DMG MORI

NVX 5060 2nd Generation
NVX 5080 2nd Generation
NVX 5100 2nd Generation

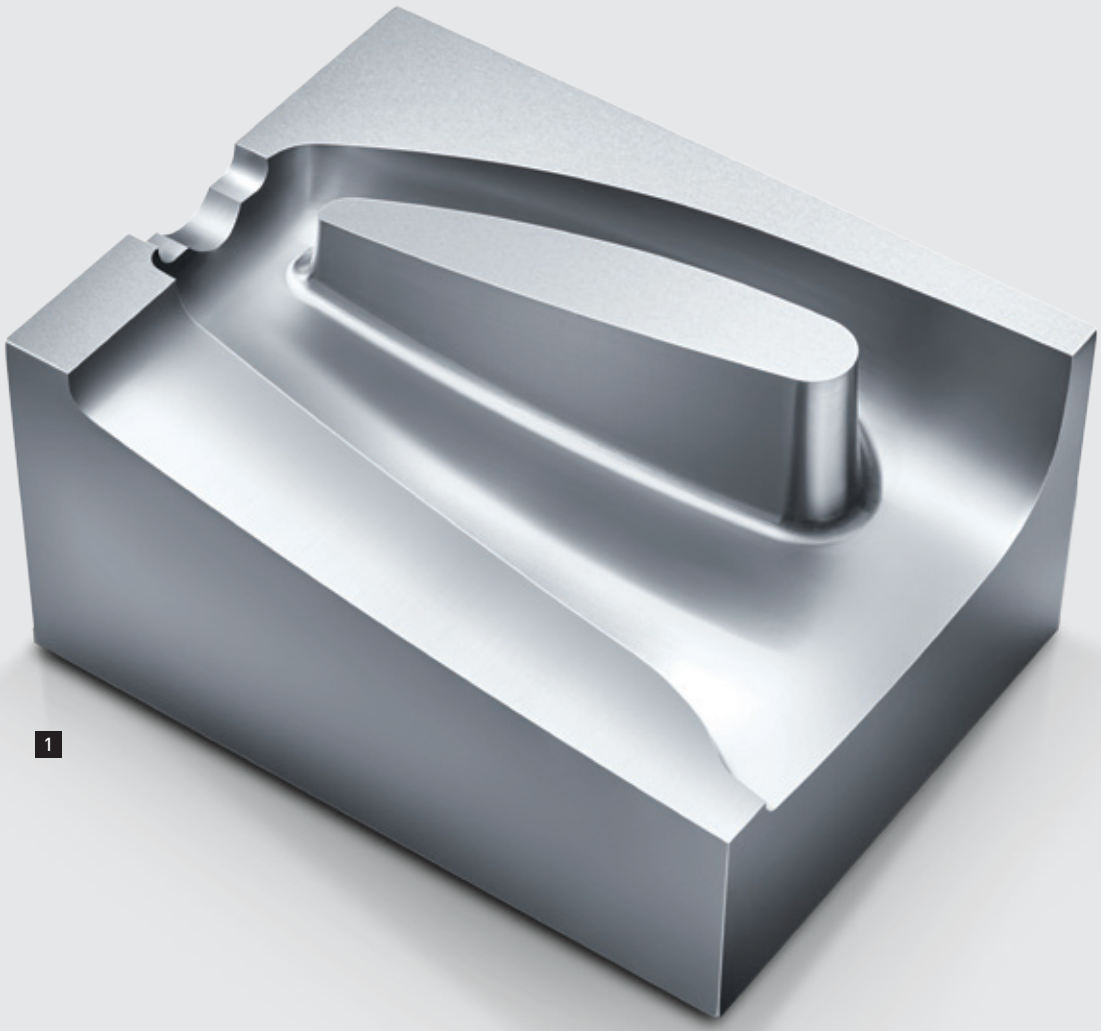
Rigid and Precise Vertical Machining Center

# NVX 5000 2nd Generation

NVX 5000 2nd Generation

# Finely-honed Accuracy
# Cutting-edge Vertical Machining Center

The NVX 5000 2nd Generation vertical machining center delivers unprecedentedly high accuracy that is achieved with DMG MORI's ingenuity and meticulous attention to details.
Offering unparalleled high-precision machining, the machine can handle a wide variety of workpieces in any industry, allowing itself to be the ideal choice for customers machining various kinds of workpieces or those considering diversifying into new fields.
This high-performance machine will deliver great results to your business.



