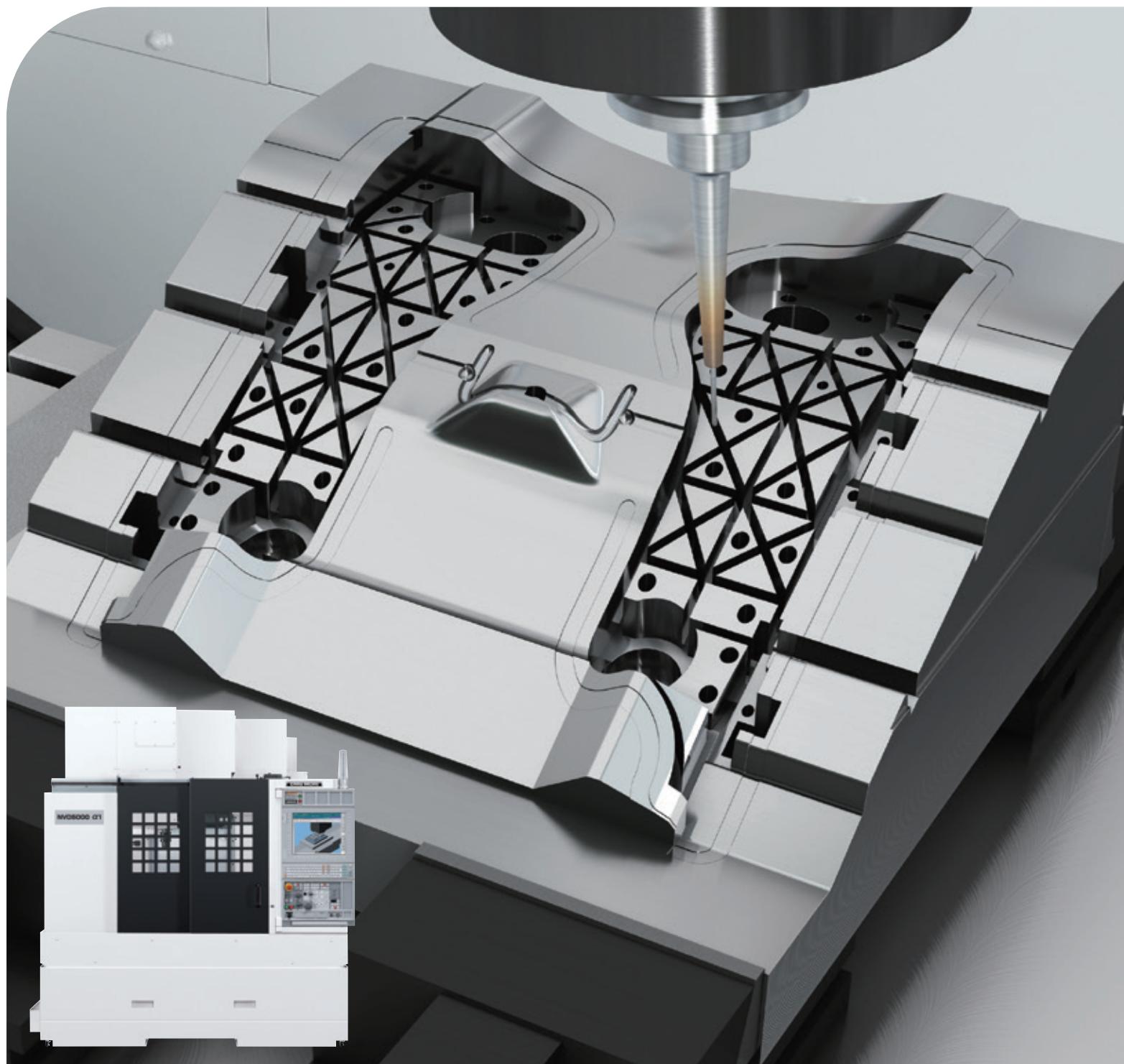


High-Precision Vertical Machining Center for Die & Mold Manufacturers

NVD5000 α1A/40
NVD5000 α1B/40

NVD5000 α1





NVD5000 α 1A/40



NVD5000 α 1B/40

● The photo shows the machine equipped with options.

● Figures in inches were converted from metric measurements.



The standard for die and mold machining that brings you rapid delivery and high quality.

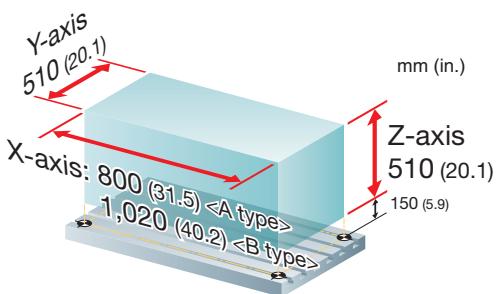
Amid increased global competition in the die and mold machining field, both rapid delivery and high quality are essential to make sure orders keep coming in. The NVD5000 α 1 clears both these hurdles because it is specifically designed to handle dies and molds for manufacturers whose goal is delivering high added value. The NVD5000 α 1 will be an indispensable tool in raising your competitiveness.

High-Precision Vertical Machining Center for Die & Mold Manufacturers

NVD5000 α 1

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.



CONTENTS

- 4 High precision
- 5 Die & Mold Specifications/
Sample workpieces
- 6 Precision
- 7 Spindle
- 8 Improved workability
- 9 Peripheral equipment
- 11 MAPPS IV
- 12 Diagrams
- 13 Standard & optional features
- 14 Numerical control unit specifications
- 15 Machine specifications

High precision

Equipped with standard functions for supporting high-quality machining of dies and molds.

The NVD5000 α 1 focuses on advanced CNC control, high-precision positioning, and measures against heat displacement. A higher level of standard features has been selected in order to ensure high added-value die and mold machining.



High-precision machining features

Direct scale feedback (X, Y and Z axes)

An absolute magnetic linear scale (full closed-loop control) made by Magnescale is equipped as standard to offer high-precision positioning.



