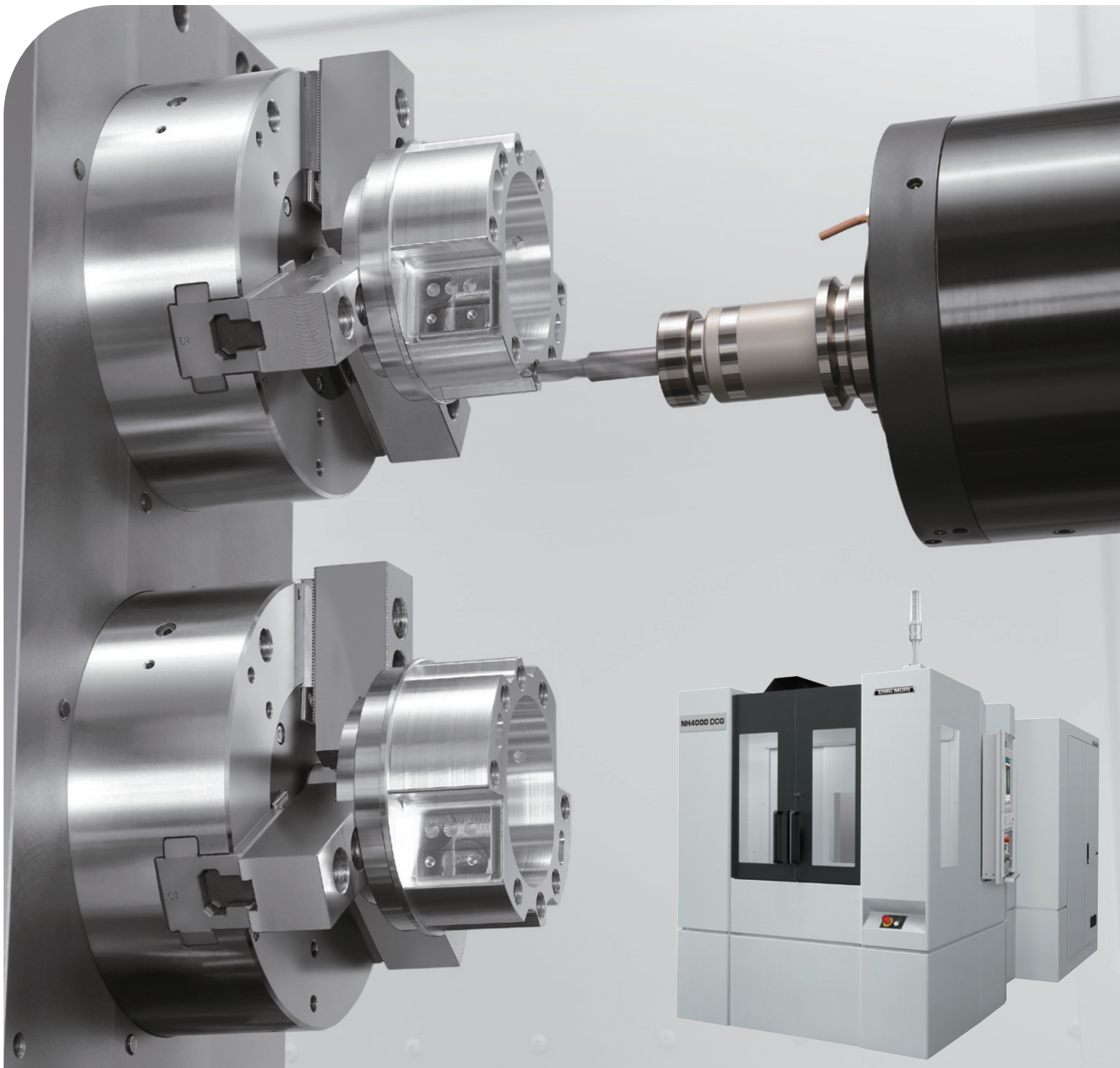


High-Precision Horizontal Machining Center

NH4000 DCG

# NH4000 DCG

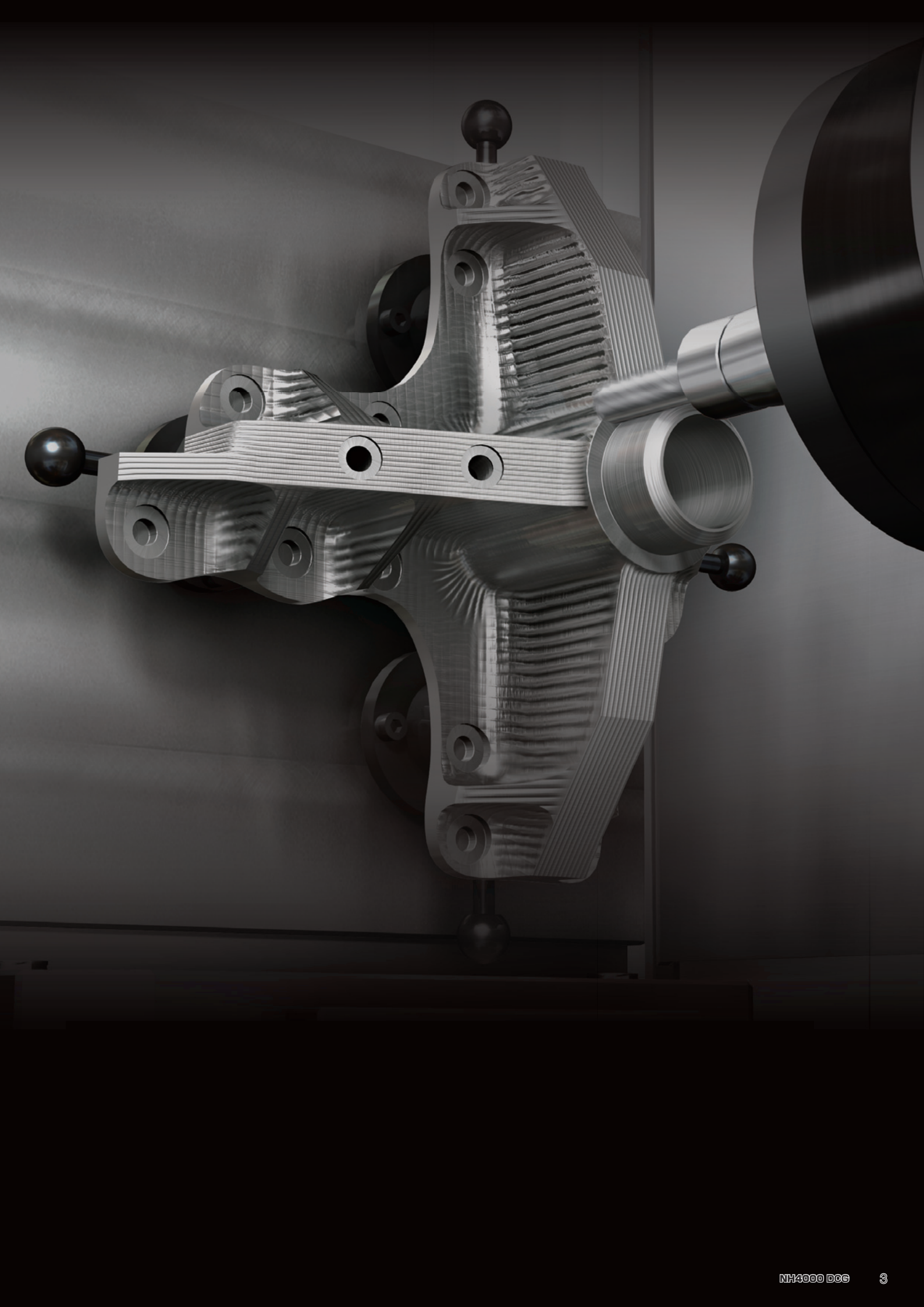


# Presenting the ideal machining center.

The NH4000 DCG is a high-precision horizontal machining center equipped with a 400 mm (15.7 in.) square pallet. It employs the DCG (Driven at the Center of Gravity) technology for vibration control and the Box-in-Box construction for excellent balance, and can achieve backlash-free rotary drive by using the optional direct drive motor.

It is a high-performance machine incorporating all the features demanded of a horizontal machining center, including high speed, high precision, chip disposal and ease of maintenance, while achieving both a space saving design and a large work envelope.

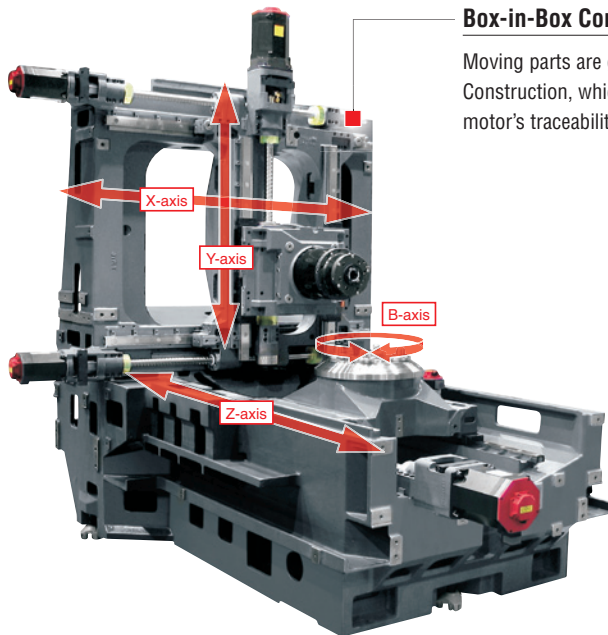






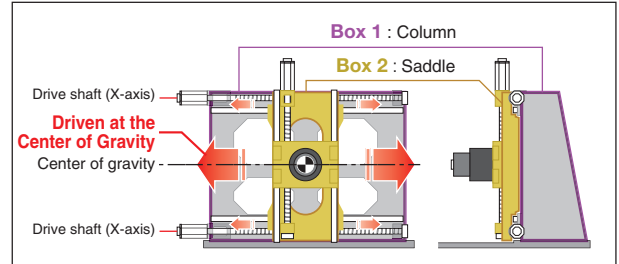
