www.dmgmori.com

DMG MORI

- NV5000 α1A/40
- NV5000 α1A/40 HSC
- NV5000 α1B/40
- NV5000 α1B/40 HSC
- NV5000 α1A/50
- NV5000 α1B/50

High-Precision Vertical Machining Center

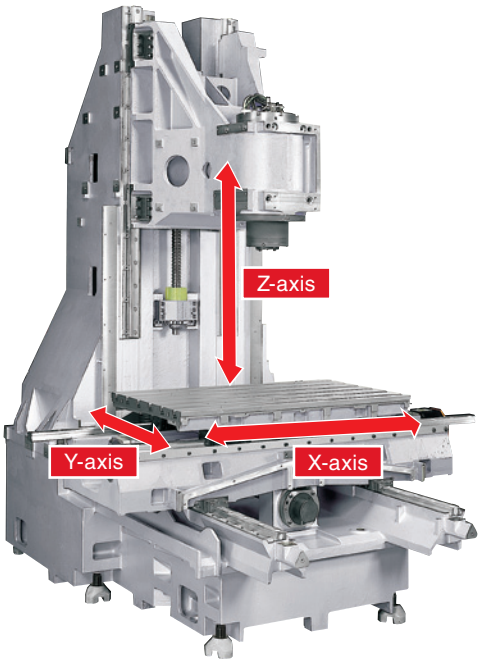
# NV5000 α1

# The NV5000 α1
# - the final word in vertical machining centers.

Thinking outside the box.  Creating the final word in vertical machining centers.
This is where the project team began as we developed the next-generation model.
We looked at machine technology at a whole new angle to create a machining center with better performance than all previous machining centers.
Producing the basic machine layout with digital design.  Considering easy repair to reduce downtime.
Offering the technology and environmental awareness necessary for the production floor of the 21st century.
The NV5000 α1 goes beyond simply incorporating new technology;
it lifts production to a new level by achieving the ideal form.
This machine will forever change production philosophy.

# Principal mechanisms

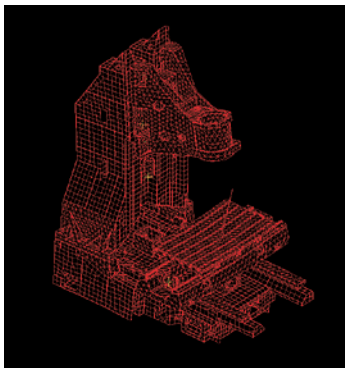
## Basic structure



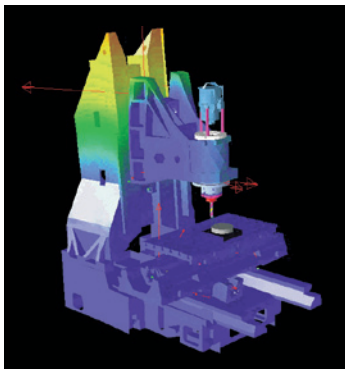

Stronger ductile cast iron is used for the columns.

### Machine strength

NV5000 α1 was designed according to the principles of the Finite Element Method. FEM provides a simulation of stresses that occur in the machine's casting when placed under a load. Refinements were made in areas such as bed thickness, rib shape and rib position to improve stiffness. These refinements give the machines a high level of resistance against distortion. While increasing the strength of the casting, we were able to reduce the weight.



FEM analysis determines rigid body design.
FEM: Finite Element Method



Real cutting simulation using dynamic analysis.

**Rapid traverse rate <X, Y and Z axes>**
42 m/min (1,653.5 ipm)

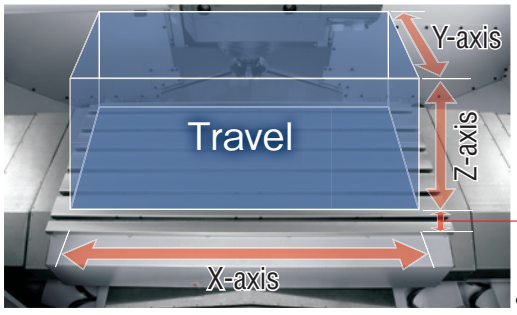
**Max. acceleration**
**NV5000 α1A/40**
X-axis 0.43 G {4.21 m/s² (13.81 ft/s²)}
Y-axis 0.39 G {3.82 m/s² (12.53 ft/s²)}
Z-axis 0.74 G {7.25 m/s² (23.78 ft/s²)}

## Variations

Choose the table size you need, as well as the spindle taper, to make the combination that's right for you.

| | A type | | B type | |
|---|---|---|---|---|
| **Type of spindle taper** | No. 40 taper | No. 50 taper | No. 40 taper | No. 50 taper |
| **Machine type** | **NV5000 α1A/40** | **NV5000 α1A/50** | **NV5000 α1B/40** | **NV5000 α1B/50** |
| **Table working surface** | 1,100×600 mm (43.3×23.6 in.) | | 1,320×600 mm (52.0×23.6 in.) | |
| **Table loading capacity** | 1,000 kg (2,200 lb.) | | 1,200 kg (2,640 lb.) | |

## Working area




● The photo shows the NV5000 α1A

| A type | B type |
|---|---|
| X-axis 800 mm (31.5 in.) | X-axis 1,020 mm (40.2 in.) |
| Y-axis 510 mm (20.1 in.) | Y-axis 510 mm (20.1 in.) |
| Z-axis 510 mm (20.1 in.) | Z-axis 510 mm (20.1 in.) |

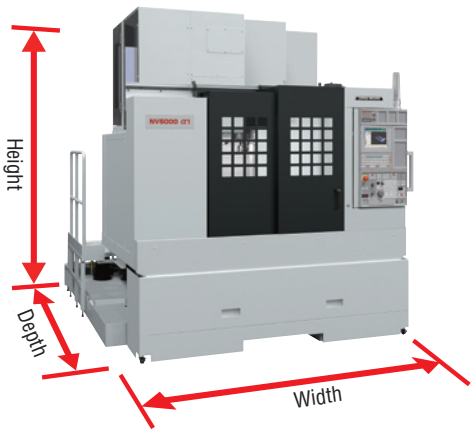
From table surface 150 mm (5.9 in.)

## Machine size

The basic design ensures maximum spindle movement, creating a large processing space. With moving room to spare, this machine can handle any type of job.