Resolution (X, Y and Z axes)

0.01 μm

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

Oil chiller (separate type)

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



High-precision equipment

Coolant chiller (separate type) OP

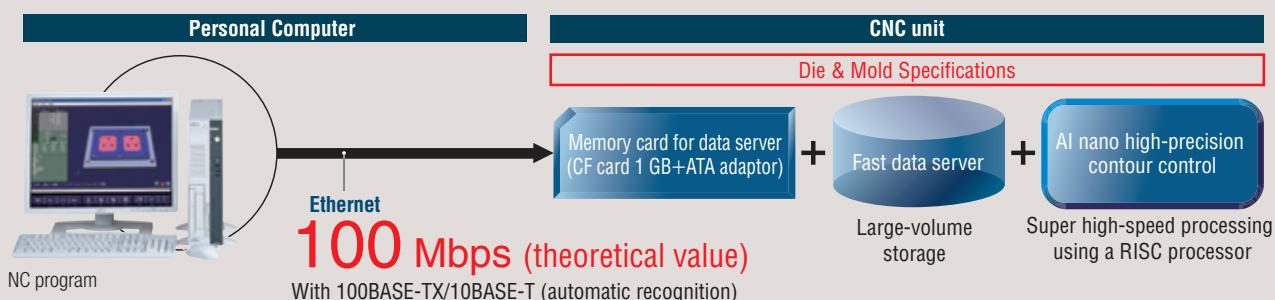
Increased coolant temperature causes thermal displacement in the fixtures and workpiece, affecting the machining accuracy of the workpiece. Use this unit to prevent the cutting coolant from heating up. When using oil-based coolant, the coolant temperature can become extremely high even with the standard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

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

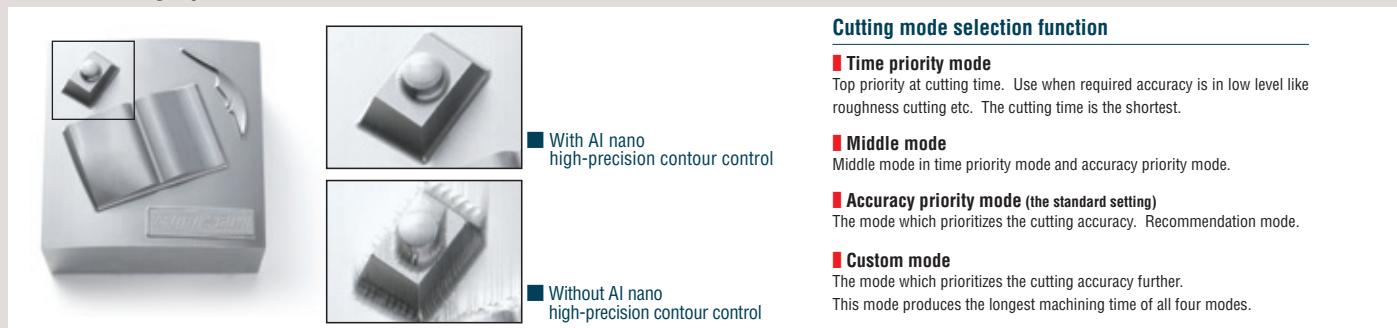
- We cannot guarantee that this unit will completely control the coolant temperature. It is designed to help prevent oil temperature increases.



Die & Mold Specifications (standard features)



- **AI nano high-precision contour control** This speeds up program processing, makes machine movement smoother and raises machining precision.



Surface roughness

X : Y is 2 : 1 taper machining

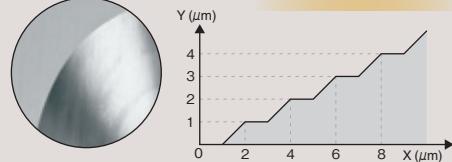


Previous model

Calculates the least command increment in 1 μm units.

Feed command 1.0 μm

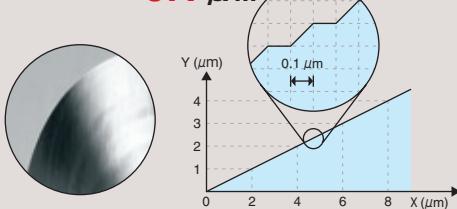
10 times better



NVD5000 α1

Improves surface roughness using smooth interpolation in nanometer increments.

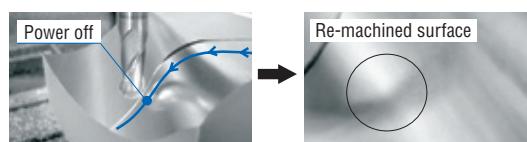
Feed command 0.1 μm



• The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Z-axis drop prevention function ideal for blackouts

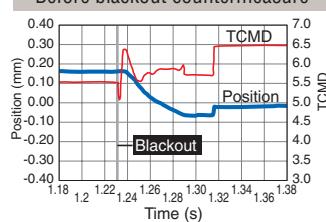
Raising the spindle slightly during blackouts prevents any contact between the tool and the workpiece caused by the spindle dropping.



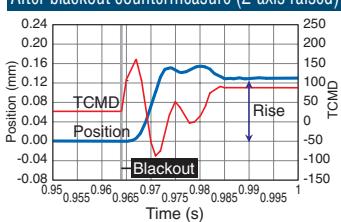
※ The Z-axis drop prevention function is not available in the following situations.

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.
- Depending on how voltage drops (slowly or suddenly), it may not always be possible to detect a blackout.

Before blackout countermeasure



After blackout countermeasure (Z-axis raised)

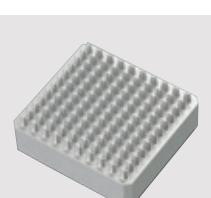


TCMD: Torque command

Sample workpieces



Wheel



Speaker



Button



Plastic model



Gear

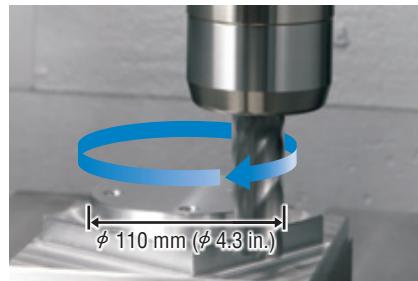


Motor cover

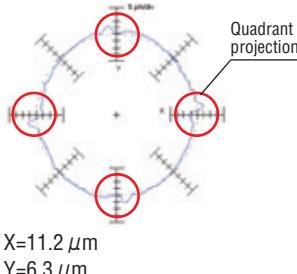
Precision

I Quadrant projection compensating function

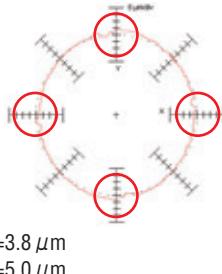
Circular shapes from small to large radius can be machined to a high degree of accuracy with less protrusions, nicks or irregularities.