# Principal mechanisms

## 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.



### Max. acceleration

#### Standard specifications

**X-axis** 0.6 G {6.0 m/s<sup>2</sup> (19.7 ft/s<sup>2</sup>)}

**Y-axis** 0.9 G {8.3 m/s<sup>2</sup> (27.2 ft/s<sup>2</sup>)}

**Z-axis** 0.6 G {6.3 m/s<sup>2</sup> (20.7 ft/s<sup>2</sup>)}

#### High-acceleration specifications OP

**X-axis** 1.1 G {10.8 m/s<sup>2</sup> (35.4 ft/s<sup>2</sup>)}

**Y-axis** 1.2 G {11.7 m/s<sup>2</sup> (38.4 ft/s<sup>2</sup>)}

**Z-axis** 1.1 G {10.4 m/s<sup>2</sup> (34.1 ft/s<sup>2</sup>)}

### Rapid traverse rate <X, Y and Z axes>

**50 m/min**  
(1,968.5 ipm)

### Cutting feedrate <X, Y and Z axes>

**50 m/min**  
(1,968.5 ipm)

## Driven at the Center of Gravity



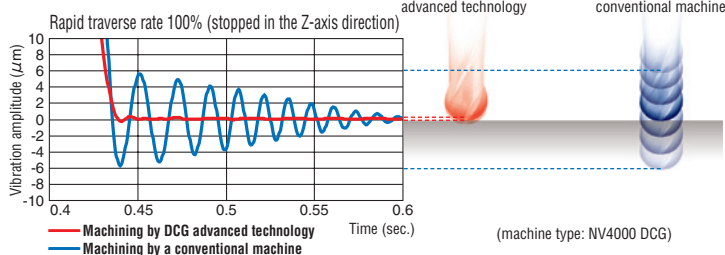
### Original technology

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.

#### Residual vibration comparison



### ■ Features of DCG

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

## Space-saving design

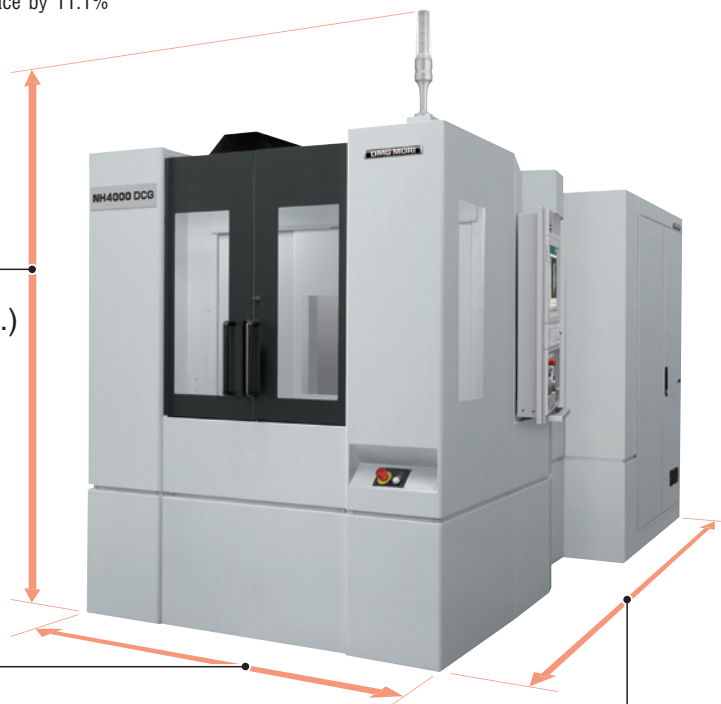
Offering both space-saving design and a large work envelope, reducing the required floor space by 11.1% compared to existing machines.

