine	●	●
	60-tool drum-type magazine	○	○
	80-tool chain-type magazine	○	○
	120-tool chain-type magazine	○	○
	160-tool chain-type magazine	○	○
	180-tool rack magazine (TOOL HIVE)	○	○
	204-tool rack magazine (TOOL HIVE)	○	○
	240-tool rack magazine (TOOL HIVE)	○	○
	288-tool rack magazine (TOOL HIVE)	○	○
	312-tool rack magazine (TOOL HIVE)	○	○
	348-tool rack magazine (TOOL HIVE)	○	○
Set up	Automatic tool length measurement & tool breakage detection	●	●
	Laser milling tool measurement system (RENISHAW/NC4)	○	○
	Tool breakage detection (detection in ATC area)	○	○
	Magazine operation panel for tool ID	●	●
	Mazak monitoring system B (OMP60)	○	○
	Remote manual pulse generator	○	○
Automation	Mist collector	○	○
	Hydraulic power supply through pallet for fixtures [(NC rotary table, NC rotary table (with scale), DDM table)]	○	○
	Hydraulic power supply from top of machine for fixtures (2 ports/2 pallets)	○	-
	Preparation for PALLETECH	○	-
	Automatic power ON/OFF + warm up operation	●	●
Coolant/ chip disposal	Flood coolant	●	●
	Coolant through spindle [(0.8 MPa) (116 psi)]	●	●
	Coolant through spindle [(1.5 MPa, 3.5 MPa) (218 psi, 508 psi)]	○	○
	Preparation for coolant through spindle [(7.0 MPa) (1015 psi)]	○	○
	Niagara coolant	●	●
	Secondary coolant filter for aluminum	○	○
	Hand-held coolant nozzle (for workpiece washing on pallet changer)	○	○
	Oil skimmer (RB-200)	○	○
	Magnetic separator for cast iron	○	○
	Preparation for chip conveyor (rear discharge ConSep 2000)	●	●
Chip conveyor (rear discharge, ConSep 2000)	○	○	
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●	●
	Chiller unit	●	●
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
	Scale feedback (X, Y, Z axis)	○	○

\*Without pallet weight

# MAZATROL SmoothG Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	
Least input increment	0.0001 mm, 0.00001", 0.0001 deg	
High-speed, high-precision control	Shape compensation, SMOOTH CORNER CONTROL, Rapid traverse overlap, Rotary axis shape compensation	Shape compensation, SMOOTH CORNER CONTROL, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Synchronous tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time/rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time/rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant*
Program registration	Number of programs: 256 (Standard)/960 (Max.), Program memory: 2MB, Program memory expansion: 8MB*, Program memory expansion: 32 MB*	
Control display	Display: 19" touch panel/Resolution: SXGA	
Spindle functions	S code output, Spindle speed limitation, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Spindle speed range setting	
Tool functions	Number of tool offset: 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)	Number of tool offset: 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)
Miscellaneous functions	M code output, Simultaneous output of multiple M codes	
Tool offset functions	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool wear offset	
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	-	Shaping function*, Dynamic compensation II *
Machine compensation	Backlash compensation, Pitch error compensation, Volumetric compensation*	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, SAFETY SHIELD (manual mode), SAFETY SHIELD (automatic mode)*, VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine
Automatic measuring functions	WPC coordinate measurement, Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*	Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*
MDI measurement	Partial auto tool length measurement, Auto tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Card interface	SD card interface, USB	
EtherNet	10M/100M/1Gbps	

\* Option

\*Option

# Environmentally friendly

## Designed with environmental considerations

The environment and our impact on natural surroundings have always been important concerns for Mazak. All factories in Japan that produce Mazak machine tools are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land.

### Reduced electrical power consumption

An automatic-off LED worklight and CNC screen are standard equipment. The chip conveyor stops operation automatically after cycle completion for reduced electrical power consumption.

### Reduced lubricant consumption

High-efficiency lubrication system delivers the optimal amount of grease to the linear roller guides and ballscrew for lower lubricant consumption.

### Extended coolant service life

The grease lubrication system eliminates tramp oil for extended coolant service life.

## Energy Dashboard OPTION

Process screen displays total energy consumption



### ⚡ Electrical consumption display



### ⚡ Electrical consumption statistics/analysis display



# Mazak

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