Without using look-ahead control function

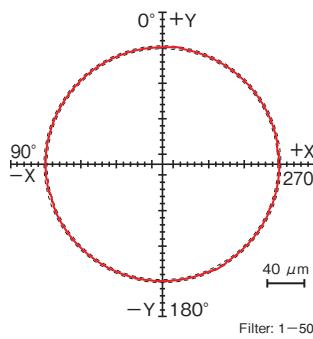


With look-ahead control function

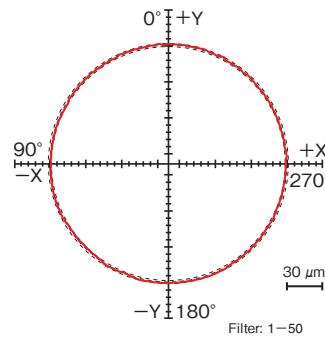


Circularity

Ideally controls circular cutting. (**NVD5000 α1A/40**)



Material <JIS> : A5056*¹ (Aluminum)
<outer diameter: 140 mm (5.5 in.)>
Tool : φ 20 mm (φ 0.8 in.)
Carbide end mill <4 flutes>
Spindle speed : 2,500 min⁻¹
Cutting feedrate : 1,000 mm/min (39.4 ipm)



Material <JIS> : FC250*² (Cast iron)
<outer diameter: 140 mm (5.5 in.)>
Tool : φ 28 mm (φ 1.1 in.)
Coated end mill <4 flutes>
Spindle speed : 400 min⁻¹
Cutting feedrate : 160 mm/min (6.3 ipm)

*1 5056 (ANSI), NB6 (BS), AlMg5 (DIN), 5A05 (GB) *2 NO.45 (ANSI/SAE), 250 (BS), GG25 (DIN), HT250 (GB)

JIS: Japanese Industrial Standard

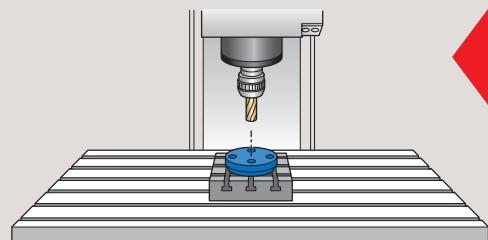
• The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

I Stable circularity which is not affected by the table load (**NVD5000 α1A**)

We conducted tests under various cutting conditions to see how changes in the machining position above the table and the amount of load affect round cutting.

Table center

Spindle speed : 2,500 min⁻¹
Feedrate : 1,000 mm/min (39.4 ipm)
Tool : φ 20 mm (φ 0.8 in.)
square end mill <4 flutes>



Material	A	NAK55 (40 HRC) <φ 100 mm (φ 3.9 in.)>
	B	A5052* ³ <JIS> (Aluminum) <φ 150 mm (φ 5.9 in.)>

Table edge

Material	Difference in circularity
A	0.5 μm
B	0 μm

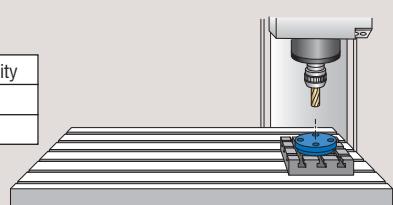
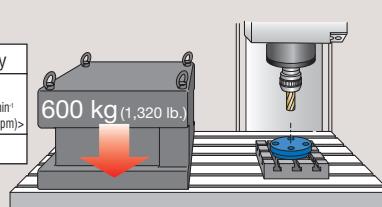


Table edge + load

Material	Difference in circularity
A	1.2 μm <0.3 μm with a spindle speed of 5,000 min ⁻¹ and a feed speed of 2,000 mm/min (78.7 ipm)>
B	0.3 μm



*3 5052 (ANSI), NS4 (BS), AlMg2.5 (DIN), 5A02 (GB) • Filter: 1–50 JIS: Japanese Industrial Standard

Spindle

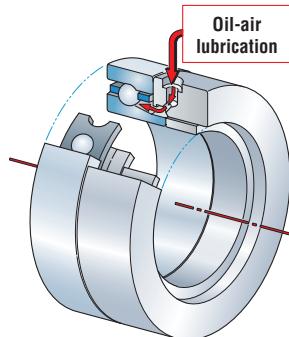


High-speed, high-power DDS motor.

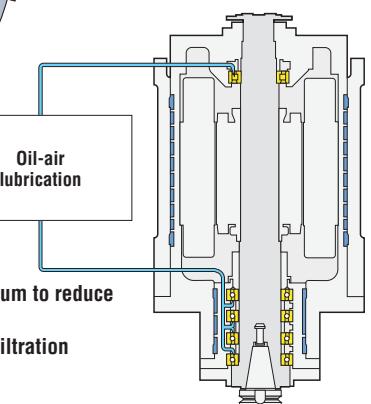
DDS: Direct Drive Spindle

High-speed spindle bearing

Spindle bearing design



Super high speeds are achieved with the stable supply of lubricant and the internal cooling effect of the air. It is further equipped with a long-life spindle bearing with greater wear-resistance and burn-resistance than previous models.



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

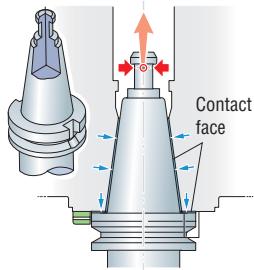
Spindle bearing roller life

Compared with previous model

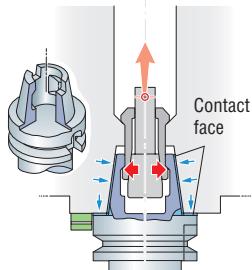
Approximately 70% longer

Two-face contact specifications

BT40*(standard)



HSK-A63(option)



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

● Please use a dual contact tool when cutting at 15,000 min⁻¹ or higher.

Spindle acceleration/deceleration time

Spindle acceleration time

Previous model

5.32 sec.

NVD5000 α1

2.68 sec.

Reduced by

50%

Spindle deceleration time

Previous model

5.48 sec.

NVD5000 α1

2.56 sec.

Reduced by

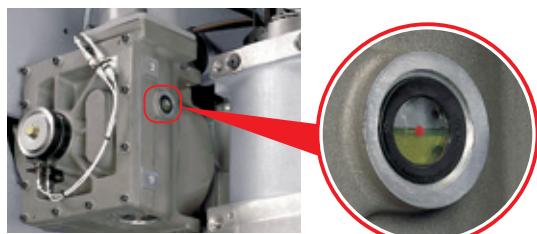
53%

Eco-friendly design

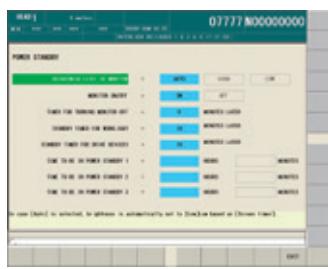
Reduced consumption of lubricating oil

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.



Reduced consumption of electricity



Energy-saving settings screen

Automatic sleep function

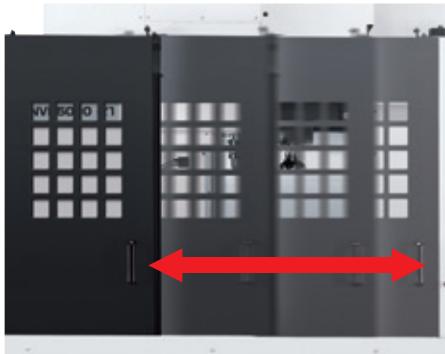
If the keyboard is not touched for a certain amount of time and NC operation is not being performed, power is cut off to the servo motor, the spindle, the coolant pump and the chip conveyor, thereby saving energy.

Automatic machine light 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.

