



YAMAZAKI MAZAK CORPORATION

1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131 FAX : +(81)587-95-2717

www.mazak.com

- Specifications are subject to change without notice.
- This product is subject to all applicable export control laws and regulations.
- The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions. (room temperature, workpiece materials, tool material, cutting conditions, etc.)
- Unauthorized copying of this catalogue is prohibited.

HCN SERIES 20.07.0 GH 99J342218E2

HCN SERIES



4000
5000
5000S
5000/50
5000/50S
6000



HCN
S E R I E S



Advanced features of the MAZATROL SmoothC and SmoothG CNC

Fastest CNC in the world—Latest hardware and software for
unprecedented speed and precision

Operation control panel layout and process support home screen
designed for unsurpassed ease of operation

CNC system with the essentials for your programming requirements
[MAZATROL SmoothC]

Smooth graphical user interface allows operation similar to
your smart phone / tablet for unsurpassed ease of operation
[MAZATROL SmoothG]

PC with Windows® 8 embedded OS [MAZATROL SmoothG]

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



MAZATROL
SMOOTHC
MAZATROL
SMOOTHG

Standard CNC system varies by market.

High speed, high accuracy horizontal machining center

HCN SERIES



Designed for unsurpassed productivity

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

Extensive series range to meet any machining requirement



HCN-4000 No.40 spindle taper

High speed machining of small components

Max. spindle speeds :
from 12000 min⁻¹ (rpm) to 30000 min⁻¹ (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 min⁻¹ (rpm) to 30000 min⁻¹ (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



HCN-5000S No.40 spindle taper

Single table machine for large volume production

Max. spindle speeds :
from 12000 min⁻¹ (rpm) to 30000 min⁻¹ (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
Gantry loader preparation : **optionally available**



HCN-5000/50 No.50 spindle taper

Optimum for large volume production of small to mid size steel and castings components

Max. torque : **216 N·m [40% ED]**
Max. tool diameter : **Φ250 mm***
Spindle acceleration : **1.2 sec.**

* When adjacent pockets are empty and pockets next to them have tools less than 240 mm, max. tool diameter is Φ260 mm.



HCN-5000/50S No.50 spindle taper

Single table machine for convenient integration into a production line

Max. torque : **216 N·m [40% ED]**
Max. tool diameter : **Φ250 mm***
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, max. tool diameter is Φ260 mm.



HCN-6000 No.50 spindle taper

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

Max. torque : **350 N·m [10000 min⁻¹ (rpm), 30 min. rating to] to 442 N·m [7000 min⁻¹ (rpm), 30 min. rating]**

Max. tool diameter : **Φ250 mm***
Max. tool length : **500 mm**
Max. table load : **1000 kg**

* When adjacent pockets are empty and pockets next to them have tools less than 240 mm, max. tool diameter is Φ260 mm.



Workpiece : Connecting rod
Material : SCM 435

Workpiece : Pump cover
Material : SC 450

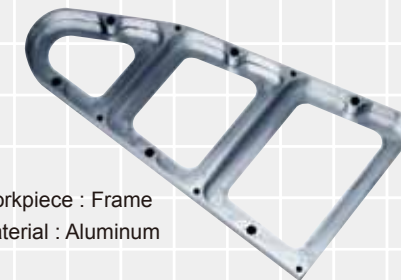


Workpiece : Housing
Material : FC 250

Workpiece : Crankcase
Material : Aluminum



Workpiece : Frame
Material : Aluminum



Workpiece : Cylinder head
Material : Aluminum



Workpiece : Rib
Material : Aluminum



Workpiece : Gear box
Material : SCM 435

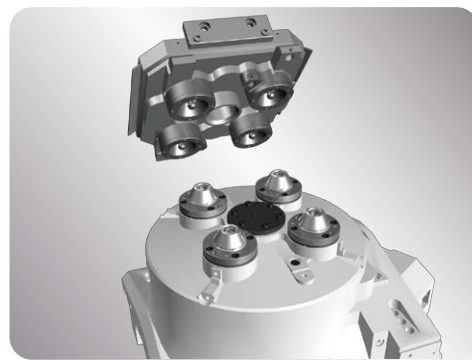


Higher Productivity & Higher Accuracy

High rigidity construction for high accuracy machining

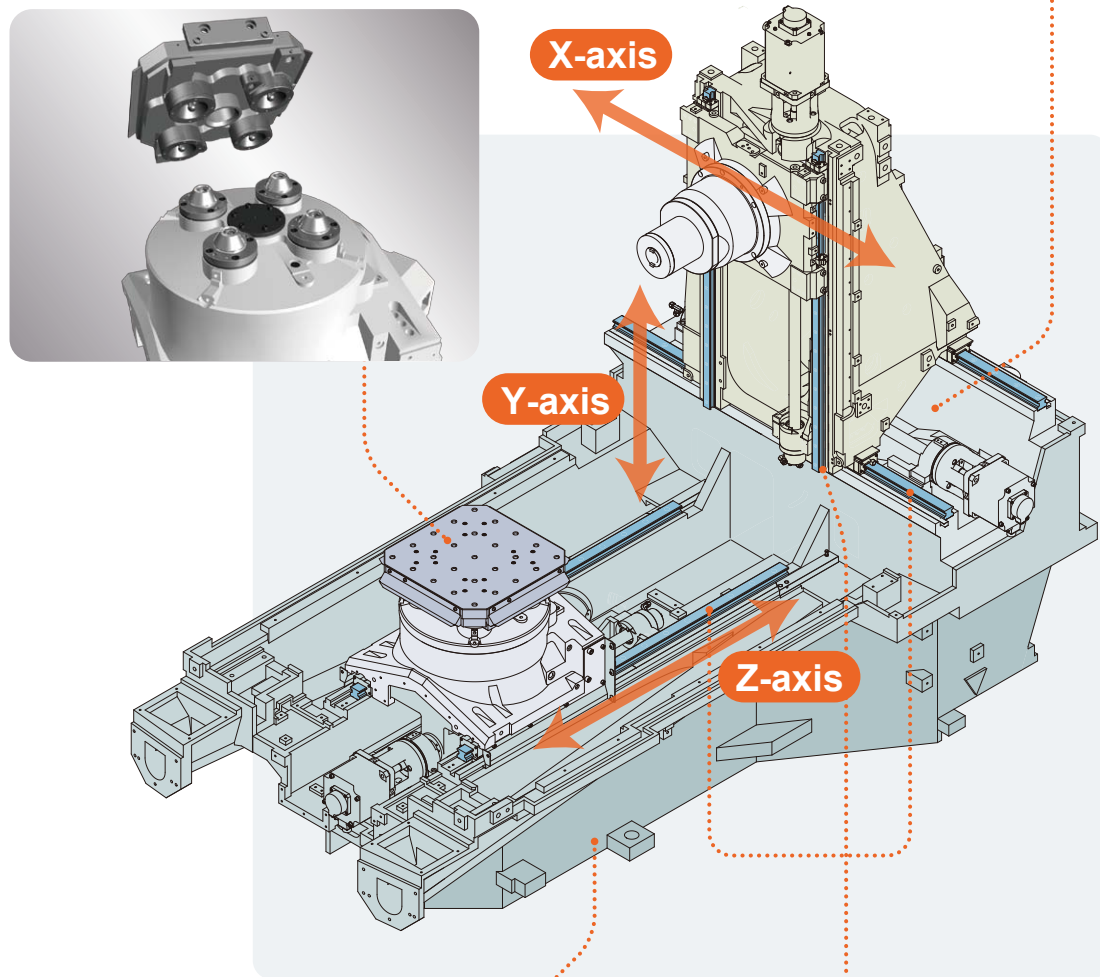
Table coupling

The table and pallet are clamped on 4 taper cones by 73.2 kN of force.
The index table coupling is clamped by 85.2 kN of force for stable machining 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
(X-, Y-, Z-axis)

Maximum feedrate
60 m/min
(X-, Y-, Z-axis)

Acceleration / deceleration
1.0 G
(X-, Y-, Z-axis)
(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.

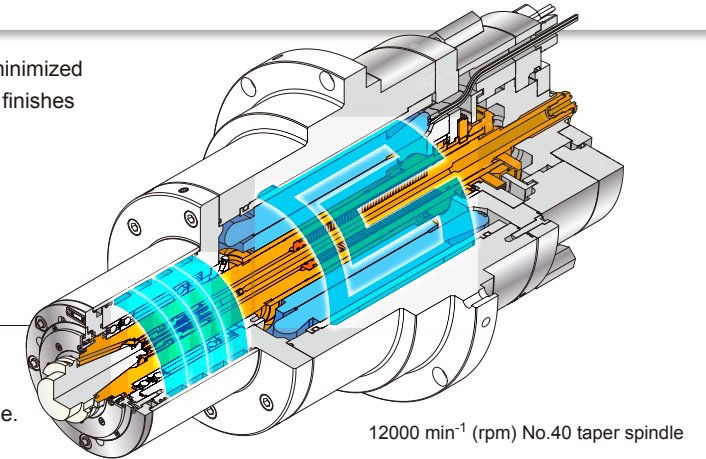
Linear roller guides utilized on the X-,Y- and Z-axis

Linear roller guides on the X-, Y-, and Z-axis are utilized by the HCN series in order 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.



12000 min⁻¹ (rpm) No.40 taper spindle

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.