### Machine height

**2,711 mm (106.7 in.)**

### Machine width×Machine depth

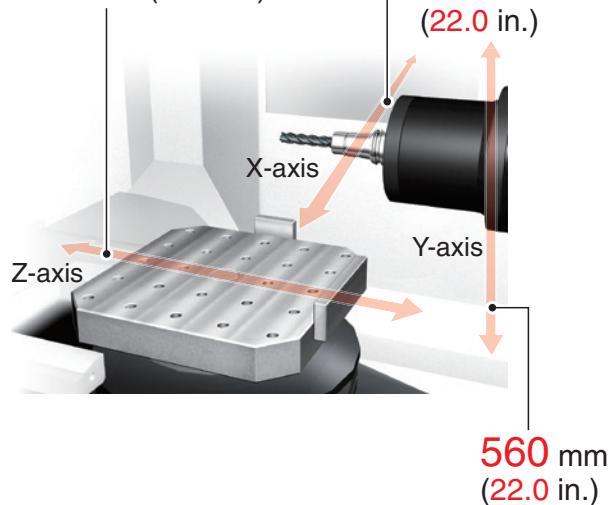
**2,397×4,004 mm  
(94.4×157.6 in.)**



## Travel <X, Y and Z axes>

**630 mm (24.8 in.)**

**560 mm (22.0 in.)**



## Working area

### Max. workpiece swing diameter

**630 mm (24.8 in.)**

**560 mm (22.0 in.)** **OP**  
<3-station turn-type APC>

### Max. workpiece height

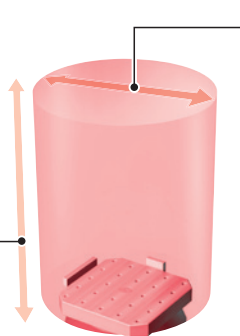
**900 mm (35.4 in.)**

**800 mm (31.4 in.)** **OP**  
<3-station turn-type APC>

### Pallet loading capacity

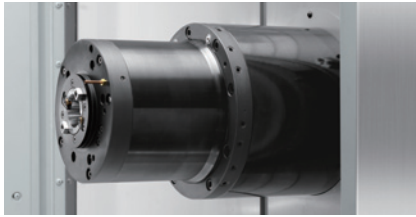
2-station turn-type APC: **400 kg (880 lb.)**

3-station turn-type APC: **300 kg (660 lb.)** **OP**



# Principal mechanisms

## Spindle



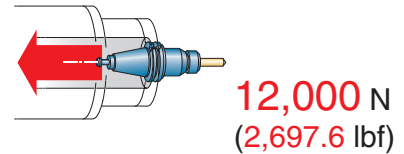
Max. spindle speed  
**NH4000 DCG**  
**14,000** min<sup>-1</sup>

14,000 min<sup>-1</sup> <high output> **OP**  
20,000 min<sup>-1</sup> <high speed> **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.



Machine type	Spindle acceleration time	Spindle deceleration time
<b>NH4000 DCG</b>	<b>1.43</b> sec. (0→14,000 min <sup>-1</sup> )	<b>1.35</b> sec. (14,000 min <sup>-1</sup> →0)
<b>NH4000 DCG</b> <high output> <b>OP</b>	<b>2.01</b> sec. (0→14,000 min <sup>-1</sup> )	<b>1.73</b> sec. (14,000 min <sup>-1</sup> →0)
<b>NH4000 DCG</b> <high speed> <b>OP</b>	<b>2.64</b> sec. (0→20,000 min <sup>-1</sup> )	<b>2.42</b> sec. (20,000 min <sup>-1</sup> →0)

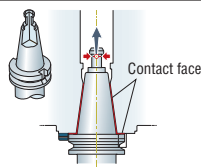
● Please use a two-face contact tool when cutting at 15,000 min<sup>-1</sup> or higher.

## Two-face contact specification

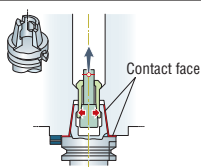
**OP**

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



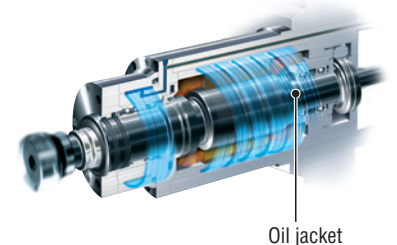
### HSK specifications



- 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

**400** mm (15.7 in.)

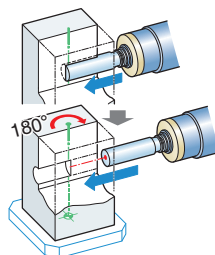
### Pallet working surface

**400×400** mm  
(15.7×15.7 in.)

### Boring

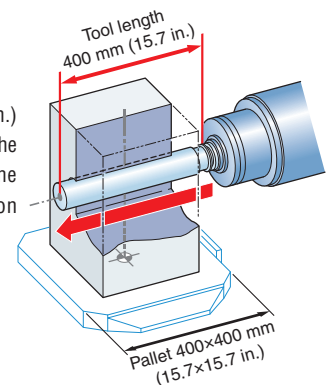
#### Previous model

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



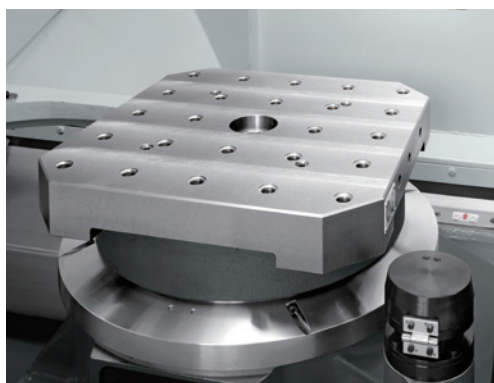
### NH4000 DCG

Boring up to 400 mm (15.7 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 <b>OP</b> DDM®
Minimum pallet indexing angle	1°	0.001°
Pallet indexing time (90°) <including clamping and unclamping time>	1.54 sec.	0.72 sec.