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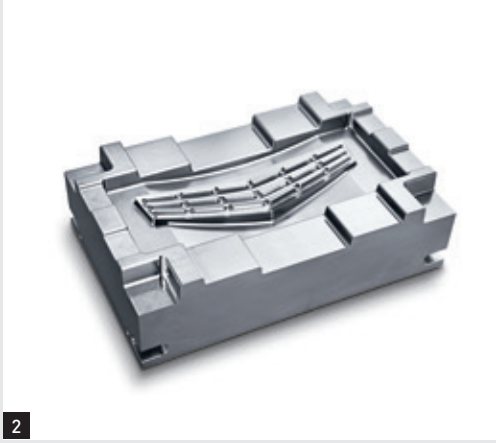
Scan the QR code for the NVX 5000 2nd Generation movie





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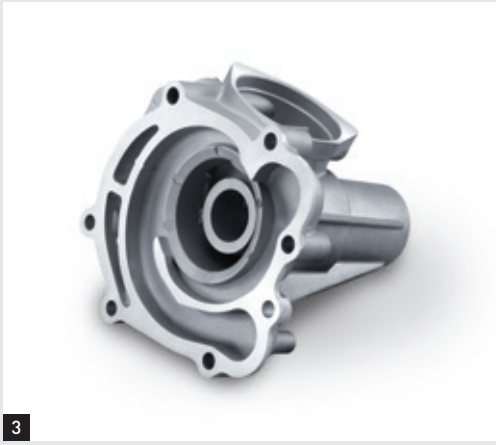

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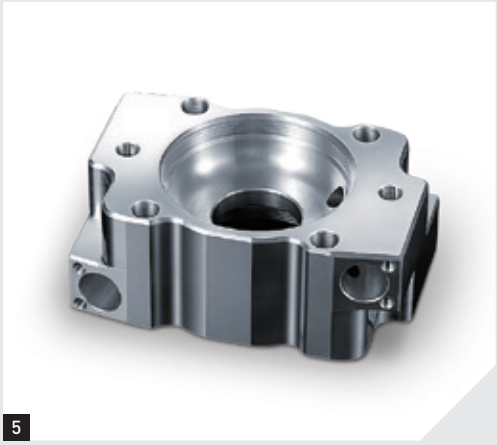

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**Die & mold**

1 Handy cleaner mold

2 Radiator grille mold

**Automobiles**

3 Pump body

**Industrial machinery**

4 Seat frame

**Hydraulic & Pneumatic equipment**

5 Valve

● Figures in inches were converted from metric measurements.

NVX 5000 2nd Generation

# Best Surface Quality Highest Accuracy for Any Machining Operations

The machine structure of NVX 5000 2nd Generation including guideways has been thoroughly optimized to achieve high accuracy and high rigidity. The customer requests towards the conventional model are fully incorporated in the structure, which has dramatically evolved the machine into a contributor to higher productivity.



CELOS: Control Efficiency Lead Operation System


## High Rigidity

+ Wide slideways compared to the conventional model
+ Max. acceleration:
  NVX 5080 40 <X- / Y- / Z-axis> //
  0.32 / 0.33 / 0.65 G
  {3.13 / 3.23 / 6.41 m/s² (10.27 / 10.60 / 21.03 ft/s²)}
+ Travel:
  NVX 5080 <X- / Y- / Z-axis> //
  800 / 530 / 510 mm (31.5 / 20.9 / 20.1 in.)
+ Rapid traverse rate <X, Y and Z axes>:
  30 m/min (1,181.1 ipm)

## High-precision equipment

+ High-resolution full closed loop control
  (Scale feedback)
+ Environmental thermal displacement control

## CELOS

+ Consistent administration, documentation and visualization of order, process and machine data
+ Extension of functions possible by adding applications, and high compatibility with existing information infrastructure and software

## Power-saving

+ Function for energy-saving and visualization of the effect

● The photo shows the machine equipped with options.

