

High-Precision Horizontal Machining Center

NH5000 DCG

NH5000 DCG



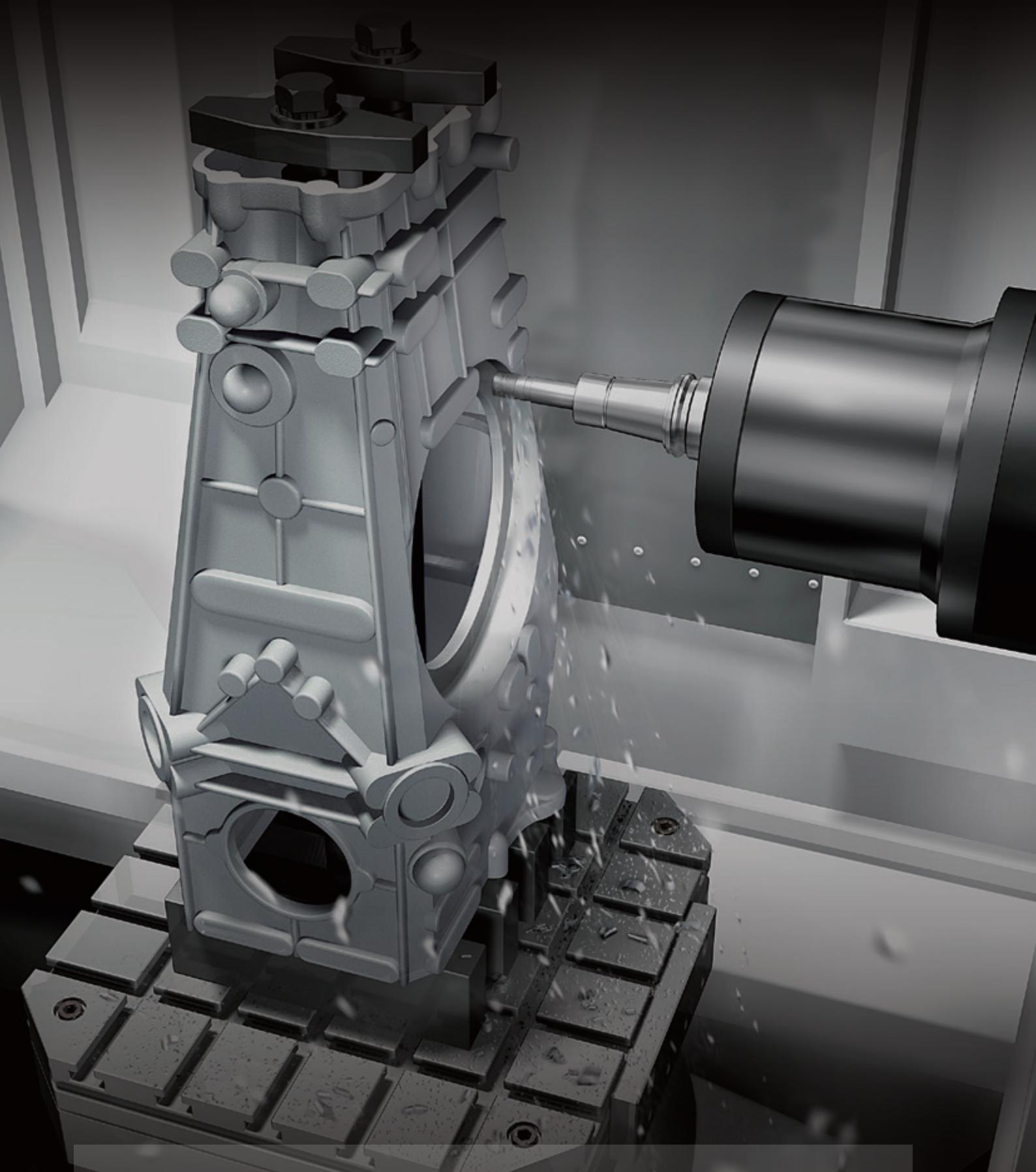
Achieving highest-level speed in the world

The NH5000 DCG, a high-precision horizontal machining center in the NH Series, is equipped with a 500 mm (19.7 in.) square pallet and employs DMG MORI's original technologies of DCG (Driven at the Center of Gravity) as standard and DDM (Direct Drive Motor) as an option.

We have prepared No. 40 and No. 50 taper spindles for the model.

A machine with a No. 40 taper spindle offers both space saving design and a large work envelope, while a machine with a No. 50 taper spindle focuses on high cutting ability. The two varieties of spindles will solve a wide range of production problems with parts machining, and realize unprecedented high productivity.





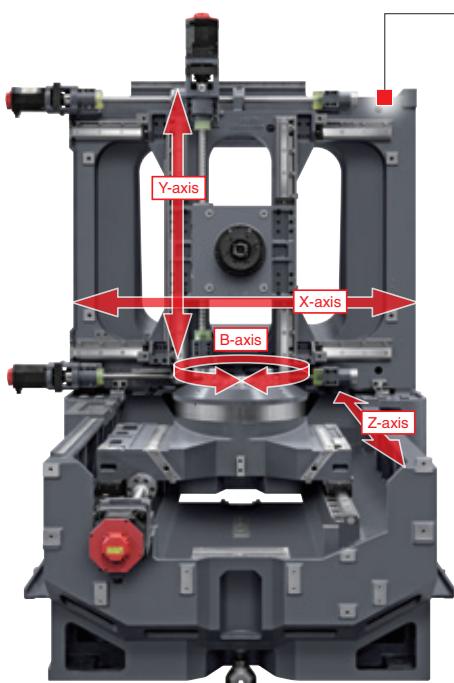
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MAPPS: Mori Advanced Programming Production System
• Figures in inches were converted from metric measurements.

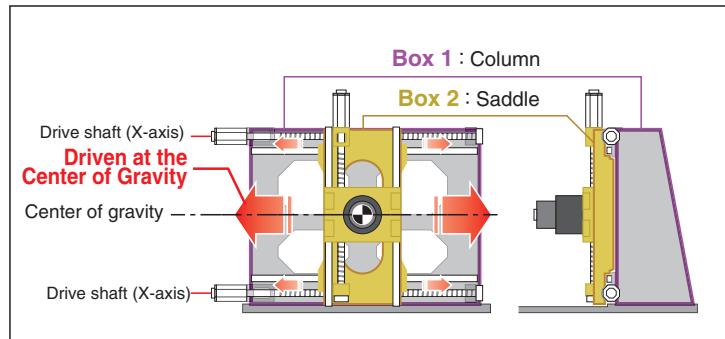
Principal mechanisms

Basic structure



Box-in-Box Construction

Moving parts are guided and driven with perfect balance at their center of gravity by the "Box-in-Box" Construction, which supports the saddle at both ends. At the same time, we have improved the servo motor's traceability, allowing higher speed and greater acceleration than ever before.



Rapid traverse rate <X, Y and Z axes>

50 m/min (1,968.5 ipm)

Feedrate <X, Y and Z axes>

50 m/min (1,968.5 ipm)

• With AI contour control

Max. acceleration

X-axis 1.0 G {9.8 m/s² (32.2 ft/s²)}

Y-axis 1.1 G {10.8 m/s² (35.4 ft/s²)}

Z-axis 0.7 G {6.9 m/s² (22.6 ft/s²)}

Driven at the Center of Gravity



DCG

Driven at the Center of Gravity

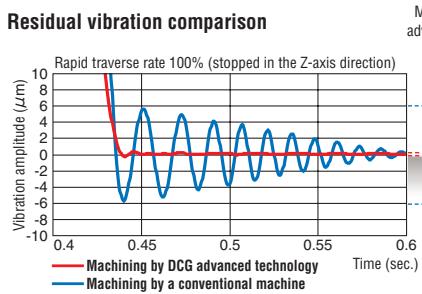
Original technology

Our DCG (Driven at the Center of Gravity) technology controls vibration, which is one of the main enemies of high speed and high precision, by driving structural parts at their center of gravity.

Vibration Controlled

For positioning, machines with DCG virtually eliminate vibration, while machines without DCG continue to vibrate for a long time.

DCG controls the rotational vibration which appears at every acceleration start point, and which is proportional to the distance between the drive point and the center of gravity. This prevents deterioration of the quality of the machined surface.



Machining by DCG advanced technology

(machine type: NV4000 DCG)

Machining by a conventional machine

Machining by DCG advanced technology

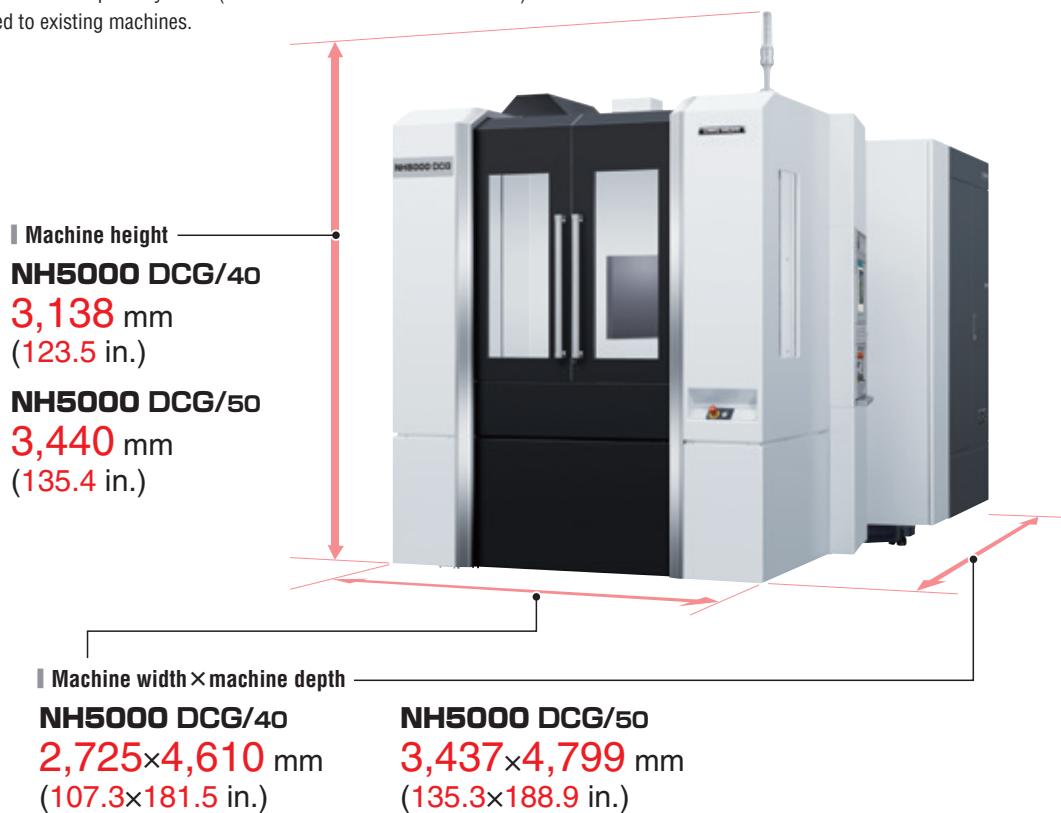
Machining by a conventional machine

■ Features of DCG

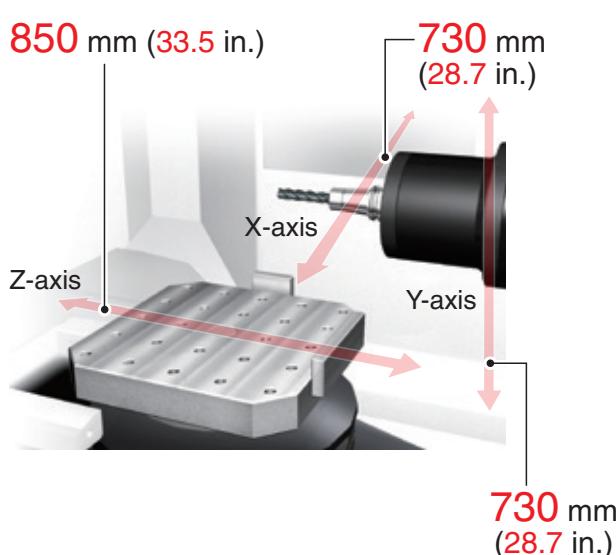
- Improved surface quality
- Outstanding acceleration
- Improved roundness
- Longer tool life

Space-saving design

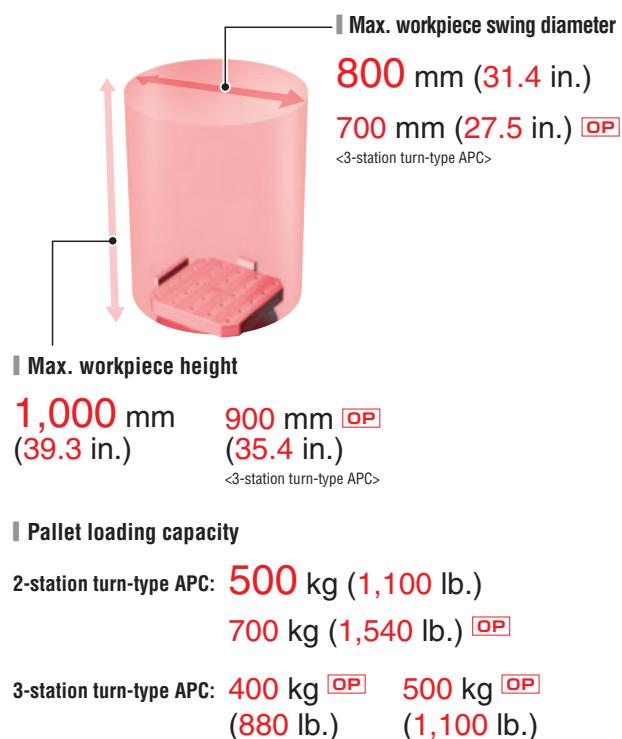
Offering both space-saving design and a large work envelope, reducing the required floor space by 10% (in the case of the NH5000 DCG/40) compared to existing machines.



Travel <X, Y and Z axes>



Working area



Principal mechanisms

Spindle



For the spindle drive, we use the high-efficiency DDS (Direct Drive Spindle) motor which extracts full power over a wide range, from high-speed machining to heavy-duty cutting. This machine handles all types of materials from steel to aluminum and other non-ferrous metals.