Improved workability

Working environment



Door opening

NVD5000 α1A: **1,032 mm (40.6 in.)**

NVD5000 α1B: **1,386 mm (54.6 in.)**

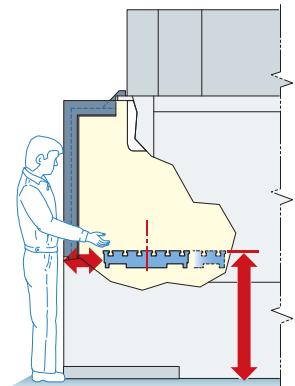
Easy access to the machine's table

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

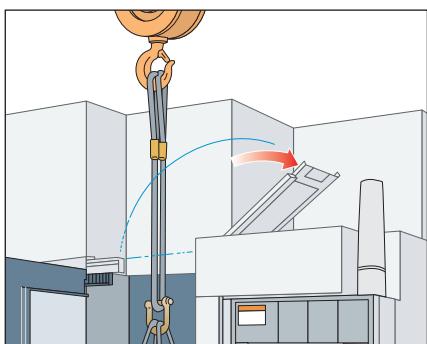
262 mm (10.3 in.)



Height from the floor to the upper face of the table

900 mm (35.4 in.)

Improved ease of setup

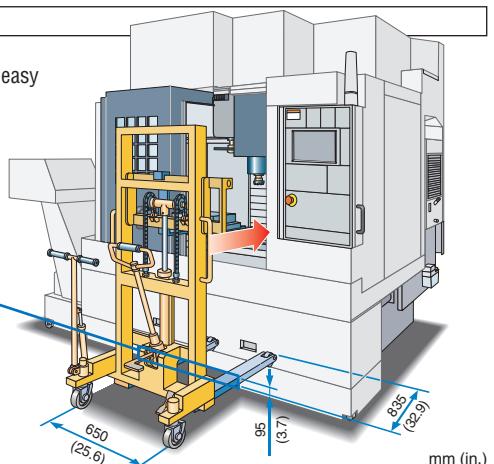


The top panel can be opened and closed, making crane accessibility quick and easy.

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

There is an area that has been designed into the bottom of the machine to make moving workpieces easier during set-up.

- The illustration shows the NVD5000 α1A.
- Except for chip conveyor outside machine (scraper type+drum filter type and hinge type+drum filter type) specifications.

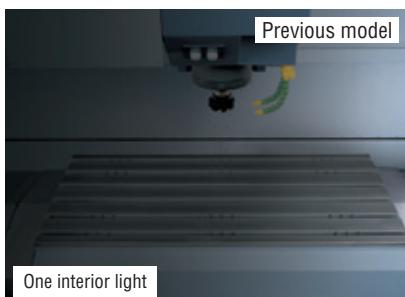


Easy tool switching



The large magazine door allows replacement of several tools at once.

Interior brightness



Brightness at tool tip position compared with previous model

×2



Peripheral equipment

[OP] Option

I Automatic measurement

[OP]

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.

■ In-machine measuring system (spindle)

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

Optical type touch sensor



Automatic

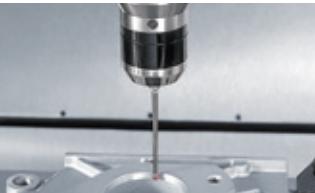
- Centering
- Measurement

Manual

The workpiece setter function can be added

Workpiece zero point setting and centering are possible

Inductive type touch sensor

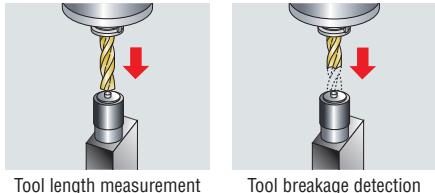


■ In-machine measuring system (table)

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



Touch sensor



Automatic

- Tool length measurement
- Tool breakage detection

Manual

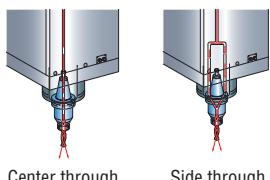
The tool setter function can be added

Tool length offset is possible

I Through-spindle coolant system

[OP]

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



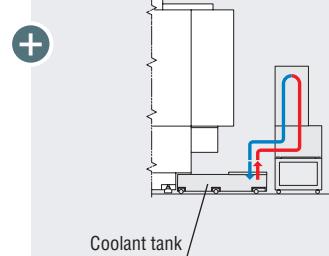
High-pressure coolant system
(separate type)

	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 mm (in.) <width×depth>	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. For details, please consult with our sales representative.

Recommended equipment

The high-pressure coolant unit generates a lot of heat because it discharges coolant at high pressure. The coolant chiller controls the temperature of the coolant and suppresses temperature increases in the workpiece, tools and table, ensuring stable machining accuracy. This is essential equipment when using high-pressure coolant. A unit with a heater will be customized.



Coolant chiller
(separate type)



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.

I Through-spindle air specifications (for air only)

[OP]



Air / Air

I Shower coolant

[OP]

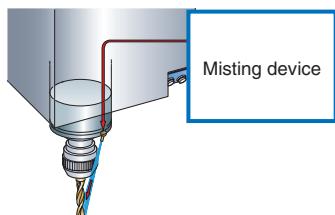
Prevents chips from accumulating by releasing coolant from the nozzles.



I Semi-dry unit

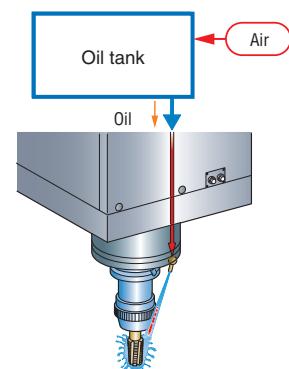
[OP]