## Direct Drive Motor

OP

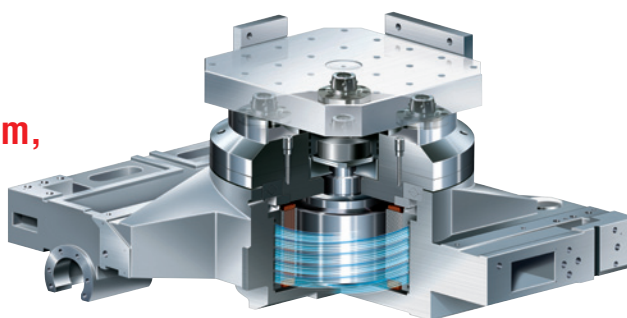


**DDM®**  
Direct Drive Motor

**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)

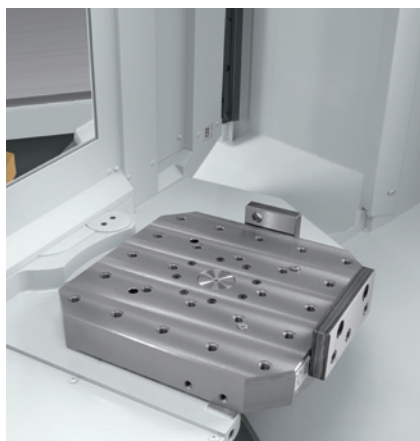
22 min<sup>-1</sup>

**NH4000 DCG (DDM)**

▶ 100 min<sup>-1</sup>

Approximately  
**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\*

**6 sec.**

\* 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

The tool clamp mechanism has been simplified, improving ATC reliability.

### Tool changing time

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

40 tools	60 tools <span style="border: 1px solid red; padding: 0 2px;">OP</span>	120 tools <span style="border: 1px solid red; padding: 0 2px;">OP</span>	180 tools <span style="border: 1px solid red; padding: 0 2px;">OP</span>	240 tools <span style="border: 1px solid red; padding: 0 2px;">OP</span>
<b>8.7</b> sec. (max.)	<b>11.4</b> sec. (max.)	<b>19.7</b> sec. (max.)	<b>15.8</b> sec. (max.)	<b>15.8</b> sec. (max.)
<b>2.8</b> sec. (min.)	<b>2.8</b> sec. (min.)	<b>2.8</b> sec. (min.)	<b>2.8</b> sec. (min.)	<b>2.8</b> sec. (min.)

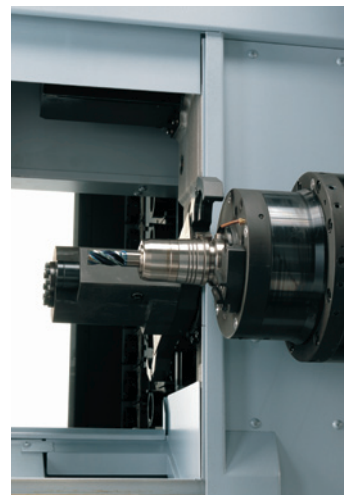
ISO 10791-9 JIS B6336-9 ISO: International Organization for Standardization JIS: Japanese Industrial Standard  
 ● The time differences are caused by the different conditions (travel distances, etc.) for each standard.

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

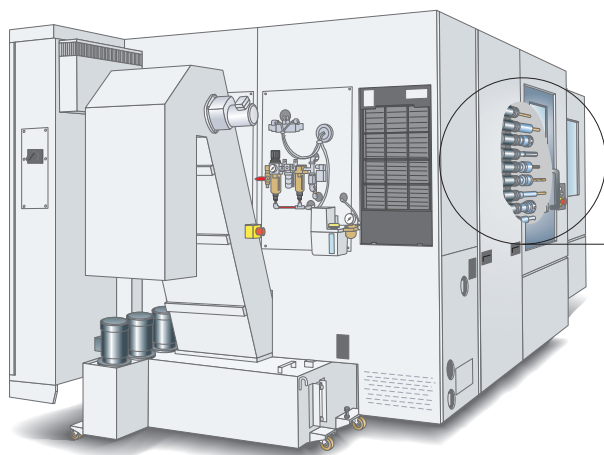
**2.8** sec. <MAS>

#### Tool-to-tool

**0.9** 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)

**40** tools **60** tools OP

Chain-type magazine (separate type)

**120** tools OP



Rack-type magazine (separate type) OP

**180** tools OP

**240** tools OP

**300** tools OP

**360** tools OP



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

Max. tool length	Max. tool mass	Max. tool diameter
<b>400</b> mm ( <b>15.7</b> in.)	<b>8</b> kg ( <b>17.6</b> lb.)	<b>70</b> mm ( <b>2.7</b> in.) <with adjacent tools> <b>140</b> mm ( <b>5.5</b> in.) <without adjacent tools>



# High-precision equipment

## Coolant chiller (separate type)

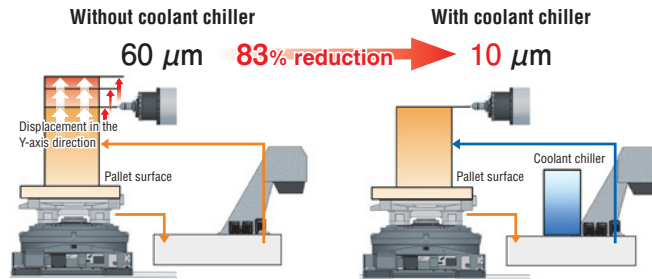
OP

Increase in the oil temperature, which is caused by heat generation during machining or by coolant circulation, causes thermal displacement in the fixtures and workpiece, affecting the dimensional accuracy of the workpiece. Please use this unit to prevent the coolant from heating. For the machining described below, this unit must be selected.

- Machining with required accuracy of less than 20  $\mu\text{m}$
- High-precision machining that requires a large amount of high-pressure coolant
- Machining that requires oil-based coolant

### <Thermal displacement of the Y-axis tombstone>

As an example, when a coolant chiller is used, thermal displacement in the Y-axis plus direction decreases by 83% to 10  $\mu\text{m}$ .



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

## Direct scale feedback

OP

The absolute magnetic linear scale (full closed-loop control) made by Magnescale is effective for high-precision positioning, and is available as an option.



Resolution  
0.01  $\mu\text{m}$

**Magnescale**

High accuracy absolute scale

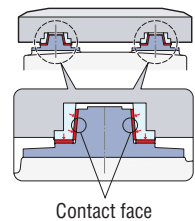
- High accuracy, high resolution
- Greater accuracy than optical scale
- Highly resistant to condensation and oil
- Vibration and impact resistant characteristics

## Pallet clamp system

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

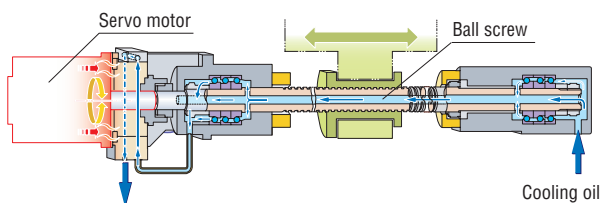


● Auto-coupler specifications pictured



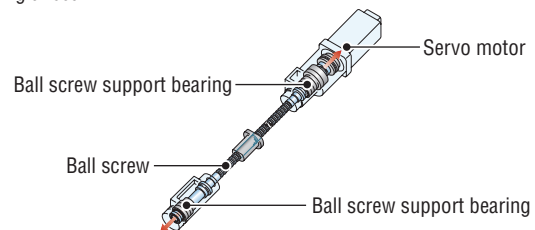
## Ball screw center cooling

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.