Equipped with a No. 40 taper spindle

Max. spindle speed	NH5000 DCG/40
14,000 min ⁻¹	
20,000 min ⁻¹ OP	

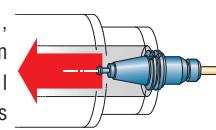
Equipped with a No. 50 taper spindle

Max. spindle speed	NH5000 DCG/50
8,000 min ⁻¹	
15,000 min ⁻¹ OP	
8,000 min ⁻¹ <high torque> OP	

Tool clamp power

Improved tool clamping force

Using the newly developed collet, clamping power on the tool has been increased. The ability to control vibration during spindle rotation ensures high-precision machining.



NH5000 DCG/40

12,600 N
(2,832.4 lbf)

NH5000 DCG/50
21,000 N
(4,720.7 lbf)

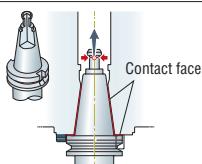
Machine type	Spindle acceleration time	Spindle deceleration time
NH5000 DCG/40	1.72 sec. (0 → 14,000 min ⁻¹)	1.49 sec. (14,000 min ⁻¹ → 0)
NH5000 DCG/40 <high speed> OP	2.55 sec. (0 → 20,000 min ⁻¹)	2.35 sec. (20,000 min ⁻¹ → 0)
NH5000 DCG/50	1.91 sec. (0 → 8,000 min ⁻¹)	1.80 sec. (8,000 min ⁻¹ → 0)

• Please use a two-face contact tool when using a No. 40 taper spindle at 15,000 min⁻¹ or higher, or a No. 50 taper spindle at 10,000 min⁻¹ or higher.

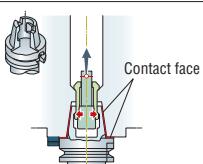
Two-face contact specification **OP**

Tool rigidity has been improved by contact of both the spindle taper and the tool flange. This extends the useful life of a tool, raises cutting power and improves the machining precision.

BT specifications



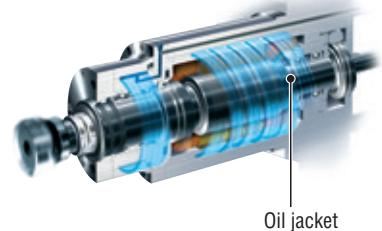
HSK specifications



- All DMG MORI spindles are made in-house to better meet our customer needs. For details, please consult with our sales representative.
- When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.

Spindle cooling

Stator coil in DDS motor: the coolant supplied by the oil chiller minimizes heat diffusion by circulating through an oil jacket, which is placed around the stator coil.



Tool, Boring

The maximum tool length is the same as the pallet size. Deep hole boring up to the maximum tool length can be done without turning the table around, reducing cutting time and achieving high-precision machining.

Max. tool length

500 mm (19.6 in.)

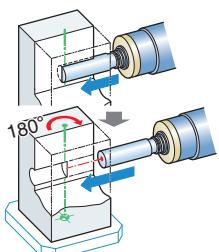
Pallet working surface

**500×500 mm
(19.6×19.6 in.)**

Boring

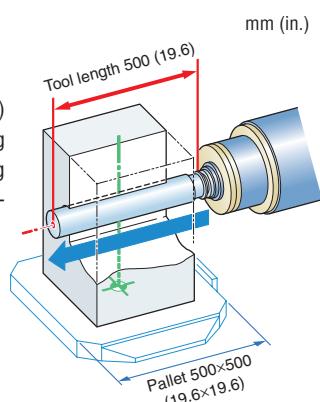
Previous model

Concentric drilling can be done on both sides by flipping the table.



NH5000 DCG

Boring up to 500 mm (19.6 in.) can be done without turning the B-axis, reducing cutting time and achieving high-precision machining.



• Depending on condition, machining may not always be possible.

Table

A one-degree indexing table is standard, and a full indexing table equipped with DDM is available as an option. These have significant advantages for machining of workpieces that require high speed and high positioning accuracy.

■ Selection of tables

Table type	1° indexing table	Full 4th axis rotary table [OP] DDM Direct Drive Motor
Minimum pallet indexing angle	1°	0.001°
Pallet indexing time (90°) <including clamping and unclamping time>	1.57 sec.	1.12 sec.

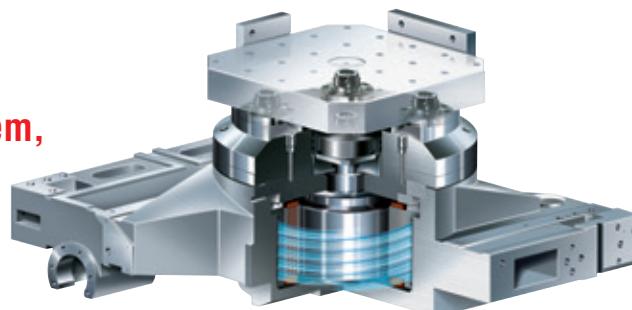
Direct Drive Motor

[OP]

**Original technology**

The world's fastest rotary axis drive system, which achieves zero backlash.

Until now, gears have been used to transmit the drive power to the rotary axes, but this drive system had a negative effect on drive speed and precision. By transmitting the drive power to the rotary axes directly without using gears, DDM offers outstanding transmission efficiency and high-speed feed. DDM also achieves zero backlash.

**■ Features of DDM**

- High-speed rotation
- High-precision indexing
- Less maintenance
- Longer product life

■ B-axis Max. rotational speed

Previous model
(worm gear system)

NH5000 DCG (DDM)22 min⁻¹► 100 min⁻¹Approximately
4.5 times faster**APC**

It uses a front 2-station turn-type APC. This APC offers high-speed pallet change that reduces non-cutting time.

Pallet changing time***■ 2-station turn-type APC****7** sec.

13 sec. [OP] <Pallet loading capacity 700 kg (1,540 lb.)>

* Excluding clamping and unclamping time.

When equipped with the auto-coupler, time taken to shut off/supply hydraulic pressure to the fixture is not included.

The pallet changing time of the 3-station APC differs from that of the standard specification. Please contact our sales representative for details.

Principal mechanisms

ATC

By using a double arm, which offers high-speed tool change, non-cutting time is dramatically reduced.

Tool changing time

Cut-to-cut (chip-to-chip)

Machine type	Max. <ISO>	Min. <ISO>	<MAS>
NH5000 DCG/40 (40 tools)	8.9 sec.	3.5 sec.	3.3 sec.
NH5000 DCG/50 (54 tools)	14.3 sec.	4.4 sec.	4.0 sec.

ISO 10791-9 JIS B6336-9

ISO: International Organization for Standardization JIS: Japanese Industrial Standard

• The time differences are caused by the different conditions (travel distances, etc.) for each standard.

Tool-to-tool

NH5000 DCG/40

0.9 sec.

NH5000 DCG/50

1.8 sec.

Magazine

We prepared two types of magazine: a chain type and a rack type.

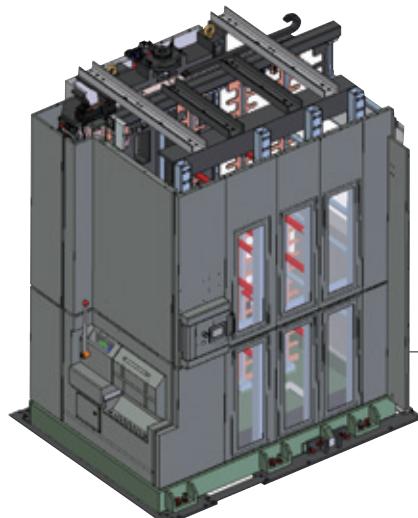
Customers can choose either a chain type or rack type to suit their production needs.

Tool storage capacity

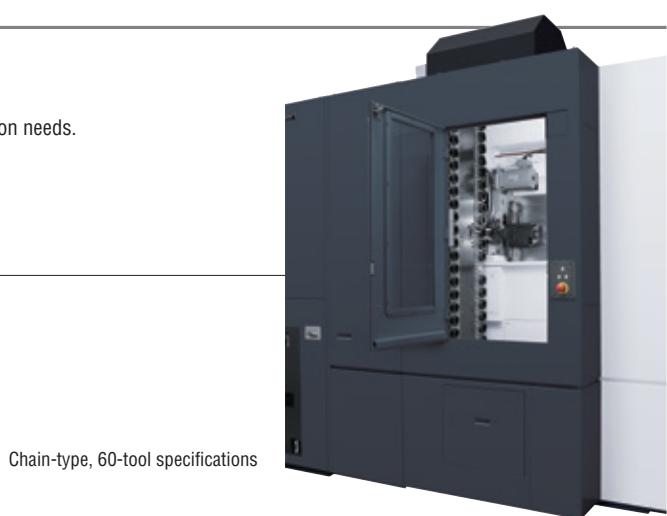
Chain-type magazine (attached to the machine)

NH5000 DCG/40

40 tools **60** tools [OP](#)



Rack-type,
140-tool specifications



Chain-type, 60-tool specifications

Chain-type magazine (separate type)

NH5000 DCG/40

120 tools [OP](#)

NH5000 DCG/50

54 tools

Rack-type magazine (separate type) [OP](#)

NH5000 DCG/40

180 tools [OP](#) **300** tools [OP](#)

240 tools [OP](#) **360** tools [OP](#)

NH5000 DCG/50

100 tools [OP](#) **180** tools [OP](#)

140 tools [OP](#) **240** tools [OP](#)

Consultation is required

• Magazines incorporate a pot transfer mechanism and the tool capacity includes one tool at the spindle side.

Machine type	Max. tool length	Max. tool mass	Max. tool diameter
NH5000 DCG/40	500 mm (19.6 in.)	12 kg (26.4 lb.)	70 mm (2.7 in.) <with adjacent tools> 140 mm (5.5 in.) <without adjacent tools>
NH5000 DCG/50		30 kg (66 lb.)	110 mm (4.3 in.) <with adjacent tools> 300 mm (11.8 in.) <without adjacent tools>

• The maximum tool diameter is limited to 255 mm (10.0 in.) or less when using a No. 50 taper spindle at 10,000 min¹ or higher.

High-precision equipment

Full closed loop control (Scale feedback)

OP



- Superior precision with full closed loop control (Scale feedback)
- Magnetic measuring system with a high resolution of 0.01 µm
- Resistance to oil and condensation due to a magnetic detection principle



- Impact resistance of 450 m/s² (17,716.5 in./s²)
- Vibration resistance of 250 m/s² (9,842.5 in./s²)
- High-accuracy machining is ensured by a scale with the same thermal expansion rate as the cast iron machine structure

Coolant chiller (separate type) <option>

OP



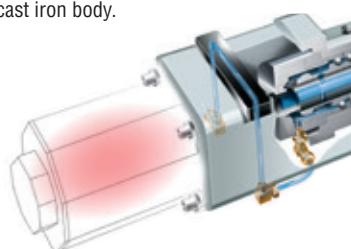
Increased coolant temperature causes thermal displacement in the fixtures and workpiece, affecting the machining accuracy of the workpiece. Use this unit to prevent the cutting coolant from heating up. When using oil-based coolant, the coolant temperature can become extremely high even with the standard coolant pump, so please be sure to select this unit.

When using oil-based coolant or a high-pressure coolant system, please be sure to consult our sales representative.

- We cannot guarantee that this unit will completely control the coolant temperature. It is designed to help prevent oil temperature increases.

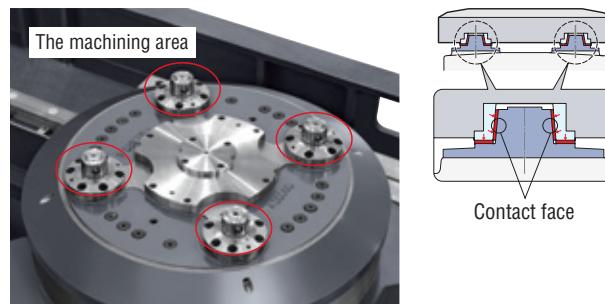
Servo motor thermal insulation

By circulating coolant inside the flange, heat from the motor is prevented from being transmitted to the cast iron body.



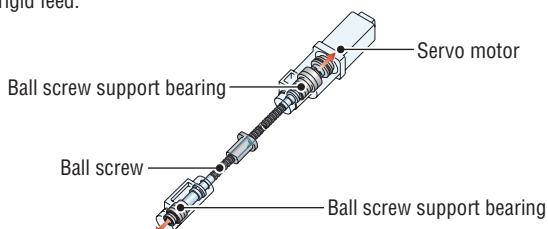
Pallet clamp system

The dual contact taper cone pallet stabilizes the pallet with its powerful clamping force, and improves the repeatability.



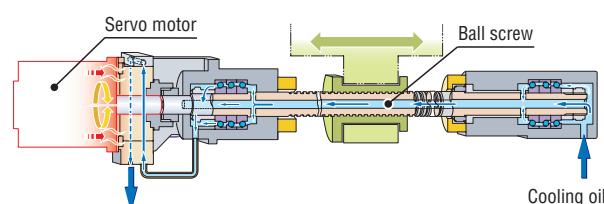
High-rigidity double-anchor support

As well as ball screw core cooling, it uses a double-anchor support for highly rigid feed.



Ball screw center cooling

In order to control thermal displacement and to keep high-accuracy positioning, the ball screw core cooling system in which cooling oil circulates through the support bearings is used.