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



I Oil shot system

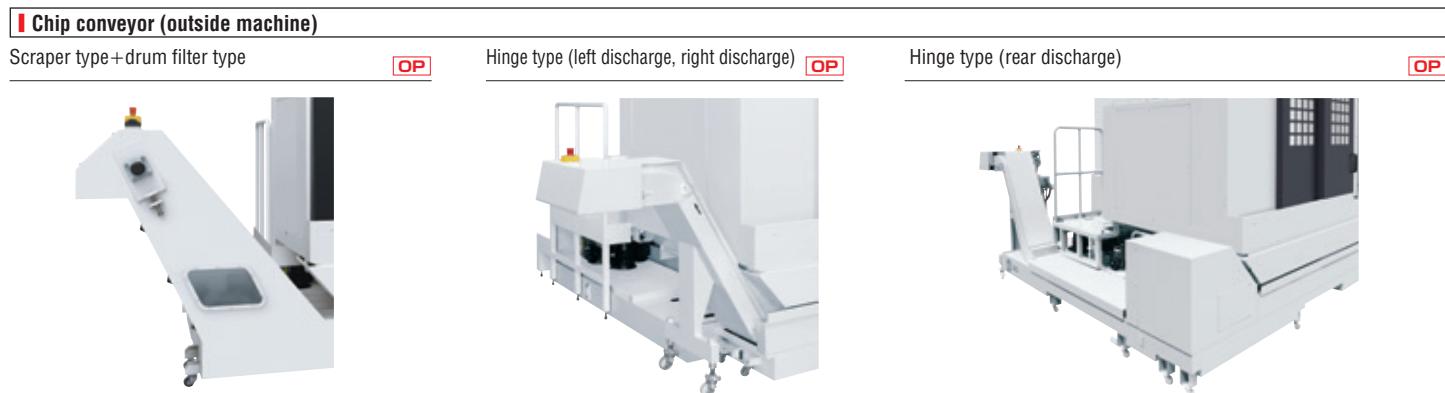
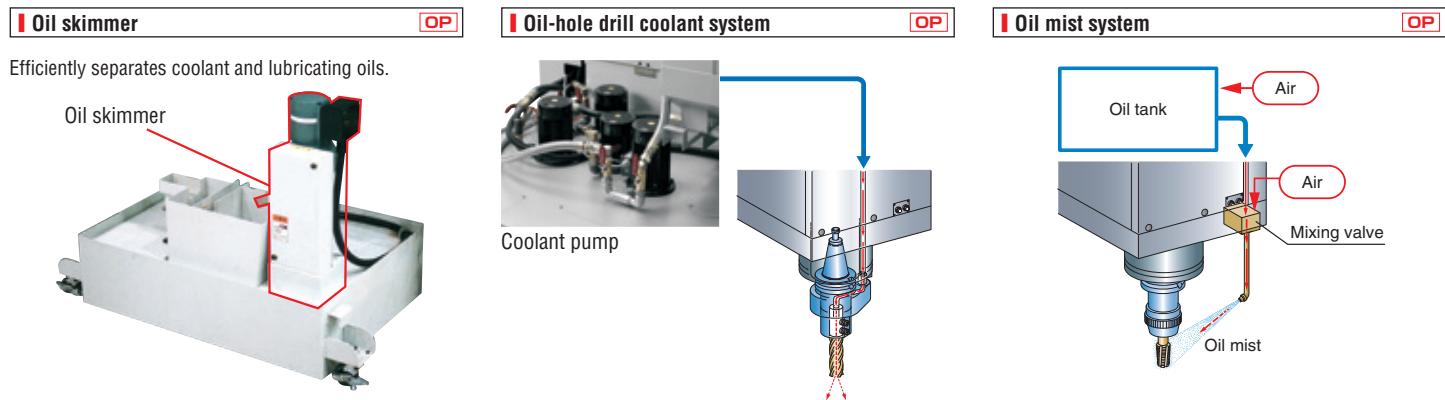
[OP]



- When the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required.

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

Peripheral equipment



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 [Consultation is required]	○	○	○	○	○	○	○		
Hinge type	○	○	×	○	○	○	×		
Scaper type+drum filter type	×	○	○	×	○	○	○		
Magnet scraper type [Consultation is required]	×	○	○	×	○	×	×		

- Chip size guidelines

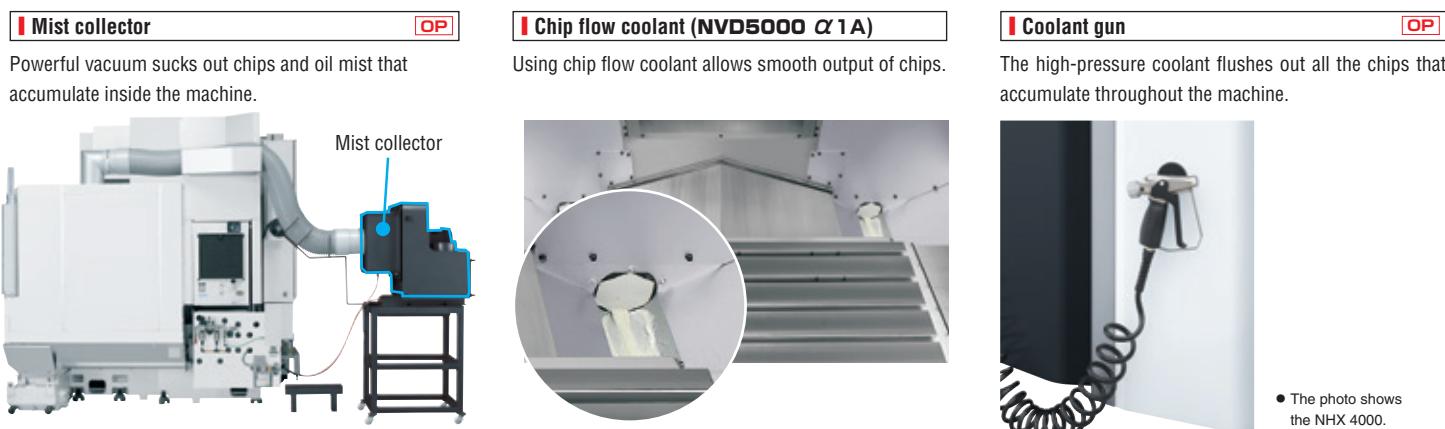
Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ϕ 40 mm (ϕ 1.6 in.) or less

Long: bigger than the above

- The options table shows the general options when using coolant. Changes may be necessary if you are not using coolant, or depending on the amount of coolant, compatibility with machines, or the specifications required.

- Please select a chip conveyor to suit the shape of your chips. When using special or difficult-to-cut material (chip hardness HRC45 or higher), please consult with our sales representative.

- Chip conveyors are available in various types for handling chips of different shape and material. For details, please consult with our sales representative.



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

MAPPS IV

High-Performance Operation System
for Machining Centers

OP Option



• 19-inch operation panel

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

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

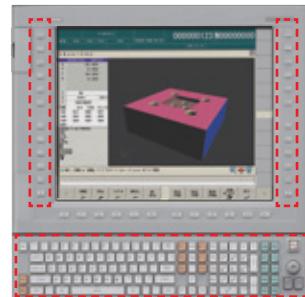
Outstanding operability

Vertical soft-keys

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

Keyboard

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



Advanced hardware

Reduction of drawing time*1

Shorter drawing time was achieved thanks to increased CPU performance.

MAPPS III	68 sec.	Approx.
MAPPS IV	45 sec.	Reduced by 33%

*1 The reduction rate differs depending on the program.