40 : No. 40 taper
50 : No. 50 taper

NVX 5000 2nd Generation

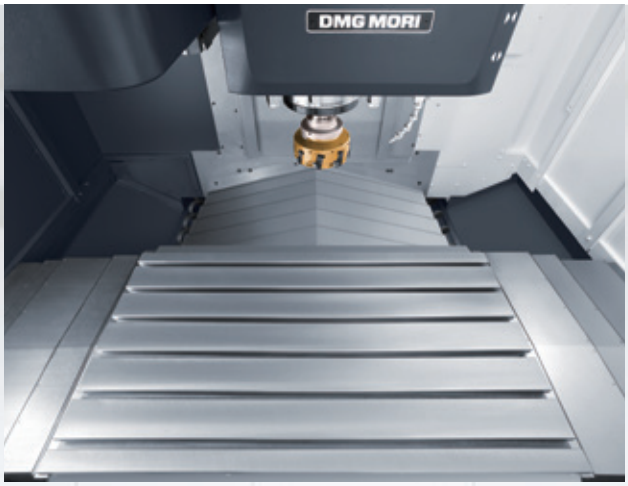
# A Variety of Variations

The NVX 5000 2nd Generation is available in six variations.
Customers can choose the ideal machine based on their work envelope and spindle taper needs.




| | | NVX 5060 40 | NVX 5080 40 | NVX 5100 40 |
|---|---|---|---|---|
| Type of spindle taper hole | | No. 40 | | |
| Travel <X- / Y- / Z-axis> | mm (in.) | 600 / 530 / 510 (23.6 / 20.9 / 20.1) | 800 / 530 / 510 (31.5 / 20.9 / 20.1) | 1,050 / 530 / 510 (41.3 / 20.9 / 20.1) |
| Table working surface | mm (in.) | 900 × 600 (35.4 × 23.6) | 1,100 × 600 (43.3 × 23.6) | 1,350 × 600 (53.1 × 23.6) |
| Table loading capacity | kg (lb.) | 800 (1,760) | 1,000 (2,200) | 1,200 (2,640) |
| Floor space*<width × depth> | mm (in.) | 2,337 × 2,971 (92.0 × 117.0) | 2,460 × 2,971 (96.9 × 117.0) | 3,018 × 2,971 (118.8 × 117.0) |