X-, Y-, Z-axis ball screw core cooling

Temperature controlled cooling oil circulates through the ball screw 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

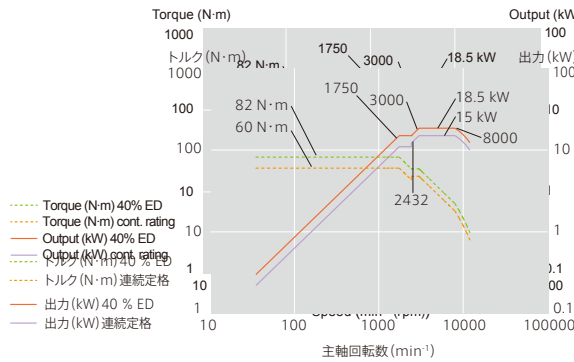
HCN-4000, HCN-5000, HCN-5000S

Standard

High speed machining of steel, cast iron and aluminum

No.40	Speed	12000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 18.5 kW (25 HP) [40% ED] AC 15 kW (20 HP) [cont. rating]
Grease lubrication	Max. torque	82 N·m (8.3 kgf·m) [40% ED]

12000 min⁻¹ (rpm) Milling spindle output / torque diagram

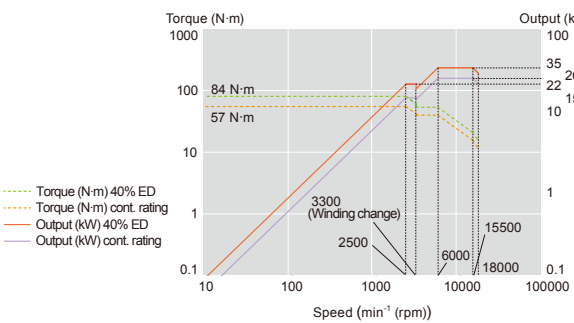


General machining

Designed for versatile performance

No.40	Speed	18000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 35 kW (47 HP) [40% ED] AC 26 kW (35 HP) [cont. rating]
Oil & air lubrication	Max. torque	84 N·m (8.5 kgf·m) [40% ED]

18000 min⁻¹ (rpm) Milling spindle output / torque diagram

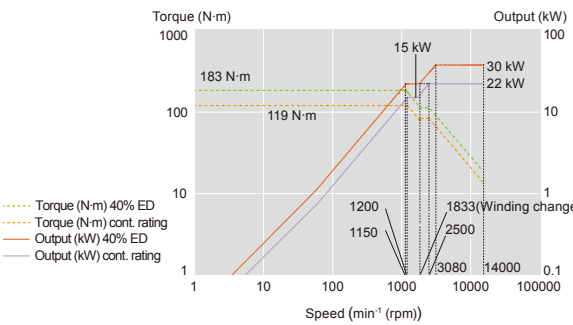


High torque

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

No.40	Speed	14000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 30 kW (40 HP) [40% ED] AC 22 kW (30 HP) [cont. rating]
Oil & air lubrication	Max. torque	183 N·m (18.6 kgf·m) [40% ED]

14000 min⁻¹ (rpm) Milling spindle output / torque diagram

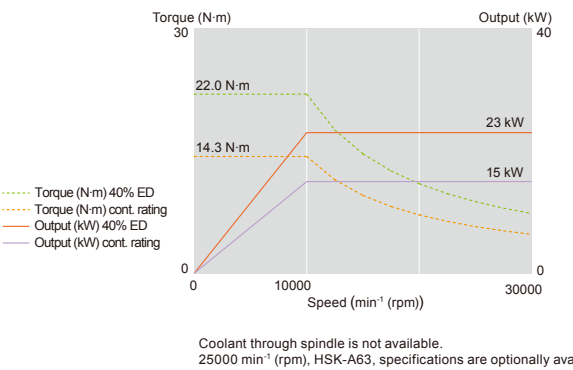


High speed

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

HSK-F63	Speed	30000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 23 kW (30.6 HP) [40% ED] AC 15 kW (20 HP) [cont. rating]
Oil & air lubrication	Max. torque	22 N·m (2.2 kgf·m) [40% ED]

30000 min⁻¹ (rpm) Milling spindle output / torque diagram



Coolant through spindle is not available.
25000 min⁻¹ (rpm), HSK-A63, specifications are optionally available.

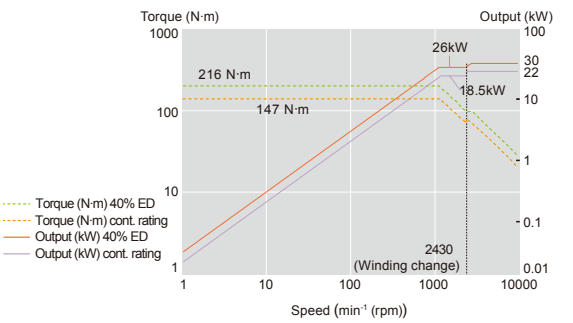
HCN-5000/50, HCN-5000/50S

Standard

Large volume production of small / mid-size steel and castings components

No.50	Speed	10000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 30 kW (40 HP) [40% ED] AC 22 kW (30 HP) [cont. rating]
Oil & air lubrication	Max. torque	216 N·m (22.02 kgf·m) [40% ED]

10000 min⁻¹ (rpm) Milling spindle output / torque diagram



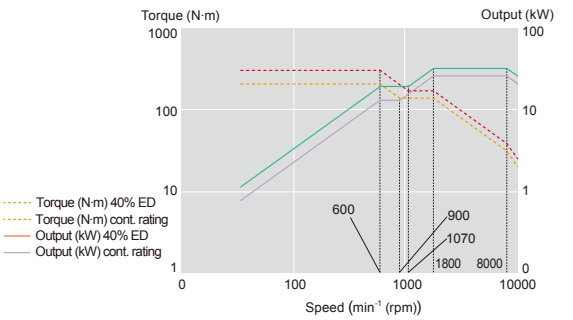
HCN-6000

Standard

For general purpose machining of a variety of materials

No.50	Speed	10000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 37 kW (50 HP) [40% ED] AC 30 kW (40 HP) [cont. rating]
Oil & air lubrication	Max. torque	350 N·m (35.68 kgf·m) [40% ED]

10000 min⁻¹ (rpm) Milling spindle output / torque diagram

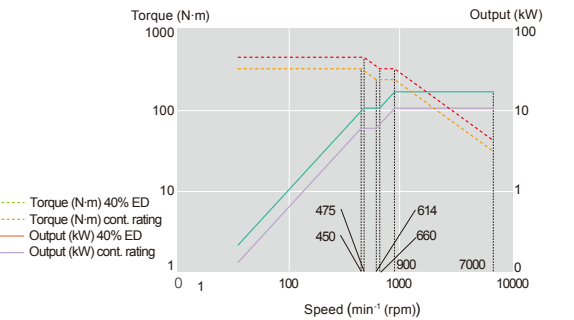


High torque

Heavy duty machining of steel and cast iron

No.50	Speed	7000 min ⁻¹ (rpm)
Integral spindle / motor	Output	AC 30 kW (40 HP) [40% ED] AC 22 kW (30 HP) [cont. rating]
Oil & air lubrication	Max. torque	442 N·m (25.07 kgf·m) [40% ED]

7000 min⁻¹ (rpm) Milling spindle output / torque diagram



Higher Productivity

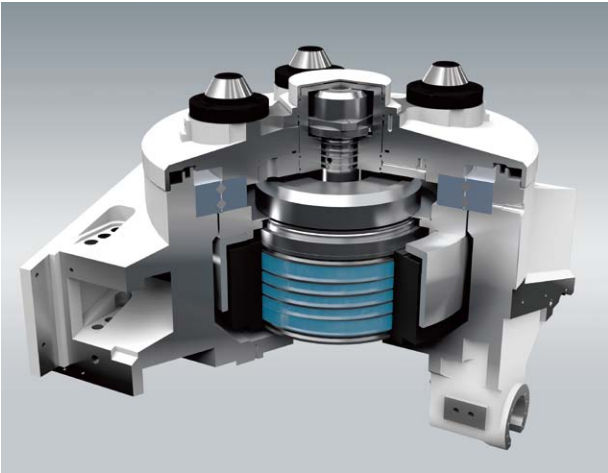
Wide variety of tables available

1° × 360 index table is standard equipment.
NC rotary table and DDM table with 0.0001° × 3600000 positions are optionally available.



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.



Shown with optional automatic top door for gantry loader

A-axis NC positioning table OPTION

High efficiency multiple surface machining.