Main specifications

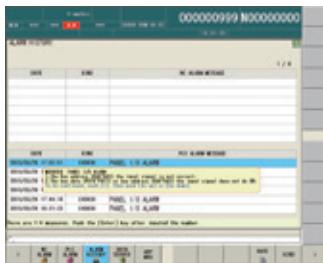
Main memory	2 GB
User area	6 GB
Interface	<ul style="list-style-type: none">• USB 2.0 3 ports (Screen side: 2, Bottom of operation panel: 1*)• LAN 1 port (1000BASE-T)• RS-232-C port
Soft-keys	Left/right 12 keys Bottom 12 keys

*2 Option

Improved ease of maintenance

Alarm help function

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

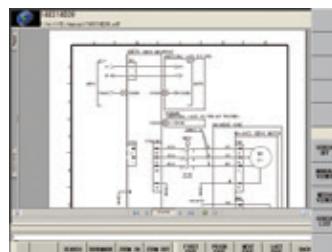


MAPPS: Mori Advanced Programming Production System

Improved ease of setup

File display and Memo function

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



Viewable file types

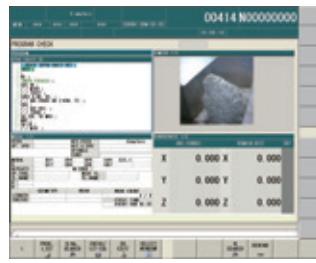
- PDF
- TXT (Editable)
- Any file that can be displayed with Internet Explorer is available

Improved work efficiency

Fixed-point in-machine camera

OP Consultation is required

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



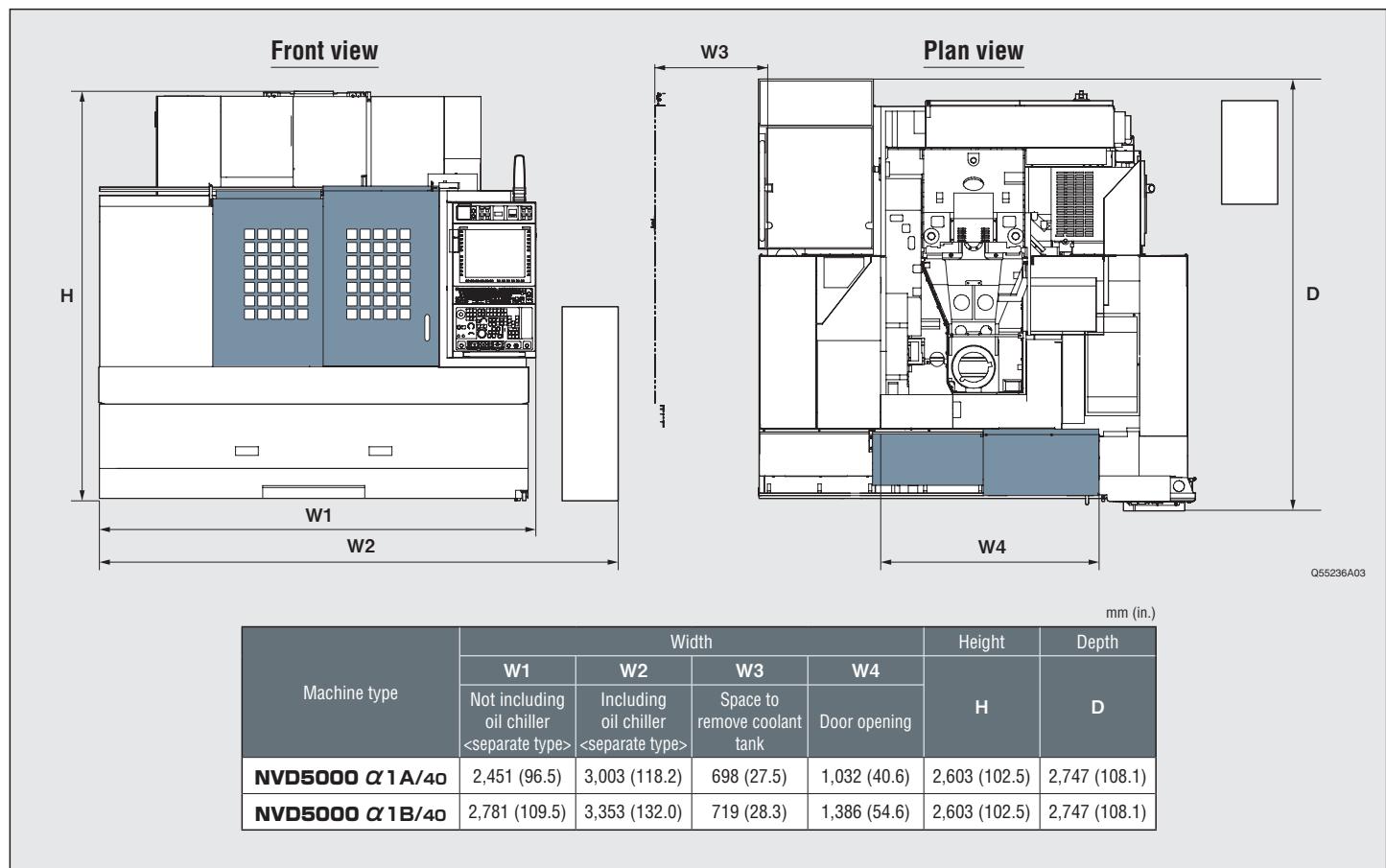
Examples of camera locations

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

• The photo shown may differ from actual machine.
• Information about the screen is current as of November 2020.

Diagrams

General view



Tool restrictions

Tool restrictions		
Item	NVD5000 α1	
Type of tool shank	BT40*	HSK-A63
Max. tool length A	mm (in.)	300 (11.8)
Max. tool diameter <with adjacent tools> B	mm (in.)	80 (3.1)
Max. tool diameter <without adjacent tools> B	mm (in.)	125 (4.9)
Tool limitation C	mm (in.)	32 (1.3)
Tool limitation D	mm (in.)	63 (2.5)
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)

[] Option

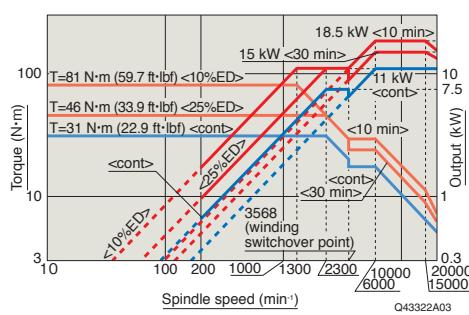
* When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.