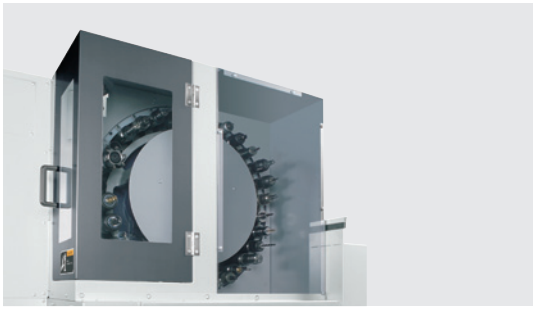
| | | NV5000 α1A/40 | NV5000 α1B/40 |
|---|---|---|---|
| Width | mm (in.) | 2,458 (96.8) | 2,788 (109.8) |
| Depth | mm (in.) | 2,710 (106.7) | |
| Height | mm (in.) | 2,603 (102.5) | |

| | | NV5000 α1A/50 | NV5000 α1B/50 |
|---|---|---|---|
| Width | mm (in.) | 2,728 (107.4) | 3,026 (119.1) |
| Depth | mm (in.) | 2,636 (103.8) | |
| Height | mm (in.) | 2,640 (103.9) | |




## ATC, Magazine

The unique ATC cam construction combines with the shortened acceleration/deceleration time to produce the fastest cut-to-cut (chip-to-chip) time in its class. This hasdrastically reduced non-cutting time.



**Tool storage capacity**

30 tools　60 tools OP　90 tools OP

(No. 40 taper only)

| Magazine: 30 tools | Standards | NV5000 α1A/40 | NV5000 α1B/40 | NV5000 α1A/50 | NV5000 α1B/50 |
|---|---|---|---|---|---|
| Cut-to-cut (chip-to-chip) <without ATC shutter> | ISO 10791-9, JIS B6336-9 | Max. tool changing time: 8.8 sec. Min. tool changing time: 3.1 sec. | | Max. tool changing time: 12.5 sec. Min. tool changing time: 5.5 sec. | |
| | MAS011 | 2.6 sec. | | 4.9 sec. | |
| | VDI2852 | 2.6 sec. | | 4.9 sec. | |

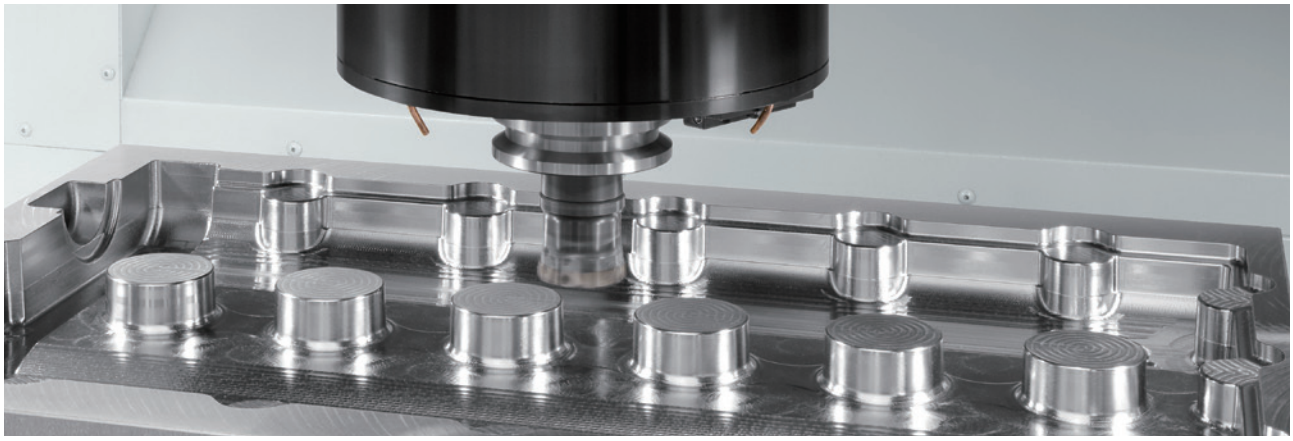
[ ] Option　ISO: International Organization for Standardization　JIS: Japanese Industrial Standard

- Depending on the arrangement of tools in the magazine, the cut-to-cut (chip-to-chip) time may be longer.
- The time differences are caused by the different conditions (travel distances, etc) for each standard.
- For heavy tool specifications <No. 40 taper 8 kg (17.6 lb.) or more, No. 50 taper 10 kg (22 lb.) or more>, the values may be bigger than those above.

# Principal mechanisms

## Spindle

The spindle drive uses DDS (Direct Drive Spindle) motor gearless technology to bring out its full power at all speeds. With a maximum standard speed of 14,000 min$^{-1}$ (NV5000 $\alpha$1/40), faster than conventional specifications, acceleration has also been radically improved.

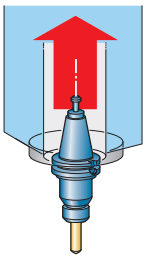


| | NV5000 $\alpha$1A/40<br>NV5000 $\alpha$1B/40 | NV5000 $\alpha$1A/40 HSC<br>NV5000 $\alpha$1B/40 HSC | NV5000 $\alpha$1A/50<br>NV5000 $\alpha$1B/50 | |
|---|---|---|---|---|
| | Standard | Standard | Standard | High speed OP |
| **Max. spindle speed** | 14,000 min$^{-1}$ | 20,000 min$^{-1}$ | 8,000 min$^{-1}$ | 15,000 min$^{-1}$ |
| **Spindle acceleration time** | 1.40 sec.<br>(0→14,000 min$^{-1}$) | 2.68 sec.<br>(0→20,000 min$^{-1}$) | 1.42 sec.<br>(0→8,000 min$^{-1}$) | 7.08 sec.<br>(0→15,000 min$^{-1}$) |
| **Spindle deceleration time** | 1.15 sec.<br>(14,000 min$^{-1}$→0) | 2.56 sec.<br>(20,000 min$^{-1}$→0) | 1.42 sec.<br>(8,000 min$^{-1}$→0) | 6.00 sec.<br>(15,000 min$^{-1}$→0) |

### Tool clamp power

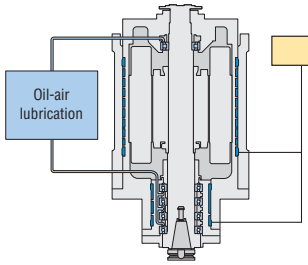
Using the newly developed collet, clamping power on the tool has been increased. The ability to control vibration during spindle rotation ensures high-accuracy machining.

**NV5000 $\alpha$1A/40**
12,000 N
(2,697.6 lbf)



## Spindle lubrication

- Oil feed is kept to a minimum to reduce frictional loss.
- Air purge prevents dust infiltration.



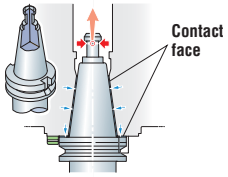

Oil circulated through a jacket surrounding the spindle minimizes thermal displacement.

**Oil cooler**
Cooling oil is circulated to counter thermal displacement.

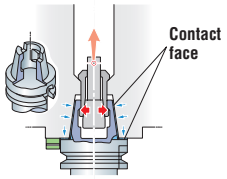
## Two-face contact specifications OP

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.

BT40*, BT50*




HSK-A63, HSK-A100




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

HSC: High Speed Cutting

# High-precision equipment

## 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 μm

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

Magnescale

High accuracy absolute scale

## Oil cooler (separate type)

An energy-saving oil cooler is used that delivers very little temperature fluctuation.