Max. workpiece dimension / weight

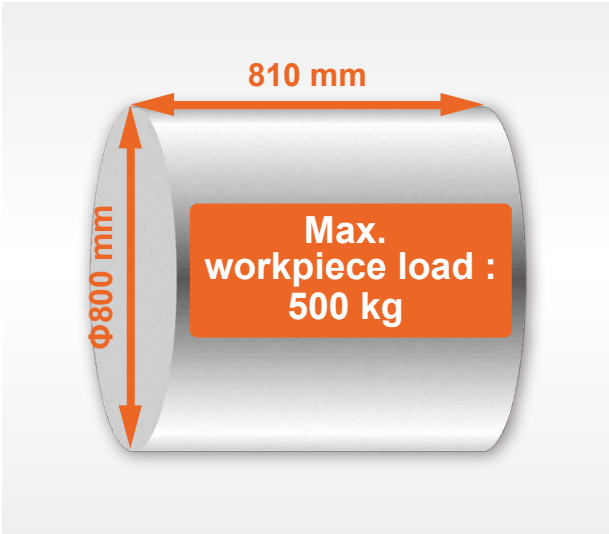


Table specifications

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

[] : Option

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
STANDARD	OPTION	OPTION	STANDARD	OPTION	OPTION	OPTION	STANDARD	OPTION	OPTION
500 kg [700 kg]	500 kg [700 kg]	500 kg [700 kg]	500 kg [700 kg]	500 kg [700 kg]	500 kg [700 kg]	500 kg	1000 kg	1000 kg	1000 kg
1°	0.0001°	0.0001°	1°	0.0001°	0.0001°	1°	1°	0.001°	0.0001°
1.4 sec.	1.2 sec. [1.3 sec.]	0.9 sec. [1.0 sec.]	1.4 sec.	1.2 sec. [1.3 sec.]	0.9 sec. [1.0 sec.]	1.5 sec.	1.9 sec.	2.2 sec.	1.8 sec.

Higher Productivity

ATC

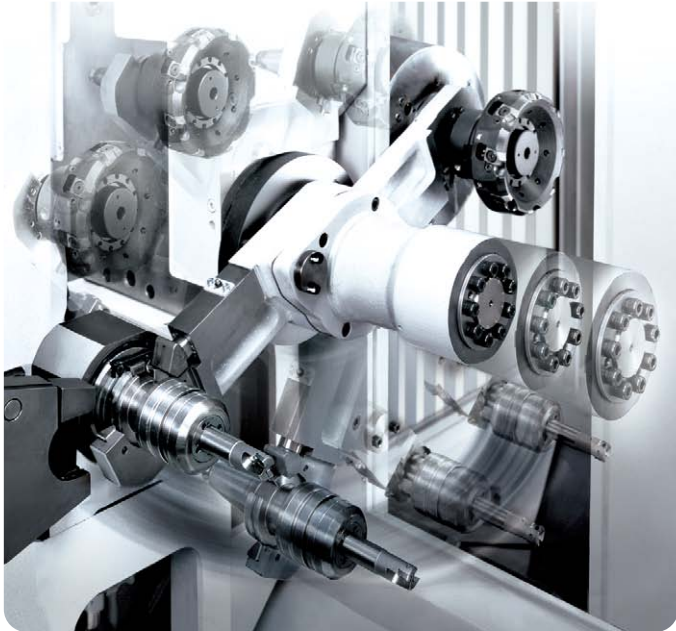
Can handle long boring bars and large diameter mills for higher productivity.

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	510 mm	510 mm [550 mm]	500 mm
	Tool weight		12 kg	12 kg	30 kg	30 kg
	Tool diameter	with adjacent tools	Φ95 mm	Φ95 mm	Φ125 mm	Φ125 mm
		with adjacent pockets empty	Φ170 mm	Φ170 mm	Φ250 mm*1	Φ250 mm*1
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, maximum tool diameter is Φ260 mm.

[] : Option

SMOOTH MACHINING CONFIGURATION

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



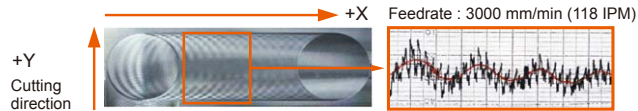
VARIABLE ACCELERATION CONTROL

New function which permits the faster acceleration capability 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.

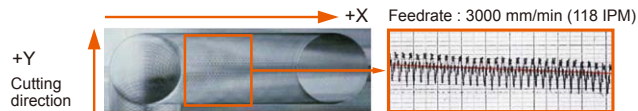
ACTIVE VIBRATION CONTROL

Minimized vibration function for high speed, high accuracy machining and longer tool life.

Other systems



ACTIVE VIBRATION CONTROL

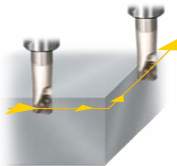


SMOOTH CORNER CONTROL

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

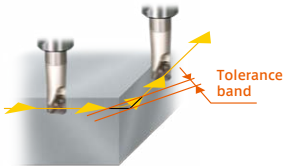
Other systems

Move to next command position after reaching current command position



SMOOTH CORNERCONTROL

Move to next command position within tolerance band

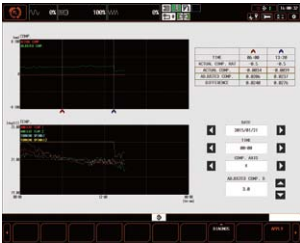


Higher Accuracy

Heat Displacement Control - THERMAL SHIELD

THERMAL SHIELD is an automatic compensation system for room temperature changes, which realizes enhanced continuous machining accuracy. Mazak has performed extensive testing in a variety of environments in a temperature controlled room 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.



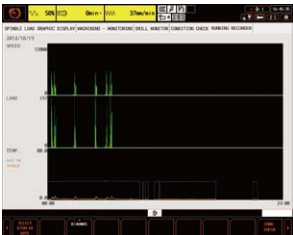
Ease of Maintenance

Comprehensive Spindle Monitoring - PERFORMANCE SPINDLE

The PERFORMANCE SPINDLE monitors a variety of properties such as temperature with sensors housed in the spindle and provides useful information to the operator. Thanks to this monitoring, production loss due to machine down time can be minimized.



▲ Condition check
Temperature as well as the 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 preventative maintenance to prevent unexpected machine downtime.



Automation

Pallet changer

Rotary 2-pallet changer and optional 6-pallet changer.

Fast pallet change

Rotary-type pallet changers quickly change pallets with heavy workpieces for higher productivity.



6-pallet changer OPTION

Multiple workpieces can be setup on the 6 pallets making unmanned operation able to be performed 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	500 kg [700 kg]	1000 kg
Max. workpiece diameter on pallet	Φ630 mm	Φ800 mm	Φ900 mm
Max. workpiece height on pallet	900 mm	1000 mm	1000 mm
Pallet change time	7 sec.	8 sec. [10sec.]	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 optionally available 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 optionally available.

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



PALLETECH SYSTEM

The modular design of the PALLETECH conveniently 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 and three levels for large pallet storage capacity with small floor space requirements.

		Minimum	Maximum
Machine(s)		1	16
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
P M C

FMS control / management software — Unsurpassed ease of system operation to meet sudden changes in schedule.



MAZATROL
SMOOTHG

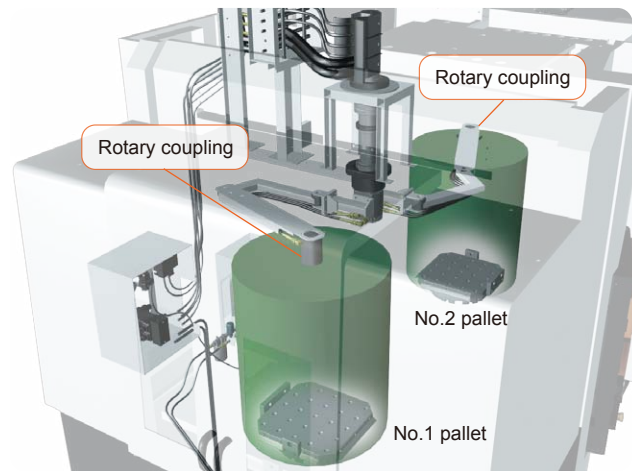
Optional factory automation equipment

Hydraulic fixtures OPTION

Type A (supply from machine top, maximum : 8 ports)

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

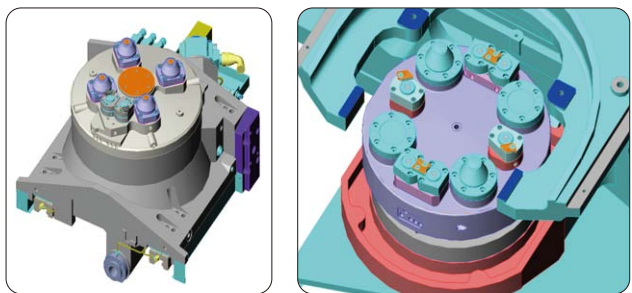
Hydraulic power supply from top



Type B (supply through pallet, maximum : 6 ports)

By using a leak-free coupling, hydraulic power is supplied to the supply port on the pallet bottom.