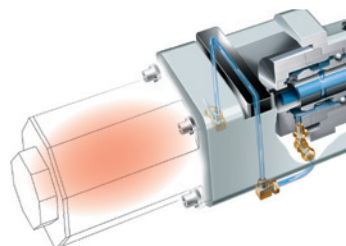
## High-rigidity double-anchor support

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



## Servo motor thermal insulation

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



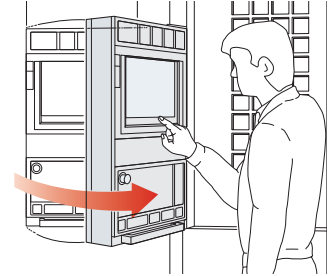
## Improved workability

For the NH4000 DCG, we have installed features throughout the machine to improve the 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°**

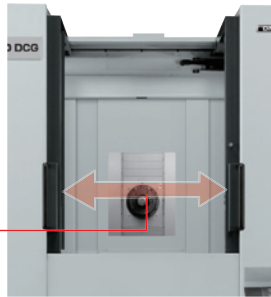
### Setup station

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

Distance from pallet  
**385 mm (15.2 in.)**

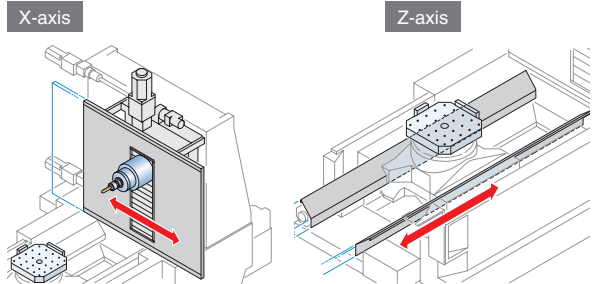
Door opening  
**760 mm (29.9 in.)\***

\* For the automatic door specification, the door opening is 718 mm (28.3 in.).



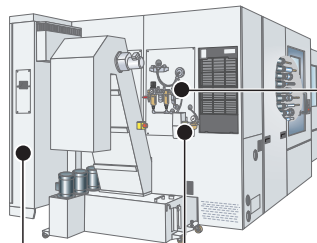
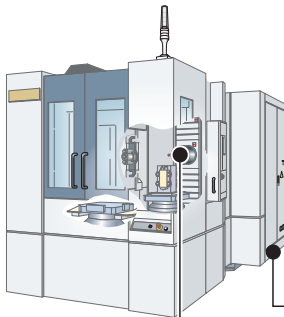
### Single cover

A highly reliable design that prevents chip clogging.



## Maintenance

For the NH4000 DCG, the maintenance is improved by placing the oil chiller, hydraulic unit, and pneumatic instruments all in one place and offering better accessibility for operators.



### Centralized layout of devices

Controls are on the side panel to facilitate maintenance.



### Replacement of spindle unit

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

### Slimmer electrical cabinet

A slim electrical cabinet closes the proximity between you and the insides of the machine during maintenance.

**300 mm (11.8 in.)** <including doors>



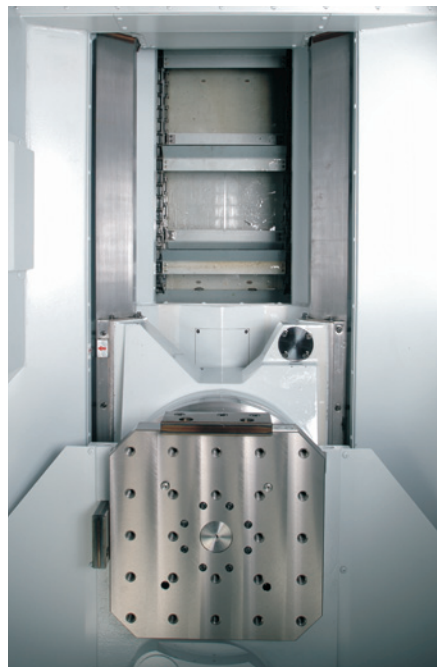
### A closer lubrication tank



# Peripheral equipment

## Chip conveyor

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



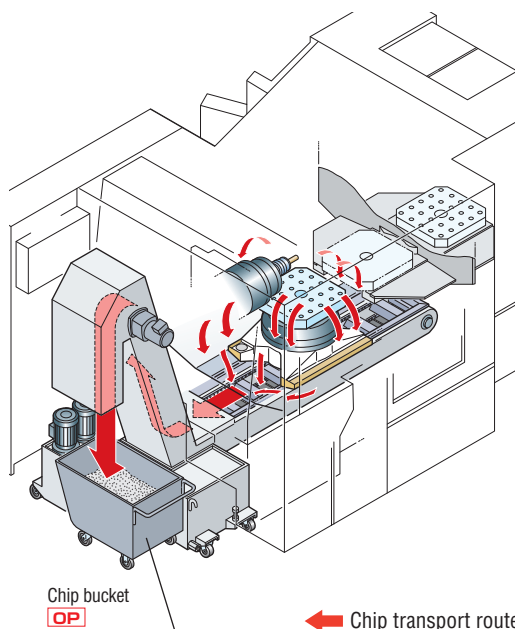
Scraper type +  
drum filter type



Hinge type +  
drum filter type **OP**



Scraper type + drum filter type



Specifications	Workpiece material and chip size						
	Steel			Cast iron	Aluminum/non-ferrous metal		
	Long	Short	Powdery	Short	Long	Short	Powdery
Scraper type+drum filter type	×	○	○	○	×	○	○
Hinge type+drum filter type <b>OP</b>	○	○	○	○	○	○	○

● Chip size guidelines

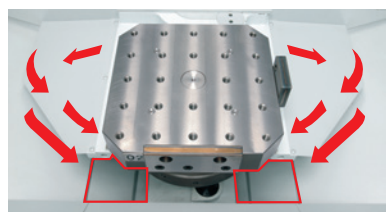
Short: chips 50 mm (2.0 in.) or less in length, bundles of chips  $\phi$  40 mm ( $\phi$  1.6 in.) or less

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

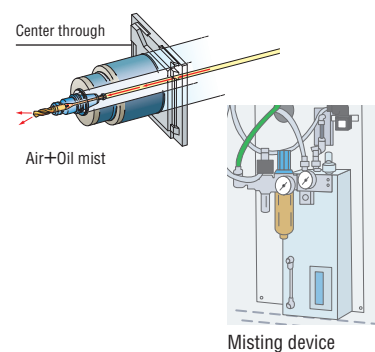
As well as preventing chips from scattering during machining, this allows them to fall smoothly into the center conveyor.