## Coolant cooling system (separate type) OP

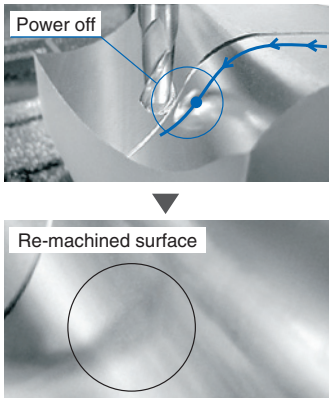
Raised coolant temperature causes thermal displacement in the fixtures and workpiece, affecting the machining accuracy of the workpiece. Use this unit to prevent the coolant from heating up. When using oil-based coolant, the coolant temperature can become extremely high even with the standard coolant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

**When using oil-based coolant, please be sure to consult with our sales representative.**

- While this unit is not the only way to completely control the temperature of the coolant, it makes a major contribution to preventing increases in the oil temperature.

## Z-axis drop prevention function ideal for blackouts

Raising the spindle slightly during blackouts prevents any contact between the tool and the workpiece caused by the spindle dropping.



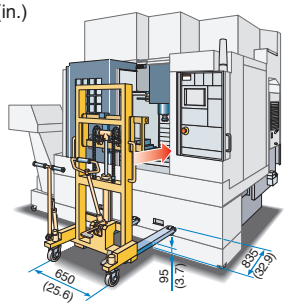

**※ The Z-axis drop prevention function is not available in the following situations.**

1. When the feed axis servo alarm has gone off.
2. When the power supply module alarm has gone off.
3. When the communication alarm between the CNC and the amp has gone off.

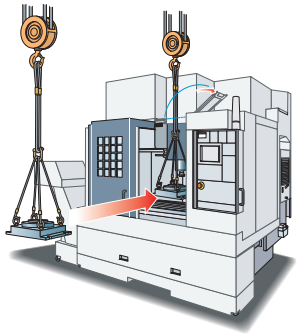
# Improved workability

With an easy-to-access table and openable ceiling, the NV5000 α1 is designed to offer superior operability and ease of setup that are required of vertical machining centers.

mm (in.)



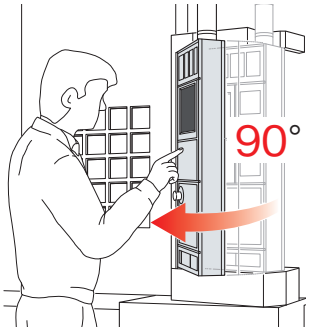

Handlifts approach close to the setup station, making it easy to load and unload heavy workpieces.



The top panel can be opened and closed, making crane accessibility quick and easy.

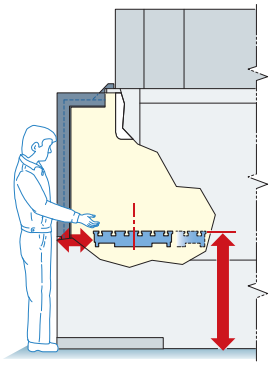
## Swivel-type operation panel

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




- Except for chip conveyor outside machine (scraper type + drum filter type and hinge type + drum filter type) specifications.
- The illustration shows the NV5000 α1A.

## Accessibility



### Easy access to the machine's table

The table is located in front of the operator to make work inside the machine easier. The distance from the front of the machine to the table has been shortened.

**Distance from the front of the machine to the table**

262 mm (10.3 in.)

**Height from the floor to the upper face of the table**

900 mm (35.4 in.)

**Door opening**

**NV5000 α1A:** 1,032 mm (40.6 in.)

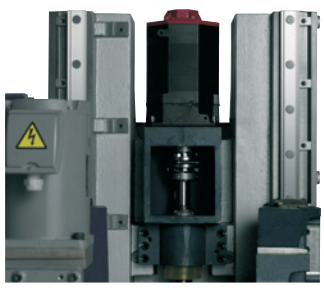
**NV5000 α1B:** 1,386 mm (54.6 in.)

# Maintenance

NV5000 α1 is designed with features for ease of maintenance to increase the machine operating rate.

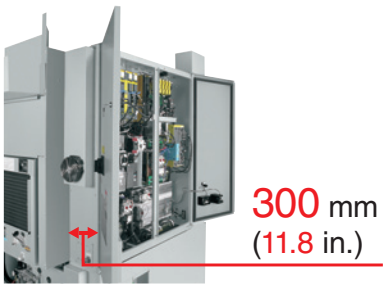
## A servo motor with a brake has been added

The Z-axis timing belt has been removed and the servo motor has been connected directly to the ball screw. There is no more need to maintain or replace the timing belt.



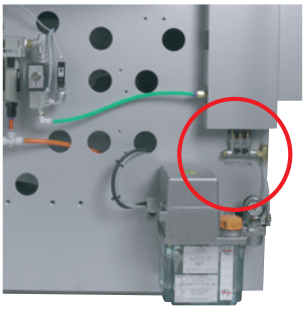
## Electrical cabinet

We removed the cable earth and pulled all the cables out from underneath the machine, succeeding in creating a slim electrical cabinet that is only 300 mm (11.8 in.) thick. The machine is easier to approach and cable replacement can be done even faster.




## Lubricant distributors

We reduced the number of lubricant distribution points and placed them outside the machine, continuing to ease maintenance.



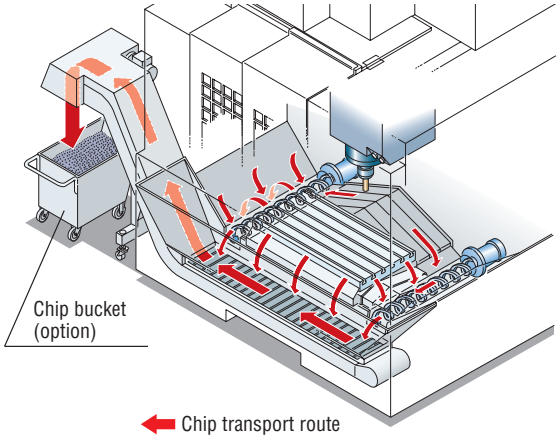
- The colors and configurations shown in the photographs or illustrations may differ from those of the actual product.

# Peripheral equipment

## Chip conveyor (inside machine)

### NV5000 α1B Spiral type (two on the right and two on the left)

### NV5000 α1A Spiral type (one on the right and one on the left) OP

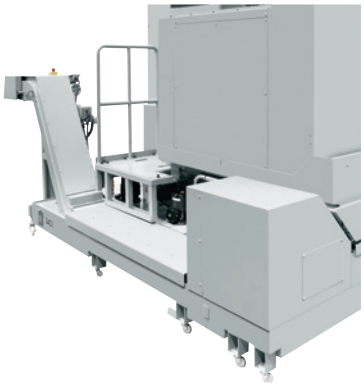



## Chip conveyor (outside machine) OP

### Scraper type + drum filter type

### Hinge type (left discharge, right discharge)

### Hinge type (rear discharge)



| Specifications | Workpiece material and chip size ○: Suitable ×: Not suitable | | | | |
|---|---|---|---|---|---|
| | Steel | | Cast iron | Aluminum/non-ferrous metal | |
| | Long | Short | Short | Long | Short |
| Hinge type+drum filter type* | ○ | ○ | ○ | ○ | ○ |
| Hinge type | ○ | ○ | × | ○ | × |
| Scraper type+drum filter type | × | ○ | ○ | × | ○ |
| Magnet scraper type Consultation is required | × | ○ | ○ | × | × |

* Machine height needs to be raised by 100 mm (3.9 in.).