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

MAZATROL
SMOOTHG

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

MAZATROL
SMOOTHG

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 tool data input, reducing setup time. (requires retention bolt with tool ID and tool presetter)



Ergonomics

Design focus on ergonomics provides unsurpassed ease of operation

Large window

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

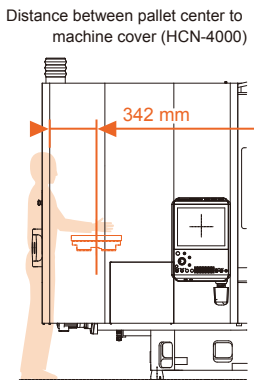


Large window

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

Convenient setup

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



Maintenance area

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

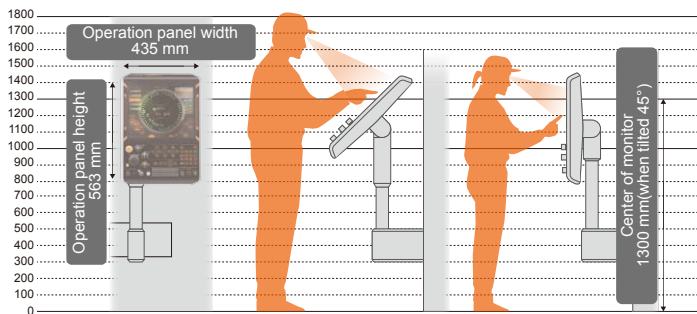


ergonomics

Adjustable CNC touch panel

MAZATROL SMOOTHG

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



Rotating operation panel

MAZATROL SMOOTHG

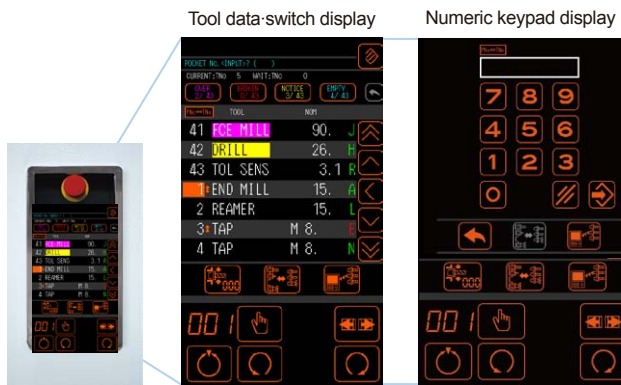
The operation panel easily rotates to each operator's preferred position.



Tool magazine operation panel / Tool ID

MAZATROL SMOOTHG

The tool magazine operation panel is designed for increased ease of operation. Instead of having just a forward / reverse button for indexing the tool magazine and manually positioning the desired tool pocket, the pocket number or tool number can be input into the operation panel numeric keypad and the desired pocket will be automatically brought into position. Additionally, 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. Its display shows the position display and the machine coordinate values. 4 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 for unsurpassed ease of operation

Touch screen operation — operates similar to your smart phone / 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.



Process home screens

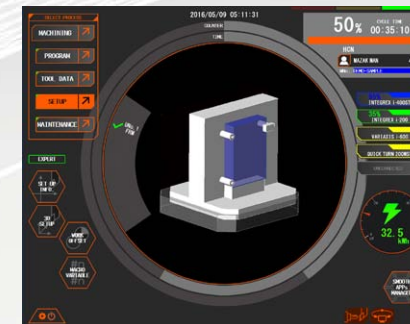
Five different home process screens — each home screen displays the appropriate data in an easy-to-understand manner. Icons can be touched in each process display for additional screen displays.



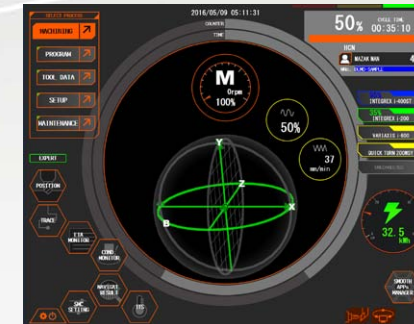
Programming



Tool data



Set up



Machining



Maintenance

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

QUICK MAZATROL

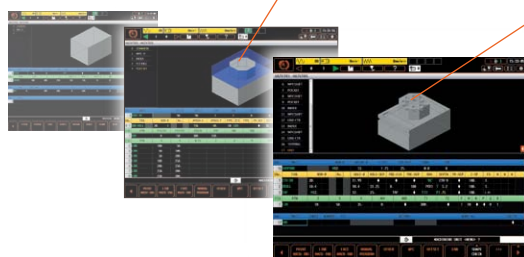
MAZATROL program, unit list and 3D workpiece shape are linked to each other. After defining a machining unit in a MAZATROL program, the 3D shape is immediately displayed to easily and quickly check for any programming error.

3D ASSIST

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

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



CAD model importing

Shape selection

Automatically input to MAZATROL program



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.

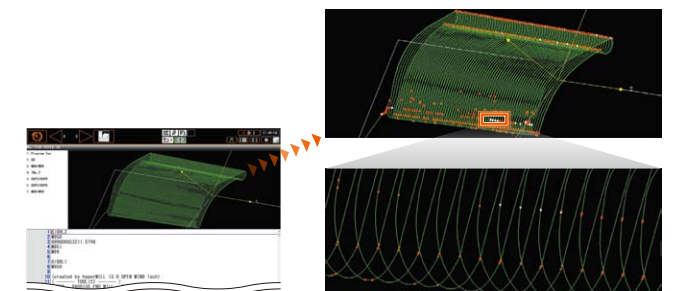
Selecting tool path by touching the screen

Moving to the corresponding EIA program line



VIEW SURF

By analyzing tool path, any predictable failure on the finished surface can be visualized. Program modification can be done before machining to minimize the time for test cutting.



MAZATROL CNC System

MAZATROL SMOOTH^{HC}

4-axes simultaneous CNC

Fastest CNC in the world

— Latest hardware and software for unprecedented speed and precision
Same servo as MAZATROL SmoothG

Essential functions for increased ease of programming

Ease of operation



Home screen

The home screen displays overall process status in an easy to understand manner.

Comprehensive status display on one screen

Machining

Displays axes in operation and load on motors.

Programming

Displays the simulation time and machining time.

Tool data

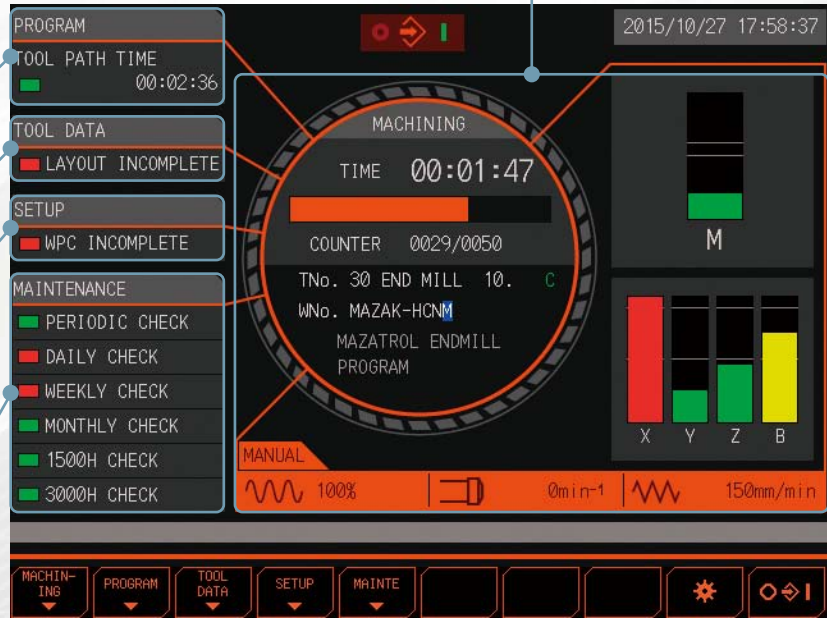
Displays status of tool layout.

Set up

Displays status of workpiece coordinate setting.

Maintenance

Overview of the status of items requiring maintenance.



Simplified display and key input operation

Following traditional conversational MAZATROL programming, this new system is designed for ease of operation by simplified key operation.



Menu keys under the display can be pressed to go to other pages for program data input and editing.

Home screen key goes to the home screen from any display.

Compact keypad with unique design for ease of input

MAZATROL conversational programming

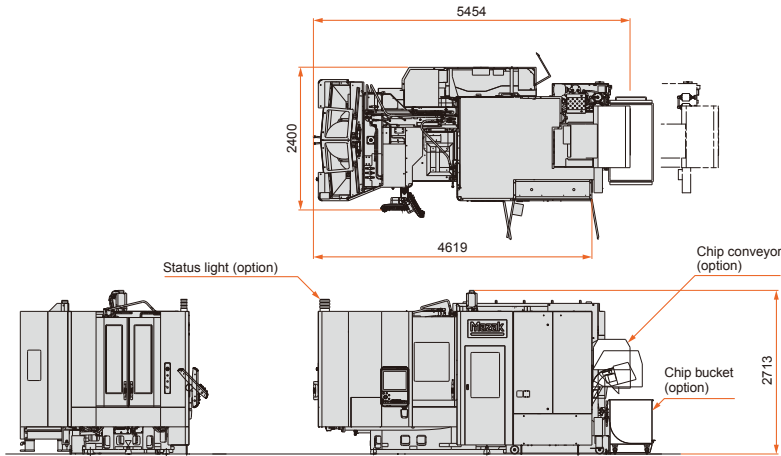
MAZATROL interactive programming uses conversational language and automatically determines cutting conditions, M codes, and G codes. Even a beginner operator can quickly make programs.



