HCN SERIES

Mazak

HCN

SERIES

[HCN-8800, 10800, 12800]

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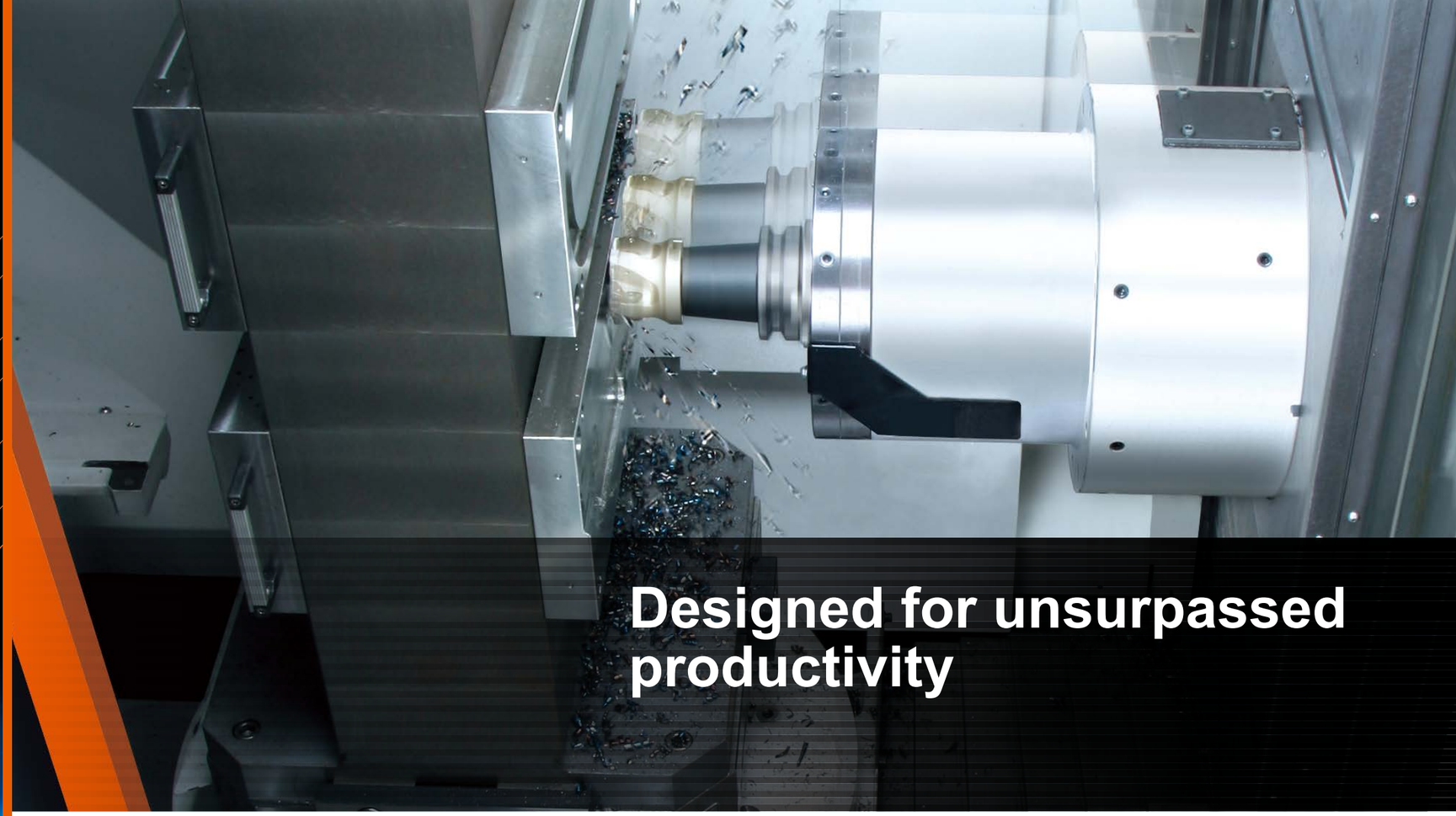
SE

HCN-8800,10800,12800 SmoothG 21.09.0 G 99J342920E2

Advanced features of the MAZATROL SmoothG CNC

- Touch screen operation — Operates similar to your smart phone / tablet
- PC with Windows® embedded OS
- Fastest CNC in the world — 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
- Fine tuning functions — Easily configure machine parameters for different workpiece materials and application requirements
- MTConnect® ready — Convenient networking

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.



Designed for unsurpassed productivity

HCN-12800
Shown with optional status light (3 colors)

High speed, high accuracy horizontal machining centers

HCN SERIES

- Pallet sizes : □800 mm, □1000 mm and □1250 mm
- No.50 taper spindle specifications for any production requirement :
  - Standard : 10000 min^{-1} (rpm)
  - High speed : 16000 min^{-1} (rpm) OPTION
  - High torque : 8000 min^{-1} (rpm) OPTION
  - Hard metal : 6000 min^{-1} (rpm) OPTION
- Rigid machine construction for heavy duty machining
- Unsurpassed ease of operation

Extensive Series Range

No. 50 spindle horizontal machining centers for large workpieces

HCN-8800
Shown with optional equipment

HCN-10800
Shown with optional equipment

HCN-12800
Shown with optional equipment

Horizontal machining center with spindle quill (HCN-Q series) is available.

Pallet size
- 1000 mm × 1250 mm
- 1250 mm × 1600 mm

Machines	HCN-8800	HCN-10800	HCN-12800
Max. workpiece diameter × Max. workpiece height	Φ1450 mm × 1450 mm	Φ2050 mm × 1600 mm	Φ2400 mm Φ3000 mm* × 2000 mm
Max. load on pallet (evenly distributed)	2200 kg, 3000 kg*	3000 kg, 4000 kg*	6000 kg, 8000 kg*, 10000 kg*[1]
Pallet size	☐ 800 mm 800 mm × 1000 mm* ☐ 1000 mm*	☐ 1000 mm 1000 mm × 1250 mm* ☐ 1250 mm*	☐ 1250 mm 1250 mm × 1600 mm* ☐ 1600 mm*
Stroke (X / Y / Z)	1400 mm / 1200 mm / 1325 mm	1700 mm / 1400 mm / 1525 mm	2200 mm, 2800 mm* / 1600 mm / 1850 mm

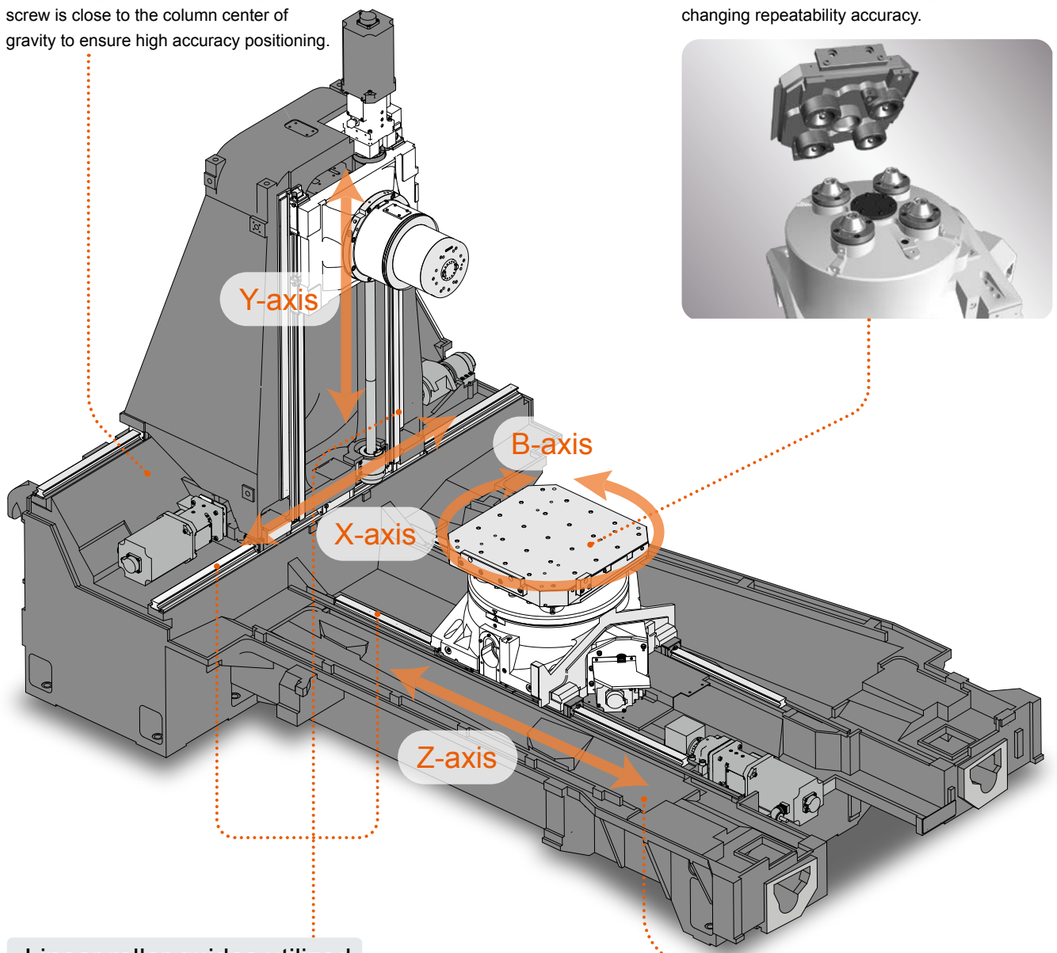
* Option
*[1] Single table (option) specification (not available with FMS)