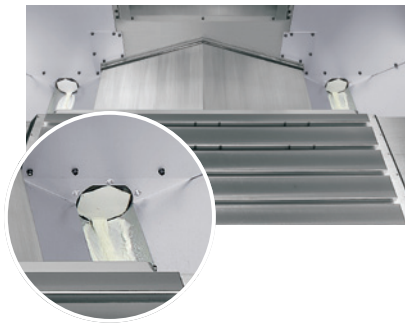
- Chip size guidelines
  Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ϕ 40 mm (ϕ 1.6 in.) or less
  Long: bigger than the above
- The options table below the general options when using coolant.
  Changes may be necessary if you are not using coolant, or depending on the amount of 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.

# Peripheral equipment

## Chip flow coolant

**NV5000 α1A**

Using chip flow coolant allows smooth output of chips.

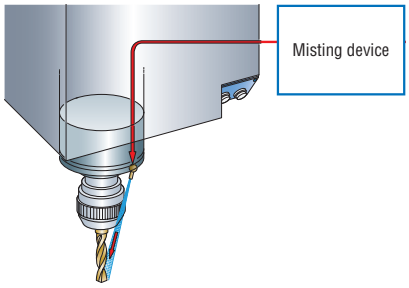


## Shower coolant OP

It prevents chips from accumulating by releasing coolant from a total of 6 nozzles.

## Semi-dry unit OP

Supplies air and oil mist to the cutting tip. This unit is also eco-friendly.



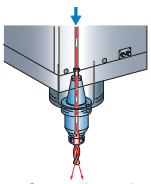

## Through-spindle coolant system OP

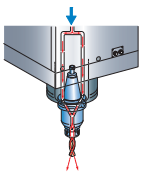
The through-spindle coolant system effectively eliminates chips, cooling the machine point and lengthening the lives of your tools.

| | | Unit on coolant tank | Separate type |
|---|---|---|---|
| Discharge pressure | MPa (psi) | 1.5 (217.5) | 1.5/3.5/7.0 (217.5/507.5/1,015) |
| Installation space <width×depth> | mm (in.) | 360×360 (14.2×14.2) <line filter unit> | 780×1,085 (30.7×42.7) <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.

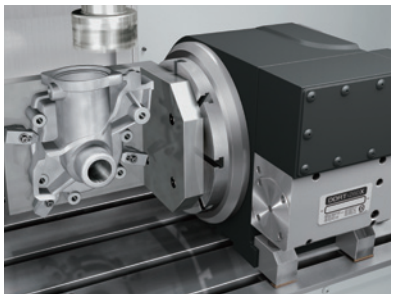
⚠ Do not use a flammable coolant or oil-based coolant because it may ignite and cause fire or machine breakage. If you have to use a flammable coolant for any reason, please consult with our sales representative.


Center through


Side through


High-pressure coolant system (separate type)

## Rotary table DDRT Series OP



**For models (4 axes)**
DDRT-200X, 260X, 300

● The photo shows the DDRT-260X.

It is possible to equip the machine with the high-speed, high-accuracy DDRT Series rotary table which incorporates the DDM (Direct Drive Motor). The high-efficiency machining using 4 axes and high-speed and high-precision indexing realize process integration.
(for details on the machining ranges, please consult your DMG MORI SEIKI representative.)

- Equipped with DDM
- Zero backlash
- Achieves high-precision indexing
- Offers stable machining through powerful clamping
- Allows high-efficiency machining using 4 axes

### Rotational speed of the table

Conventional machine 17 min$^{-1}$ ▶ DDRT-260X 150 min$^{-1}$

Compared with conventional machine Approx. 9 times greater

### Positioning accuracy

Conventional machine 20 sec. ▶ DDRT SERIES 5 sec.

Compared with conventional machine 1/4

### Features of DDM

DDM® Direct Drive Motor

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

DDM: Direct Drive Motor

● The colors and configurations shown in the photographs or illustrations may differ from those of the actual product.

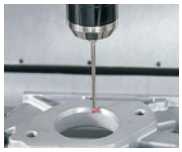
# Measurement

For the measuring devices, an automatic measuring function can be selected alone or in combination with manual measuring functions.
Select the right devices for your use.

## Automatic measurement OP

### In-machine measuring system (spindle)

- Automatic centering and automatic measurement are possible.
- Automatic measurement applications are included.



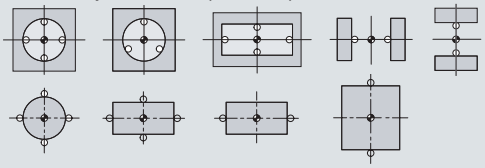
### In-machine measuring system (table)

- Automatic tool length measurement and automatic breakage detection are possible.
- Automatic measurement applications are included.

#### Automatic measurement applications

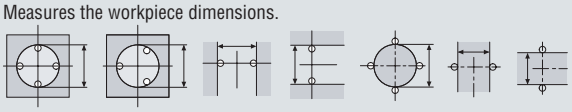
■ **Centering**

Automatically sets the workpiece zero point.



■ **Measurement**

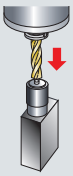
Measures the workpiece dimensions.



#### Automatic measurement applications

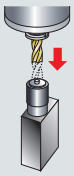
■ **Tool length measurement**

Measures tool length automatically.



■ **Tool breakage detection**

Prevent further damage with the automatic tool breakage detection.



## Automatic measurement + Manual measurement functions OP

Manual measurement applications can be added to the automatic measurement function

## Workpiece measurement function OP

**In-machine measuring system (spindle)**
**Optical type touch sensor**

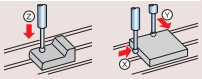
**In-machine measuring system (spindle)**
**Inductive type touch sensor**

+

#### Work setter function (manual measurement application)

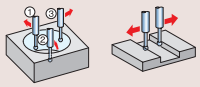
■ **Reference plane measurement**

The machining reference point can be calculated simply by applying the sensor from the Z, X and Y-axis directions.



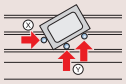
■ **Reference hole measurement**

Centering a boss, hole, groove or width can be done at any two or three points, simply by applying the sensor.



■ **Coordinate rotation measurement**

Machining can be done without changing the program even if the workpiece is attached crookedly, simply by performing this operation within the X-axis and Y-axis plane.



## Tool measurement function OP

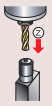
**In-machine measuring system (table)**
**Touch sensor (tool length)**

+

#### Tool setter function (manual measurement application)

■ **Tool length measurement**

The tool length value can be registered automatically to the designated tool offset number.