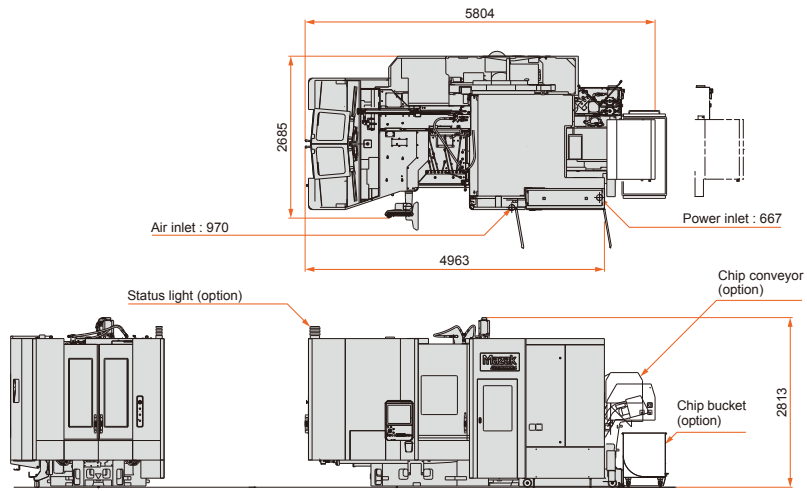
Machine Dimensions (MAZATROL SmoothG)

Unit : mm

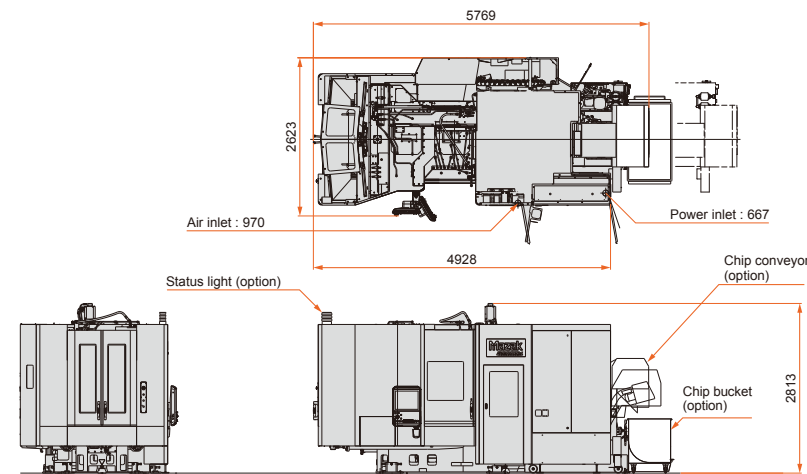
HCN-4000



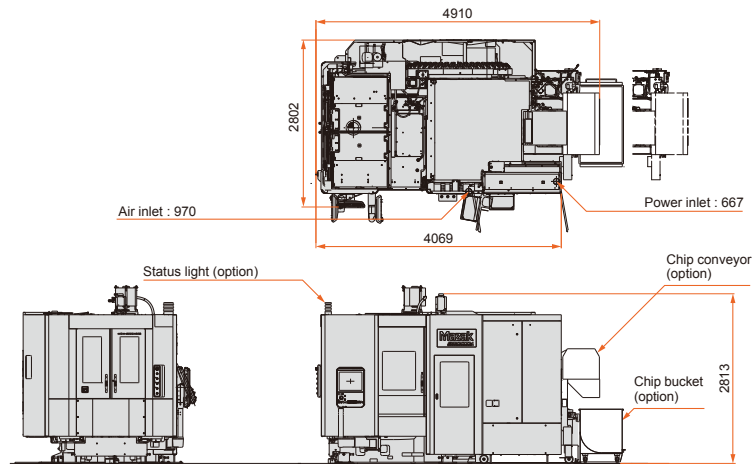
HCN-5000/50



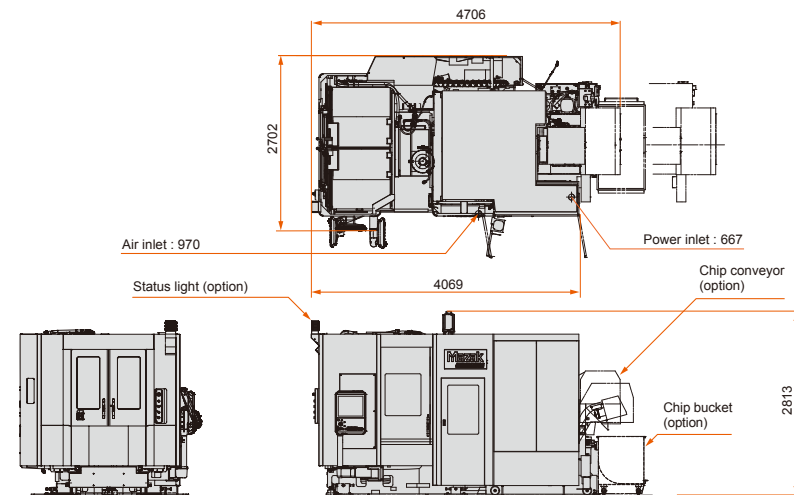
HCN-5000



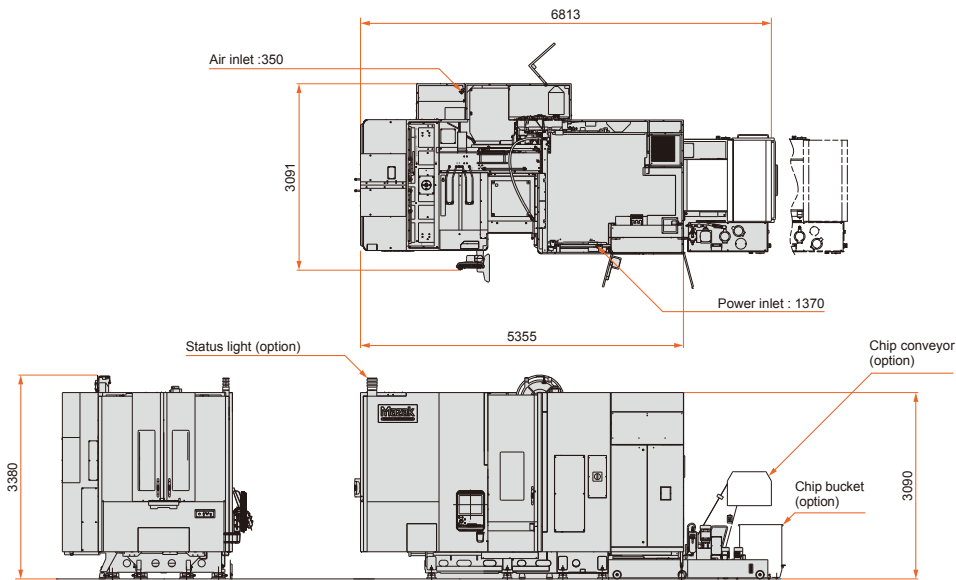
HCN-5000/50S



HCN-5000S



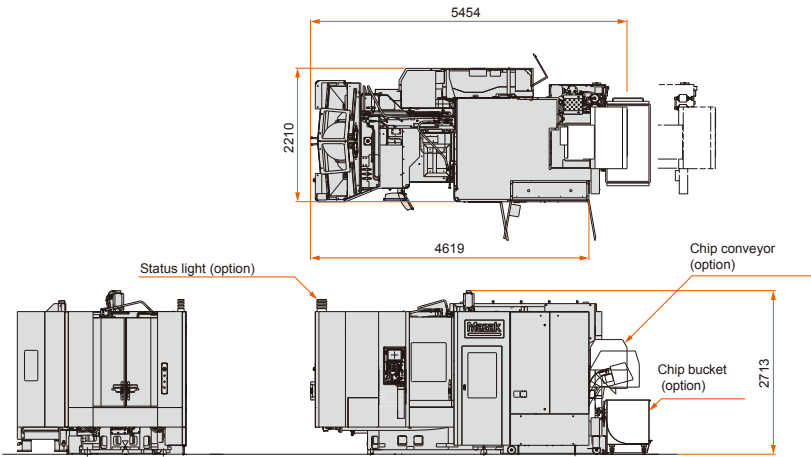
HCN-6000



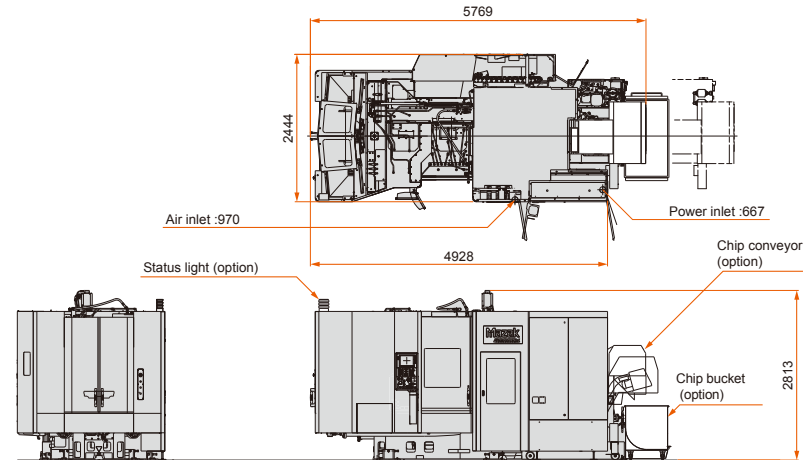
Machine Dimensions (MAZATROL SmoothC)