Higher Accuracy, Higher Productivity

High rigidity construction for high accuracy machining

Base X-axis construction

The bottom of the column has a slanted surface for mounting the X-axis linear guides. The ball screw is close to the column center of gravity to ensure high accuracy positioning.



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.

Pallet clamping

The table and pallet are clamped on taper cones. This construction ensures high rigidity and pallet changing repeatability accuracy.

High rigidity bed

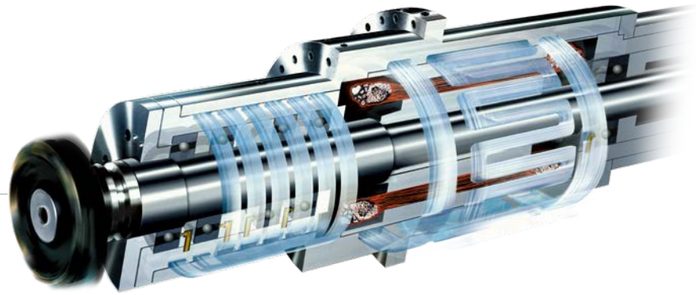
The high rigidity bed is reinforced with strategically located ribs to ensure stability during heavy duty machining.

Designed for high accuracy machining

Spindle

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.

X-, Y- and 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.

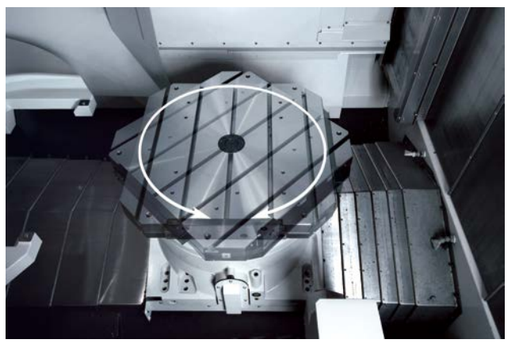
Tables

High index coupling

To realize high accuracy indexing, the standard 1° indexing table of the HCN-8800 uses a 360° high index coupling.

Roller gear cam

The NC rotary table uses a roller gear cam system for 0.0001°positioning increments and high accuracy performance (standard on the HCN-10800 and HCN-12800. Optional for the HCN-8800).



Spindle specifications for any workpiece material requirement

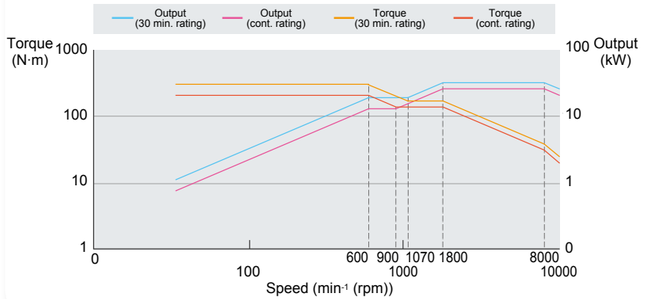
Standard 10000 min^{-1} (rpm) spindle

Integral spindle / motor | Oil & air lubrication

High performance from low speed to high speed for a wide variety of materials such as cast iron and aluminum.

Speed	10000 min^{-1} (rpm)
Output	AC 37 kW (50 HP) [30 min. rating]
	AC 30 kW (40 HP) [cont. rating]
Max. torque	350 N·m [30 min. rating]

10000 min^{-1} (rpm) spindle output / torque diagram



Mount (stainless)
Construction machinery component

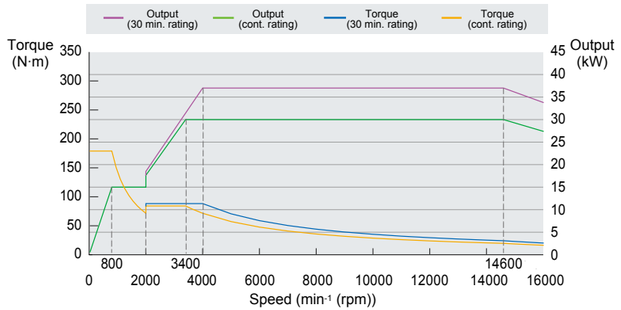
High speed 16000 min^{-1} (rpm) spindle OPTION

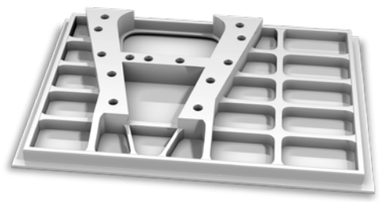
Integral spindle / motor | Oil & air lubrication | Bearing preload change

Thanks to the changeable bearing preload, rigidity is ensured during low speed machining as well as high speed machining of aluminum.

Speed	16000 min^{-1} (rpm)
Output	AC 37 kW (50 HP) [30 min. rating]
	AC 30 kW (40 HP) [cont. rating]
Max. torque	179 N·m [30 min. rating]

16000 min^{-1} (rpm) spindle output / torque diagram





Frame (aluminum alloy)
Aerospace component

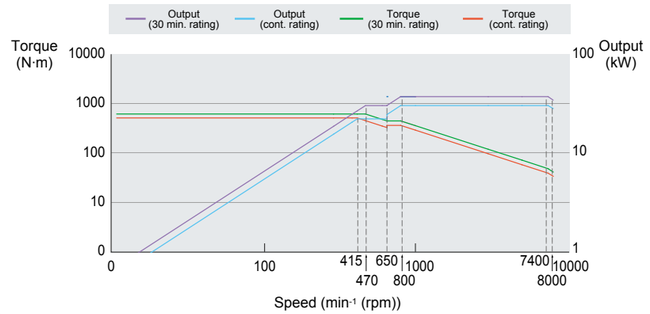
High torque 8000 min^{-1} (rpm) spindle OPTION

Integral spindle / motor | Oil & air lubrication

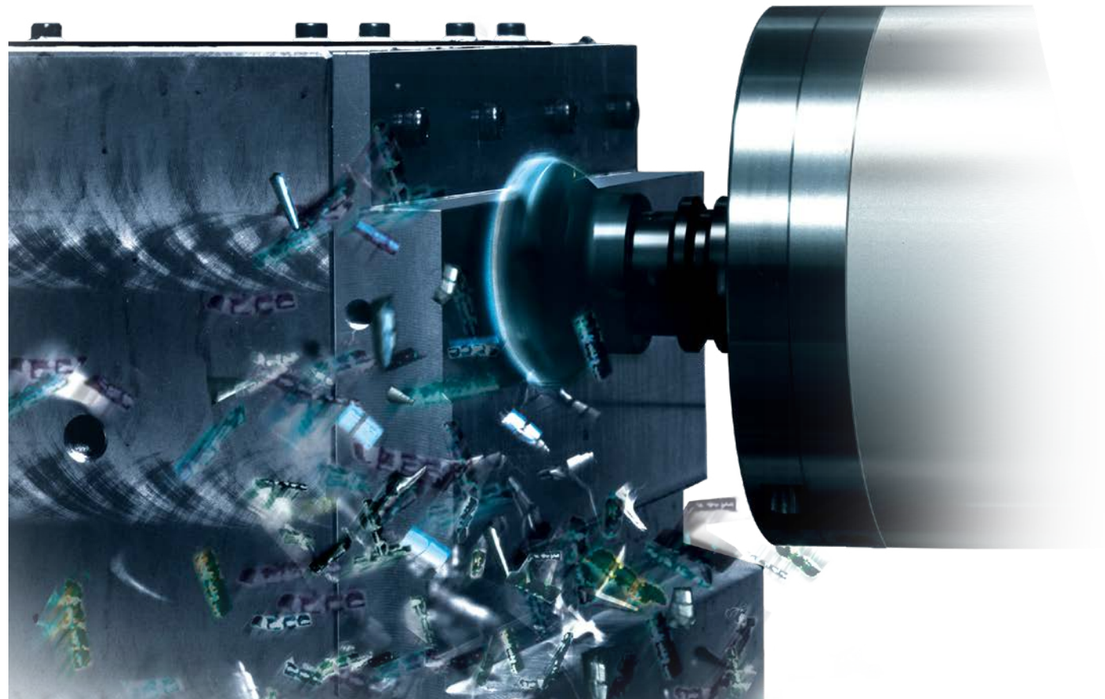
High torque, No. 50 taper 8000 min^{-1} (rpm) integral spindle / motor for heavy duty machining of steel and difficult to machine materials.