Spindle speed torque/output diagram

Spindle drive motor: **18.5/15/11 kW** (24.7/20/15 HP) <10 min/30 min/cont>

Max. spindle speed: **20,000 min⁻¹**

Max. spindle torque: **81 N·m** (59.7 ft·lbf) <10%ED>



Standard & optional features

●: Standard features ○: Options ☆: Consultation is required ×: Not applicable

Spindle

NVD5000 α1B/40
NVD5000 α1A/40

Type of tool shank	BT40*	●
	CAT40	○
	DIN40	○
	HSK-A63	○
Type of retention knob	DMG MORI 90° type	●
<Not available with through-spindle coolant system (center through) when BT40 is selected>	45° (MAS-I)	○
	60° (MAS-II)	○
Type of retention knob	DIN	○
	HSK-A63	○
BT40*	Two-face contact	●
HSK-A63	Two-face contact	○
20,000 min ⁻¹ : 18.5/15/11 kW (24.7/20/15 HP) <10 min/30 min/cont>		●
Positioning block for angle head tool		○

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

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

Table

Table	T-slot	●
Sub table	Solid	○
	T-slot	○

Fixture/Steady rest

Additional 1-axis interface	With motor	○
	Without motor	○
Index table interface (M signal output from terminal block)		○
Hydraulic fixture interface		○

Magazine

Tool storage capacity	30 tools	●
	60 tools	○
	90 tools	○
Heavy tool specifications	Max. weight 12 kg (26.4 lb.)	○
ATC shutter		○

Coolant

Coolant system		●
Additional coolant system for tool tip		○
Oil mist system		○
Semi-dry unit		○
Coolant flow switch		○
Coolant float switch		○
Coolant gun	Machining side	○
	Setup station side	○
Shower coolant		○
Through-spindle air specifications (only for air)		○
Through-spindle coolant/air (switching specifications)		○
<through-spindle coolant system is necessary required separating>		
Oil shot system		○
Through-spindle coolant system (unit on coolant tank) center through	1.5 MPa (217.5 psi)	○
Oil-hole drill coolant system		○
Oil-hole drill coolant/air switching specifications		○
<oil-hole drill coolant system is necessary required separating>		
Through-spindle coolant system (unit on coolant tank) side through	1.5 MPa (217.5 psi)	○
Through-spindle coolant system (separate type)	Interface	○*
	Optional when using water-soluble coolant	○
Coolant chiller (separate type)	Essential when using oil-based coolant (for details, please consult with our sales representative)	○
Mist collector HVS-220	Including stand	○*
	Interface (electric parts only)	○*
Oil skimmer		○

Chip disposal

Air blow	Tool tip <when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required>	●
Additional air blow for tool tip		○
Air gun		○
Chip flushing coolant		● ×

*DMQP (DMG MORI Qualified Products)

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

● Specifications, accessories, safety device and function are available upon request.

● Some options are not available in particular regions. Please contact our sales representative for details.

Chip disposal

NVD5000 α1B/40
NVD5000 α1A/40

Chip conveyor (external)	Left discharge, hinge type	○
	Right discharge, hinge type	○
	Rear discharge, hinge type	○
	Left discharge, scraper type + drum filter type	○
	Left discharge, hinge type + drum filter type	☆
Interface	Left discharge, hinge type	○
	Right discharge, hinge type	○
	Magnet scraper type	☆
Chip conveyor (internal)	Spiral type	○
Chip bucket	254 L (67.1 gal.)	○*

Measurement

In-machine measuring system (table)	Touch sensor (M)	○
	Touch sensor + tool setter function (tool length only)	○
	Touch sensor + tool setter function (tool length + diameter)	○
In-machine measuring system (spindle)	Optical type touch sensor (R)	○
	Optical type touch sensor + workpiece setter function	○
	Inductive type touch sensor (D)	○
	Inductive type touch sensor + workpiece setter function	○
In-machine manual measuring system	W setter (tool setter + workpiece setter)	○

● The specifications vary depending on the manufacturers.

(M): Made by Magnescale (R): Made by RENISHAW (D): Made by BIG DAISHOWA

Improved accuracy

Direct scale feedback for X, Y, Z-axis	●
Oil chiller (separate type)	●

Automation

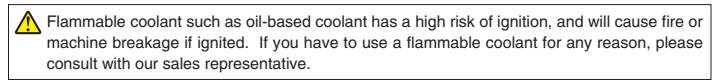
Auto power off	●
EtherNet/IP interface	○
Robot interface (EtherNet/IP) <EtherNet/IP interface is necessary required separating>	○
Automatic door	○

Other

• Full cover	
• Door interlock system (incl. mechanical lock): front door	
• Door interlock system: electrical cabinet door	
• Low air pressure detecting switch	
• Residual pressure relief valve	
• Built-in worklight	●
• Hand tools	●
• Signal light 3 layers (red, yellow, green)	●
Dry anchor	○
Earth leakage breaker	○
Danger sensing device interface (recommended when oil-based coolant is used or during unmanned operation)	○
Refrigerating type air dryer	○*
Tool wagon	○*
Tool cabinet	○*
Basic tooling kit	○*
Weekly timer	○
Total counter	○
Workpiece counter	○
External M-code	5 10
Manual pulse generator (separate type)	○
Electrical cabinet chiller	☆

■ Through-spindle coolant system (separate type) <high-pressure coolant system is attached>

Discharge pressure MPa (psi)	Side through	Center through (special retention knobs are required)
1.5 (217.5)	○*	○*
3.5 (507.5)	○*	○*
7.0 (1,015)	○*	○*



Numerical control unit specifications F31iB, F31iB5

●: Standard ○: Option

Controlled axes

Controlled axes	X, Y, Z, MG	●
Simultaneously controlled axes	3 axes	●
	4 axes	●
Least input increment	0.0001 mm (0.00001 in.)	●
Least command increment	0.0001 mm (0.00001 in.)	●
Max. command value	±99,999.9999 mm (±9,999,999.999 in.)	●
Inch/metric conversion	G20/G21	●
Axis interlock	By external input: option	●
Machine lock		●
Overttravel		●
Door interlock		●
Stroke limit check before movement		●
Mirror image		●
Software damper	Abnormal load detection	●
Load monitor function C	Soft key type	●

Operation

Dry run		●
Single block		●
Jog feed	0–5,000 mm/min (0–197.0 ipm) <20 steps>	●
Manual reference position return		●
Manual pulse handle feed	Manual pulse generator: 1 unit ×1, ×10, ×100, ×1,000 (per pulse)	●
Z-axis neglect		●
Sequence number comparison and stop		○
Program restart		○
Tool retract and recover		○
Manual handle interruption		○

Interpolation functions

Nano interpolation		●
Positioning	G00	●
Single direction positioning		●
Exact stop mode	G61	●
Tapping mode	G63	●
Cutting mode	G64	●
Exact stop	G09	●
Helical interpolation	Optional 2 axes and other 1 axis	●
Reference position return	G28	●
Reference position return check	G27	●
Return from reference position	G29	●
2nd reference position return	G30 (used for ATC)	●
Cylindrical interpolation	G7.1	○
Involute interpolation	G2.2/G3.2	○
Spiral/conical interpolation		○
Smooth interpolation		○
Nano smoothing		○
External high-speed skip (installation of high-speed skip terminal)		○
3rd, 4th reference position return		○
Tool spindle Cs control (Cs contour control+normal direction control)	<consultation is required if orbit machining or hole machining needs to be performed>	○
NURBS interpolation		○