Unit : mm

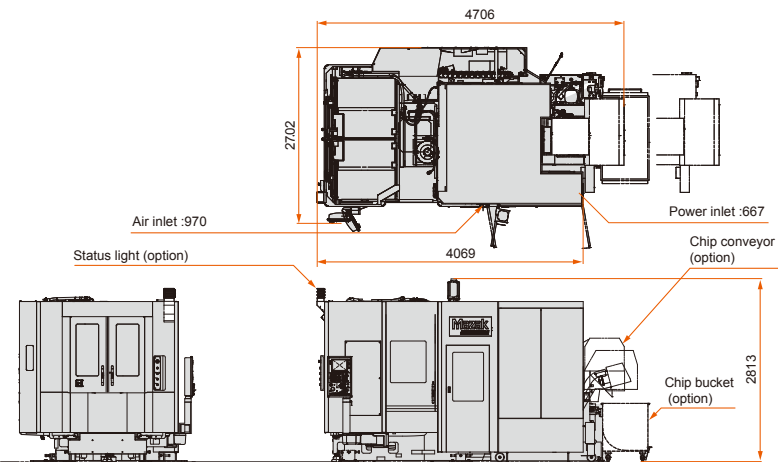
HCN-4000



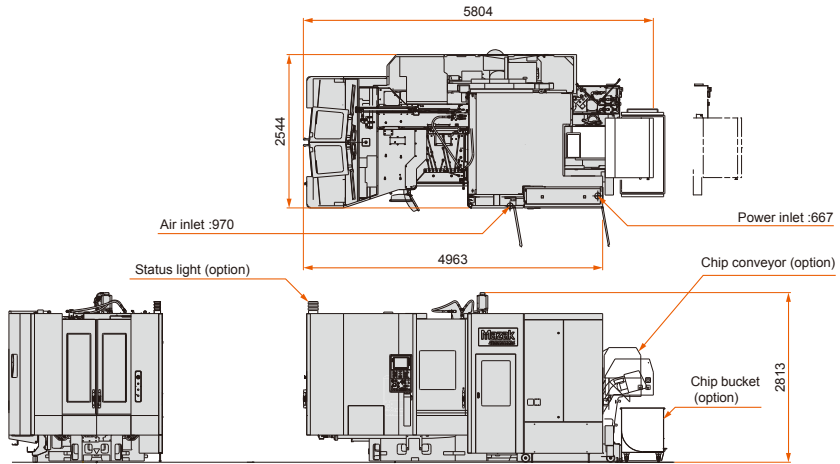
HCN-5000



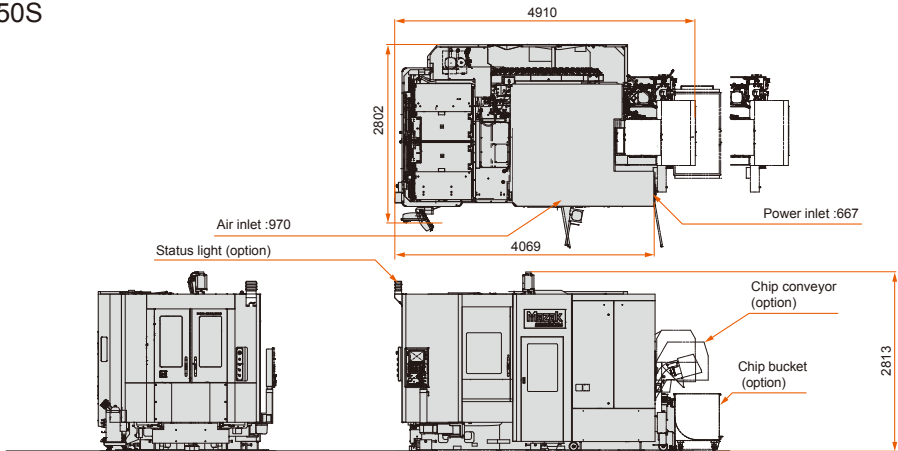
HCN-5000S



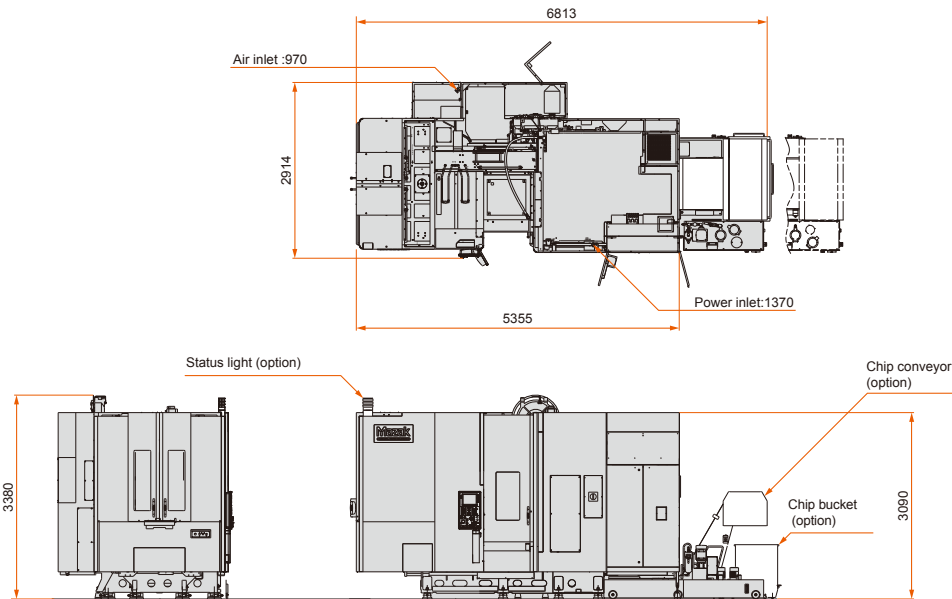
HCN-5000/50



HCN-5000/50S



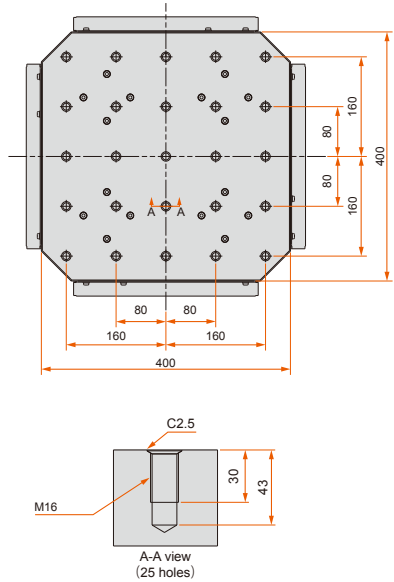
HCN-6000



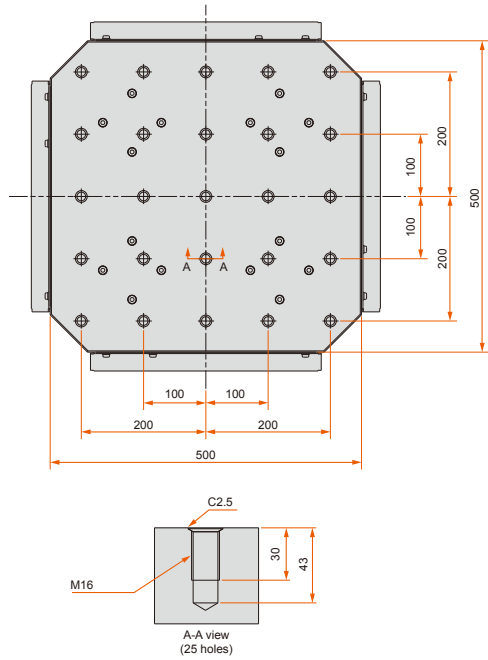
Pallet Dimensions

Unit : mm

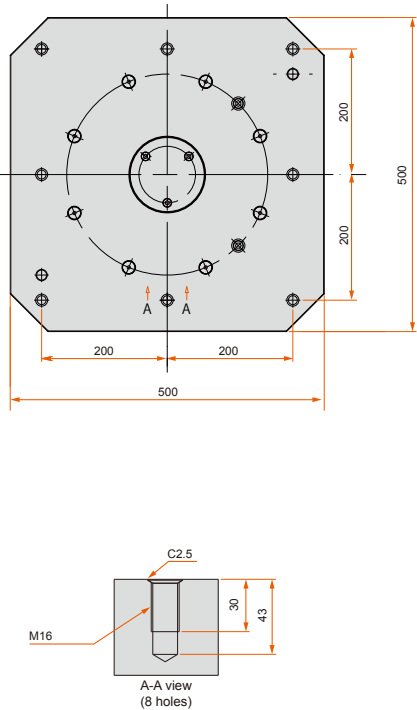
HCN-4000
400 mm × 400 mm tapped pallet



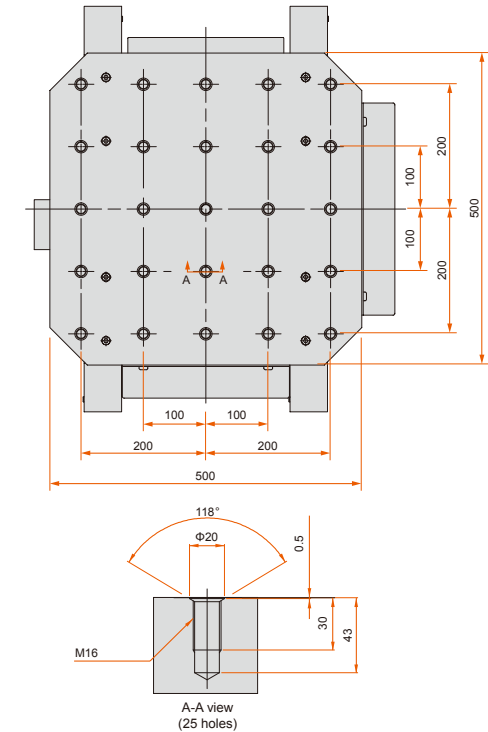
HCN-5000, 5000/50
500 mm × 500 mm tapped pallet