Speed	8000 min^{-1} (rpm)
Output	AC 37 kW (50 HP) [30 min. rating]
	AC 30 kW (40 HP) [cont. rating]
Max. torque	609 N·m [30 min. rating]

8000 min^{-1} (rpm) spindle output / torque diagram



Cylinder block (cast iron)
Automotive component



Hard metal package OPTION

Hard metal package with protective functions is optionally available. High torque spindle, larger thrust force on feed axes and the high rigidity base are designed for high productivity machining of difficult to machine materials.

High torque 6000 min^{-1}(rpm) spindle

Integral spindle / motor with a maximum torque of 800 N·m torque (continuous rating) for high performance, heavy duty machining.
HSK-A100 and BIG PLUS No.50 tool shank are available.

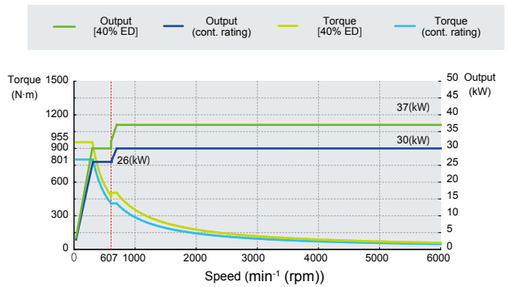
Integral spindle / motor | Oil & air lubrication

Speed		6000 min^{-1} (rpm)
Output	HCN-8800 HCN-10800	AC 37 kW (50 HP) [40% ED]
		AC 30 kW (40 HP) [cont. rating]
	HCN-12800	AC 56 kW (75 HP) [40% ED]
		AC 45 kW (60 HP) [cont. rating]
Torque		955 N·m [40% ED]

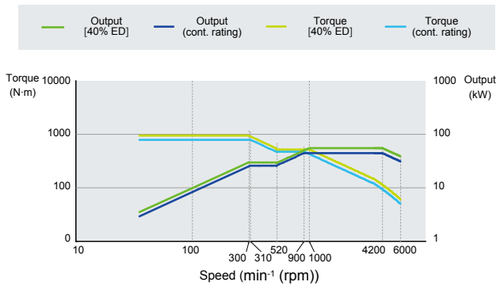
Track guide (titanium alloy)
Aerospace component

6000 min^{-1}(rpm) spindle output / torque diagram

HCN-8800, HCN-10800



HCN-12800



X-, Y-, Z-axis thrust

Feed thrust on all axes is 20 kN* for heavy duty machining.

* HCN-12800 X-axis: 31.53 kN, Y-axis: 19 kN, Z-axis: 42.21 kN.

Protective functions

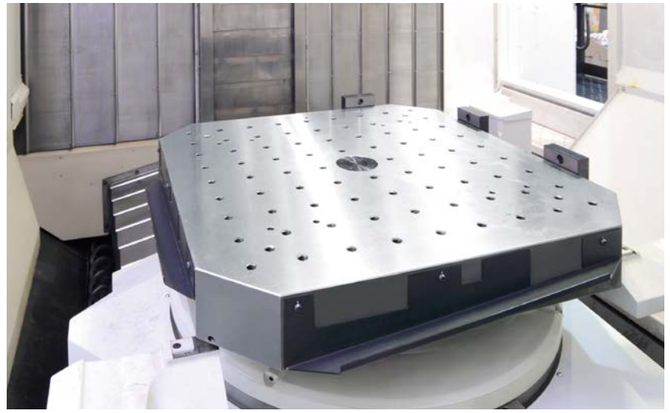
Minimized damage to workpiece and machine by detection of any errors.

- Crash detection
  Feed is stopped when the registered thrust force is exceeded in order to protect workpiece and machine
- Pallet displacement
  Detects displacement of pallet on pallet seats
- Spindle clamp sensor
  Confirms proper tool clamping

Higher Productivity

Wide variety of tables available

For production flexibility, a 0.0001°× 3600000 position NC rotary table is available on all machines (standard on the HCN-10800 and HCN-12800). On the HCN-8800, a 1° indexing table is standard equipment and a 0.001° indexing table is optionally available.



1° × 360 index table

The 360° high index coupling provides high accuracy indexing in 1°increments.

0.001° × 360000 NC positioning table

The table can be indexed in 0.001°increments (contouring is not available). Hydraulic power supply through the table is optionally available.

0.0001° × 3600000 NC rotary table

The backlash-free rotary gear cam utilized by the NC rotary table ensures high accuracy as well as a long service life. Scale feedback system for the rotary axis is optionally available.

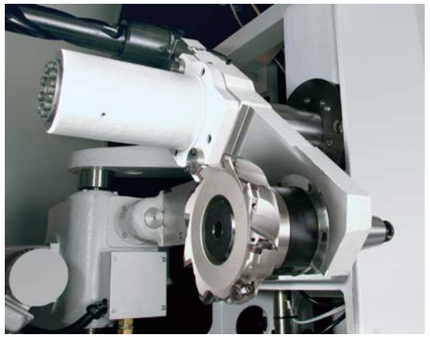
● : Standard ○ : Option — : N / A

	1° × 360 index table	0.001° × 360000 NC positioning table	0.0001° × 3600000 NC rotary table
HCN-8800	●	○	○
HCN-10800	—	—	●
HCN-12800	—	—	●

Higher Productivity

Tool changing of heavy large diameter tools

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



ATC Specifications

Machines		HCN-8800	HCN-10800	HCN-12800
Max. tool diameter	With tools in adjacent pockets	Φ125 mm	Φ135 mm	Φ135 mm
	With adjacent pockets empty	Φ250 mm	Φ260 mm	Φ260 mm
	When adjacent pockets are empty and pockets next to them have tools less than Φ240 mm	Φ260 mm	—	—
	When adjacent pockets are empty and pockets next to them have tools less than Φ200 mm	—	Φ320 mm*	Φ320 mm
	When adjacent pockets are empty and pockets next to them have tools less than Φ180 mm	Φ320 mm*	—	—
	When adjacent pockets are empty and pockets next to them have tools less than Φ160 mm	—	Φ360 mm*	Φ360 mm
	With X-axis stroke limitation	Φ320 mm*	Φ360 mm*	—
Max. tool length		630 mm 800 mm*	650 mm 800 mm*	800 mm
Max. tool weight		30 kg	30 kg	30 kg

* Option

Large capacity tool magazine

Large capacity tool magazines make it possible to perform production of a wide variety of workpieces in small size lots as well as store spare tools for automatic operation.
For tool storage larger than 180 tools, two types of rack type tool magazines are available:
The TOOL HIVE, stores No.50 or HSK-A100 tools horizontally.
The TOOLTECH stores tools (No.50 tools only) vertically with small floor space requirements.

● : Standard ○ : Option — : N / A

	Chain type magazine					
	60	80	100	120	140	160
HCN-8800	●	○	○	○	○	○
HCN-10800	—	●	○	○	○	○
HCN-12800	—	●	○	○	○	○

	TOOL HIVE (rack type magazine)						TOOLTECH (rack type magazine)		
	180	204	240	288	312	348	206	276	348
HCN-8800	○	○	○	○	○	○	○	○	○
HCN-10800	○	○	○	○	○	○	○	○	○
HCN-12800	○	○	○	○	○	○	○	○	○

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 HIVE Specifications

Tool storage	180, 204, 240, 288, 312, 348
Tool shank	No.50, HSK-A100
Magazine	Rack type

240 tool TOOL HIVE magazine

TOOLTECH OPTION

Tools (No.50 tools only) are stored vertically in a magazine with compact floor space requirements.