- 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

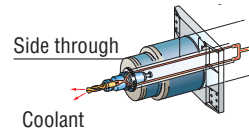
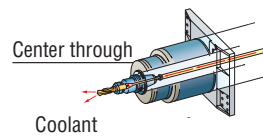
OP

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	○	○
Oil-based coolant	×	○*
Coolant filtration accuracy	40 μm	20 μm

\* Oil-based coolant may not be filtered appropriately depending on its viscosity. In such cases it is advisable to select the high-pressure coolant unit (special option), which uses a ceramic backwashing filter in the filtration system instead of a regular cyclone filter. Please contact our sales representative for details.

**⚠** 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 consult with our sales representative.

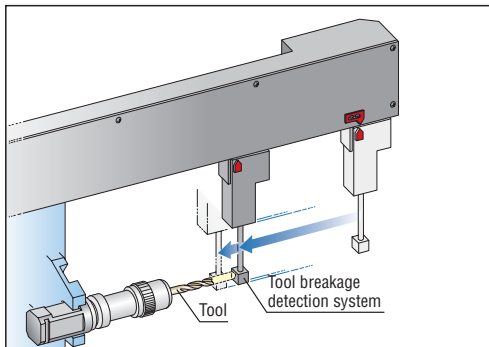


High-pressure coolant system  
(separate type)

## 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.

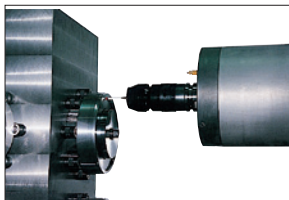


## Automatic measurement

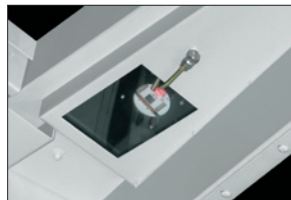
OP

### In-machine measuring system (spindle)

#### Optical type touch sensor



Sensor



Receiver

Automatic

- Centering
- Measurement

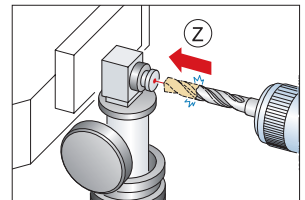
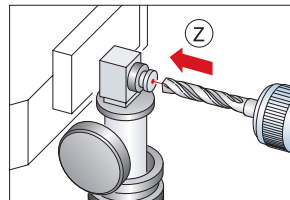
Manual

The workpiece setter function can be added

Workpiece zero point setting and centering are possible

### In-machine measuring system (table)

#### Touch sensor



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.



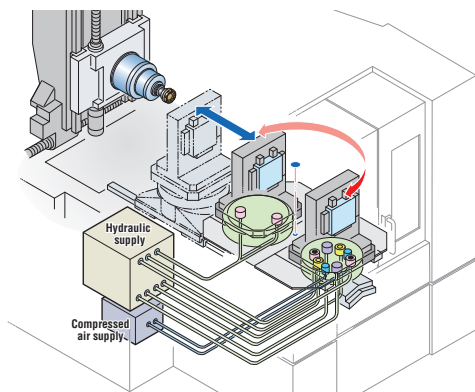
# Fixture interface

## Fixture interface



### Auto-coupler fixture interface

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

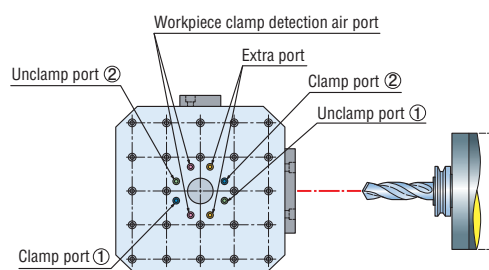


Compressed air is supplied to the setup station. Hydraulic fluid is supplied to both the setup station and the machining table.

- 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 washing coolant system
  - ☐ Fixture air blow system



### Auto-coupler

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



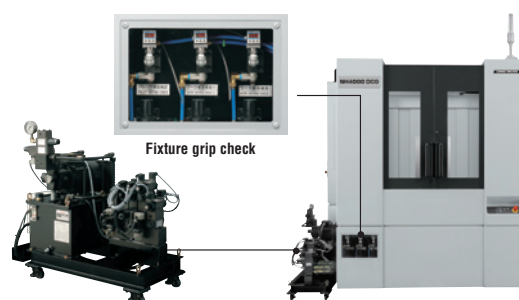
Setup station: 8 ports\*

\* Includes two extra ports.



Machining table: 2 ports

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



Separate hydraulic unit for the auto coupler

- Unit pictured with optional coolant gun.

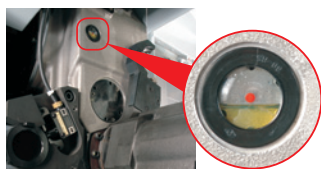
# Reduction in environmental burden

## Eco-friendly design

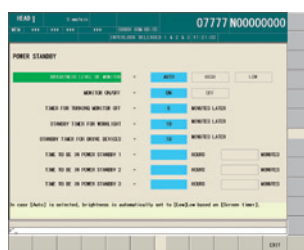
### Reduced consumption of lubricating oil

#### 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)

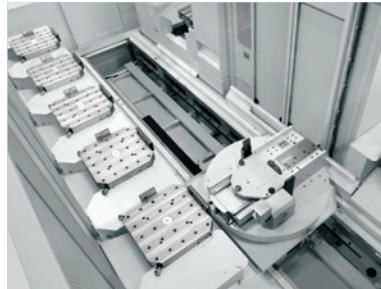
With its simple construction provided in predefined packages, this system is easy to introduce.  
For the system configuration, the customer can select from 8 packages to provide the optimum specifications for their needs.

#### ■ Controller

Handy controller  
(Standard features)



- MCC-LPS III is available as an option.
- When the number of machines or workpiece setup stations is two or more, the MCC-LPS III is required.
- For models and systems, please consult with our sales representative.



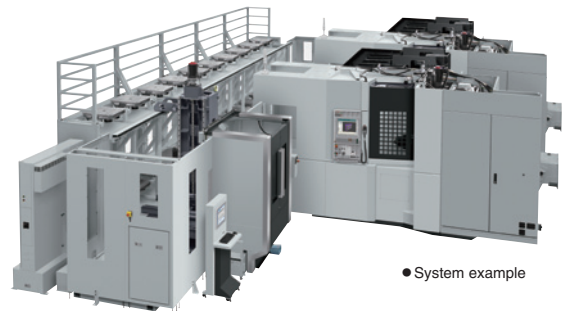
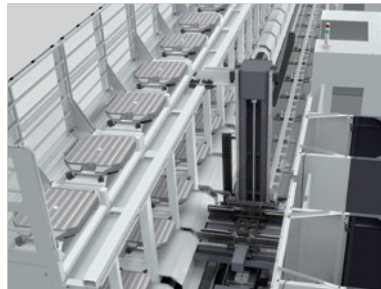
● System example

### LPP system (Linear Pallet Pool System)

It is a system with a high level of automation, equipped with multi-level pallet racks.  
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

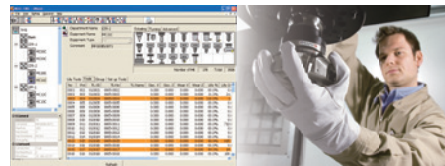
## MCC-LPS III



- DMG MORI's original, highly reliable system allows easy operation/management of the pallet transfer system.
- Machining programs can be managed and automatically downloaded.
- Urgent production requests will be flexibly prioritized.