HCN-5000S, 5000/50S
500 mm × 500 mm tapped pallet



HCN-6000
500 mm × 500 mm tapped pallet



Standard Machine Specifications

		HCN-4000
Stroke	X-axis (column right / left)	560 mm
	Y-axis (spindle up / down)	640 mm
	Z-axis (table back / forth)	640 mm
	Distance between table top to spindle nose	70 mm ~ 710 mm
	Distance between pallet top to spindle center	80 mm ~ 720 mm
Table	Table size	400 mm × 400 mm
	Max. workpiece dimensions	Φ630 mm × 900 mm
	Pallet load capacity (evenly distributed)	400 kg
	Pallet top surface	M16 × P2, 25 places 80 mm pitch
	Minimum indexing angle increment	1°
Spindle	Indexing time	1.3 sec. / 90°
	Max. spindle speed	12000 min ⁻¹ (rpm)
	Spindle speed range	2-step (electric)
	Spindle taper	No.40
	Spindle bearing ID	Φ70 mm
Feedrate	Spindle acceleration	1.48 sec. (0 → 12000 min ⁻¹ (rpm))
	Rapid traverse rate (X-, Y-, Z-axis)*1	60000 mm/min
	Cutting feedrate (X-, Y-, Z-axis)*1	1 mm ~ 60000 mm/min
	Axis acceleration / deceleration	1.0 G
Automatic tool changer	Tool shank	MAS BT-40
	Tool storage capacity	40
	Max. tool diameter / length (from gauge line) / weight	Φ95 mm / 420 mm / 12 kg (max. moment : 5.9 N·m)
	Max. tool diameter with adjacent pockets empty	Φ170 mm
	Tool selection method	Random selection / shortest path
Automatic pallet changer	Tool change time (chip-to-chip)	2.4 sec.
	Number of pallets	2
	Changing system	Rotary type
	Pallet change time	7.0 sec.
Motors	Spindle motor (40% ED / 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 / 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 (5 ~ 9 kgf/cm ²) / 210 L/min*2
Machine size	Machine height	2713 mm
	Floor space requirement*3 (MAZATROL SmoothG)	2400 mm × 5454 mm (ConSep2000)
	Floor space requirement*3 (MAZATROL SmoothC)	2210 mm × 5454 mm (ConSep2000)
	Machine weight	10720 kg

*1 Limited feedrate with continuous axis movement
*2 210 L/min for optional 14000, 18000 and 30000 min⁻¹ (rpm) spindle.
*3 Including optional rear coolant tank and chip conveyor
Standard spindle depends on market.

Standard Machine Specifications

		HCN-5000	HCN-5000S
Stroke	X-axis (column right / left)	730 mm	
	Y-axis (spindle up / down)	730 mm	
	Z-axis (table back / forth)	800 mm	
	Distance between table top to spindle nose	70 mm ~ 870 mm	
	Distance between pallet top to spindle center	100 mm ~ 830 mm	
Table	Table size	500 mm × 500 mm	
	Max. workpiece dimensions	Φ800 mm × 1000 mm	
	Pallet load capacity (evenly distributed)	500 kg	
	Pallet top surface	M16 × P2, 25 places 100 mm pitch	M16 × P2, 8 places 200 mm pitch
	Minimum indexing angle increment	1°	
	Indexing time	1.4 sec./ 90°	
Spindle	Max. spindle speed	12000 min ⁻¹ (rpm)	
	Spindle speed range	2-step (electric)	
	Spindle taper	No.40	
	Spindle bearing ID	Φ70 mm	
	Spindle acceleration	1.48 sec. (0 → 12000 min ⁻¹ (rpm))	
Feedrate	Rapid traverse rate (X-, Y-, Z-axis)*1	60000 mm/min	
	Cutting feedrate (X-, Y-, Z-axis)*1	1 mm ~ 60000 mm/min	
	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	Φ95 mm / 510 mm / 12 kg (max. moment : 5.9 N·m)	
	Max. tool diameter with adjacent pockets empty	Φ170 mm	
	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 / 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 / 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 / 85 L/min*2	
Machine size	Machine height	2813 mm	
	Floor space requirement*3 (MAZATROL SmoothG)	2623 mm × 5769 mm (ConSep2000)	2702 mm × 4706 mm (ConSep2000)
	Floor space requirement*3 (MAZATROL SmoothC)	2444 mm × 5769 mm (ConSep2000)	2702 mm × 4706 mm (ConSep2000)
	Machine weight	11430 kg	10750 kg

*1 Limited feedrate with continuous axis movement
*2 210 L/min for optional 14000, 18000 and 30000 min⁻¹ (rpm) spindle
*3 Including optional rear coolant tank and chip conveyor

		HCN-5000/50	HCN-5000/50S
Stroke	X-axis (column right / left)	730 mm	
	Y-axis (spindle up / down)	730 mm	
	Z-axis (table back / forth)	800 mm	
	Distance between table top to spindle nose	70 mm ~ 870 mm	
	Distance between pallet top to spindle center	100 mm ~ 830 mm	
Table	Table size	500 mm × 500 mm	
	Max. workpiece dimensions	Φ800 mm × 1000 mm	
	Pallet load capacity (evenly distributed)	500 kg	
	Pallet top surface	M16 × P2, 25 places 100 mm pitch	M16 × P2, 8 places 200 mm pitch
	Minimum indexing angle increment	1°	
	Indexing time	1.4 sec. / 90°	
Spindle	Max. spindle speed	10000 min ⁻¹ (rpm)	
	Spindle speed range	2-step (electric)	
	Spindle taper	No.50	
	Spindle bearing ID	Φ90 mm	
	Spindle acceleration	1.2 sec. (0 → 10000 min ⁻¹ (rpm))	
Feedrate	Rapid traverse rate (X-, Y-, Z-axis)*1	60000 mm/min	
	Cutting feedrate (X-, Y-, Z-axis)*1	1 mm ~ 60000 mm/min	
	Axis acceleration / deceleration (X-, Y- / Z-axis)	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	Φ125 mm / 510 mm / 30 kg (max. moment : 29.4 N·m)	
	Max. tool diameter with adjacent pockets empty	Φ250 mm	
	Tool selection method	Random selection / shortest path	
	Tool change time (chip-to-chip)	3.4 sec.	
Automatic pallet changer	Number of pallets	2	1
	Changing system	Rotary type	—
	Pallet change time	8.0 sec.	—
Motors	Spindle motor (40 % ED / 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 / 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 / 210 L/min	
Machine size	Machine height	2813 mm	
	Floor space requirement*2 (MAZATROL SmoothG)	2685 mm × 5804 mm (ConSep2000)	2802 mm × 4910 mm (ConSep2000)
	Floor space requirement*2 (MAZATROL SmoothC)	2544 mm × 5804 mm (ConSep2000)	2802 mm × 4910 mm (ConSep2000)
	Machine weight	12830 kg	12150 kg

*1 Limited feedrate with continuous axis movement
*2 Including optional rear coolant tank and chip conveyor

Standard Machine Specifications

		HCN-6000
Stroke	X-axis (column right / left)	800 mm
	Y-axis (spindle up / down)	800 mm
	Z-axis (table back / forth)	800 mm
	Distance between table top to spindle nose	150 mm ~ 950 mm
	Distance between pallet top to spindle center	100 mm ~ 900 mm
Table	Table size	500 mm × 500 mm
	Max. workpiece dimensions	Φ900 mm × 1000 mm
	Pallet load capacity (evenly distributed)	1000 kg
	Pallet top surface	M16 × P2, 25 places 100 mm pitch
	Minimum indexing angle increment	1°
	Indexing time	1.9 sec. / 90°
Spindle	Max. spindle speed	10000 min ⁻¹ (rpm)
	Spindle speed range	2-step (electric)
	Spindle taper	No.50
	Spindle bearing ID	Φ100 mm
	Spindle acceleration	3.0 sec. (0 → 10000 min ⁻¹ (rpm))
Feedrate	Rapid traverse rate (X-, Y-, Z-axis)*1	60000 mm/min
	Cutting feedrate (X-, Y-, Z-axis)*1	1 mm ~ 60000 mm/min
	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	Φ125 mm / 500 mm / 30 kg max. moment : 29.4 N·m)
	Max. tool diameter with adjacent pockets empty	Φ250 mm*2
	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 / cont. rating)	AC 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 / 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 / 350 L/min
Machine size	Machine height	3380 mm
	Floor space requirement*3	3091 mm × 6813 mm (ConSep2000II)
	Floor space requirement*3	2914 mm × 6813 mm (Consep2000II)
	Machine weight	15800 kg

*1 Limited feedrate with continuous axis movement

*2 When adjacent pockets are empty and pockets next to them have tools less than $\Phi 240$ mm, maximum tool diameter is $\Phi 260$ mm

*³ Including rear coolant tank and chip conveyor

Standard and Optional Equipment

		● : Standard ○ : Option - : N/A	
		HCN-4000	
		MAZATROL SmoothG	MAZATROL SmoothC
Spindle	12000 min ⁻¹ (rpm) (No.40)	●	●
	12000 min ⁻¹ (rpm) (BBT-40, HSK-A63)	○	○
	14000 min ⁻¹ (rpm) (No.40, BBT-40, HSK-A63)	○	○
	18000 min ⁻¹ (rpm) (No.40, BBT-40, HSK-A63)	○	○
	25000 min ⁻¹ (rpm) (HSK-A63)	○	○
	30000 min ⁻¹ (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 tapped pallet without edge locator	●	●
	400 mm × 400 mm tapped pallet with edge locator	○	○
	400 mm × 400 mm tapped pallet with edge locator and center bore	○	○
	500 mm × 500 mm tapped pallet without edge locator	○	○
	500 mm × 500 mm tapped pallet with edge locator	○	○
	500 mm × 500 mm tapped pallet with edge locator and center bore	○	○
	500 mm × 400 mm tapped pallet with edge locator	○	○
	500 mm × 400 mm 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 (wired)	○	○
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)	○	○
	Coolant through spindle (1.5 MPa, 3.5 MPa)	○	○
	Preparation for coolant through spindle (7.0 MPa)	○	○
	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	Ball screw core cooling (X-, Y-, Z-axis)	●	●
	Chiller unit	●	●
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
	Scale feedback (X-, Y-, Z-axis)	○	○

*1 Not available with coolant through spindle

Above specifications are for Asian market.