TOOLTECH Specifications

Tool storage	206, 276, 348
Tool shank	No.50
Magazine	Rack type

206 tool TOOLTECH magazine

Automation

Automation from single machine to multiple machine system

Pallet changer

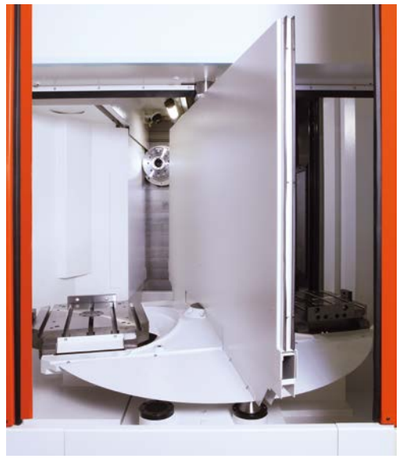
Rotary 2-pallet changer and optional 6-pallet changer

2-pallet changer

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

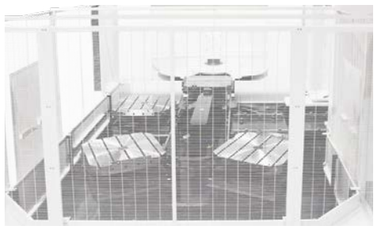
	Pallet change time	Pallet load capacity (evenly distributed)	Max. workpiece diameter
HCN-8800	13.0 sec	2200 kg	Φ1450 mm × 1450 mm
HCN-10800	25.0 sec	3000 kg	Φ2050 mm × 1600 mm
HCN-12800*	48.0 sec	6000 kg	Φ2400 mm × 2000 mm

*Shuttle type pallet changer



6-pallet changer OPTION

Multiple workpieces can be setup on the 6-pallets making automatic operation able to be performed over extended periods of time. Available for the HCN-8800.



HCN-8800 with 6 pallet changer

Hydraulic power supply OPTION

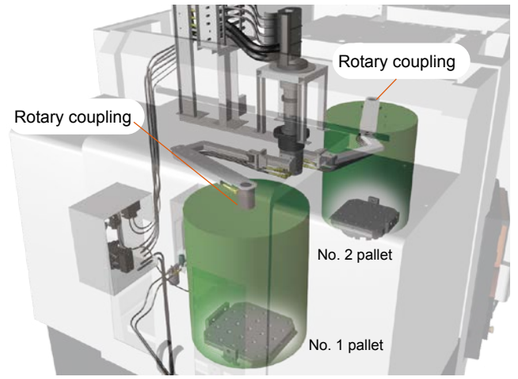
Type A
(supply from machine top, maximum : 8 ports)

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

Type B
(supply through pallet, maximum : 3 ports)

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

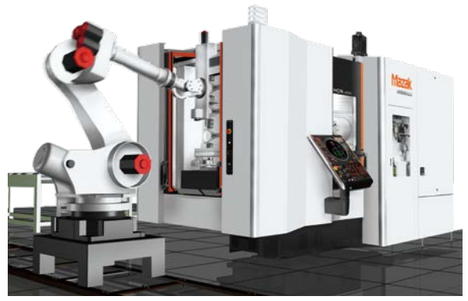
Type A (Hydraulic power supply from top)



Robot system OPTION

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

- Field network available
- Cycle start, door open / close, work loading confirmation, hydraulic fixture operation, pallet position interface are optionally available.



Automation

PALLETECH MANUFACTURING CELL OPTION

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.

System specifications

		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

Pallet stocker	HCN-8800	HCN-10800	HCN-12800
1 level	○	○	○
2 levels	○	—	—
3 levels	—	—	—

○ : Available — : N/A

SMOOTH PMC

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

Optimum system for the maximum versatility

Integration of multiple machine models in a PALLETECH system

Horizontal machining centers, 5-axis machining centers, multi-tasking machines and turning centers can be integrated to comprise a system with unsurpassed versatility.

e.g.)
PALLETECH with single level 12 pallet stocker
Smooth PMC
Loading station
5-axis machining center
Horizontal machining center

PALLETECH system combination applicable machine models

PALLETECH system pallet size	Horizontal machining center	5-axis machining center	Multi-tasking machine	Turning center
800 mm × 800 mm	HCN-8800	VORTEX e-1250V/8 VORTEX i-800V/8	INTEGREX e-1250V/8 INTEGREX i-800V/8	—
1000 mm × 1000 mm	HCN-10800	VORTEX e-1600V/10	INTEGREX e-1600V/10	—

Tool transport system

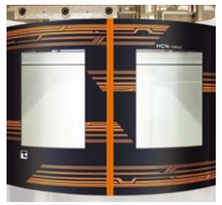
Tool transport system allows the automatic tool transportation within the PALLETECH system by linking the Smooth Tool Management (option) and Smooth PMC. The number of stored tools in the machine magazine can be minimized and special tools can be shared among machines.

Ergonomics

Design focused on ergonomics provides unsurpassed ease of operation

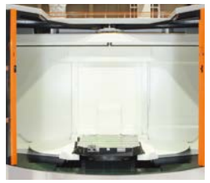
Large window

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.

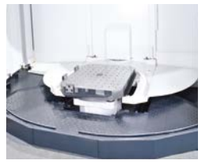


Large window

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

Convenient setup

The 2-pallet changer on the HCN-10800 and HCN-12800 has a platform inside the setup station for convenient operation.



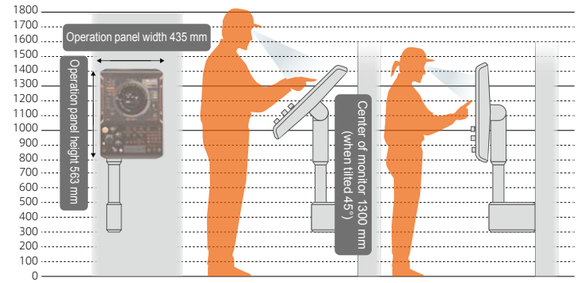
Maintenance area

Hydraulic and air pressure inlets and lubrication reservoirs are conveniently arranged in a central location for convenient maintenance.

*Instead of a 2-pallet safety cover door, the HCN-12800 has an area sensor in the setup station.

Adjustable CNC operation

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

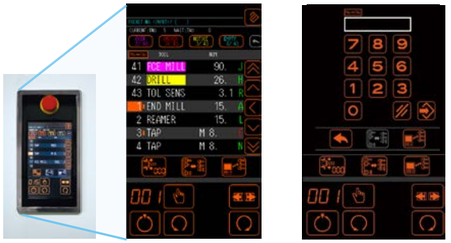


Tool magazine operation panel / Tool ID

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 keyboard and the desired pocket will be automatically brought into position. Additionally, tool data are 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.

Tool data switch display

Numeric keypad display



Remote manual pulse generator

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.
A wireless remote manual pulse generator is optionally available.

MAZATROL CNC System

MAZATROL
SMOOTH G

4-axes simultaneous CNC

Advanced CNC control

— Latest hardware and software for unprecedented speed and precision

Smooth graphical user interface

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

Ease of operation

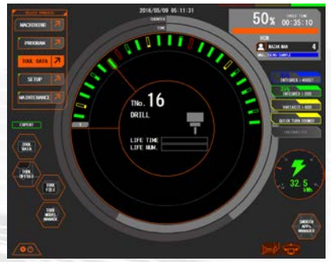
Designed for unsurpassed ease of operation
with advanced functions

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

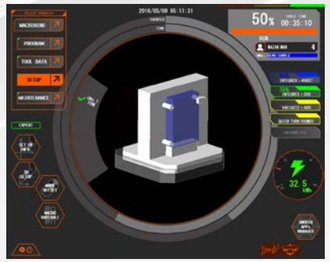
Process home screens

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.

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.

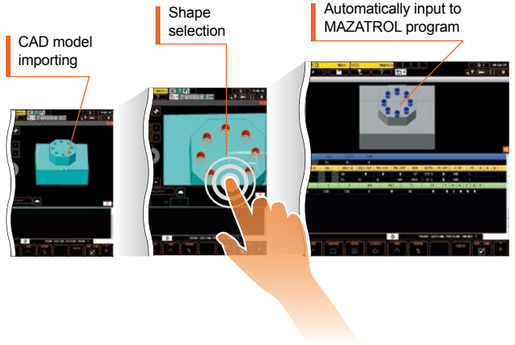
3D ASSIST

Workpiece and 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.