#### The Tool Management System

## MCC-TMS



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

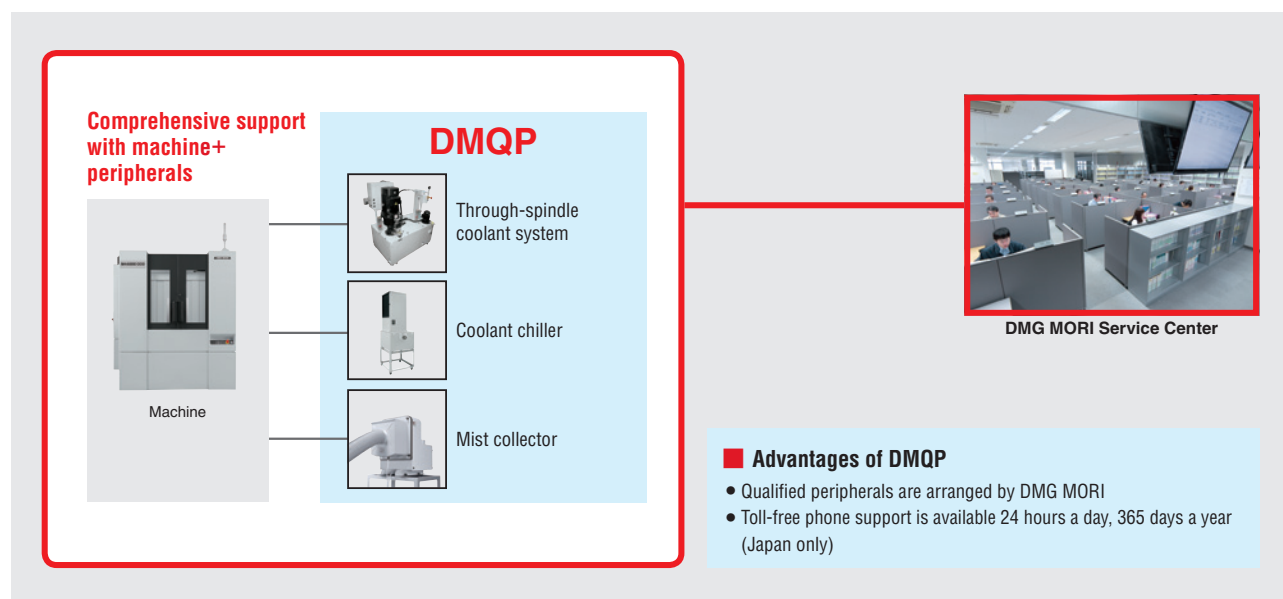
# DMQP (DMG MORI Qualified Products)

## 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 (NH4000 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 Operating System  
for Machining Centers



● 19-inch operation panel

High-performance operating 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
- ▶ New 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.

Approx.  
Reduced by **33%**

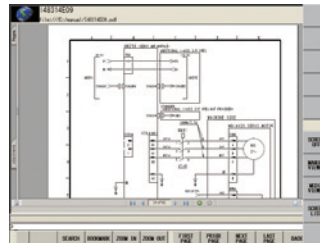
### Main specifications

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

## 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 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

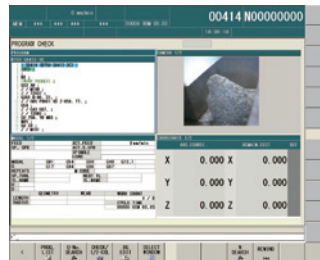
Operation schedule of the APC can be controlled through MAPPS. The ability to set various schedules supports unmanned continuous operation. This function can also handle changes to machining schedules flexibly.



## Improved 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)

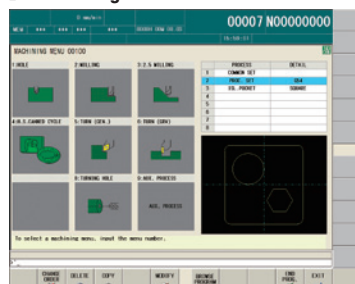


## Conversational automatic programming

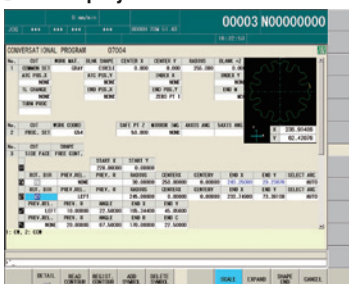
This function allows users to create programs simply by following the guidance on the screen.

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

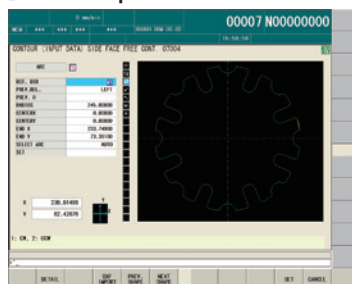
### Machining menu



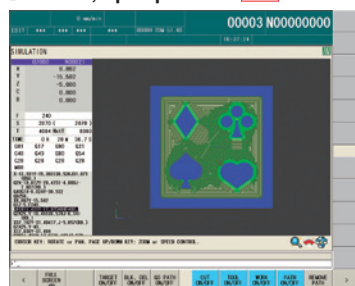
### List display function



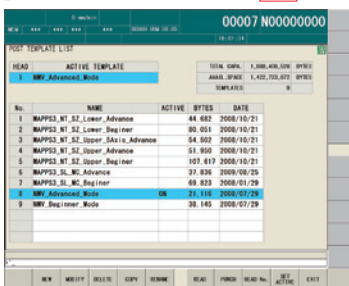
### Contour input



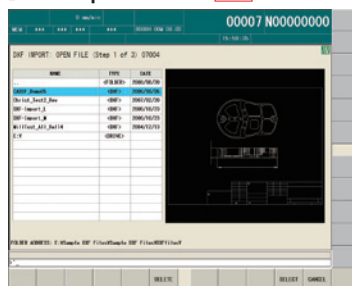
### Islands, open pockets\* OP



### MORI-POST advanced mode OP



### DXF import function OP



\* For Europe, this specification is provided as standard.