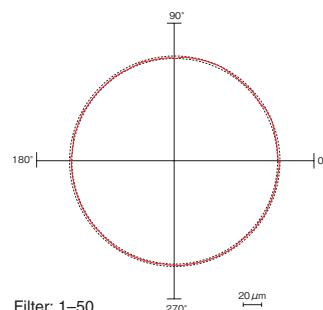


High-accuracy data

Circularity

NH5000 DCG/40

1.97 μm (actual result)



Material <JIS>	A5052* <outer diameter: 130 mm (5.1 in.)>
Tool	φ 16 mm (φ 0.6 in.) carbide end mill <4 flutes>
Spindle speed	8,000 min ⁻¹
Cutting feedrate	2,000 mm/min (78.7 ipm)

A5052: Aluminum

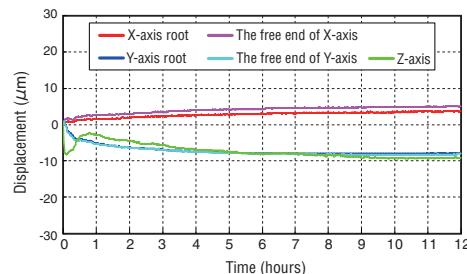
* 5052 (ANSI), NS4 (BS), AlMg2.5 (DIN), 5A02 (GB)

X, Y, Z-axes thermal displacement

Max. spindle speed: 14,000 min⁻¹

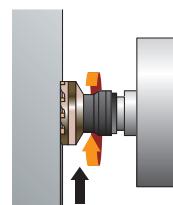
10 μm or less

(actual results with spindle thermal displacement compensation)



Cutting test

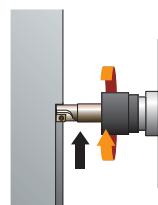
Face mill



Material <JIS>: A5052*

	NH5000 DCG/40	NH5000 DCG/50
Tool	φ 80 mm (φ 3.1 in.) <7 flutes>	φ 100 mm (φ 3.9 in.) <9 flutes>
Material removal rate	1,536 mL/min (93.7 in³./min)	1,920 mL/min (117.1 in³./min)
Width of cut	64 mm (2.5 in.)	80 mm (3.1 in.)
Depth of cut	1.5 mm (0.06 in.)	1.5 mm (0.06 in.)
Spindle speed	14,000 min ⁻¹	8,000 min ⁻¹
Feedrate	16,000 mm/min (629.9 ipm)	16,000 mm/min (629.9 ipm)

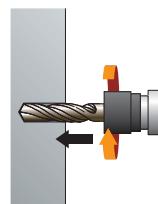
Throw-away end mill



Material <JIS>: S50C*

	NH5000 DCG/40	NH5000 DCG/50
Tool	φ 25 mm (φ 1.0 in.) <2 flutes>	φ 25 mm (φ 1.0 in.) <2 flutes>
Material removal rate	101 mL/min (6.2 in³./min)	178 mL/min (10.9 in³./min)
Width of cut	25 mm (1.0 in.)	25 mm (1.0 in.)
Depth of cut	8 mm (0.31 in.)	14 mm (0.6 in.)
Spindle speed	2,546 min ⁻¹	2,546 min ⁻¹
Feedrate	509 mm/min (20.0 ipm)	509 mm/min (20.0 ipm)

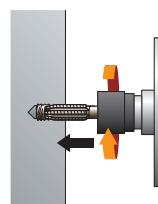
Drill



Material <JIS>: S50C*

	NH5000 DCG/40	NH5000 DCG/50
Tool	φ 50 mm (φ 2.0 in.) <2 flutes>	φ 50 mm (φ 2.0 in.) <2 flutes>
Material removal rate	79 mL/min (4.8 in³./min)	94 mL/min (5.7 in³./min)
Spindle speed	160 min ⁻¹	160 min ⁻¹
Feedrate	40 mm/min (1.6 ipm)	48 mm/min (1.9 ipm)

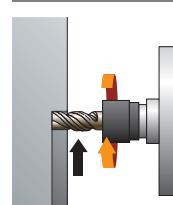
Tap



Material <JIS>: S50C*

	NH5000 DCG/40	NH5000 DCG/50
Tool	M42×P4.5	M42×P4.5
Spindle speed	76 min ⁻¹	76 min ⁻¹
Feedrate	342 mm/min (13.5 ipm)	342 mm/min (13.5 ipm)

Roughing end mill



Material <JIS>: S50C*

	NH5000 DCG/40	NH5000 DCG/50
Tool	φ 20 mm (φ 0.8 in.) <4 flutes>	φ 40 mm (φ 1.6 in.) <5 flutes>
Material removal rate	57 mL/min (3.5 in³./min)	60 mL/min (3.7 in³./min)
Width of cut	20 mm (0.8 in.)	40 mm (1.6 in.)
Depth of cut	30 mm (1.2 in.)	25 mm (1.0 in.)
Spindle speed	400 min ⁻¹	200 min ⁻¹
Feedrate	96 mm/min (3.8 ipm)	60 mm/min (2.4 ipm)

*1 5052 (ANSI), NS4 (BS), AlMg2.5 (DIN), 5A02 (GB)

*2 1049 (ANSI), C50, C50E, C50R (BS, DIN), 50 (GB)

● The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
A5052: Aluminum S50C: Carbon steel JIS: Japanese Industrial Standard

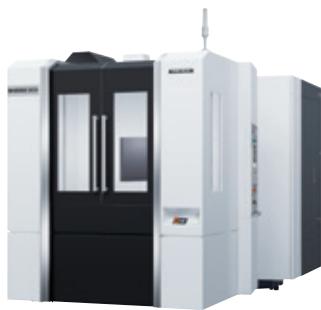
Productivity

The NH5000 DCG has realized even higher productivity by increasing the speed of each structure.

Data for comparison

NH5000 DCG/40

Previous model (1988 year—)



Max. spindle speed
14,000 min⁻¹

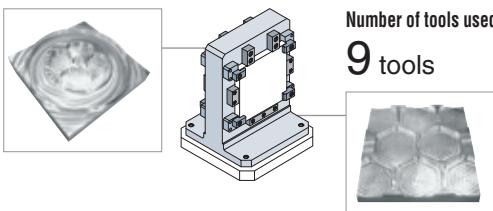
Rapid traverse rate <X, Y and Z axes>
50 m/min
(1,968.5 ipm)
Tool changing time
Cut-to-cut <chip-to-chip>
3.3 sec. <MAS>



Max. spindle speed
7,000 min⁻¹

Rapid traverse rate <X, Y and Z axes>
20 m/min
(787.4 ipm)
Tool changing time
Cut-to-cut <chip-to-chip>
4.6 sec. <MAS>

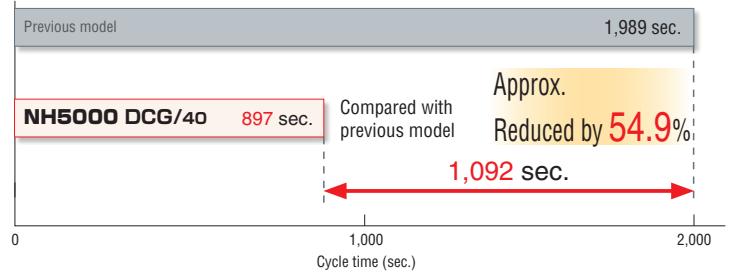
Workpiece



Material <JIS>: A5052* (Aluminum)

- When machining 2 kinds of workpieces at the same time.
- * 5052 (ANSI), NS4 (BS), AlMg2.5 (DIN), 5A02 (GB)

Cycle time comparison



JIS: Japanese Industrial Standard

Comparison of production volume and sales

5 USD/EUR per work

Running time (one day):

$$8 \text{ hours} \times 85\% = 3,600 \text{ sec.} \times 8 \times 0.85 = 24,480 \text{ sec.}$$

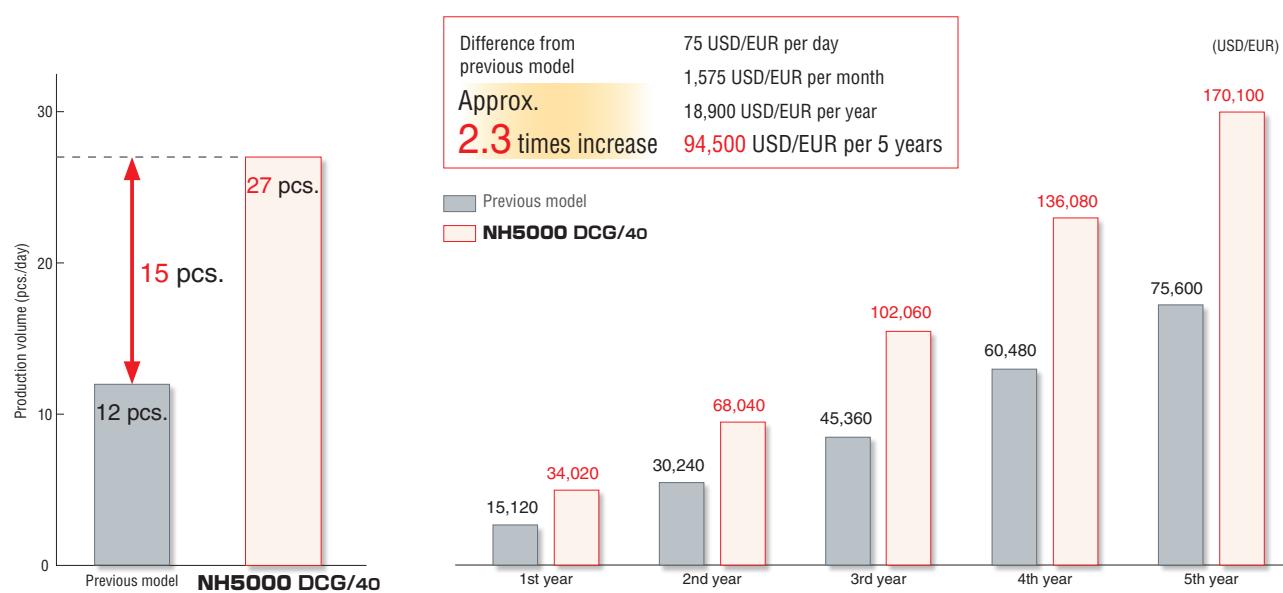
Production volume (pcs./day):

$$24,480 \text{ sec.} \div \text{Cycle time (sec.)}$$

Number of days operating in 1 year:

$$21 \text{ days} \times 12 \text{ months} = 252 \text{ days}$$

5-year sales simulation



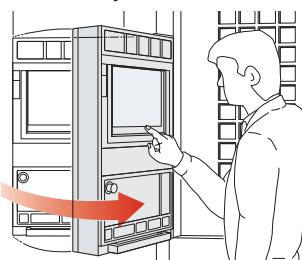
Improved workability

For the NH5000 DCG, we have installed features throughout the machine to improve operability based on the complete operator-centered concept.



Swivel-type operation panel

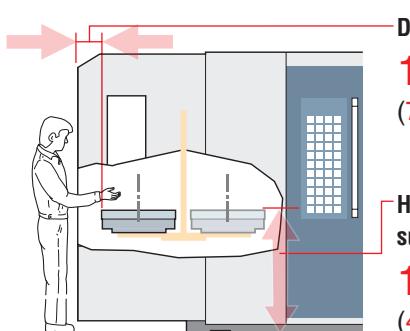
The operation panel which can swivel from 0° to 90° improves operability and visibility.



Swivel range 90°

Setup station

With excellent access to the table and a wide door opening, setup operations such as fixture adjustment can be done smoothly.



Distance from pallet

**190 mm
(7.5 in.)**

Height of pallet top surface

**1,200 mm
(47.2 in.)**

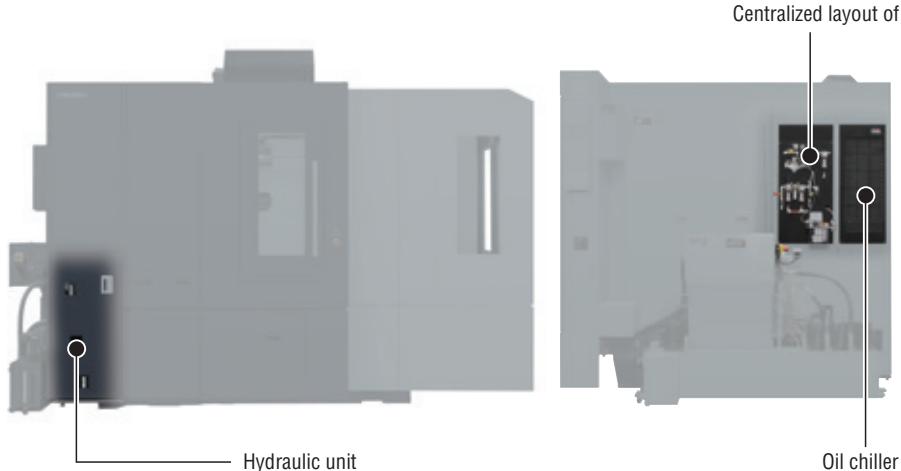


Door opening
**860 mm
(33.9 in.)***

* For the automatic door specification, the door opening is 845 mm (33.3 in.).

Maintenance

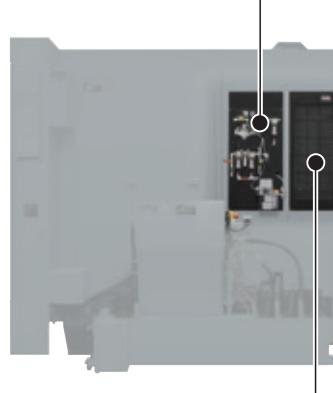
For the NH5000 DCG, maintenance is improved by placing the oil chiller, hydraulic unit, and pneumatic instruments all in one place and offering better accessibility to operators.



Centralized layout of devices



Hydraulic unit



Oil chiller

Replacement of spindle unit

By changing the spindle unit to a cartridge, which even includes the rear bearings, we have dramatically reduced replacement time.

Peripheral equipment

Chip conveyor

The center conveyor discharges chips directly outside the machine, offering both outstanding chip disposal and space savings.



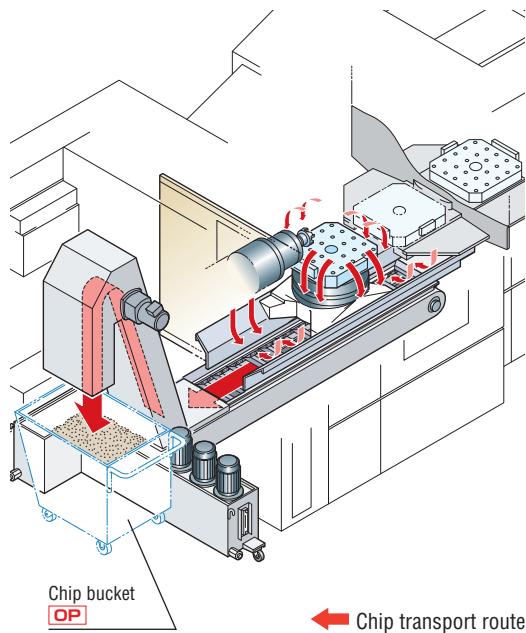
Scraper type + drum filter type



Hinge type + drum filter type [OP]



Scraper type + drum filter type



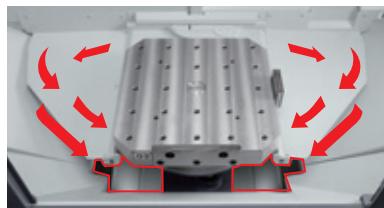
← Chip transport route

Specifications	Workpiece material and chip size							○: Suitable	×: Not suitable		
	Steel			Cast iron		Aluminum/non-ferrous metal					
	Long	Short	Powdery	Short	Long	Short	Powdery				
Scraper type+drum filter type	×	○	○	○	×	○	○				
Hinge type+drum filter type [OP]	○	○	○	○	○	○	○				

- Chip size guidelines
Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ϕ 40 mm (ϕ 1.6 in.) or less
Long: bigger than the above
- The options table shows the general options when using coolant. Changes may be necessary if you are not using coolant, or depending on the amount of coolant, compatibility with machines, or the specifications required.
- Please select a chip conveyor to suit the shape of your chips. When using special or difficult-to-cut material (chip hardness HRC45 or higher), please consult with our sales representative.
- Chip conveyors are available in various types for handling chips of different shape and material. For details, please consult with our sales representative.