CAD model importing

Shape selection

Automatically input to MAZATROL program

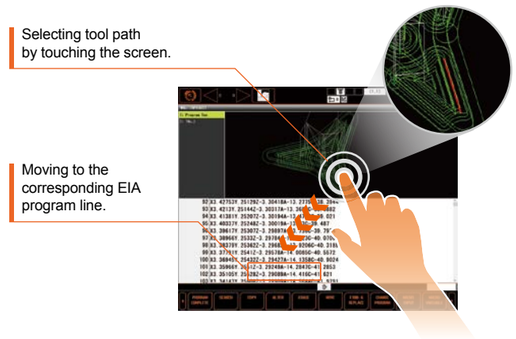


QUICK EIA

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.

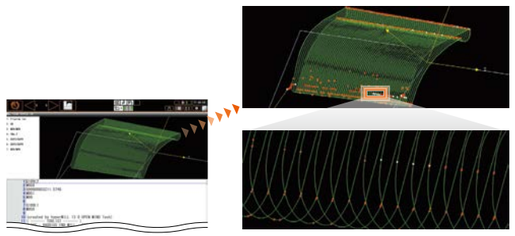
Selecting tool path by touching the screen.

Moving to the corresponding EIA program line.



VIEW SURF

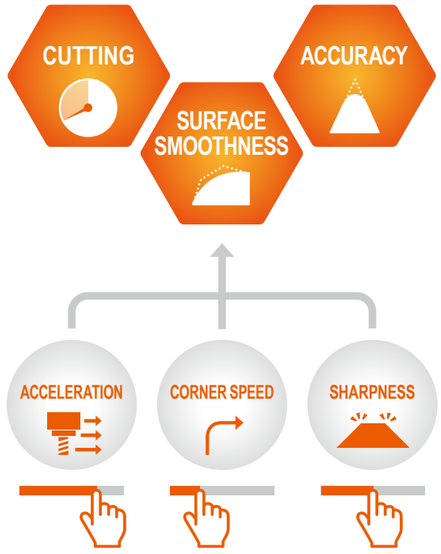
By analyzing tool path, any predictable failure on the finished surface can be visualized. Program modification can be done before machining to minimize the time for test cutting.



MAZATROL CNC System

SMOOTH MACHINING CONFIGURATION

Optimize programs just by using a touchscreen slider



When a machine tool is shipped from the factory where it was manufactured, all of the CNC parameter settings are made for all around general purpose machining. In most cases, these settings are satisfactory for a large percentage of users and will rarely be changed.

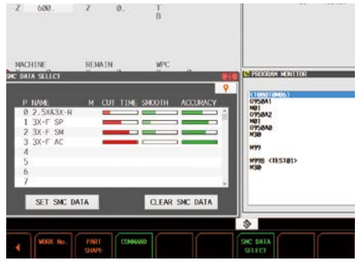
However, for aerospace workpieces or workpieces with complex surfaces, such as dies and molds, these machine parameter settings must be manually changed in order to produce workpieces with their required accuracy as well as the minimum cycle time. To optimize these settings, they must be changed according to the type of material, the type of tooling and the type of machining process. This is a complex procedure and a skilled technician is required to perform this efficiently.

As the parameter settings are changed, the default settings for acceleration, electrical gain, tolerances and other items will be modified. As one is changed, it will have a corresponding impact on others which must also change. For instance, if acceleration is increased in order to reduce the cycle time, the accuracy and surface finish may be impacted (corners may not be sharp, gouges may occur in surfaces).

One must know which settings to change, how much to change each setting, and the corresponding effect on other settings for each change in order to tune a machine efficiently. After the workpiece machining is completed, all settings should then be returned to their default settings.

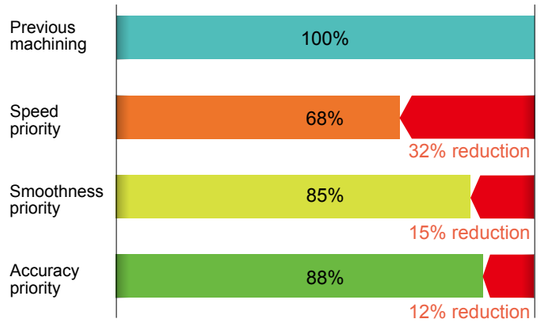
These complicated procedures are eliminated by the MAZATROL SMOOTH MACHINING CONFIGURATION

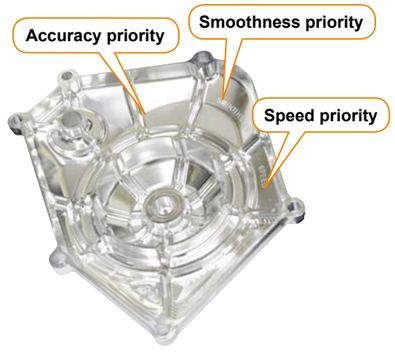
While watching the machining of a complex surface, just use the touchscreen slider switch to change the settings for accuracy, speed or smoothness. As changes in one factor are made, you can see the automatic changes in others. For example, if accuracy is increased, there will be a corresponding decrease in speed.



When the optimum cutting conditions are obtained, these settings can be easily stored in the CNC memory. The next time the same type of material is machined by the same type of tool, these settings can be easily called up by M/G code. Several different settings can be used in a single program. Conventionally, the same parameter settings are used for the entire program.
7 different settings are registered in the CNC memory at the factory (shown to the left). You are able to add your own settings with a maximum storage capacity of 20 settings in total.

Finishing time comparison





Optional equipment

Machine Specification

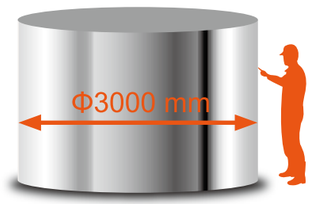
3000 kg workpiece specifications (HCN-8800)

Specifications

Pallet load	3000 kg
Z-axis rapid traverse rate	52000 mm/min
Z-axis max. acceleration	3.43 m/s^2
Table rotating time	2.4 sec / 90° (NC rotary table) 4.5 sec / 90° (1° index table)
Pallet change time	25 sec

X-axis 2800 mm stroke (HCN-12800)

The X-axis stroke is increased by 600 mm. Can be applied with the optional single table specification and heavy workpiece specification (8000 kg and 10000 kg).



Specifications

Max. workpiece diameter	Φ3000 mm
X-axis max. acceleration	2.4 m/s^2
Pallet change time	76 sec

8000 kg workpiece specifications (HCN-12800)

Available for 2-pallet changer and single table machine

Specifications

Pallet load (evenly distributed)	8000 kg
Z-axis rapid traverse rate	34000 mm/min
Z-axis max. acceleration	2.4 m/s^2
Table positioning time	3.8 sec / 90°

4000 kg workpiece specifications (HCN-10800)

Specifications

Pallet load	4000 kg
Z-axis max. acceleration	3.43 m/s^2

Single table specification (HCN-12800)

By eliminating the 2-pallet changer, floor space is reduced. Available for both single machine and machines integrated into a FMS. Can be applied with the optional 2800 mm X-axis stroke and the 8000 kg, 10000 kg heavy workpiece specification.
Note: When applied with the 10000 kg heavy workpiece specification, cannot be used with a FMS since pallet is directly bolted on the machine table.

10000 kg workpiece specifications (HCN-12800)

Available on single table machine only

Specifications

Pallet load (evenly distributed)	10000 kg
Z-axis rapid traverse rate	24000 mm/min
Z-axis max. acceleration	2.4 m/s^2
Table positioning time	4.2 sec / 90°

Setup

Smooth Set and Inspect

Inspection programs can be easily made. Work coordinates and tool compensation can automatically be updated using measurement results.

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

Smooth OMM

By manual operation, the touch probe can be moved to a measurement point and after the point is registered, a measurement program can be made. In addition to automatic update of work coordinates and tool compensation using measurement results, geometric tolerances of workpiece features can also be measured.

Mazak monitoring system B

Coordinate values are automatically shifted according to the results of probing a workpiece by a touch sensor mounted in the machine spindle.
Reads the current position by a contact signal with the measurement device (touch sensor tool) and a workpiece, and reflects the information on the CNC.

Calendar automatic power ON / OFF + warm-up operation

The setting of a self-timer is used to automatically turn on and turn off the machine.