## 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.

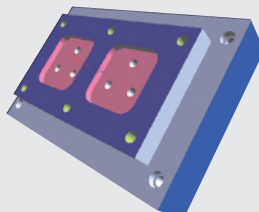
#### 1. Simple programming



##### [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 August 2015.

# MORI-NETWORK

Network Application Systems

MORI-NET, MORI-SERVER, MORI-MONITOR

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 OP

#### ■ Features

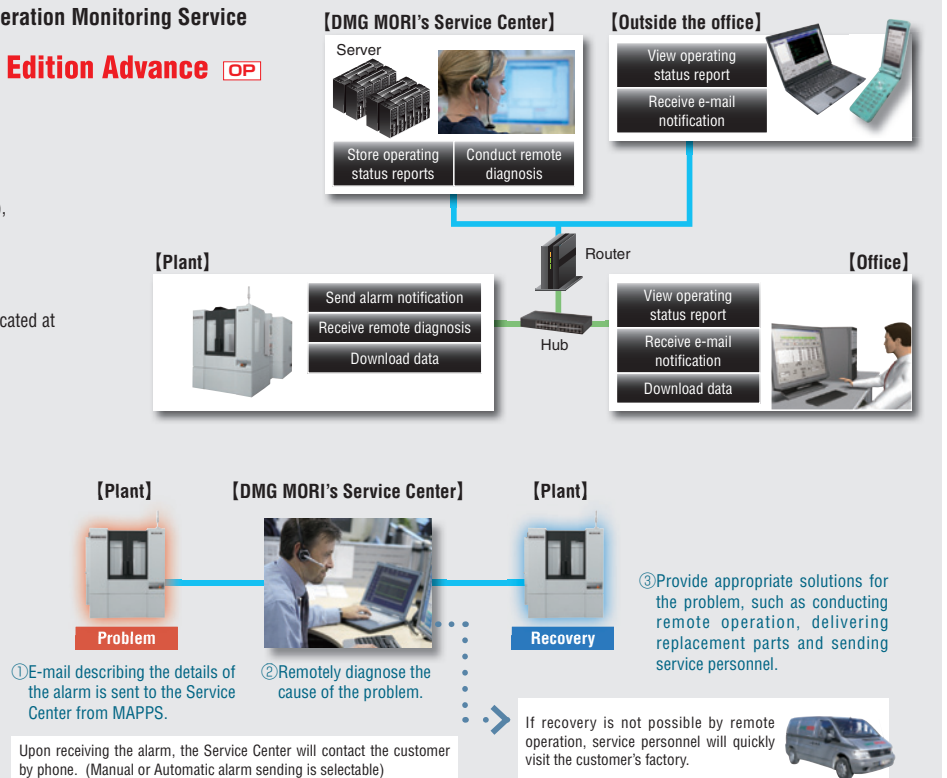
- Remote maintenance service by DMG MORI Service Center
- Internet-based, high speed (max. 1 Gbps), large capacity network
- No server installation is required — reduction in initial cost
- Download various data from the server located at DMG MORI

#### ■ 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.

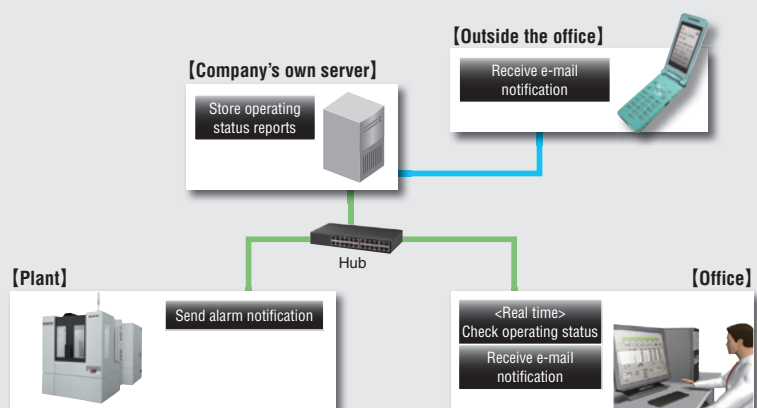


### Machine Operation Monitoring System

## MORI-NET LAN Edition OP

#### ■ 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 OP

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 (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

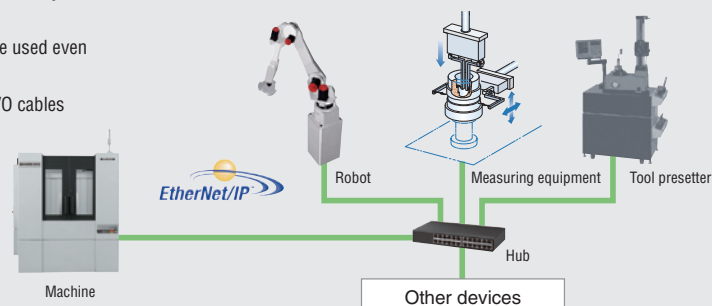
## MAPPS EtherNet/IP I/F OP

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

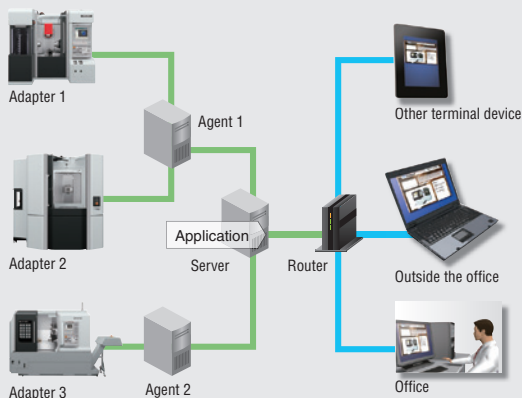
## MAPPS MTConnect I/F

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.



#### <Precautions for Machine Relocation>

**EXPORTATION:** All contracts are subject to export permit by the Government of Japan. Customer shall comply with the laws and regulations of the exporting country governing the exportation or re-exportation of the Equipment, including but not limited to the Export Administration Regulations. The Equipment is subject to export restrictions imposed by Japan and other exporting countries and the Customer will not export or permit the export of the Equipment anywhere outside the exporting country without proper government authorization. To prevent the illegal diversion of the Equipment to individuals or nations that threaten international security, it may include a "Relocation Machine Security Function" that automatically disables the Equipment if it is moved following installation. If the Equipment is so-disabled, it can only be re-enabled by contacting DMG MORI or its distributor representative. DMG MORI and its distributor representative may refuse to re-enable the Equipment if it determines that doing so would be an unauthorized export of technology or otherwise violates applicable export restrictions. DMG MORI and its distributor representative shall have no obligation to re-enable such Equipment. DMG MORI and its distributor representative shall have no liability (including for lost profits or business interruption or under the limited service warranty included herein) as a result of the Equipment being disabled.

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- If you have any questions regarding the content, contact our sales representative.
- The information in this catalog is valid as of September 2015. Designs and specifications are subject to changes without notice.
- The machines shown in the catalog may differ from the actual machines. The location and the size of the nameplates may also differ from the actual machines, or the nameplates may not be attached to some machines.
- DMG MORI is not responsible for differences between the information in the catalog and the actual machine.

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