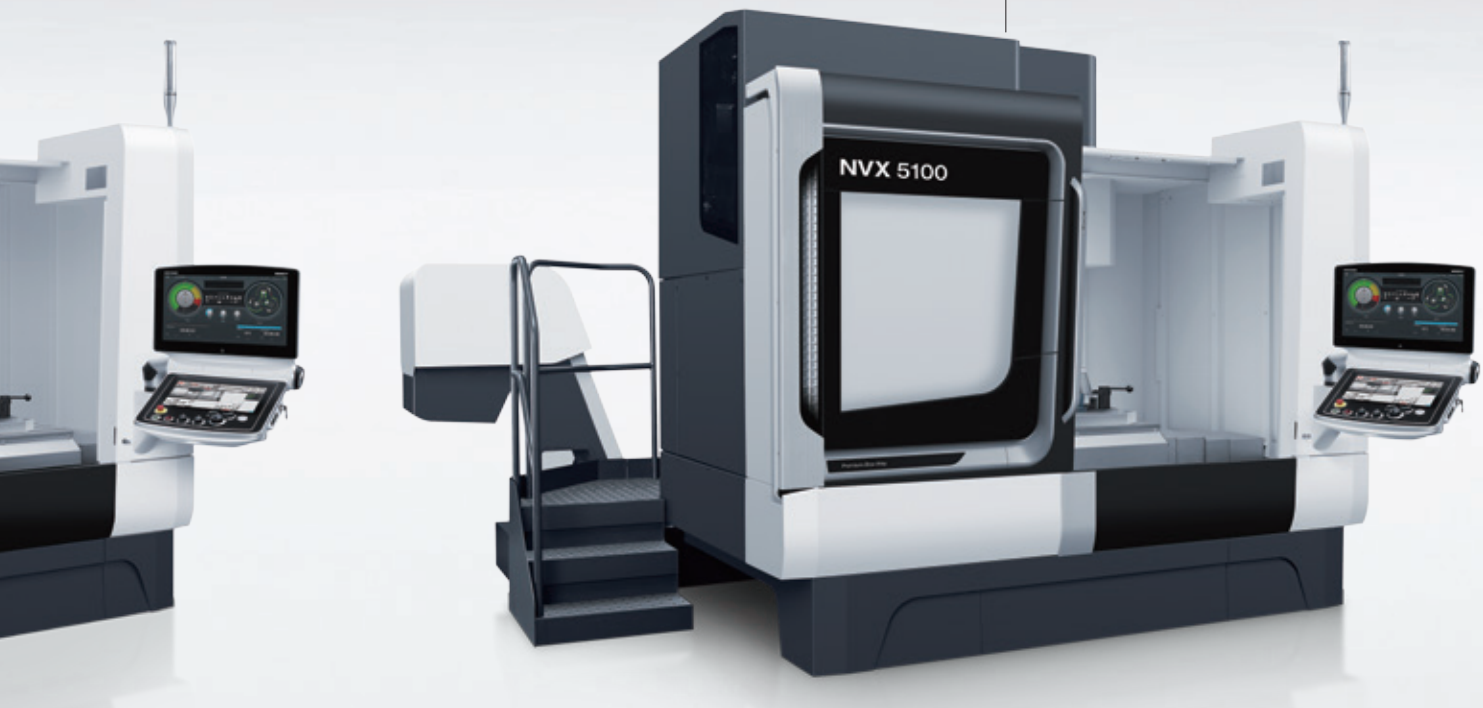
* Excluding chip conveyor





● The photo shows the machine equipped with options.