**In-machine measuring system (table)**
**Touch sensor (tool length / tool diameter)**

+

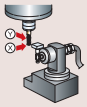
#### Tool setter function (manual measurement application)

■ **Tool length measurement**

The tool length value can be registered automatically to the designated tool offset number.

■ **Tool diameter measurement**

The tool diameter value can be registered automatically to the designated tool offset number.

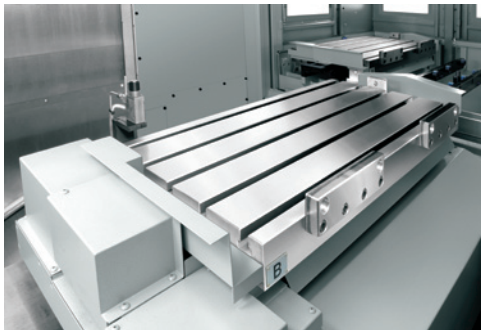


# Transfer systems

## APC

OP

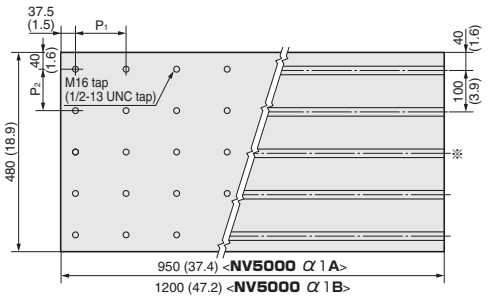
The 2-station APC significantly reduces non-cutting time. Max. loading capacity: 500 kg (1,100 lb.)



● Equipped with optional in-machine tool measuring system (table-mounted sensor).

### Pallet dimensions

mm (in.)




※Center T-slot: $18^{+0.027}_{0}$ ($0.7^{+0.001}_{0}$)
All other T-slots: $18^{+0.18}_{0}$ ($0.7^{+0.007}_{0}$)

| Pallet | P1 | P2 |
|---|---|---|
| mm | 125 | 100 |
| inch | 5 | 4 |

Max. loading capacity
500 kg (1,100 lb.) <**NV5000 α1A**>
600 kg (1,320 lb.) <**NV5000 α1B**>

### Pallet changing time (60 Hz)

**NV5000 α1A** 16.5 sec.

**NV5000 α1B** 18.0 sec. <MAS>

W: width
H: Height
D: Depth


● When APC is selected, 200 mm (7.9 in.) raised column specifications are required.
● Optional coolant gun and chip conveyor pictured here per APC specifications. (NV5000 α1A/40)

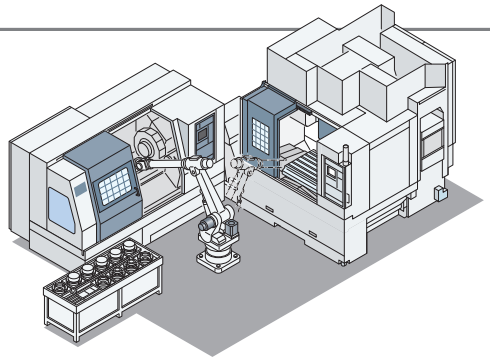
**W × D × H: 3,819 × 2,710 × 2,803 mm (150.4 × 106.7 × 110.4 in.) <NV5000 α1A>**
**4,453 × 2,710 × 2,840 mm (175.3 × 106.7 × 111.8 in.) <NV5000 α1B>**

Q51608A03

## Workpiece transfer robot

OP Consultation is required

Robots make workpiece loading and unloading more efficient, improving productivity.



● The colors and configurations shown in the photographs or illustrations may differ from those of the actual product.

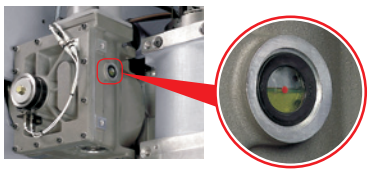
# Reduction in environmental burden

## Eco-friendly design

### Reduced consumption of lubricating oil

#### Oil-bath ATC

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



### Power-saving function


Energy-saving settings screen

#### Automatic machine light function

If the keyboard is not touched for 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 sleep function

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

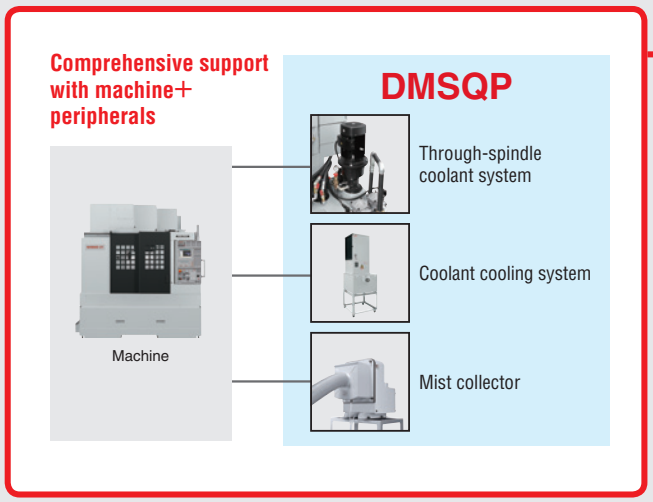
# DMSQP (DMG Mori Seiki Qualified Products) OP

## Selected peripherals with superior quality, performance and maintainability.

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

### Comprehensive support with machine+peripherals

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




DMG MORI SEIKI Service Center

**Advantages of DMSQP**

- Qualified peripherals are arranged by DMG MORI SEIKI
- Two-year warranty, the same as machines
  (Parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year)
- Toll-free phone support is available 24 hours a day, 365 days a year (Japan only)

### Examples of qualified products (NV5000 α1)

☐ **Through-spindle coolant system**
Coolant is supplied to the tool tip through the center of the tool and spindle.

☐ **Coolant cooling system**
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.

☐ **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.

☐ **Tool wagon**

☐ **Tool cabinet**

☐ **Basic tooling kit**

● For more details on DMSQP items, please contact your sales representative.

# MAPPS Ⅳ

High-Performance Operating System
for Machining Centers

● 10.4-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**
- **Enhanced functionality by using CAM software (option)**
- **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 SEIKI's remote maintenance service solves it smoothly MORI-NET Global Edition Advance OP**

## Outstanding operability

### Vertical soft-keys

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%

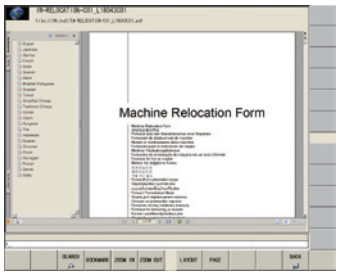
### Main specifications

| | |
|---|---|
| Main memory | 1 GB |
| User area | Standard: 50 MB Option: 6 GB |
| Interface | ·USB 2.0 2 ports (Screen side: 2)<br>·LAN 1 port (1000BASE-T)<br>·RS-232-C port (option) |
| Soft-keys | Right 10 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.