Chip disposal groove (setup station)

A chip disposal groove is also included on the setup station.



Chip disposal groove

Shower coolant

As well as preventing chips from scattering during machining, this allows them to fall smoothly into the center conveyor.

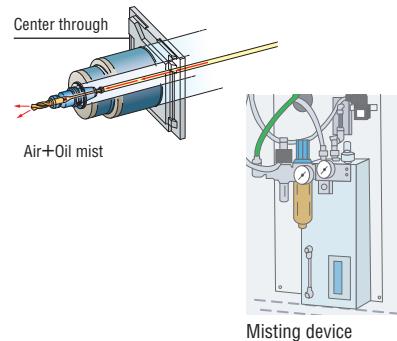


- When using shower coolant, it is used at the same time as spindle coolant.

Semi dry unit

OP Consultation is required

Supplies air and oil mist to the cutting tip. An environmentally friendly device which reduces oil consumption. We recommend using this unit together with a mist collector.



Peripheral equipment

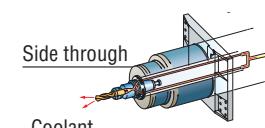
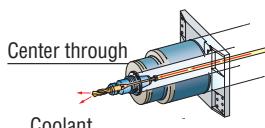
Through-spindle coolant system

OP

The through-spindle coolant system effectively eliminates chips, cooling the machine point and lengthening the lives of your tools.

	Unit on coolant tank	Separate type
Discharge pressure	1.5 MPa (217.5 psi)	1.5/3.5/7.0 MPa (217.5/507.5/1,015 psi)
Installation space <width × depth>	—	820×1,120 mm (32.3×44.1 in.) <High-pressure coolant system>
Water-soluble coolant	○	○
Coolant filtration accuracy	40 µm	20 µm

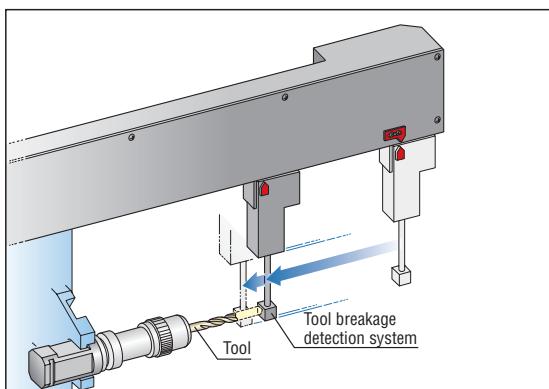
⚠ Flammable coolant such as oil-based coolant has a high risk of ignition, and will cause fire or machine breakage if ignited. If you have to use a flammable coolant for any reason, please be sure to consult our sales representative.



High-pressure coolant system
(separate type)

Tool breakage detection system (magazine)

OP



The tool breakage detection unit at the waiting pot position will detect any tool breakage in the magazine. The tool length is not measured inside the machine, so it has no effect on the operating rate.

Automatic measurement

OP

In-machine measuring system (spindle)

Touch sensor (optical signal transmission type)



Sensor



Receiver

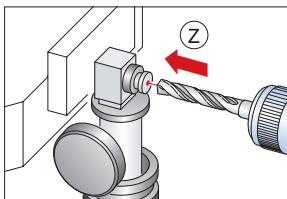
- Automatic
- Centering
- Measurement

Manual The workpiece setter function can be added

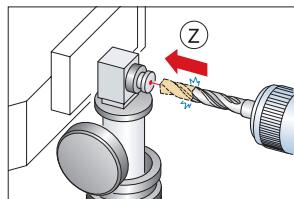
Workpiece zero point setting and centering are possible

In-machine measuring system (table)

Touch sensor



Tool length measurement



Tool breakage detection

- Automatic
- Tool length measurement
- Tool breakage detection

Manual The tool setter function can be added

Tool length offset is possible

Automatic measurement+Manual measurement functions

OP

Manual measurement applications can be added to the automatic measurement function.

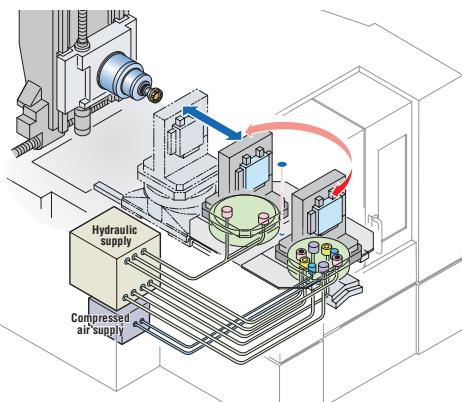
Fixture interface

Fixture interface

OP

Auto-coupler fixture interface

Easily transfer the pallets between the setup station and the work area and avoid external hoses and couplers.

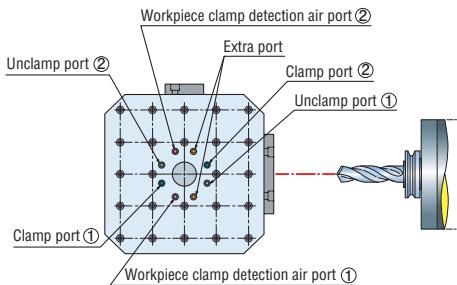


Compressed air is supplied to the setup station. Hydraulic fluid is supplied to both the setup station and the machining table.

- Hydraulic fluid is supplied to the machining table through two ports that diverge from one circuit.

Check list (for hydraulic/pneumatic fixtures)

- Pressure source
 - Hydraulic
 - Pneumatic
- Supplied pressure _____ MPa
- No. of circuits
 - Hydraulic
 - Pneumatic
 - For workpiece holding detection
- Others
 - Clamp check system
 - Fixture chip wash
 - Fixture air blow system



Auto-coupler

High pressure can be used with the anti-rising mechanism.

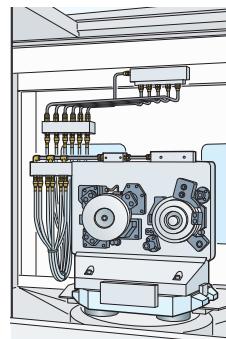
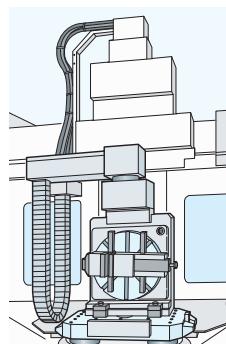


* Includes two extra ports.



• Hydraulic fluid is supplied to the machining table through two ports that diverge from one circuit.

Custom fixture interfaces are available for connecting any fixture, either part time or full time



Reduction in environmental burden

Eco-friendly design

Reduced consumption of lubricating oil

Oil-bath ATC

An oil-bath design has been integrated into the ATC unit design. Compared with conventional oil drip designs, the amount of lubricating oil used has been radically reduced.



Power-saving function



Energy-saving settings screen

Automatic sleep function

If the keyboard is not touched after a certain amount of time and NC operation is not being performed, power is cut off to the servo motor, the spindle, the coolant pump and the chip conveyor, thereby saving energy.

Automatic machine light function

If the operation panel is not touched for a certain amount of time, the interior light automatically turns off. This saves energy and lengthens the life of the machine lights.

Transfer systems OP

The versatile systems resolve production issues.

CPP system (Carrier Pallet Pool System)

With its simple construction provided in predefined packages, this system is easy to introduce. For the system configuration, the customer can select from 8 packages to provide the optimum specifications for their needs.

■ Controller

Handy controller
(Standard features)



- MCC-LPS III is available as an option.



● System example

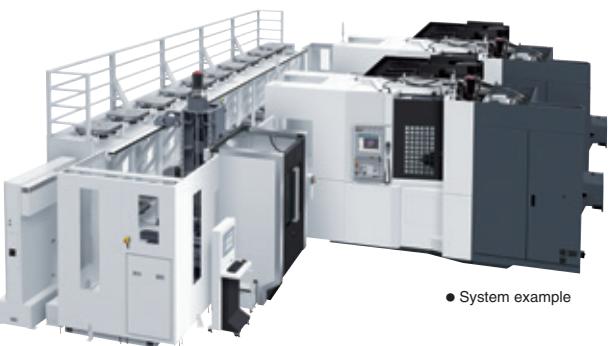
LPP system (Linear Pallet Pool System)

This system can be equipped with multi-level pallet racks, providing a high level of automation.

The system construction can also be customized however you wish, achieving the optimum productivity and operation rate.

■ Controller

MCC-LPS III (Standard features)

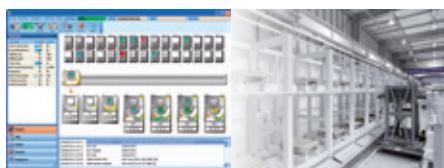


● System example

Applications

Linear Pallet Pool Control System

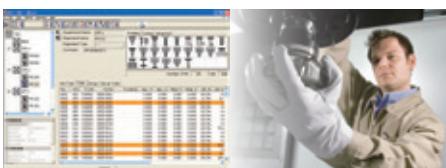
MCC-LPS III



- Easy operation / management of the pallet transfer system.
- Machining programs can be managed and automatically downloaded.
- Able to flexibly change production priority in response to urgent requests.

The Tool Management System

MCC-TMS



- Improves the system operating rate through highly efficient, centralized tool management.
- Compatible with ID tags.
- Compatible with tool presetter interface.



● MCC-LPS III is installed in the specialized cell controller and MCC-TMS can be installed in the controller and your PC.

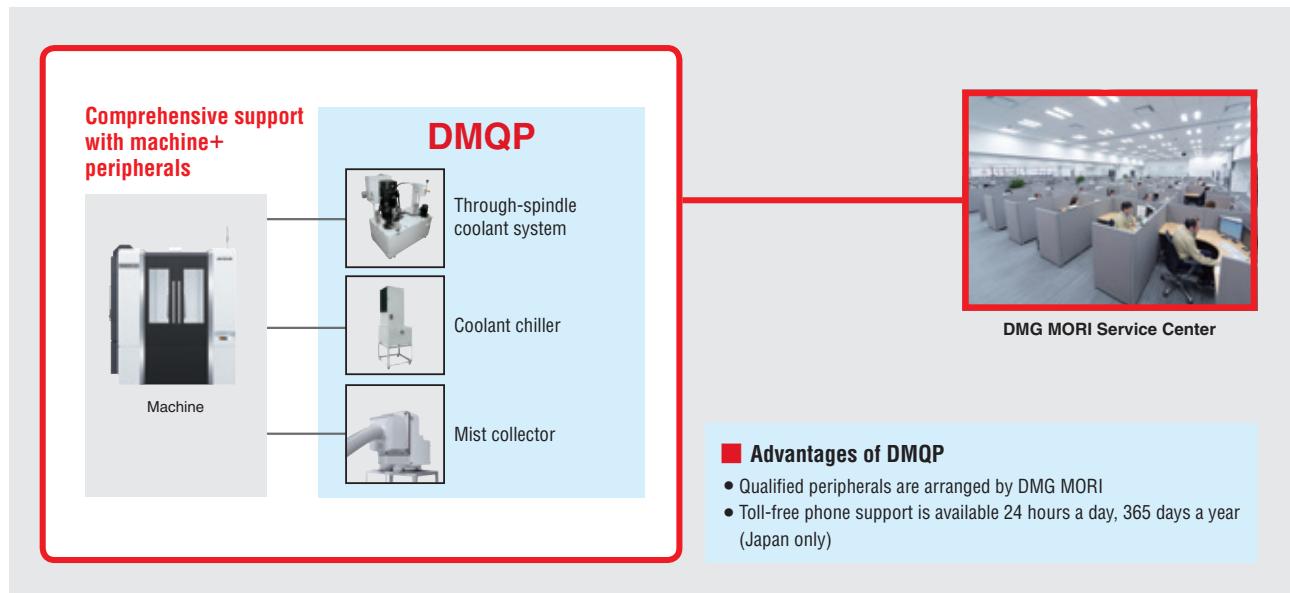
DMQP (DMG MORI Qualified Products) OP

Selected peripherals with superior quality, performance and maintainability.

The DMQP program is designed to certify peripherals that meet DMG MORI standards in quality, performance and maintainability. DMQP provides customers with even greater peace of mind.

Comprehensive support with machine + peripherals

DMG MORI provides comprehensive support, from proposal to delivery and maintenance, for high-quality peripherals that offer superior performance and maintainability.



Examples of qualified products (NH5000 DCG)

Through-spindle coolant system

Coolant is supplied to the tool tip through the center of the tool and spindle.

Coolant chiller

It cools down coolant to offer better cutting performance and minimize thermal displacement in the workpiece.

Mist collector

It removes mist, smoke, etc. generated inside the machine.

Chip bucket

Chips discharged from the chip conveyor are collected into this bucket.

Electrical cabinet chiller

This prevents temperature rise and dew condensation inside the electrical cabinet.

Refrigerating type air dryer

This unit removes moisture contained in the compressed air supplied by the compressor, preventing moisture-related problems in the pneumatic equipment.

CPP

This is a workpiece transfer system with the packaged system configuration that can be easily introduced at your factory.

LPP

This is a workpiece transfer system that can be freely customized for high-level automation.

Tool wagon

Tool cabinet

Basic tooling kit

● For more details on DMQP items, please contact our sales representative.

MAPPS IV

High-Performance Operation System
for Machining Centers



• 19-inch operation panel

High-performance operation system that pursues ease of use, and combines the best hardware in the industry with the advanced application/network systems.

- ▶ Outstanding operability thanks to upgraded hardware
- ▶ Cutting-edge functions for easier setup and maintenance
- ▶ Various types of monitoring, including internal monitoring, are possible on the screen (option)
- ▶ In the event of trouble, DMG MORI's remote maintenance service solves it smoothly **MORI-NET Global Edition Advance** [OP](#)

Outstanding operability

Vertical soft-keys

Vertical soft-keys are arranged on the left and right sides of the screen. The vertical soft-keys can be used as option buttons or shortcut keys to which you can assign your desired screens and functions, allowing you to quickly display the screen you want.



Keyboard

A PC-type keyboard is used as standard, making key input easy. A keyboard with a conventional key layout is also available as an option.

Advanced hardware

Reduction of drawing time*

Shorter drawing time was achieved thanks to increased CPU performance.

MAPPS III	68 sec.
MAPPS IV	45 sec.

* The reduction rate differs depending on the program.