Feed functions

Rapid traverse rate	Max. 20,000 mm/min (787.4 ipm)	●
Cutting feedrate	1–20,000 mm/min (0.04–787.4 ipm) <with look-ahead control>	●
Rapid traverse override	F0/1/10/25/100%	●
Feed per minute		●
Tangential speed constant control		●
Cutting feedrate clamp		●

Feed functions

Automatic acceleration/deceleration	Linear type (rapid traverse)/Exponential function type (cutting feed)	●
Rapid traverse bell-shaped acceleration/deceleration		●
Feedrate override	0–200% (10% increments)	●
Override cancel		●
Linear acceleration/deceleration after cutting feed interpolation		●
AI contour control II + Fast Data Server (1,000 look-ahead blocks, high-speed processing)		●
One-digit F code feed	F1 to F9	○
Small-hole peck drilling cycle (the arbor with the overload torque detection function must be attached)		○

Program input

Optional block skip		●
Max. command value	±9 digits (R, I, J, K is ±12 digits)	●
Program number/program name	4 digits 8 digits	●
Absolute/incremental programming	G90/G91	●
Decimal point programming	Decimal point programming or electronic calculator type decimal point programming can be set using parameters	●
Diameter/radius programming		●
Plane selection	G17, G18, G19	●
Rotary axis designation		●
Rotary axis roll-over		●
Coordinate system setting	G92	●
Automatic coordinate system setting		●
Workpiece coordinate system	G52–G59	●
Programmable data input	G10	●
Sub-program call	Up to 10 nestings	●
Custom macro		●
Hole machining canned cycle	G80–G89	●
F15 format		●
Programming resolution multiplied by 1/10 (least input increment C)		●
Additional workpiece coordinate systems	48 sets 300 sets	○
Addition of optional block skip	Soft key type (2–9)	○
Optional chamfering/corner R		○
Additional custom macro common variables	#100 to #199, #500 to #999	○
Interruption type custom macro		○
Automatic corner override		○
Scaling		○
Coordinate system rotation		○
Programmable mirror image		○
Graphic copy	G72.1/G72.2	○
High-speed canned cycle* <MAPPS>		○
MORI-POST advanced mode <MAPPS>		○
DXF import function <MAPPS>		○
Islands, open pockets* <MAPPS>		○
Text engraving function <MAPPS>		○

* For Europe, this specification is provided as standard.

Miscellaneous function/Spindle speed function

Miscellaneous function (M function)	4-digit M code	●
Auxiliary function lock		●
Multiple miscellaneous function commands	3 commands	●
Spindle speed function (S function)	5-digit S code	●
Spindle speed override	50–150% (10% increments)	●
Spindle orientation		●
Synchronous tapping		●
Multiple M cords in single block (Multi M code function)		○
<incl. M code group check>		○

Tool function/Tool offset function

Tool function (T function)	4-digit T code	●
	32 sets	●
Number of tool offsets	(diameter + length=1 set, number of offsets indicates that diameter and length are displayed separately)	●
Tool offset memory C	D/H code, geometry/wear	●
Tool length offset	G43, G44, G49	●
Cutter radius offset	G40–G42	●
Tool length measurement		●
	64 sets	○
Number of tool offsets <in total>	99 sets 200 sets 400 sets 499 sets 999 sets	○
Tool position offset	G45–G48	○
Rotary table dynamic fixture offset		○
Tool life management		○
Tool pair in total for tool life management	1,024 sets	○
MAPPS tool management system*		○
MAPPS tool management system*+Tool IC (MAPPS software only)*2		○
MAPPS tool management system*+Tool ID (MAPPS software only)*2		○

*1 Includes common variable 600 for custom macro.

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

Mechanical accuracy compensation

Backlash compensation	±9,999 pulses	●
Rapid traverse/cutting feed backlash compensation		●
Stored pitch error compensation		●
Interpolation type pitch error compensation		●

Machine control support function

Z-axis drop prevention function		●
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Editing

Expanded program editing	Copy buffer: 10 KB	●
Background editing		●
Playback		○
Machining time stamp		○
Undo/Redo function <MAPPS>		●
Line number display <MAPPS>		●

Operation and display

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

I/O functions and units

I/O interface	USB RS-232C	●
Ethernet	10/100/1000BASE-T (access to user memory area by Ethernet function with MORI-SERVER Software)	●
Fast data server	100BASE-TX/10BASE-T (automatic recognition)	●
Memory card for data server	CF card 1 GB+ATA adaptor	●
6 GB Program storage area (for MAPPS-DNC operation function, for data backup) <MAPPS>	Files up to 10 MB in size can be edited	●
Memory card for MAPPS	CF card (4 GB/2 GB/512 MB) + ATA adaptor	○
DNC operation using external memory (front USB port)		○

I95049A02

Program storage length and registerable programs

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

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

Machine specifications

Item		NVD5000 α1A/40	NVD5000 α1B/40
Travel	X-axis <longitudinal movement of table>	mm (in.)	800 (31.5) 1,020 (40.2)
	Y-axis <cross movement of saddle>	mm (in.)	510 (20.1)
	Z-axis <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	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: 20,000 (787.4)
	Cutting feedrate	mm/min (ipm)	1–20,000 (0.04–787.4) <when using look-ahead control>
	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 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) <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-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 ISO 10791-9 JIS B6336-9 s Max. tool changing time: 8.8 Min. tool changing time: 3.1 MAS011 s 2.6 VDI2852 s 2.6
		[60 tools]	ISO 10791-9 JIS B6336-9 s Max. tool changing time: 15.9 Min. tool changing time: 4.1 MAS011 s 3.7 VDI2852 s 3.7 <adjacent> 6.8 <farthest>
		[90 tools]	ISO 10791-9 JIS B6336-9 s Max. tool changing time: 21.7 Min. tool changing time: 4.5 MAS011 s 3.7 VDI2852 s 3.7 <adjacent> 13.0 <farthest>
Motor	Spindle drive motor <10 min/30 min/cont>	kW (HP)	18.5/15/11 (24.7/20/15)
	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 Hz/60 Hz>	kW (HP)	0.635+0.73 (0.84+0.97)/1.04+1.21 (1.39+1.61) 0.635 (0.84)/1.04 (1.39)
Power source (standard)	Electrical power supply <cont>	i94316B02 kVA	32.3 32.4
	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 height	mm (in.)	2,603 (102.5)
Machine size	Floor space <width×depth> (machine body only)	mm (in.)	2,451×2,747 (96.5×108.1) 2,781×2,747 (109.5×108.1)
	Mass of machine	kg (lb.)	7,450 (16,390) 8,060 (17,732)
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

* 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 a dual contact tool when cutting at 15,000 min⁻¹ or higher.

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

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

• Compressed air supply: please be sure to supply clean compressed air <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 values were measured at the front of the NV5000 α1 with 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 November 2020.

<Precautions for Machine Relocation>

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

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

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- + If you have any questions regarding the content, please consult our sales representative.
- + The information in this catalog is valid as of January 2021. 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.
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