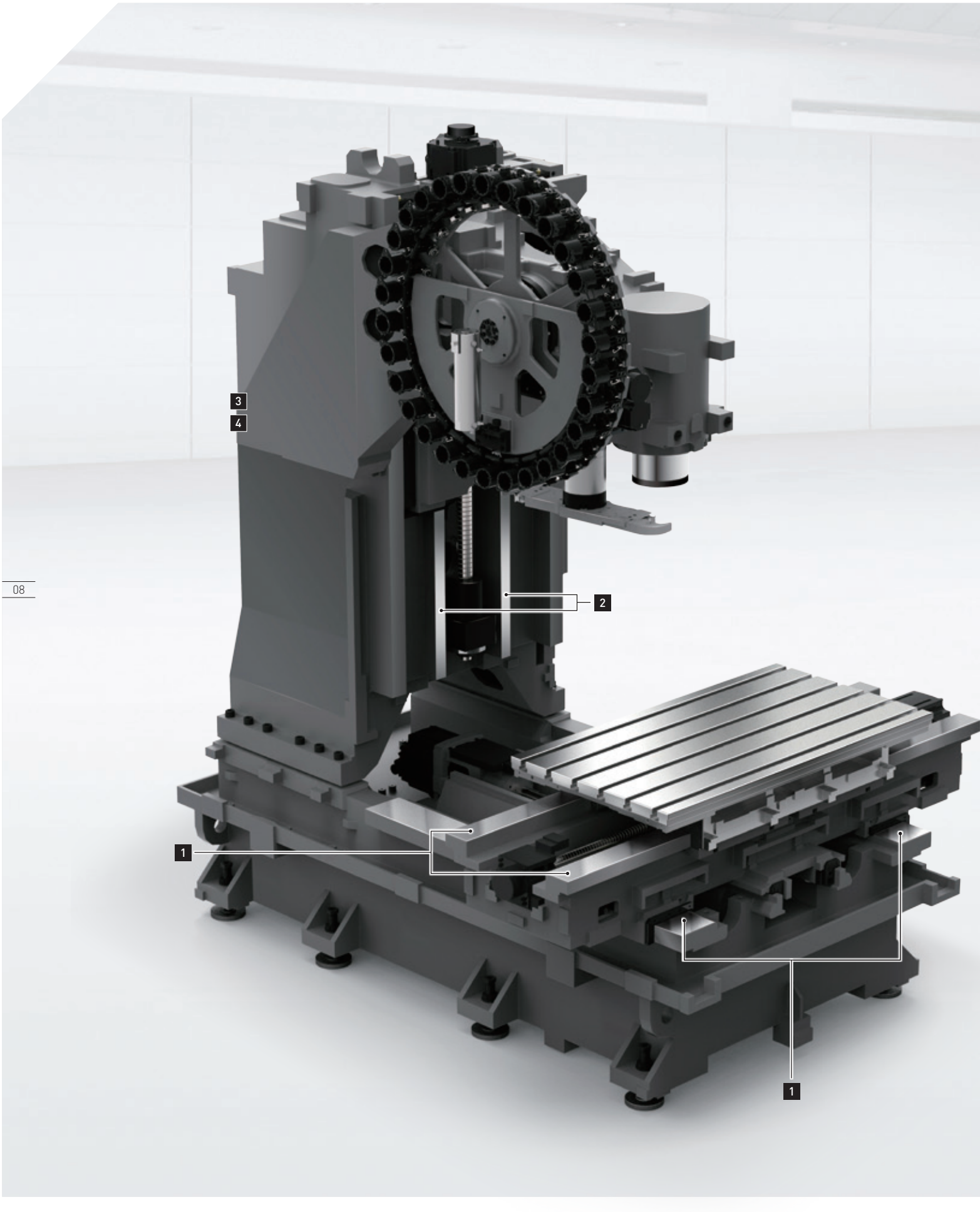
NVX 5100






| | | NVX 5060 50 | NVX 5080 50 | NVX 5100 50 |
|---|---|---|---|---|
| Type of spindle taper hole | | No. 50 | | |
| Travel <X- / Y- / Z-axis> | mm (in.) | 600 / 530 / 510 (23.6 / 20.9 / 20.1) | 800 / 530 / 510 (31.5 / 20.9 / 20.1) | 1,050 / 530 / 510 (41.3 / 20.9 / 20.1) |
| Table working surface | mm (in.) | 900 × 600 (35.4 × 23.6) | 1,100 × 600 (43.3 × 23.6) | 1,350 × 600 (53.1 × 23.6) |
| Table loading capacity | kg (lb.) | 800 (1,760) | 1,000 (2,200) | 1,200 (2,640) |
| Floor space*<width × depth> | mm (in.) | 3,168 × 2,971 (124.7 × 117.0) | 3,291 × 2,971 (129.6 × 117.0) | 3,604 × 2,971 (141.9 × 117.0) |

* Excluding chip conveyor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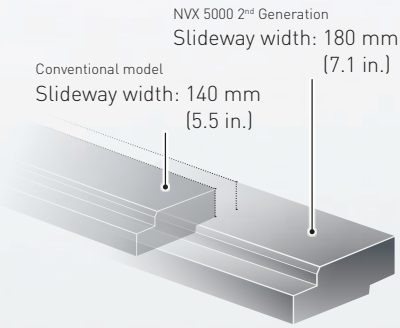
NVX 5000 2nd Generation

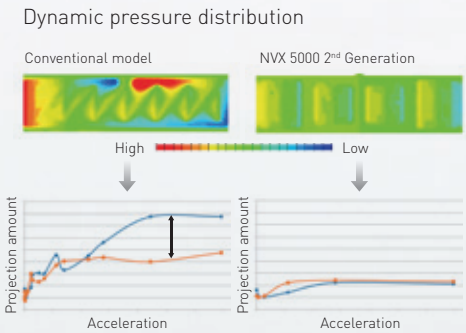
# Unprecedented Rigidity and Accuracy Ultimate Hybrid Structure

The NVX 5000 2nd Generation employs slideways on the X- and Y-axis to improve vibration damping performance and dynamic rigidity.
The wider slideways ensure stable machining compared to the conventional model.
Highly rigid roller guides are used for the Z-axis.
The hybrid structure, in which the roller guides and the slideways are combined, has enabled the machine to achieve both high rigidity and high accuracy.
What's more, the optimized lead of ball screws allows for higher follow-up performance.