Main specifications

Main memory	2 GB
User area	6 GB
Interface	<ul style="list-style-type: none"> • USB 2.0 3 ports (Screen side: 2, Bottom of operation panel: 1) • LAN 1 port (1000BASE-T) • RS-232-C port
Soft-keys	Left/right 12 keys Bottom 12 keys

Improved ease of maintenance

Alarm help function

When an alarm occurs, MAPPS identifies the cause of the trouble and provides solutions.

Improved productivity

APC schedule operation function [OP](#)

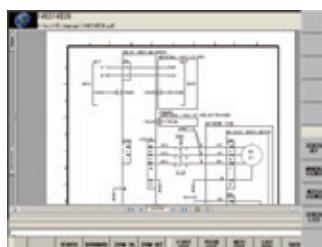
Operation schedule of the APC can be controlled through MAPPS. The ability to set various schedules supports unmanned continuous operation. This function can also handle changes to machining schedules flexibly.



Improved ease of setup

File display and Memo function

Data necessary for setups such as operating instructions, drawing data and text data can be viewed on MAPPS. Text data is editable.



Viewable file types

- PDF • TXT (Editable)
- Any file that can be displayed with Internet Explorer is available

Improved work efficiency

Fixed-point in-machine camera [OP](#) Consultation is required

Images taken by cameras installed inside/outside the machine can be viewed on the programming screen. This function is useful for maintenance.



Examples of camera locations

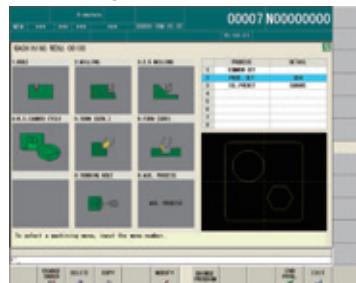
- Inside machine (to check machining)
- Tool magazine (to check cutting tools)
- Chip bucket (to check chip accumulation)

Conversational automatic programming

This function allows users to create programs simply by following the guidance on the screen.

Much of the programming process has been simplified due to the minimal key entry required for even the most complex shapes.

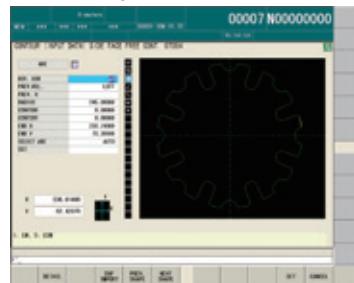
Machining menu



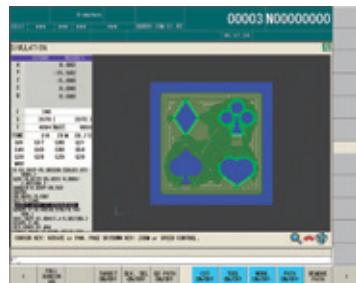
List display function



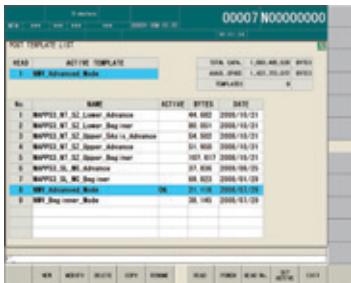
Contour input



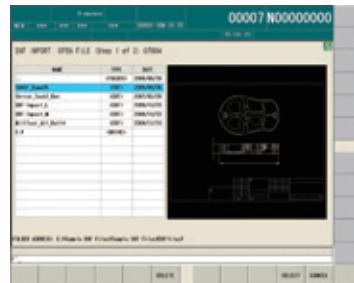
Islands, open pockets OP



MORI-POST advanced mode OP



DXF import function OP



Application System

MORI Automatic Programming System for Machining Center

MORI-APM OP

MORI-APM are application systems which let you create machining programs easily on your PC.

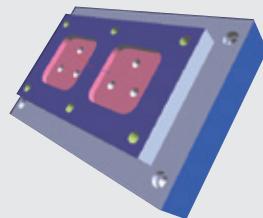


1. Simple programming



[Conversational automatic programming]
Easy operation by simply inputting product shapes according to the screen guidance.

2. Reduce programming time



[Supporting complicated programming]
Simply enter the machining shape using conversational automatic programming and the machine automatically selects the necessary tools and cutting conditions.

3. Save costs



[Compatibility with the MAPPS conversational function]

Prepared conversational programs can be converted into NC programs with MAPPS. Cutting conditions can also be changed on MAPPS.

- The photo shown may differ from actual machine.
- Information about the screen is current as of June 2018.

MORI-NETWORK

Network Application Systems

MORI-NET, MORI-SERVER, MORI-MONITOR, DMG MORI MESSENGER

For shorter total production time for all our customers

DMG MORI's software Line-up

This network system application achieves fast information sharing and increased production efficiency.

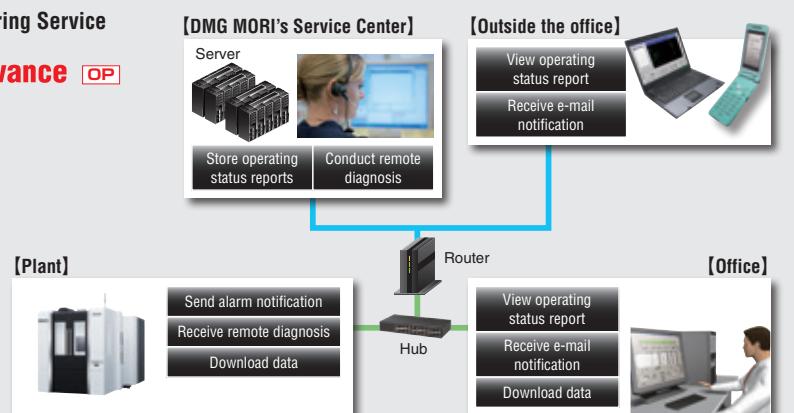
[Internet]
 [LAN]

Remote Maintenance/Machine Operation Monitoring Service

MORI-NET Global Edition Advance

■ Features

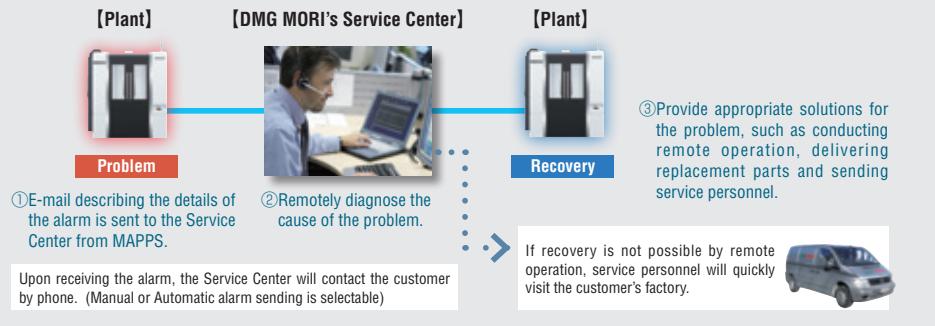
- Remote maintenance service by DMG MORI Service Center
- Internet-based, high speed (max. 1 Gbps), large capacity network
- No server installation is required — reduction in initial cost
- Download various data from the server located at DMG MORI



■ Remote alarm support

When an alarm goes off, an alarm notification will be sent to the DMG MORI Service Center simply by pressing the "Send e-mail" button on MAPPS. DMG MORI service personnel will remotely diagnose the cause of the problem, and quickly provide solutions for machine recovery.

- This service may not be available in some areas. Please contact our sales representative for details.

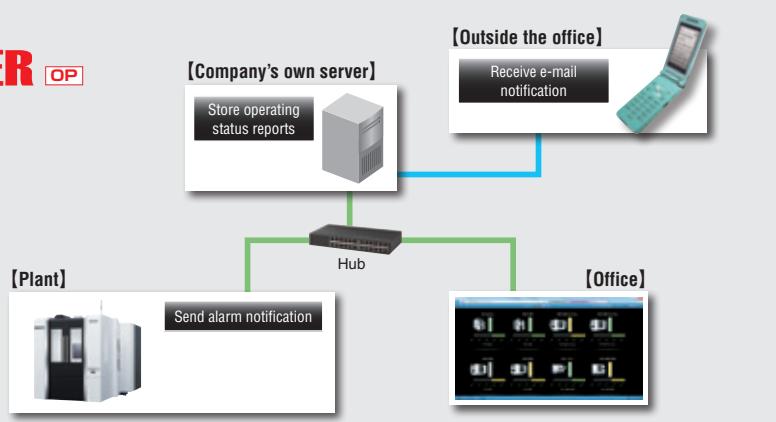


Machine Operation Monitoring System

DMG MORI MESSENGER

■ Features

- Intra-corporate network system
- Up to 30 machines can be connected with one server
- The operating status of your machines can be centrally managed in real time



Application for Data Transmission

MORI-SERVER [Standard features]

This enables high-speed transfer of programming data between your office computer and machine, reducing the lead time of pre-machining processes.

MAPPs Screen Remote Control and Browsing Application

MORI-MONITOR

This is an application which allows you to remotely operate and view the MAPPs screens from your office computer.

ACT Advanced Communication Technology

Advanced
Communication
Technology

Advanced Communication Technology (ACT) connects machine tool and peripheral devices

DMG MORI's new proposal, ACT, is designed to strengthen connections between machine tools and peripheral equipment by standardizing communication and software of the entire system. With ACT, standardization of interfaces of peripherals, simplified wiring, and labor saving can be achieved.

[Internet]
[LAN]

Industrial Network for Peripheral Equipment Control

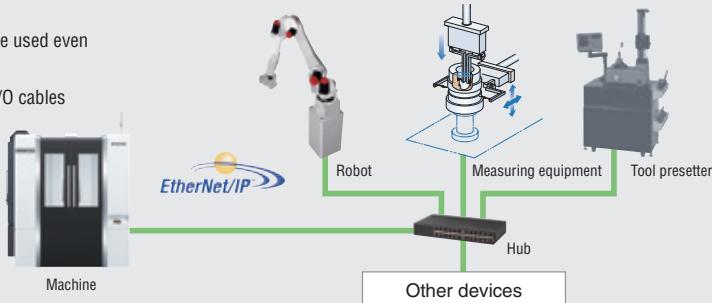
MAPPs EtherNet/IP I/F [OP]

This industrial network using the standard Ethernet (TCP/IP) offers high speed and reliable connection. Simple Plug and Play connections, which are made available just by connecting to the hub through MAPPs, enable you to build a system easily. The use of standard cables also helps to reduce costs.

■ Features

- Connections between a machine and peripheral equipment become easy because standard LAN cables are used
- Thanks to increased versatility, your peripheral equipment can be used even when the machine tools are replaced by new ones
- Reliability is significantly increased by reducing the number of I/O cables

- Easy system construction
- Connection with existing devices
- Inexpensive devices



Communication Interface for Monitoring Machine Operation

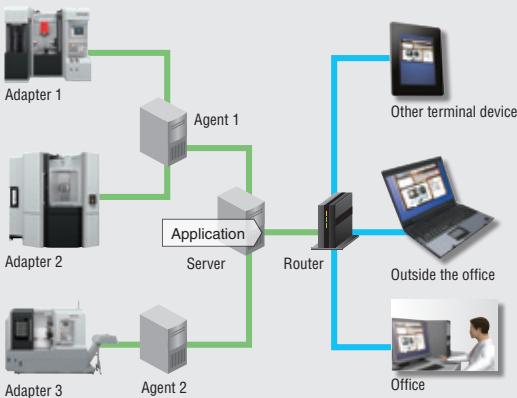
MAPPs MTConnect I/F

MTConnect, which was introduced by the Association for Manufacturing Technology (AMT) in 2008, is a new XML (Extensible Markup Language) based communication protocol that offers an open interface. This interface allows you to build a system to monitor the operating status of your machines.

■ Features

- Open communication interface allows you to access to your company's system
- This makes it possible for you to build a system to monitor the operating status of your machines via the Internet

■ System examples



■ Application examples



Your machines are displayed all at once, allowing you to quickly call up the machine you wish to check.



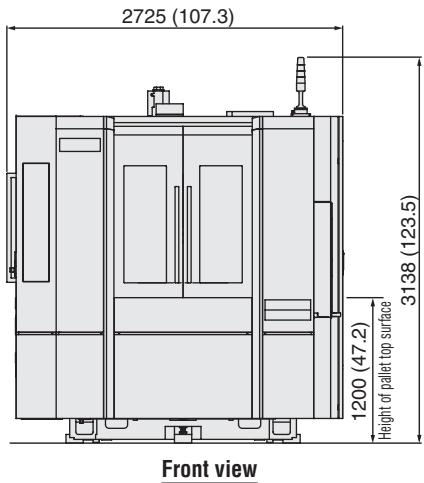
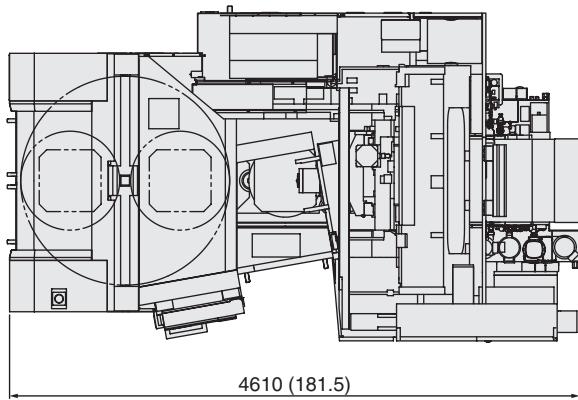
Operating status can be checked in real time.



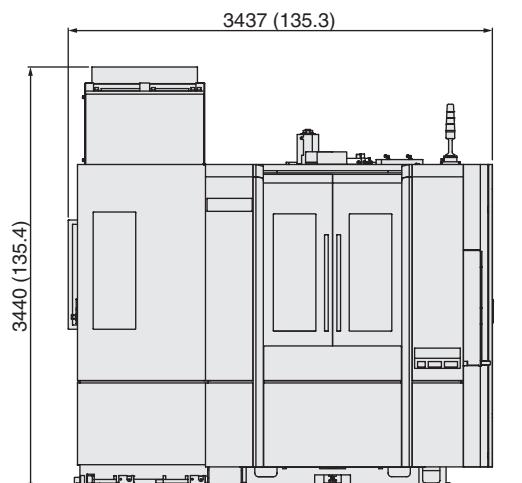
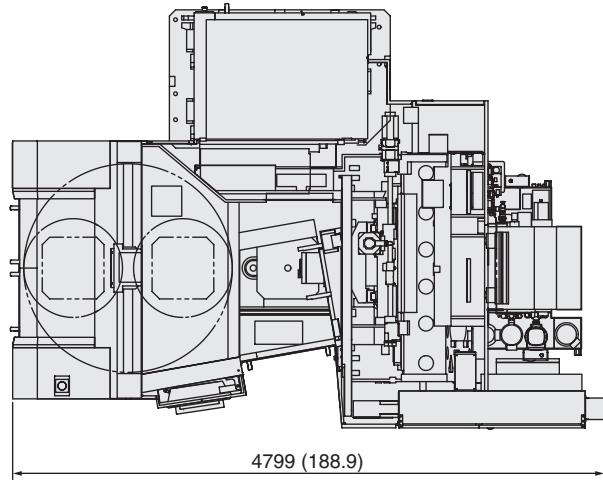
You can check the operating history on the Gantt chart screen.