Standard and optional equipment vary by market

Standard and Optional Equipment

		● : Standard ○ : Option - : N / A			
		HCN-5000		HCN-5000S	
		MAZATROL SmoothG	MAZATROL SmoothC	MAZATROL SmoothG	MAZATROL SmoothC
Spindle	12000 min ⁻¹ (rpm) (No.40)	●	●	●	●
	18000 min ⁻¹ (rpm) (BBT-40, HSK-A63)	○	○	○	○
	14000 min ⁻¹ (rpm) (No.40, BBT-40, HSK-A63)	○	○	○	○
	12000 min ⁻¹ (rpm) (No.40, BBT-40, HSK-A63)	○	○	○	○
	25000 min ⁻¹ (rpm) (BBT-40, HSK-A63)	○	○	○	○
	30000 min ⁻¹ (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* ²	●	●	●	●
	Table load capacity 700 kg* ²	○	○	○	○
Pallet	500 mm × 500 mm tapped pallet without edge locator	●	●	●	●
	500 mm × 500 mm tapped pallet with edge locator	○	○	○	○
	500 mm × 500 mm tapped pallet with edge locator and center bore	○	○	○	○
	630 mm × 630 mm tapped pallet with edge locator	○	○	○	○
	630 mm × 630 mm tapped pallet with edge locator and center bore	○	○	○	○
	630 mm × 500 mm tapped pallet with edge locator	○	○	○	○
	630 mm × 500 mm 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 (wired)	○	○	○	○
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)	○	○	○	○
	Coolant through spindle (1.5 MPa, 3.5 MPa)	○	○	○	○
	Preparation for coolant through spindle (7.0 MPa)	○	○	○	○
	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	Ball screw core cooling (X-, Y-, Z-axis)	●	●	●	●
	Chiller unit	●	●	●	●
	Hydraulic unit temperature control	○	○	○	○
	Coolant temperature control	○	○	○	○
	Scale feedback (X-, Y-, Z-axis)	○	○	○	○

** Not available with coolant through spindle
** Pallet weight not included
Above specifications are for Asian market.
Standard and optional equipment vary by market.

		● : Standard ○ : Option - : N / A			
		HCN-5000/50		HCN-5000/50S	
		MAZATROL SmoothG	MAZATROL SmoothC	MAZATROL SmoothG	MAZATROL SmoothC
Spindle	10000 min ⁻¹ (rpm) (No.50)	●	●	●	●
	10000 min ⁻¹ (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*	●	●	●	●
	Table load capacity 700 kg*	○	○	○	○
	A-axis table	-	-	○	○
Pallet	500 mm × 500 mm tapped pallet without edge locator	●	●	●	●
	500 mm × 500 mm tapped pallet with edge locator and center bore	○	○	○	○
	630 mm × 630 mm tapped pallet without edge locator	○	○	○	○
	630 mm × 630 mm tapped pallet with edge locator and center bore	○	○	○	○
	630 mm × 500 mm tapped pallet without edge locator	○	○	○	○
	630 mm × 500 mm 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 (wired)	○	○	○	○
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)	○	○	○	○
	Coolant through spindle (1.5 MPa, 3.5 MPa)	○	○	○	○
	Preparation for coolant through spindle (7.0 MPa)	○	○	○	○
	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	Ball screw core cooling (X-, Y-, Z-axis)	●	●	●	●
	Chiller unit	●	●	●	●
	Hydraulic unit temperature control	○	○	○	○
	Coolant temperature control	○	○	○	○
	Scale feedback (X-, Y-, Z-axis)	○	○	○	○

* Pallet weight not included
Above specifications are for Asian market.
Standard and optional equipment vary by market.

Standard and Optional Equipment

		● : Standard ○ : Option - : N / A	
		HCN-6000	
		MAZATROL SmoothG	MAZATROL SmoothC
Spindle	10000 min ⁻¹ (rpm) (No.50)	●	●
	10000 min ⁻¹ (rpm) (BBT-50, HSK-A100)	○	○
	7000 min ⁻¹ (rpm) (No.50, BBT-50, HSK-A100)	○	○
Table	1° indexing table	●	●
	0.0001°× 3600000 NC rotary table	○	○
	0.0001°× 3600000 NC rotary table (with scale)	○	○
	0.001°× 360000 NC indexing table (without contouring)	○	○
Pallet	500 mm × 500 mm tapped pallet with edge locator	●	●
	500 mm × 500 mm tapped pallet with edge locator and center bore	○	○
	500 mm × 500 mm T-slot pallet with edge locator and center bore	○	○
	630 mm × 630 mm tapped pallet with edge locator	○	○
	630 mm × 630 mm tapped pallet with edge locator and center bore	○	○
	630 mm × 630 mm T-slot pallet with edge locator and center bore	○	○
	630 mm × 500 mm tapped pallet with edge locator	○	○
	630 mm × 500 mm tapped pallet with edge locator and center bore	○	○
	630 mm × 500 mm T-slot pallet with edge locator and center bore	○	○
Pallet changer	2-pallet changer	●	●
	6-pallet changer	○	○
Tool magazine	43 tool chain type magazine	●	●
	60 tool chain 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)	○	—
	206 tool rack magazine (TOOL TECH)	○	—
	240 tool rack magazine (TOOL HIVE)	○	—
	276 tool rack magazine (TOOL TECH)	○	—
	288 tool rack magazine (TOOL HIVE)	○	—
	312 tool rack magazine (TOOL HIVE)	○	—
	348 tool rack magazine (TOOL HIVE)	○	—
	348 tool rack magazine (TOOL TECH)	○	—
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 indexing 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)	○	○
	Coolant through spindle (1.5 MPa, 3.5 MPa)	○	○
	Preparation for coolant through spindle (7.0 MPa)	○	○
	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 2000II)	●	●
	Chip conveyor (rear discharge, ConSep 2000II)	○	○
High accuracy	Ball screw core cooling (X-, Y-, Z-axis)	●	●
	Chiller unit	●	●
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
	Scale feedback (X-, Y-, Z-axis)	○	○

Above specifications are for European market.
Standard and optional equipment vary by market.

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	PosPositioning (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 : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB*	
Control display	Display : 19" touch panel / Display : 10.4" touch panel, Resolution : SXGA / Resolution : VGA	
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	10 M / 100 M / 1 Gbps	

* Option

MAZATROL SmoothC Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	
Least input increment	0.0001 mm, 0.00001 inch, 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, Cylindrical interpolation*, Spiral interpolation, Helical 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, G0 slope constant*, Variable acceleration control	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, G0 slope constant*, Variable acceleration control
Program registration	Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB*	
Control display	Display : 19" touch panel / Display : 10.4" touch panel, Resolution : SXGA / Resolution : VGA	
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 dydtem	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	
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	Semi automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Card interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

Environmentally Friendly

Designed with environmental considerations

The environment and our impact on natural surroundings have always been important concerns of Yamazaki Mazak. This is shown by the fact that all factories in Japan where Mazak machine tools are produced are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land.

Reduction of electrical power consumption

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

Reduction of lubricant consumption

High efficiency lubrication system delivers the optimum amount of grease to he linear roller guides and ball screw with lower lubricant consumption.

Extended coolant service life

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

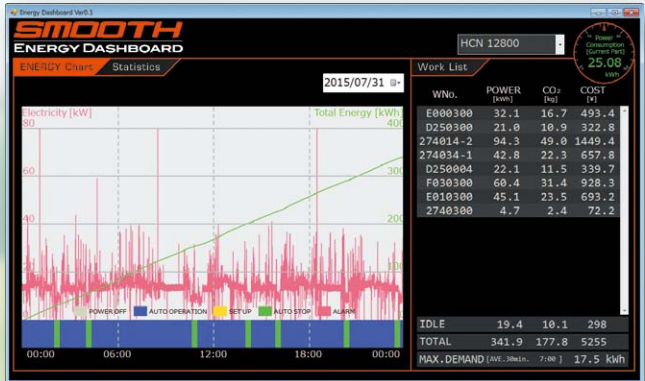
Energy Dashboard

OPTION

Process screen displays total energy consumption



Electrical consumption display



Electrical consumption statistics / analysis display