Standard and Optional equipment

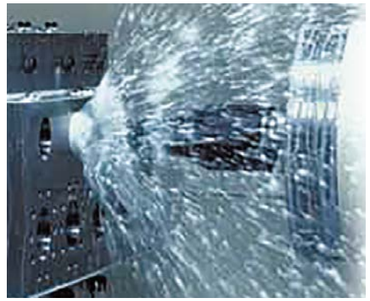
Coolant / chip disposal

SUPERFLOW coolant system OPTION

The SUPERFLOW coolant system features lower tool tip temperatures, improved coolant lubrication and chip disposal by supplying a maximum 7.0 MPa (70 kgf/cm^2) coolant pressure.

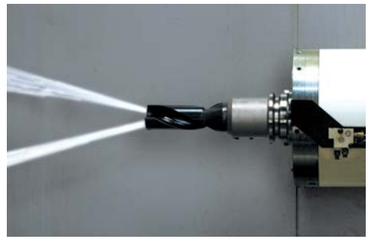
・Adjustable coolant pressure
・High performance cyclone filter with minimum maintenance requirements to reduce running cost

High pressure pump unit



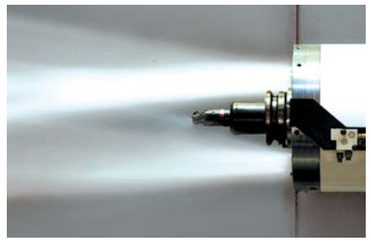
Coolant through spindle OPTION

Coolant is fed to the tool tip by passages through the tool holder and tool.
3 pump pressure specifications are available : 0.8 MPa (8 kgf/cm^2) 1.5 MPa (15 kgf/cm^2) and 7.0 MPa (70 kgf/cm^2).



Flood coolant

Coolant is discharged from nozzles on spindle housing to cool workpiece and remove chips.



Niagara coolant

Large volume of coolant is discharged from the nozzles mounted on the machine top cover to flush chips from the workpiece to conveyors on both sides of the table.

Secondary coolant filter for aluminum OPTION

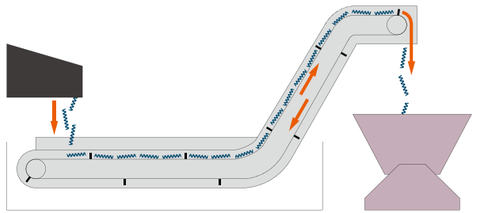
Stable coolant fed is availavle by filtrating aluminum chips from a dirty layer of the coolant tank.

Magnetic separator OPTION

Magnetic separator which is inside the coolant tank separates ferrous chips from the coolant.

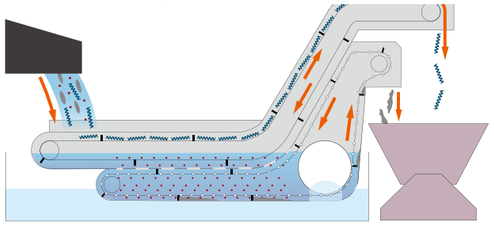
Chip conveyor (hinge) OPTION

Chips are removed by hinge-plate belt and discharged from the side of machine. Very suitable for curly shaped steel chips from 30 mm ~ 150 mm long.



Chip conveyor (ConSep) OPTION

The upper conveyor discharges long and curly chips.
The lower conveyor discharges fine chips and performs coolant filtration using the drum filter.



Chip conveyor

The type of chip conveyor to be selected based on the type of machined chips that will be produced.

○ : Applicable × : Not applicable

Chip shape		Sludge-like chips (0.25 mm ～1 mm)	Needle-like chips (～0.5 mm)	1 ～ 5 mm	5~30mm (Max. 30mm)	30~70mm (Max. 70mm)	70 mm ～	Features
Hinge	For ferrous machining	×	×	×	×	○	○	Applicable for long, steel chips
ConSep	For ferrous / aluminium / cast-iron machining	○	○	○	○	○	○	Applicable regardless of chip length

Standard and Optional Equipment

● : Standard ○ : Option — : N/A

		8800	10800	12800
	Hard metal package	○	○	○
Spindle	10000 min^{-1}(rpm) (No.50) spindle	●	●	●
	10000 min^{-1}(rpm) (BBT-50, HSK-A100) spindle*	○	○	○
	8000 min^{-1}(rpm) (No.50, BBT-50, HSK-A100) high torque spindle*	○	○	○
	16000 min^{-1}(rpm) (HSK-A100) high speed spindle*	○	○	○
Tool magazine	60 tool (No.50) chain type magazine	●	—	—
	60 tool (HSK-A100) chain type magazine	○	—	—
	80 tool (No.50) chain type magazine	○	●	●
	80 tool (HSK-A100) chain type magazine	○	○	○
	100, 120, 140, 160 tool (No.50, HSK-A100) chain type magazine	○	○	○
	180, 204, 240, 288, 312, 348 tool (No.50, HSK-A100) TOOL HIVE	○	○	○
	206, 276, 348 tool (No.50) TOOLTECH	○	○	○
Table	1° indexing table	●	—	—
	NC positioning table (contouring not available)	○	—	—
	NC rotary table	○	●	●
	NC rotary table with scale	○	○	○
	Pallet load 3t for □800 mm pallet	○	—	—
	Pallet load 4t	—	○	—
	Pallet load 8t	—	—	○
	Pallet load 10t	—	—	○
Pallet	□800 mm tapped pallet	●	—	—
	□800 mm tapped pallet with location bore	○	—	—
	□800 mm T-slot pallet with location bore	○	—	—
	800 mm × 1000 mm tapped pallet	○	—	—
	800 mm × 1000 mm T-slot pallet with location bore	○	—	—
	□1000 mm tapped pallet	○	●	—
	□1000 mm tapped pallet with location bore	○	○	—
	□1000 mm T-slot pallet with location bore	○	○	—
	1000 mm × 1250 mm tapped pallet	—	○	—
	1000 mm × 1250 mm tapped pallet with location bore	—	○	—
	1000 mm × 1250 mm T-slot pallet with location bore	—	○	—
	□1250 mm tapped pallet without edge locator	—	○	●
	□1250 mm tapped pallet with edge locator	—	○	○
	□1250 mm tapped pallet with location bore	—	○	○
	□1250 mm T-slot pallet with location bore	—	○	○
	1250 mm × 1600 mm tapped pallet	—	—	○
	1250 mm × 1600 mm tapped pallet with location bore	—	—	○
	1250 mm × 1600 mm T-slot pallet with location bore	—	—	○
	□1600 mm tapped pallet	—	—	○
	□1600 mm tapped pallet with location bore	—	—	○
	□1600 mm T-slot pallet with location bore	—	—	○

* Requires tool magazine for HSK

● : Standard ○ : Option — : N/A

		8800	10800	12800
Automation	2-pallet changer	●	●	●
	6-pallet changer with safety fence and door of setup area	○	—	—
	Hydraulic power supply through pallet (N/A 1°indexing table and NC rotary table)	○	—	—
	Tapped pallet for hydraulic power supply through pallet	○	—	—
	Tapped pallet with location bore for hydraulic power supply through pallet	○	—	—
	T-slot pallet for hydraulic power supply through pallet	○	—	—
	T-slot pallet with location bore hydraulic power supply through pallet	○	—	—
	Hydraulic power supply from top of pallet changer 2 ports × 2 pallets	○	—	—
	Workpiece seating detection, ON / OFF switch	○	—	—
	Preparation for PMC	○	○	○
	PMC application	○	○	○
	Automatic power ON / OFF + warm-up operation	●	●	●
Setup	Remote manual pulse generator (wired)	●	●	●
	Remote manual pulse generator (wireless)	○	○	○
	Tool ID magazine operation panel	●	●	●
	Mazak monitoring system B (optical) OMP60	○	○	—
	Mazak monitoring system B (electrical) RMP60	—	—	○
	Automatic tool length measurement & tool breakage detection	●	●	●
	RENISHAW NC4 laser tool length measurement*	○	○	○
	Tool breakage detection (ATC areas / up to standard tool length)	○	○	○
	Tool run out detection (due to chip contamination between spindle & tool holder)	○	○	○
High accuracy	Operator door interlock	●	●	●
	Hydraulic unit temperature control	○	○	○
	Scale feedback (X-,Y-,Z-axis)	○	○	—
	Scale feedback (X-,Z-axis)	—	—	○
	Scale feedback (Y-axis)	—	—	●
	Chiller unit	●	●	●
	Coolant temperature control	○	○	○
	Ball screw core cooling	●	●	●
Coolant / chip disposal	Flood coolant	●	●	●
	Niagara coolant	●	●	●
	Oil mist coolant	○	○	○
	Coolant through spindle 0.8 MPa (8 kgf/cm^2)	○	○	○
	High pressure coolant through spindle 1.5 MPa (15 kgf/cm^2)	○	○	○
	SUPERFLOW coolant system 7.0 MPa (70 kgf/cm^2)	○	○	○
	Air through spindle (cannot be used with spindle rotating)	●	●	●
	Work air blast	○	○	○
	Hand held coolant nozzle	○	○	○
	Secondary coolant filter for aluminum	○	○	○
	Oil skimmer (RB-200)	○	○	○
	Magnetic plate	○	○	○
	Magnetic separator for cast iron	○	○	○
	Mist collector	○	○	○
	Chip conveyor (side disposal, hinge) not available with 6PC	○	—	—
	Chip conveyor (side disposal, ConSep) not available with 6PC	○	—	—
	Chip conveyor (rear disposal, hinge)	○	—	—
	Chip conveyor (rear disposal, ConSep)	○	—	—
	Chip conveyor (rear right disposal, hinge)	—	○	○
	Chip conveyor (rear right disposal ConSep)	—	○	○
	Inverter system for hinge chip conveyor	○	○	○