- A server and application must be prepared by the customer.
- For introduction of MTConnect, separate consultation is required.

General view

NH5000 DCG/40Front viewPlan view

mm (in.)

Q55549A01
Q55553A02**NH5000 DCG/50**Front viewPlan viewQ55558A01
Q55562A01

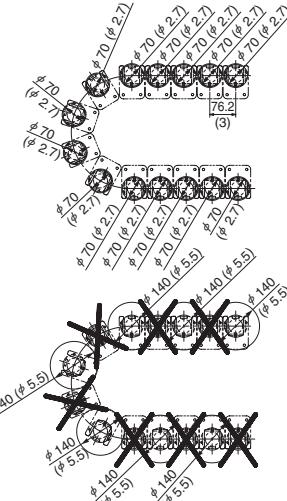
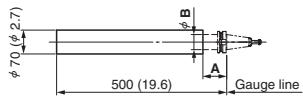
Tool restrictions

NH5000 DCG/40

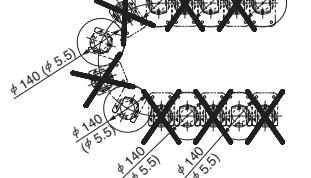
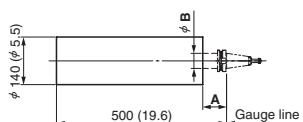
40-tool specifications (chain-type)/60-, 120-tool specifications (chain-type) OP

mm (in.)

With adjacent tools <max. tool diameter: 70 (2.7)>



Without adjacent tools <max. tool diameter: 140 (5.5)>



- Do not use the pots marked with "x", because they cause interference.

Tool restrictions				
Type of tool shank	BT40	CAT40	DIN40	HSK-A63
Max. tool length mm (in.)	500 (19.6)			
Max. tool diameter mm (in.)	With adjacent tools: 70 (2.7) <40, 60, 120 tools> Without adjacent tools: 140 (5.5) <40, 60, 120 tools>			
Tool limitation A mm (in.)	32 (1.3)	34.925 (1.375)	35 (1.4)	42 (1.7)
Tool limitation B mm (in.)	63 (2.5)	44.45 (1.75)	50 (2.0)	53 (2.1)
Max. tool mass kg (lb.)	12 (26.4)			
Max. tool mass moment N·m <from spindle gauge line>	7.84 (5.7)			

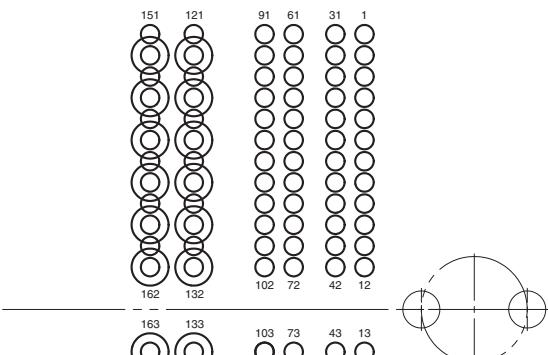
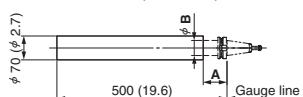
081082B03

180-tool specifications (rack-type) OP

mm (in.)

Column 1, 2, 3, 4

<the tool of the φ 70 mm (φ 2.7 in.) or less can be stored>



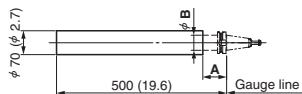
Tool restrictions

NH5000 DCG/40

240-tool specifications (rack-type) [OP](#)

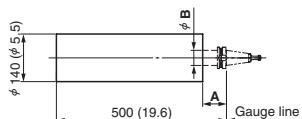
Column 1, 2, 3, 4, 5, 6, 7

<the tool of the $\phi 70$ mm ($\phi 2.7$ in.) or less can be stored>



Column 8

<the tool of the $\phi 140$ mm ($\phi 5.5$ in.) or less can be stored>

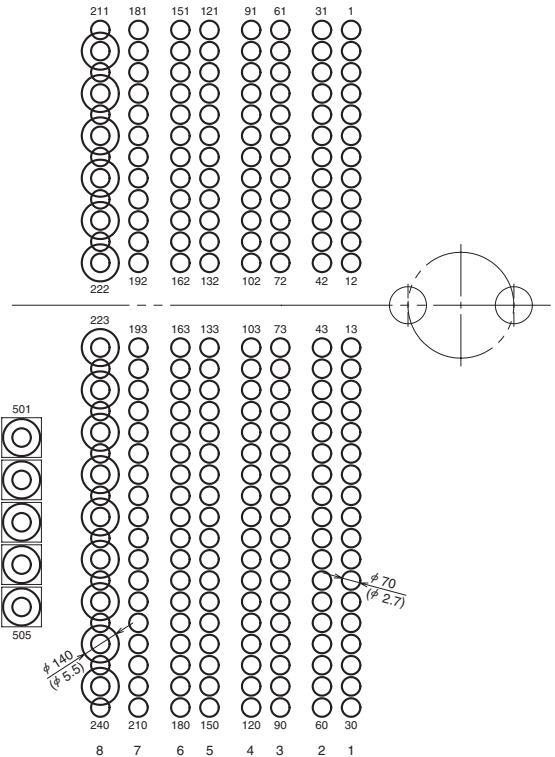


Tool restrictions

Type of tool shank	BT40	CAT40	DIN40	HSK-A63
Max. tool length mm (in.)	500 (19.6)			
Max. tool diameter mm (in.)	With adjacent tools: 70 (2.7) Without adjacent tools: 140 (5.5)			
Tool limitation A mm (in.)	32 (1.3)	34.925 (1.375)	35 (1.4)	42 (1.7)
Tool limitation B mm (in.)	63 (2.5)	44.45 (1.75)	50 (2.0)	53 (2.1)
Max. tool mass kg (lb.)	12 (26.4)			
Max. tool mass moment N·m <from spindle gauge line>	7.84 (5.7)			

- If you attach a tool with a diameter larger than $\phi 70$ mm ($\phi 2.7$ in.) in the 8th column in the rack, you may not be able to attach tools to the adjacent tool pots.

081082B03

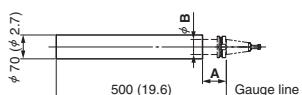


300-tool specifications (rack-type) [OP](#)

mm (in.)

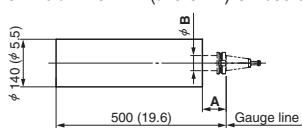
Column 1–9

<the tool of the $\phi 70$ mm ($\phi 2.7$ in.) or less can be stored>



Column 10

<the tool of the $\phi 140$ mm ($\phi 5.5$ in.) or less can be stored>

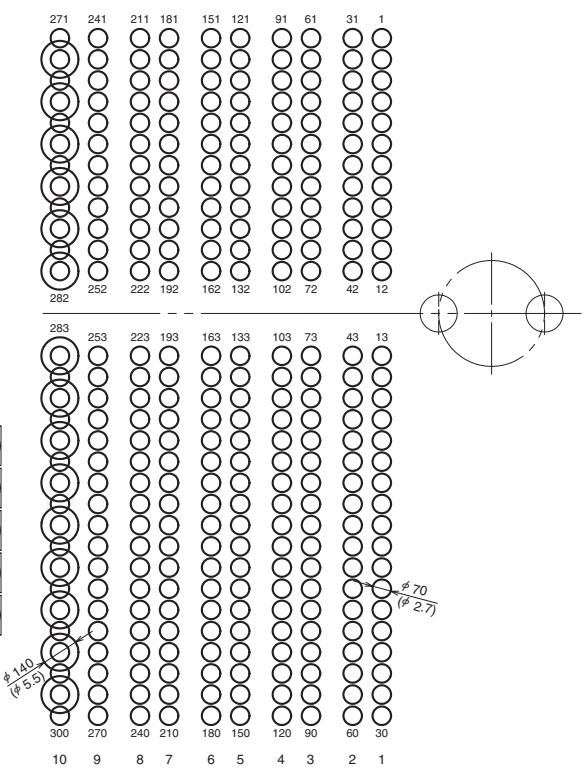


Tool restrictions

Type of tool shank	BT40	CAT40	DIN40	HSK-A63
Max. tool length mm (in.)	500 (19.6)			
Max. tool diameter mm (in.)	With adjacent tools: 70 (2.7) Without adjacent tools: 140 (5.5)			
Tool limitation A mm (in.)	32 (1.3)	34.925 (1.375)	35 (1.4)	42 (1.7)
Tool limitation B mm (in.)	63 (2.5)	44.45 (1.75)	50 (2.0)	53 (2.1)
Max. tool mass kg (lb.)	12 (26.4)			
Max. tool mass moment N·m <from spindle gauge line>	7.84 (5.7)			

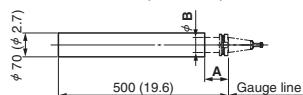
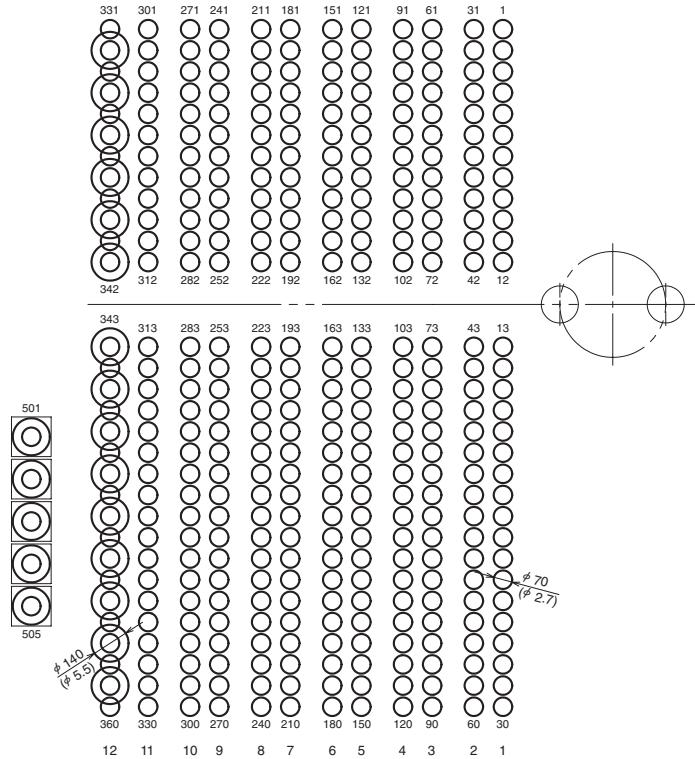
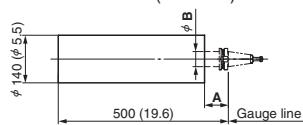
- If you attach a tool with a diameter larger than $\phi 70$ mm ($\phi 2.7$ in.) in the 10th column in the rack, you may not be able to attach tools to the adjacent tool pots.

081082B03



NH5000 DCG/40**360-tool specifications (rack-type) OP Consultation is required**

mm (in.)

Column 1–11<the tool of the $\phi 70$ mm ($\phi 2.7$ in.) or less can be stored>**Column 12**<the tool of the $\phi 140$ mm ($\phi 5.5$ in.) or less can be stored>**Tool restrictions**

Type of tool shank	BT40	CAT40	DIN40	HSK-A63
Max. tool length mm (in.)		500 (19.6)		
Max. tool diameter mm (in.)		With adjacent tools: 70 (2.7) Without adjacent tools: 140 (5.5)		
Tool limitation A mm (in.)	32 (1.3)	34.925 (1.375)	35 (1.4)	42 (1.7)
Tool limitation B mm (in.)	63 (2.5)	44.45 (1.75)	50 (2.0)	53 (2.1)
Max. tool mass kg (lb.)		12 (26.4)		
Max. tool mass moment N·m <from spindle gauge line> (ft·lbf)		7.84 (5.7)		

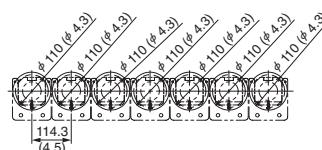
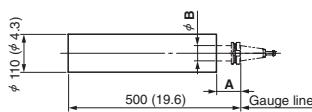
- If you attach a tool with a diameter larger than $\phi 70$ mm ($\phi 2.7$ in.) in the 12th column in the rack, you may not be able to attach tools to the adjacent tool pots.

081082B03

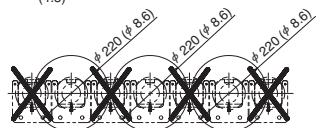
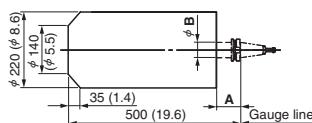
NH5000 DCG/50**54-tool specifications (chain-type)**

mm (in.)

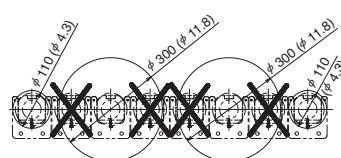
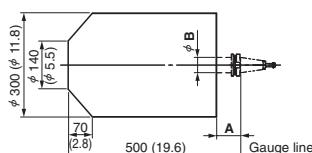
With adjacent tools <max. tool diameter: 110 (4.3)>



Without adjacent tools <max. tool diameter: 220 (8.6)>



Without adjacent tools <max. tool diameter: 300 (11.8)>



- Do not use the pots marked with "X", because they cause interference.