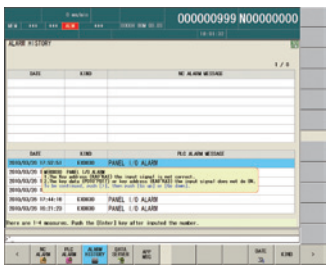

**Viewable file types**

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

## Improved ease of maintenance

### Alarm help function

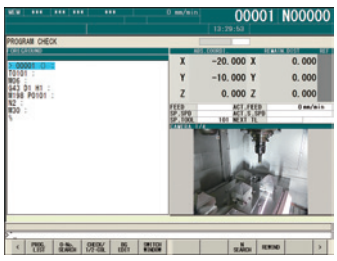
When an alarm occurs, MAPPS identifies the cause of the trouble and provides solutions.



## Improved 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)

MAPPS: Mori Advanced Programming Production System

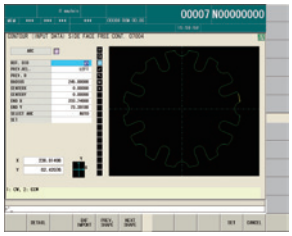
## Conversational automatic programming

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.

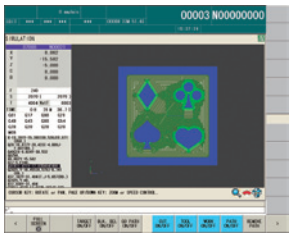
### Machining menu

### List display function

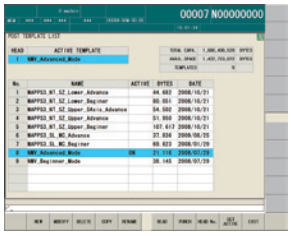
### Contour input



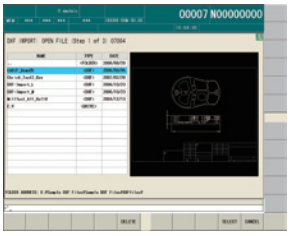
### Islands, open pockets OP



### MORI-POST advanced mode OP



### DXF import function*1 OP



**MORI Automatic Programming System for Machining Center**

## MORI-APM OP

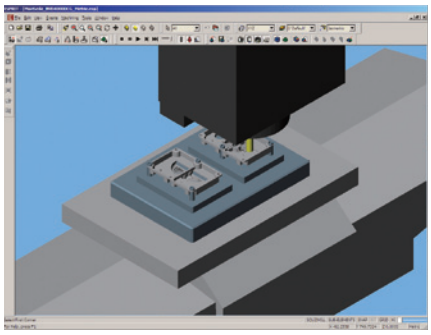
Application systems which let you create machining programs easily on your PC.

- Easy operation, simply by entering the product shapes while following the instructions on the screen.
- Its functions, data and operability are fully compatible with the conversational programming system of the MAPPS Ⅳ operating systems.

*1 A mouse is required. Please prepare a mouse by yourself.

## CAM software OP

ESPRIT® allows you to create complex 3D programming with high-added value. By just installing the software on your PC with connection to LAN, you will be able to use it. (Once the software is started on the computer, it can be used for up to 7 days without LAN connection)



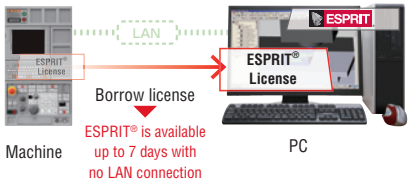
- **Postprocessor as standard**
- **CAM software will be ready to use once your machine is installed**
- **Cost for introducing CAM software can be saved**
- **ESPRIT® data can be modified on the machine** (through Remote Desktop connection*2)
- **The software can be installed on multiple PCs on the network** (It cannot be simultaneously started up on more than one PC)
- **2-year warranty support** (including free update)

### Remote Desktop <Patent pending>

ESPRIT® installed on your PC can be operated from your machine via LAN.*3 (It cannot be simultaneously started up on more than one PC)


### License borrowing system

By borrowing the ESPRIT® license from the machine over LAN, ESPRIT® can be run on the PC up to 7 days without LAN connection (or turning on the machine).




### Support system

Distributors/Trading companies, DMG MORI SEIKI Technical Centers and ESPRIT® Support Team will answer inquiries about the CAM software.

*2 Applicable Operating Systems: Windows® Vista Business/Ultimate, Windows® 7 Professional/Ultimate
*3 A mouse is required. Please prepare a mouse by yourself.
● A PC is required to use ESPRIT®. Please prepare PCs by yourself.

● The photo shown may differ from actual machine.
● Information about the screen is current as of December 2013.

# MORI-NETWORK

Network Application Systems
MORI-NET, MORI-SERVER, MORI-MONITOR

## For shorter total production time for all our customers

### DMG MORI SEIKI's software Line-up

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

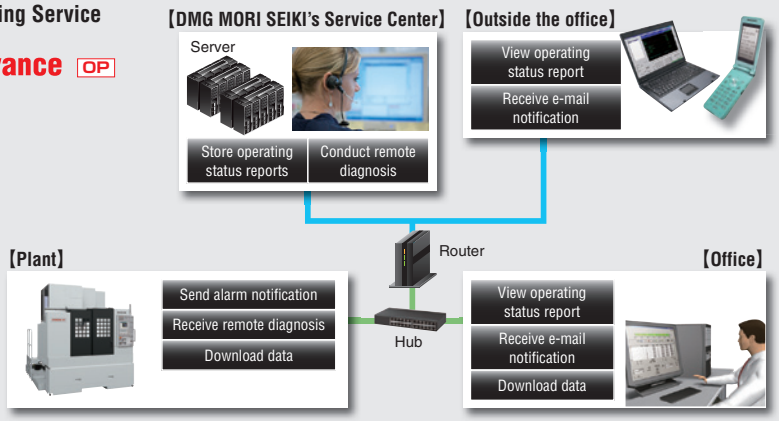
【Internet】
【LAN】

**Remote Maintenance/Machine Operation Monitoring Service**

## MORI-NET Global Edition Advance OP

### ■ Features

- Remote maintenance service by DMG MORI SEIKI 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 SEIKI




### ■ Remote alarm support

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


Upon receiving the alarm, the Service Center will contact the customer by phone. (Manual or Automatic alarm sending is selectable)

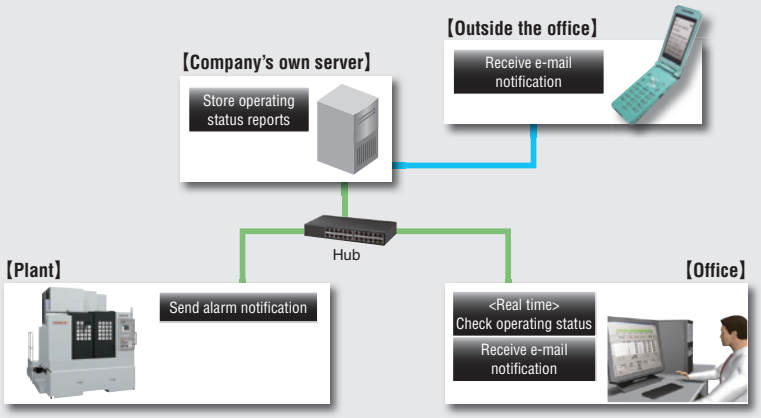
- This service may not be available in some areas. Please contact our sales representative for details.