* Not available with automatic tool length measurement

Standard Machine Specifications

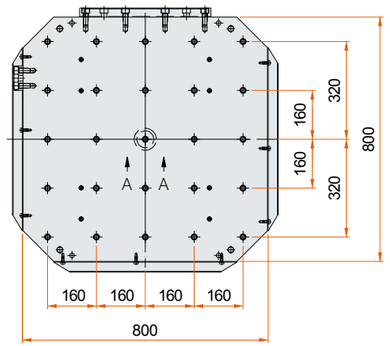
		HCN-8800	HCN-10800	HCN-12800
Stroke	X-axis (column right / left)	1400 mm	1700 mm	2200 mm
	Y-axis (spindle up / down)	1200 mm	1400 mm	1600 mm
	Z-axis (table back / forth)	1325 mm	1525 mm	1850 mm
	Distance between table center to spindle nose	100 mm ~ 1425 mm	150 mm ~ 1675 mm	250 mm ~ 2100 mm
	Distance between pallet top to spindle center	100 mm ~ 1300 mm	100 mm ~ 1500 mm	100 mm ~ 1700 mm
Pallet	Pallet size	800 × 800 mm	1000 mm × 1000 mm	1250 mm × 1250 mm
	Max. workpiece dimensions	Φ1450 mm × 1450 mm	Φ2050 mm × 1600 mm	Φ2400 mm × 2000 mm
	Pallet load capacity (evenly distributed)	2200 kg	3000 kg	6000 kg
	Pallet top surface	M16×P2, tapped 25 places	M20, tapped 81 places	
		160 mm pitch	100 mm pitch	125 mm pitch
Table	Minimum indexing angle increment	1°	0.0001°	
	Indexing time	3.2 s / 90°	2.4 s / 90°	3.6 s / 90°
Spindle	Max. spindle speed	10000 min^{-1}(rpm)		
	Spindle gear range	2 (electric)		
	Spindle taper	7/24 taper No.50		
	Spindle bearing ID	Φ100 mm		
	Spindle acceleration	3.0 s (0 → 10000 min^{-1}(rpm))		
Feedrate	Rapid traverse rate (X-, Y-, Z-axis)*1	60 m/min	52 m/min	43 m/min
	Cutting feedrate (X-, Y-, Z-axis)*1	1 ~ 60000 mm/min	1~ 52000 mm/min	1 ~ 43000 mm/min
	Axis acceleration / deceleration	0.5 G	0.4 G	X,Y :0.35 G Z :0.3 G
Automatic tool changer	Tool shank	No. 50		
	Tool magazine capacity	60	80	
	Max. tool dia. / length (from gauge line) / weight	Φ125 mm / 630 mm / 30 kg	Φ135 mm / 650 mm / 30 kg	Φ135 mm / 800 mm / 30 kg
	Max. tool diameter (when adjacent pockets empty)	Φ250 mm*2	Φ260 mm*3	
	Tool selection method	MAZATROL Random memory (random pocket assignment)	Random selection, shortest path (fixed pocket assignment)	
	Tool change time (chip-to-chip)	5.0 s	5.7 s	6.8 s
Automatic pallet changer	Number of pallets	2		
	Change system	Rotary type		Shuttle type
	Pallet change time	13.0 s	25.0 s	48.0 s
Motors	Spindle motor (30 min. rating / cont. rating)	37 kW / 30 kW (50 HP / 40 HP)		
Power requirement	60 Hz Motor (30 min. rating / cont. rating)	99.20 kVA / 89.27 kVA	107.04 kVA / 97.06 kVA	117.68 kVA / 107.75 kVA
	50 Hz Motor (30 min. rating / cont. rating)	97.31 kVA / 87.38 kVA	105.15 kVA / 95.17 kVA	115.36 kVA / 105.43 kVA
	Air supply (pressure)	0.5 MPa (5 kgf/cm²) ~ 0.9 MPa (9 kgf/cm²)		
	Air supply (volume)	350 L/min	600 L/min	700 L/min
Machine size	Machine height	3727 mm	4052 mm	4511 mm
	Floor space requirement	4208 mm × 8186 mm	6081 mm × 8868 mm	7047 mm × 10896 mm
	Machine weight	30000 kg	45000 kg	57500 kg

*1 Limited feedrate with continuous axis movement
*2 When adjacent pockets are empty and pockets next to them have tools less than Φ240 mm, maximum tool diameter is Φ260 mm.
*3 When adjacent pockets are empty and pockets next to them have tools less than Φ160 mm, maximum tool diameter is Φ360 mm.

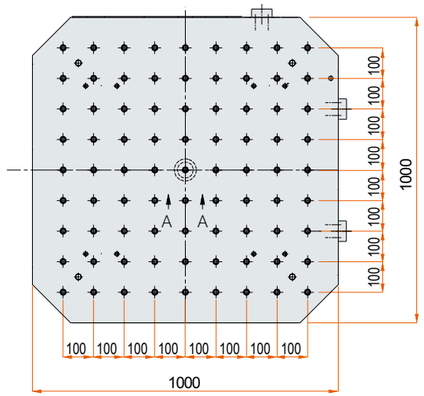
Standard Pallet Dimensions

Unit : mm

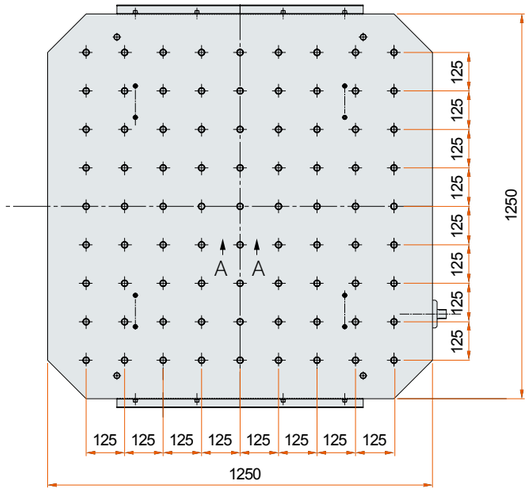
HCN-8800 800 mm × 800 mm tapped pallet



HCN-10800 1000 mm × 1000 mm tapped pallet

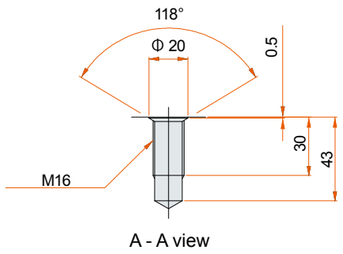


HCN-12800 1250 mm × 1250 mm tapped pallet

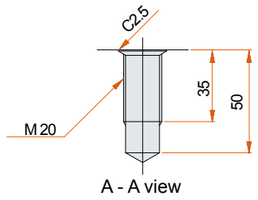


Note : Edge locator is optionally available.