Type of tool shank	BT50	CAT50	DIN50	HSK-A100	
Max. tool length mm (in.)	500 (19.6)				
Max. tool diameter mm (in.)		With adjacent tools: 110 (4.3) <54 tools> Without adjacent tools: 220 (8.6), 300 (11.8) <54 tools>			
Tool limitation A mm (in.)	38 (1.5)	38 (1.5)	38 (1.5)	45 (1.8)	
Tool limitation B mm (in.)	100 (3.9)	69.85 (2.75)	69.85 (2.75)	85 (3.3)	
Max. tool mass kg (lb.)		30 (66)			
Max. tool mass moment N·m <from spindle gauge line> (ft·lbf)		29.4 (21.6)			

081083C02

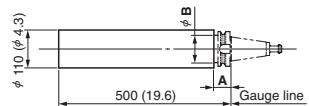
Tool restrictions

NH5000 DCG/50

100-tool specifications (rack-type) [OP](#)

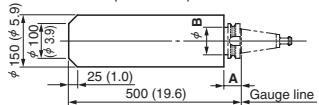
Column 1, 2

<the tool of the $\phi 110$ mm ($\phi 4.3$ in.) or less can be stored>



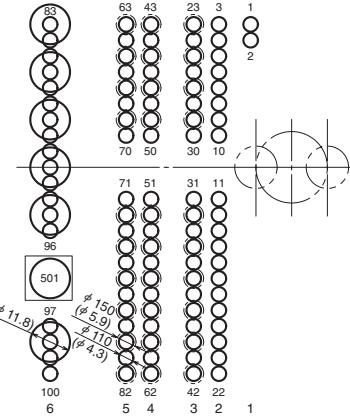
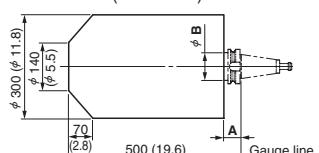
Column 3, 4, 5

<the tool of the $\phi 150$ mm ($\phi 5.9$ in.) or less can be stored>



Column 6

<the tool of the $\phi 300$ mm ($\phi 11.8$ in.) or less can be stored>



Tool restrictions

Type of tool shank	BT50	CAT50	DIN50	HSK-A100
Max. tool length	mm (in.)	500 (19.6)		
Max. tool diameter	mm (in.)		300 (11.8)	
Tool limitation A	mm (in.)	38 (1.5)	38 (1.5)	38 (1.5)
Tool limitation B	mm (in.)	100 (3.9)	69.85 (2.75)	69.85 (2.75)
Max. tool mass	kg (lb.)		30 (66)	
Max. tool mass moment	N·m <from spindle gauge line> (ft·lbf)		29.4 (21.6)	

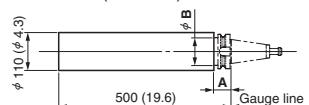
- If you attach a tool with a diameter larger than $\phi 110$ mm ($\phi 4.3$ in.) in the 3rd, 4th, 5th or 6th column in the rack, you may not be able to attach tools to the adjacent tool pots.

Q81083C02

140-tool specifications (rack-type) [OP](#)

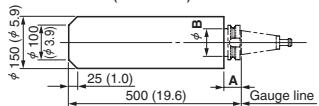
Column 1, 2, 3, 4

<the tool of the $\phi 110$ mm ($\phi 4.3$ in.) or less can be stored>



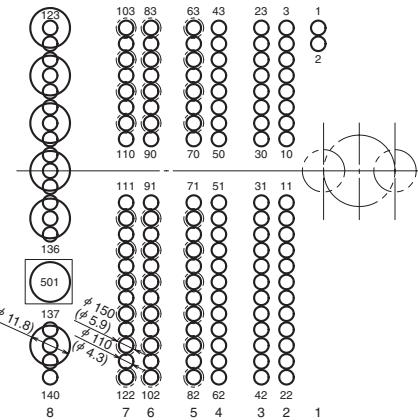
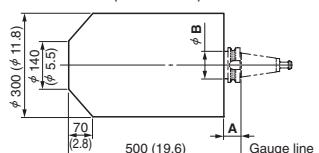
Column 5, 6, 7

<the tool of the $\phi 150$ mm ($\phi 5.9$ in.) or less can be stored>



Column 8

<the tool of the $\phi 300$ mm ($\phi 11.8$ in.) or less can be stored>



Tool restrictions

Type of tool shank	BT50	CAT50	DIN50	HSK-A100
Max. tool length	mm (in.)	500 (19.6)		
Max. tool diameter	mm (in.)		300 (11.8)	
Tool limitation A	mm (in.)	38 (1.5)	38 (1.5)	38 (1.5)
Tool limitation B	mm (in.)	100 (3.9)	69.85 (2.75)	69.85 (2.75)
Max. tool mass	kg (lb.)		30 (66)	
Max. tool mass moment	N·m <from spindle gauge line> (ft·lbf)		29.4 (21.6)	

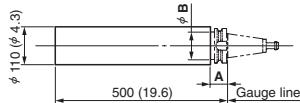
- If you attach a tool with a diameter larger than $\phi 110$ mm ($\phi 4.3$ in.) in the 5th, 6th, 7th or 8th column in the rack, you may not be able to attach tools to the adjacent tool pots.

Q81083C02

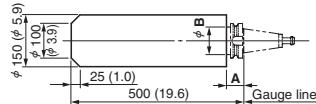
NH5000 DCG/50**180-tool specifications (rack-type) OP**

mm (in.)

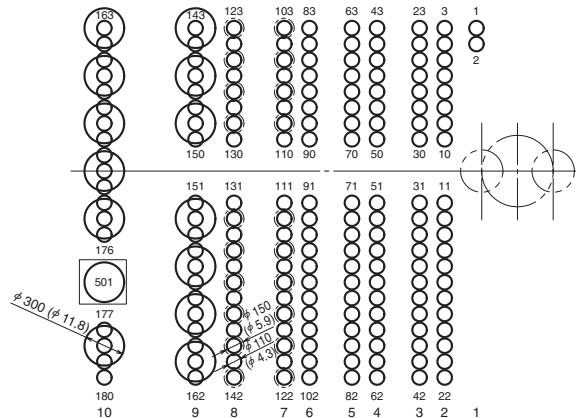
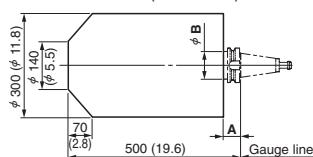
Column 1, 2, 3, 4, 5, 6

<the tool of the $\phi 110$ mm ($\phi 4.3$ in.) or less can be stored>

Column 7, 8

<the tool of the $\phi 150$ mm ($\phi 5.9$ in.) or less can be stored>

Column 9, 10

<the tool of the $\phi 300$ mm ($\phi 11.8$ in.) or less can be stored>**Tool restrictions**

Type of tool shank	BT50	CAT50	DIN50	HSK-A100
Max. tool length mm (in.)	500 (19.6)			
Max. tool diameter mm (in.)		300 (11.8)		
Tool limitation A mm (in.)	38 (1.5)	38 (1.5)	38 (1.5)	45 (1.8)
Tool limitation B mm (in.)	100 (3.9)	69.85 (2.75)	69.85 (2.75)	85 (3.3)
Max. tool mass kg (lb.)		30 (66)		
Max. tool mass moment N·m <from spindle gauge line>			29.4 (21.6)	

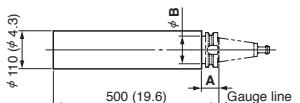
- If you attach a tool with a diameter larger than $\phi 110$ mm ($\phi 4.3$ in.) in the 7th, 8th, 9th or 10th column in the rack, you may not be able to attach tools to the adjacent tool pots.

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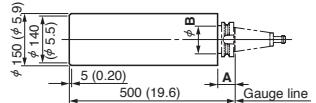
240-tool specifications (rack-type) OP

mm (in.)

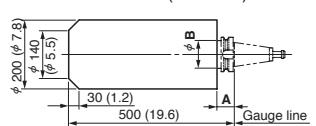
Column 1-16

<the tool of the $\phi 110$ mm ($\phi 4.3$ in.) or less can be stored>

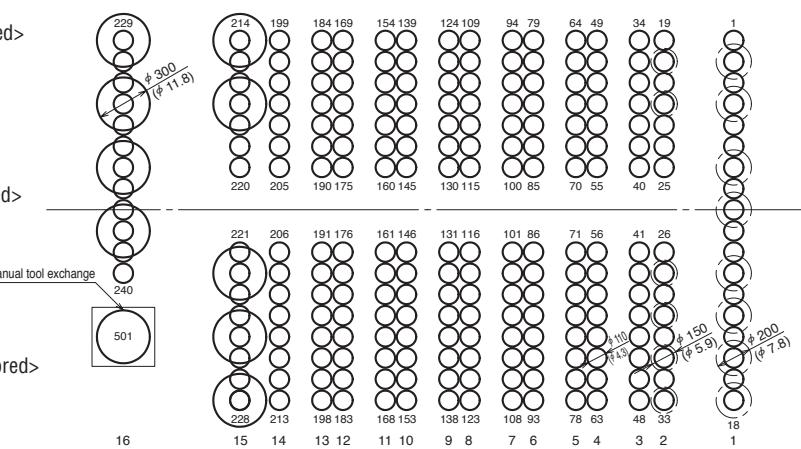
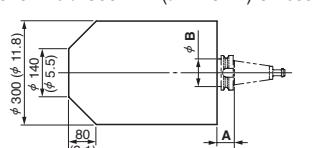
Column 2

<six tool of the $\phi 150$ mm ($\phi 5.9$ in.) or less can be stored>

Column 1

<eight tool of the $\phi 200$ mm ($\phi 7.8$ in.) or less can be stored>

Column 15, 16

<nine tool of the $\phi 300$ mm ($\phi 11.8$ in.) or less can be stored>**Tool restrictions**

Type of tool shank	BT50	CAT50	DIN50	HSK-A100
Max. tool length mm (in.)	500 (19.6)			
Max. tool diameter mm (in.)		300 (11.8)		
Tool limitation A mm (in.)	38 (1.5)	38 (1.5)	38 (1.5)	45 (1.8)
Tool limitation B mm (in.)	100 (3.9)	69.85 (2.75)	69.85 (2.75)	85 (3.3)
Max. tool mass kg (lb.)		30 (66)		
Max. tool mass moment N·m <from spindle gauge line>			29.4 (21.6)	

- If you attach a tool with a diameter larger than $\phi 110$ mm ($\phi 4.3$ in.) in the 1st, 2nd, 15th or 16th column in the rack, you may not be able to attach tools to the adjacent tool pots.

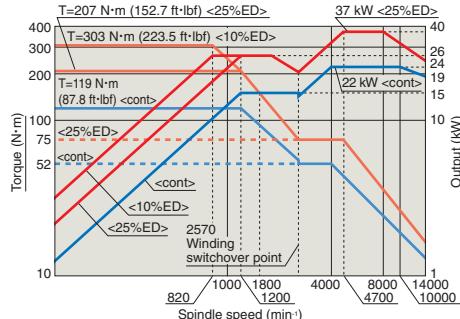
081083C02

Spindle speed torque/output diagrams

NH5000 DCG/40

[Standard]

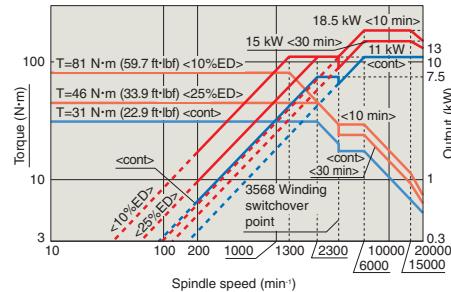
- Max. spindle speed: 14,000 min⁻¹
- Spindle drive motor: 37/22 kW (50/30 HP) <25%ED/cont> {high-speed winding side}
- Max. spindle torque: 303 N·m (223.5 ft·lbf) <10%ED>



Q43704A01

[High speed OP]

- Max. spindle speed: 20,000 min⁻¹
- Spindle drive motor: 18.5/15/11 kW (24.7/20/15 HP) <10 min/30 min/cont> {high-speed winding side}
- Max. spindle torque: 81 N·m (59.7 ft·lbf) <10%ED>

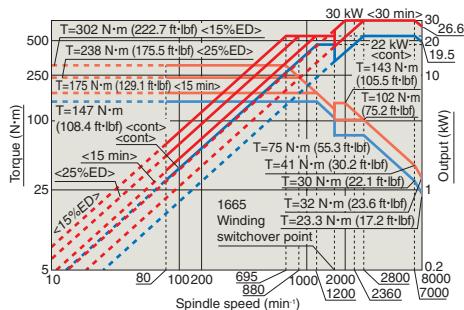


Q43322A03

NH5000 DCG/50

[Standard]

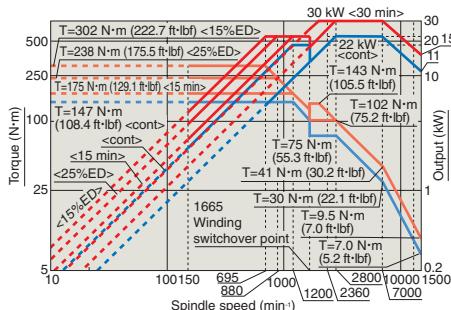
- Max. spindle speed: 8,000 min⁻¹
- Spindle drive motor: 30/22 kW (40/30 HP) <30 min/cont> {high-speed winding side}
- Max. spindle torque: 302 N·m (222.7 ft·lbf) <15%ED>



Q43334A03

[High speed OP]

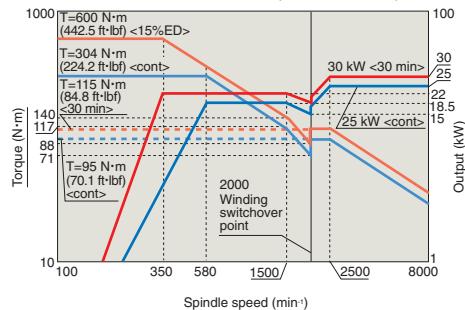
- Max. spindle speed: 15,000 min⁻¹
- Spindle drive motor: 30/22 kW (40/30 HP) <30 min/cont> {high-speed winding side}
- Max. spindle torque: 302 N·m (222.7 ft·lbf) <15%ED>



Q43336A01

[High torque OP]

- Max. spindle speed: 8,000 min⁻¹
- Spindle drive motor: 30/25 kW (40/33.3 HP) <30 min/cont> {high-speed winding side}
- Max. spindle torque: 600 N·m (442.5 ft·lbf) <15%ED>



Q43441A01

● Please use a two-face contact tool when using a No. 40 taper spindle at 15,000 min⁻¹ or higher, or a No. 50 taper spindle at 10,000 min⁻¹ or higher.