**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 SEIKI'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

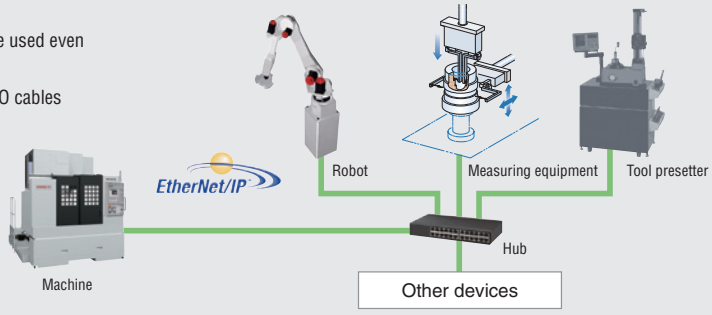
## MAPPS EtherNet/IP I/F OP

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

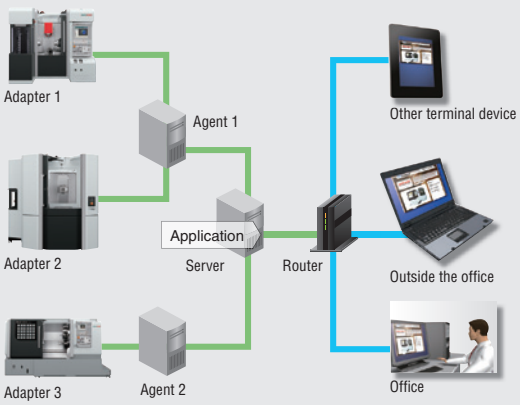
## MAPPS MTConnect I/F

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.

# Machine specifications

| Item | | | | NV5000 α1A/40 | NV5000 α1A/40 HSC | NV5000 α1B/40 | NV5000 α1B/40 HSC |
|---|---|---|---|---|---|---|---|
| Travel | X-axis travel <longitudinal movement of table> | | mm (in.) | 800 (31.5) | | 1,020 (40.2) | |
| | Y-axis travel <cross movement of saddle> | | mm (in.) | 510 (20.1) | | | |
| | Z-axis travel <vertical movement of spindle head> | | mm (in.) | 510 (20.1) | | | |
| | Distance from table surface to spindle gauge plane | | mm (in.) | 150—660 (5.9—26.0) | | | |
| Table | Working surface | | mm (in.) | 1,100×600 (43.3×23.6) | | 1,320×600 (52.0×23.6) | |
| | Table loading capacity | | kg (lb.) | 1,000 (2,200) | | 1,200 (2,640) | |
| | Table surface configuration <T slots width×pitch×No. of T slots> | | | 18 mm×100 mm×6 (0.7 in.×3.9 in.×6) | | | |
| Spindle | Max. spindle speed | | $min^{-1}$ | 14,000 | 20,000 | 14,000 | 20,000 |
| | Number of spindle speed ranges | | | 1 | | | |
| | Type of spindle taper hole | | | No. 40 | | | |
| | Spindle bearing inner diameter | | mm (in.) | 65 (2.6) | | | |
| Feedrate | Rapid traverse rate | | mm/min (ipm) | X, Y, Z: 42,000 (1,653.5) | | | |
| | Cutting feedrate | | mm/min (ipm) | X, Y, Z: 1—42,000 (0.04—1,653.5) | | | |
| | Jog feedrate | | mm/min (ipm) | 0–5,000 (0—197.0) <20 steps> | | | |
| ATC | Type of tool shank | | | BT40* [CAT40] [DIN40] [HSK-A63] | | | |
| | Type of retention knob | | | DMG MORI SEIKI 90° type [45° <MAS-Ⅰ>] [60°<MAS-Ⅱ>] [HSK-A63] | | | |
| | Tool storage capacity | | | 30 [60] [90] | | | |
| | Max. tool diameter <without adjacent tools> | | mm (in.) | 80 (3.1) <125 (4.9)> | | | |
| | Max. tool length | | mm (in.) | 300 (11.8) | | | |
| | Max. tool mass | | kg (lb.) | 8 (17.6) [12 (26.4)] | | | |
| | Max. tool mass moment <from spindle gauge line> | | N·m (ft·lbf) | 11(8.1) <60, 90-tool specifications> {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 | | | Technical memory random | | | |
| | Tool changing time: Tool-to-tool | | s | 1.0/1.5 <using a tool weighting over 8 kg (17.6 lb.) in case of 12 kg (26.4 lb.) tool mass specifications> | | | |
| | Tool changing time: Cut-to-cut (chip-to-chip) <without ATC shutter> | 30 tools | ISO10791-9, JIS B6336-9 s | Max.: 8.8 Min.: 3.1 | | | |
| | | | MAS011 s | 2.6 | | | |
| | | | VDI2852 s | 2.6 | | | |
| | | [60 tools] | ISO10791-9, JIS B6336-9 s | Max.: 15.9 Min.: 4.1 | | | |
| | | | MAS011 s | 3.7 | | | |
| | | | VDI2852 s | 3.7 <adjacent> 6.8 <farthest> | | | |
| | | [90 tools] | ISO10791-9, JIS B6336-9 s | Max.: 21.7 Min.: 4.5 | | | |
| | | | MAS011 s | 3.7 | | | |
| | | | VDI2852 s | 3.7 <adjacent> 13.0 <farthest> | | | |
| | ● Depending on the arrangement of tools in the magazine, the Cut-to-cut (chip-to-chip) time may be longer. ● The time differences are caused by the different conditions (travel distances, etc) for each standard. ● For heavy tool specifications <No. 40 taper 8 kg (17.6 lb.) or more>, the values may be bigger than those above. | | | | | | |
| Motor | Spindle drive motor | | kW (HP) | 22/18.5 (30/24.7) <30 min/cont> {high-speed winding side} | 18.5/15/11 (24.7/20/15) <10 min/30 min/cont> | 22/18.5 (30/24.7) <30 min/cont> {high-speed winding side} | 18.5/15/11 (24.7/20/15) <10 min/30 min/cont> |
| | Feed motor | | kW (HP) | X, Y: 3.0 (4) Z: 5.5 (7.5) | | X, Y: 4.0 (5.3) Z: 5.5 (7.5) | |
| | Coolant pump motor <50/60 Hz> | | kW (HP) | 0.635+0.73 (0.84+0.97)/1.04+1.21 (1.38+1.61) | | 0.635 (0.84)/1.04 (1.38) | |
| Power source (standard) | Electrical power supply <cont> | | I94316A04 kVA | 41.5 | 32.7 | 41.4 | 32.8 |
| | Compressed air supply | | MPa (psi), L/min (gpm) | 0.5 (72.5), 200 (52.8) {when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required} <ANR> | | | |
| Tank capacity | Coolant tank capacity | | L (gal) | 230 (60.7) | | 275 (72.6) | |
| Machine size | Machine height | | mm (in.) | 2,603 (102.5) | | | |
| | Floor space <width×depth> | | mm (in.) | 2,458×2,710 (96.8×106.7) | | 2,788×2,710 (109.8×106.7) | |
| | Mass of machine | | kg (lb.) | 6,350 (13,970) | | 6,960 (15,312) | |
| Noise data | A-weighted, time-average radiated sound | | dB | 60—77 (Measurement uncertainty is 4 dB) | | | |

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

NV5000α1 (201004)

* When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.