HCN-8800 tapped pallet



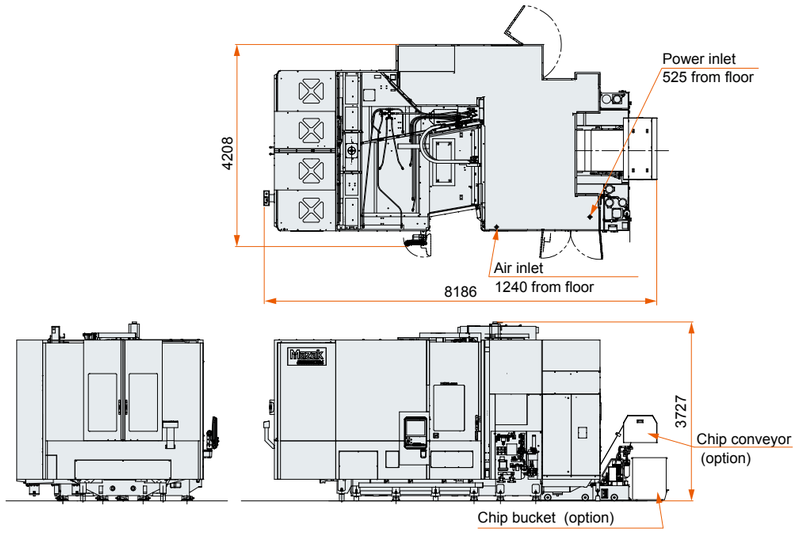
HCN-10800, HCN-12800 tapped pallet



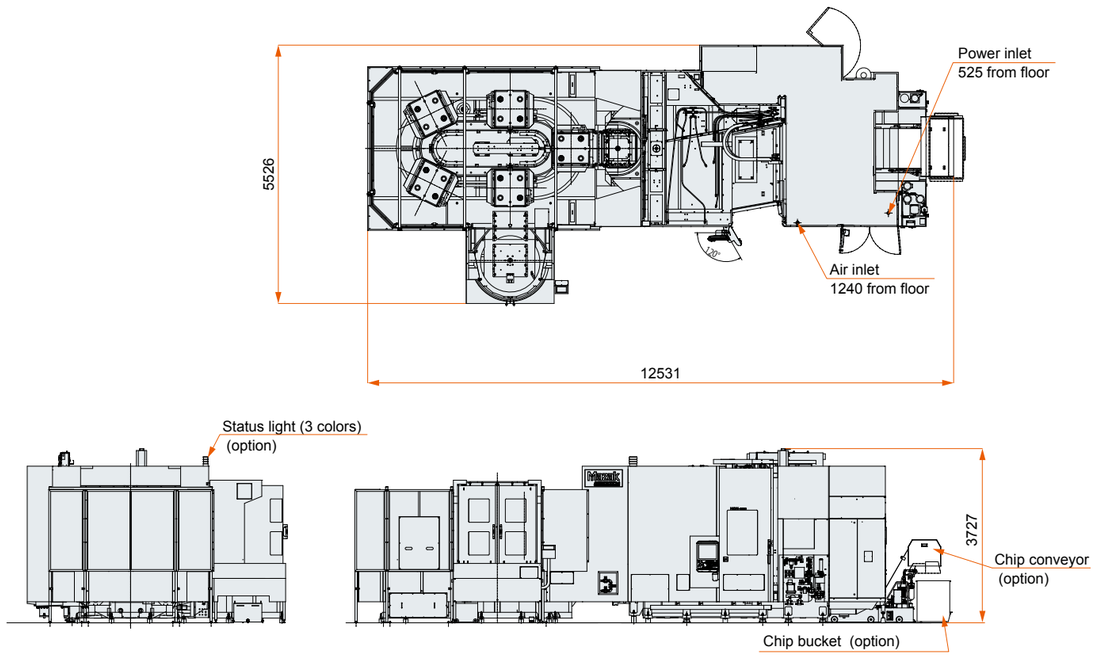
Machine Dimensions

Unit : mm

HCN-8800

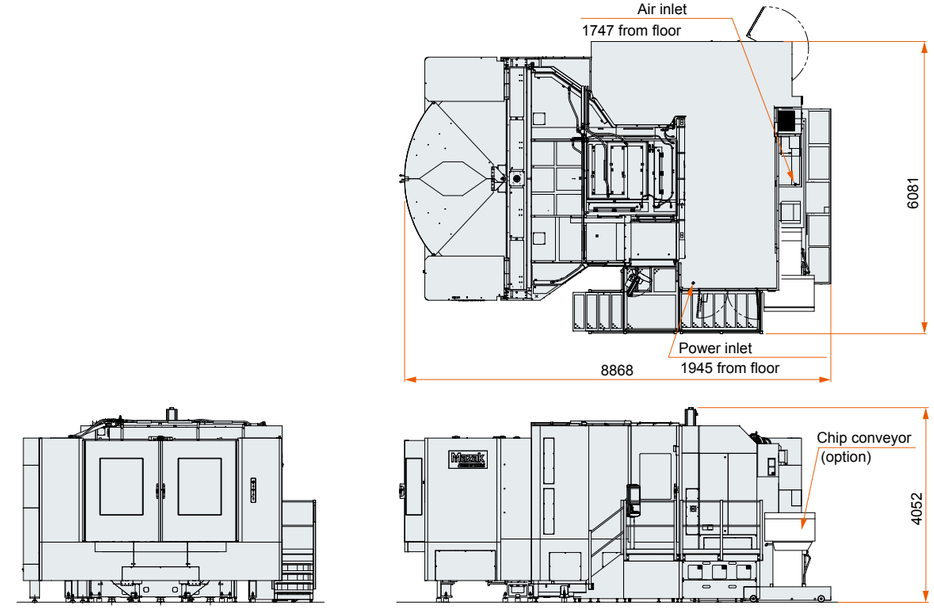


HCN-8800 6 pallet changer

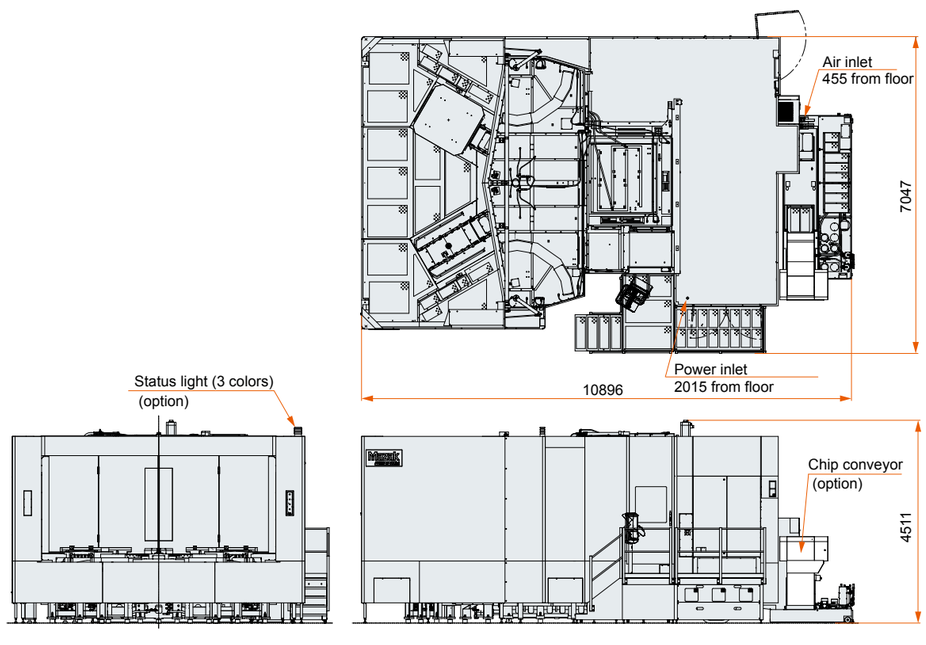


Unit : mm

HCN-10800



HCN-12800



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, 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, 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 sets)	
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, 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	
Peripheral network	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

* Option

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.

Extended coolant service life

Reduction of lubrication consumption

Reduction of electrical power consumption

Auto-power off

When the machine is not operated for a pre-registered period of time, the machine worklights are turned off automatically. They are automatically turned on when the motion sensor detects the return of the operator.

Grease lubrication

The linear roller guides and ball screws are lubricated by grease which eliminates tramp oil in the coolant resulting in a much longer service life for the coolant.

Energy Dashboard OPTION

The Energy Dashboard provides a convenient visual monitoring of energyconsumption and analysis. (Optional electrical power monitor required)

Process screen display

· Total energy consumption (of workpiece in operation)
· Current energy consumption

Energy consumption displayed on graph

Energy consumption by workpieces

Display approximate CO^2 emission and electrical power cost