Numerical control unit specifications F31iB, F31iB5

●: Standard ○: Option —: Not applicable

Controlled axis

Controlled axis	X (X2), Y, Z, B	●
Simultaneously controlled axes	F31iB: 4 axes F31iB5: 5 axes	●
Least input increment	0.001 mm (0.0001 in.)	●
Max. command value	±999,999.999 mm (99,999.999 in.)	●
Stroke limit check before movement		●
Software damper	Abnormal load detection function	●
Load monitor function C	Soft key type	●
Programming resolution multiplied by 1/10	0.0001 mm (0.00001 in.)	○

Operation

Sequence number comparison and stop	○
Program restart	○
Tool retract and recover	○
Manual handle interruption	○

Interpolation functions

Nano interpolation	●
Single direction positioning	●
Helical interpolation	Optional 2 axes and other 1 axis
External high-speed skip (installation of high-speed skip terminal)	○
Polar coordinate interpolation	G12.1, G13.1
Cylindrical interpolation	G7.1
Involute interpolation	G2.2/G3.2
Spiral/conical interpolation	○
Smooth interpolation	○
Threading, synchronous cutting/Feed per revolution	○
3rd, 4th reference position return	○
Tool spindle Cs control (consultation is required if orbit machining or hole machining needs to be performed)	Includes Cs contour control and Normal direction control
NURBS interpolation	○

Feed functions

Rapid traverse override	F0/1/10/25/100%	●
Tangential speed constant control	●	●
Feedrate override	0—200% (10% increments)	●
Override cancel	●	●
AI contour control I ^{*1}	●	●
AI contour control II ^{*2}	○	●
One-digit F code feed	F1 to F9	○
Small-hole peck drilling cycle	(the arbor with the overload torque detection function must be attached)	○

*1 Look-ahead blocks are up to 30 blocks.

*2 1,000 look-ahead blocks+high-speed processing.

Registerable programs <in total>

Part program storage length <in total>	Registerable programs <in total>		
	Without expansion <programs>	Expansion 1 <programs>	Expansion 2 <programs>
128 KB <320 m (1,050 ft)>	63	—	●
128 KB <320 m (1,050 ft)>		250	—
256 KB <640 m (2,100 ft)>		500	—
512 KB <1,280 m (4,200 ft)>		1,000	—
1 MB <2,560 m (8,400 ft)>		1,000	2,000
2 MB <5,120 m (16,800 ft)>		1,000	4,000
4 MB <10,240 m (33,600 ft)>		1,000	4,000
8 MB <20,480 m (67,200 ft)>		1,000	4,000

Items suitable for each numerical control unit

		F31iB	F31iB5
Simultaneously controlled axes	4 axes 5 axes	● —	● ●
Interpolation functions	Nano smoothing	○	●
Feed functions	AI contour control II	○	●
Program input	Tilted working plane command Cutting point command	○ —	● ●
Tool function/Tool offset function	Tool center point control 3-D cutter compensation SVC function Workpiece position error compensation Rotary table dynamic fixture offset	○ ○ — ○ ○	● ● ● ● ●
Data input/output	Fast data server Memory card for data server [*] Fast data server+Memory card for data server [*]	○ ○ ○	● ● ●

* CF card 1 GB+ATA adaptor

Program input

Program number	4 digits 8 digits	● ○
Absolute/incremental programming	G90/G91	●
Decimal point programming	Decimal point programming or electronic calculator type decimal point programming can be set using parameters	●
Diameter/radius programming	●	●
Plane selection	G17, G18, G19	●
Programmable data input	G10	●
Sub-program call	Up to 10 nestings	●
Custom macro	●	●
Custom macro common variables	#100 to #149, #500 to #549	●
Hole machining canned cycle	G80—G89	●
FS15 format	●	●
Additional workpiece coordinate systems	48 sets 300 sets	○
Addition of optional block skip	Soft key type (2—9)	○
Polar coordinate command	●	○
Optional chamfering/corner R	●	○
Additional custom macro common variables	600 variables (#100 to #199, #500 to #999)	○
Interrupt type custom macro	●	○
Automatic corner override	●	○
Scaling	●	○
Coordinate system rotation	●	○
3-D coordinate conversion	●	○
Programmable mirror image	●	○
Graphic copy	G72.1/G72.2	○
Islands, open pockets <MAPPS>	●	○
High-speed canned cycle <MAPPS>	●	○
DXF import function <MAPPS>	●	○
MORI-POST advanced mode <MAPPS>	●	○
Text engraving function <MAPPS>	●	○

Miscellaneous function/Spindle speed function

Spindle speed override	50—150% (10% increments)	●
Spindle orientation	●	●
Synchronous tapping	●	●
Multiple M cords in single block (Multi M code function) <incl. M code group check>	●	○

Tool function/Tool offset function

Tool function (T function)	8-digit T code	●
Number of tool offsets	64 sets (diameter+length=1 set, number of offsets indicates that diameter and length are displayed separately)	●
Tool offset data memory C	D/H code, geometry/wear	●
Tool length compensation	G43, G44, G49	●
Cutter radius offset	G40—G42	●
Tool length measurement	●	●
3-D tool compensation	99 sets	○
	200 sets	○
	400 sets	○
	499 sets	○
	999 sets	○
Tool position offset	G45—G48	○
Tool life management	●	○
Additional number of tool offsets to be controlled by the tool life management function	1,024 sets	○
MAPPS Tool management system ^{*1}	●	○
MAPPS Tool management system ^{*1} +Tool IC (MAPPS software only) ^{*2}	●	○
MAPPS Tool management system ^{*1} +Tool ID (MAPPS software only) ^{*2}	●	○

Tool IC: made by BIG DAISHOWA Tool ID: made by BALLUFF

*1 Includes common variable 600 for custom macro.

*2 Separate consultation is required if hardware and software are customized.

Editing

Expanded program editing	A limitation in the copy buffer (10 KB)	●
Background editing	●	●
Playback	●	○
Machining time stamp	●	○
Undo/Redo function <MAPPS>	●	●
Line number display <MAPPS>	●	●

Operation and display

Status display	●
Clock function	●
Current position display	●
Program comment display	191 characters (4-digit O code), 187 characters (8-digit O code)
Parameter setting display	●
Alarm display	●
Alarm history display	●
Operator's message history display	●
Operation history display	●
Running time/Parts count display	●
Actual cutting feedrate display	●
Self-diagnosis	Includes alarm display, I/O signal diagnosis and ladder diagram
Operation panel: display section	19-inch TFT color LCD
Multi-counter display <MAPPS>	●

Data input/output

I/O interface	USB	●
	10/100/1000BASE-T (access to user memory area by Ethernet function with MORI-SERVER Software)	●
Ethernet	●	●
Memory card for MAPPS	CF card (4 GB/2 GB/512 MB)+ATA adaptor	○
6 GB Program storage area (for MAPPS-DNC operation function, for data backup) <MAPPS>	Files up to 10 MB in size can be edited	●
DNC operation using external memory (front USB port)	●	○

i95107A01

● The information in this catalog is valid as of September 2020.

Machine specifications

Item		NH5000 DCG/40	NH5000 DCG/50	
Travel	X-axis travel <longitudinal movement of saddle>	mm (in.)	730 (28.7)	
	Y-axis travel <vertical movement of spindle head>	mm (in.)	730 (28.7)	
	Z-axis travel <cross movement of pallet>	mm (in.)	850 (33.5)	
	Distance from pallet surface to spindle center	mm (in.)	100–830 (3.9–32.7)	
	Distance from pallet center to spindle gauge plane	mm (in.)	100–950 (3.9–37.4)	
Pallet	Distance from floor surface to pallet surface	mm (in.)	1,200 (47.2)	
	Pallet working surface	mm (in.)	500×500 (19.7×19.7)	
	Pallet loading capacity	kg (lb.)	2-station turn-type APC: 500 (1,100) [700 (1,540)] 3-station turn-type APC: [400 (880)] [500 (1,100)]	
	Max. workpiece swing diameter	mm (in.)	800 (31.4) [700 (27.5) <3-station turn-type APC>]	
	Max. workpiece height	mm (in.)	1,000 (39.3) [900 (35.4) <3-station turn-type APC>]	
	Pallet surface configuration		M16 (1/2-13 UNC) Tap: 24 holes, Pitch 100 mm (4 in.)	
	Minimum pallet indexing angle		1° [0.001° <full 4th axis rotary table>]	
Spindle	Pallet indexing time <including clamping and unclamping time>	s	1.57 [1.12 <full 4th axis rotary table>] (90°)	
	Max. spindle speed	min⁻¹	14,000 [20,000]	
	Number of spindle speed ranges		1	
	Type of spindle taper hole		No. 40 [HSK-A63]	
Feedrate	Spindle bearing inner diameter	mm (in.)	65 (2.6)	
	Rapid traverse rate	mm/min (ipm)	X, Y, Z: 50,000 (1,968.5)	
	Max. rotational speed	min⁻¹	B: 38.5 [100 <full 4th axis rotary table>]	
	Cutting feedrate	mm/min (ipm)	X, Y, Z: 0–50,000 (0–1,968.5)	
ATC	Jog feedrate	mm/min (ipm)	0–5,000 (0–197.0) <20 steps>	
	Type of tool shank		BT40 [CAT40] [DIN40] [HSK-A63] <when the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together>	
	Type of retention knob		DMG MORI 90° type [45°<MAS-I>] [60°<MAS-II>] [DIN]	
	Tool storage capacity <including one tool at the spindle side>		Chain-type: 40 [60] [120] Rack-type: [180] [240] [300] [360 <Consultation is required>]	
	Max. tool diameter <with adjacent tools>	mm (in.)	70 (2.7)	
	Max. tool diameter <without adjacent tools>	mm (in.)	140 (5.5)	
	Max. tool length	mm (in.)	500 (19.6)	
	Max. tool mass	kg (lb.)	12 (26.4)	
	Max. tool mass moment <from spindle gauge line>	N·m (ft·lbf)	7.84 (5.7) <a tool with a mass moment greater than the maximum tool mass moment may cause problems during ATC operations even if it satisfies other conditions>	
	Method of tool selection		Chain-type: Fixed address, shorter route access [Rack-type: Fixed address]	
APC	Tool-to-tool	s	0.9	
	Cut-to-cut (chip-to-chip) <MAS>	s	3.3	
Motor	Tool changing time		4.0	
	Cut-to-cut (chip-to-chip)	s	40 tools Max.: 8.9 Min.: 3.5 [60 tools] Max.: 11.3 Min.: 3.5 [120 tools] Max.: 19.3 Min.: 3.5 [180 tools] Max.: 18.0 Min.: 3.5 [240 tools] Max.: 18.6 Min.: 3.5	
	● The time differences are caused by the different conditions (travel distances, etc.) for each standard.	ISO 10791-9 JIS B6336-9	[100 tools] Max.: 14.3 Min.: 4.4 [140 tools] Max.: 19.6 Min.: 4.4 [180 tools] Max.: 21.3 Min.: 4.4 [240 tools] Max.: 31.0 Min.: 4.4	
	Number of pallets		2 [3]	
	Method of pallet change		Turn-type	
	Pallet changing time* <excluding clamping and unclamping time>	s	7 [13 <pallet loading capacity 700 kg (1,540 lb)>]	
	14,000 min⁻¹	kW (HP)	37/22 (50/30) <25%ED/cont>	
Power sources <standard>	Spindle drive motor <high-speed winding side>	8,000 min⁻¹	kW (HP)	—
		20,000 min⁻¹	kW (HP)	30/22 (40/30) <>30 min/cont> [30/25 (40/33.3) <>30 min/cont>] (high torque)
	Feed motor	15,000 min⁻¹	kW (HP)	—
	Coolant pump motor	X/Y/Z-axes B-axis	kW (HP)	[30/22 (40/30) <>30 min/cont>] 2.7×2/4.5/4.5 (3.6×2/6/6) 1.8 (2.4) [10.3/5.3 (13.7/7.1) <max./cont> (full 4th axis rotary table)]
	Electrical power supply <cont>	194084801	kVA	2.2 (3) <spindle+ceiling>/1.1 (1.5) <chip removable>
Tank capacity	Compressed air supply	MPa (psi), L/min (gpm)	50.2	52.0
	Coolant tank capacity	L (gal.)	0.5 (72.5), 470 (124.1) (when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required) <ANR>	
Machine size	Machine height <from floor>	mm (in.)	680 (179.5) <scraper type> [640 (169.0) <hinge type>]	
	Floor space <width×depth>	mm (in.)	3,138 (123.5)	
	Mass of machine	kg (lb.)	2,725×4,610 (107.3×181.5)	
Noise data	A-weighted, time-average radiated sound pressure level	dB	3,440 (135.4)	
			3,437×4,799 (135.3×188.9)	
			12,900 (28,380)	
			13,100 (28,820)	
			54—79 <Measurement uncertainty is 4 dB>	
			—	

[] Option ISO: International Organization for Standardization JIS: Japanese Industrial Standard

* When equipped with the auto-coupler, time taken to shut off/supply hydraulic pressure to the fixture is not included. The pallet changing time of the 3-station APC differs from that of the standard specification. For details, please consult our sales representative.

● Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● Please use a two-face contact tool when using a No. 40 taper spindle at 15,000 min⁻¹ or higher, or a No. 50 taper spindle at 10,000 min⁻¹ or higher.

● Max. tool diameter: the maximum tool diameter is limited to 255 mm (10.0 in.) or less when using a No. 50 taper spindle at 10,000 min⁻¹ or higher.

● ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.

● Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

● Compressed air supply: please be sure to supply clean compressed air <at pressure: 0.7 MPa (101.5 psi), pressure dew point: 10 °C (50 °F) or below>.

● A criterion capacity to select a compressor is 90 L/min (23.8 gpm) per 0.75 kW (1 HP). However, this figure may differ depending on the type of compressors and options attached. For details, please check the compressor specifications.

● Noise data: the measurement was performed at the front of the machine with a No. 40 spindle taper and a maximum spindle speed of 14,000 min⁻¹. For details, please consult our sales representative.

● The information in this catalog is valid as of September 2020.

<Precautions for Machine Relocation>

This product is deemed regulated cargo when exported under the Japanese government's Foreign Exchange and Foreign Control Trade Law. Government authorization is required when exporting this product. The product shipped to you (the machine and accessory equipment) has been manufactured in accordance with the laws and standards that prevail in the relevant country or region. If it is exported, sold, or relocated to a destination in a country with different laws or standards, it may be subject to export restrictions of that country.

This product detects machine relocation. Once the machine is relocated, it is not operable unless its legitimate relocation is confirmed by DMG MORI or its distributor representative. If the restart of the machine can result in unauthorized export of cargo or technology or will violate legitimate export controls, DMG MORI and its distributor representative can refuse to restart the machine. In that case, DMG MORI and its distributor representative do not assume any loss due to the inability to operate the machine or any liability during the warranty period.

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- + The information in this catalog is valid as of September 2020. Designs and specifications are subject to changes without notice.
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