- 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 the two-face contact tool when cutting at 15,000 $min^{-1}$ or higher.
- ANR: ANR refers to a standard atmospheric state; i.e., temperature at 20 ℃ (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 <air 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 $min^{-1}$. Please contact our sales representative for details.
- The information in this catalog is valid as of December 2013.

HSC: High Speed Cutting

| Item | | | | NV5000 α1A/50 | NV5000 α1B/50 |
|---|---|---|---|---|---|
| Travel | X-axis travel <longitudinal movement of table> | | mm (in.) | 800 (31.5) | 1,020 (40.2) |
| | Y-axis travel <cross movement of saddle> | | mm (in.) | 510 (20.1) | |
| | Z-axis travel <vertical movement of spindle head> | | mm (in.) | 510 (20.1) | |
| | Distance from table surface to spindle gauge plane | | mm (in.) | 150—660 (5.9—26.0) | |
| Table | Working surface | | mm (in.) | 1,100×600 (43.3×23.6) | 1,320×600 (52.0×23.6) |
| | Table loading capacity | | kg (lb.) | 1,000 (2,200) | 1,200 (2,640) |
| | Table surface configuration <T slots width×pitch×No. of T slots> | | | 18 mm×100 mm×6 (0.7 in.×3.9 in.×6) | |
| Spindle | Max. spindle speed | | $min^{-1}$ | 8,000 [15,000] | |
| | Number of spindle speed ranges | | | 1 | |
| | Type of spindle taper hole | | | No. 50 | |
| | Spindle bearing inner diameter | | mm (in.) | 100 (3.9) | |
| Feedrate | Rapid traverse rate | | mm/min (ipm) | X, Y, Z: 42,000 (1,653.5) | |
| | Cutting feedrate | | mm/min (ipm) | X, Y, Z: 1—42,000 (0.04—1,653.5) | |
| | Jog feedrate | | mm/min (ipm) | 0–5,000 (0—197.0) <20 steps> | |
| ATC | Type of tool shank | | | BT50* [CAT50] [DIN50] [HSK-A100] [Capto C6] | |
| | Type of retention knob | | | DMG MORI SEIKI 90° type [45° <MAS-Ⅰ>] [60° <MAS-Ⅱ>] [DIN] [HSK-A100] [Capto C6] | |
| | Tool storage capacity | | | 30 [60] | |
| | Max. tool diameter <without adjacent tools> | | mm (in.) | 120 (4.7) <240 (9.4)> | |
| | Max. tool length | | mm (in.) | 350 (13.7) | |
| | Max. tool mass | | kg (lb.) | 20 (44) | |
| | Max. tool mass moment <from spindle gauge line> | | N·m (ft·lbf) | — | |
| | Method of tool selection | | | Technical memory random (fixed address method when 60-tool specifications with No. 50 taper) | |
| | Tool changing time | Tool-to-tool | s | 2.0/3.0 <for a tool of 10 kg (22 lb.) or heavier> | |
| | | Cut-to-cut (chip-to-chip) <without ATC shutter> 30 tools ISO10791-9, JIS B6336-9 | s | Max.: 12.5 Min.: 5.5 | |
| | | 30 tools MAS011 | s | 4.9 | |
| | | 30 tools VDI2852 | s | 4.9 | |
| | | [60 tools] ISO10791-9, JIS B6336-9 | s | Max.: 24.9 Min.: 5.4 | |
| | | [60 tools] MAS011 | s | 4.9 | |
| | | [60 tools] VDI2852 | s | 4.9 <adjacent> 10.3 <farthest> | |
| | ● Depending on the arrangement of tools in the magazine, the Cut-to-cut (chip-to-chip) time may be longer. ● The time differences are caused by the different conditions (travel distances, etc) for each standard. ● For heavy tool specifications < No. 50 taper 10 kg (22 lb.) or more>, the values may be bigger than those above. | | | | |
| Motor | Spindle drive motor | 8,000 $min^{-1}$ | kW (HP) | 30/22 (40/30) <30 min/cont> {high-speed winding side} | |
| | | [15,000 $min^{-1}$] <high-speed> | kW (HP) | [30/22 (40/30) <30 min/cont> {high-speed winding side}] | |
| | Feed motor | | kW (HP) | X, Y: 3.0 (4) Z: 5.5 (7.5) | X, Y: 4.0 (5.3) Z: 5.5 (7.5) |
| | Coolant pump motor <50/60 Hz> | | kW (HP) | 0.635+0.73 (0.84+0.97)/1.04+1.21 (1.38+1.61) | 0.635 (0.84)/1.04 (1.38) |
| Power source (standard) | Electrical power supply <cont> | | I94316A04 kVA | 44.8 | 45.5 |
| | Compressed air supply | | MPa (psi), L/min (gpm) | 0.5 (72.5), 200 (52.8) {when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required} <ANR> | |
| Tank capacity | Coolant tank capacity | | L (gal) | 230 (60.7) | 275 (72.6) |
| Machine size | Machine height | | mm (in.) | 2,640 (103.9) | |
| | Floor space <width×depth> | | mm (in.) | 2,728×2,636 (107.4×103.8) | 3,026×2,636 (119.1×103.8) |
| | Mass of machine | | kg (lb.) | 6,700 (14,740) | 7,310 (16,082) |
| Noise data | A-weighted, time-average radiated sound | | dB | 60—77 (Measurement uncertainty is 4 dB) | |

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

NV5000α1 (201004)

* When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.

- 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 the two-face contact tool when cutting at 10,000 $min^{-1}$ or higher.
- Max. tool diameter: the maximum tool diameter is limited to 170 mm (6.6 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 ℃ (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 <air 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 $min^{-1}$. Please contact our sales representative for details.
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HSC: High Speed Cutting

DMG MORI

**2-year warranty, twice the peace of mind.**

For machines delivered outside of Japan, parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year. Please contact our sales representative for details.

2 years Guaranteed peace of mind

**<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 SEIKI or its distributor representative. DMG MORI SEIKI 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 SEIKI and its distributor representative shall have no obligation to re-enable such Equipment. DMG MORI SEIKI 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.


- If you have any questions regarding the content, contact our sales representative.
- The information in this catalog is valid as of January 2014. 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 SEIKI is not responsible for differences between the information in the catalog and the actual machine.


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