## 1 Super-wide slideways (X- / Y-axis) to minimize quadrant projection

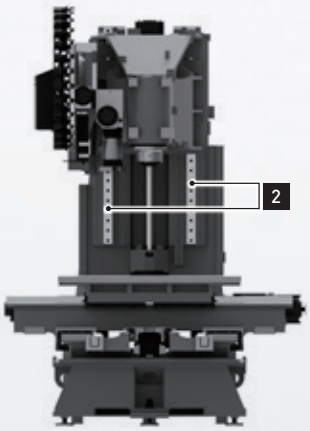
+ Improved damping performance and dynamic rigidity of slideways
+ Wider slideways for stable machining
+ Optimized oil groove shape enables pressure to be applied evenly over the entire surface of the slideways, thereby reducing variations in the quadrant projection amount




## 2 High-rigidity roller guides (Z-axis)

+ Roller guides are employed to improve responsiveness
+ Superb surface quality to meet die & mold machining requirements




## 3 Optimized column shape substantially reduces thermal displacement

+ Thanks to the latest thermal analysis, thermal displacement on the Z-axis has been reduced by half of the conventional model
+ Stable machining is made possible by control of the postural changes of the column caused by heat

## 4 FEM analysis determines rigid body design

+ Simulation of structural deformation at the time of load application
+ Fine adjustment to every part, including the thickness of the bed, the shape and layout of the ribs, to achieve a high level of flexural rigidity

FEM: Finite Element Method

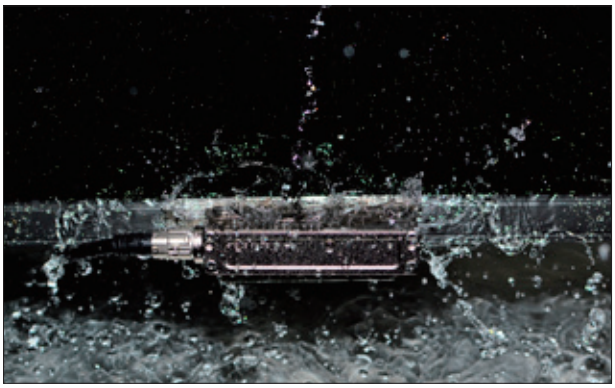
NVX 5000 2nd Generation

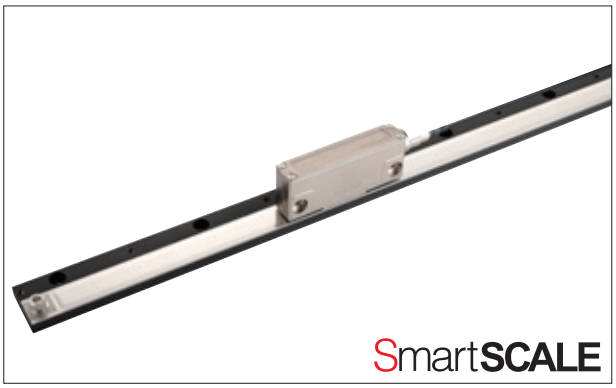
# Perfect Equipment for Ultimate Machining Accuracy

The NVX 5000 2nd Generation is equipped with everything required for stable high-precision machining.
In addition to perfect spindle cooling, a highly reliable SmartSCALE (Magnescale) with extreme accuracy is employed on all axes as standard to ensure the best positioning accuracy for a long period of time.



**Full closed loop control (Scale feedback) as standard on all axes (SmartSCALE)**

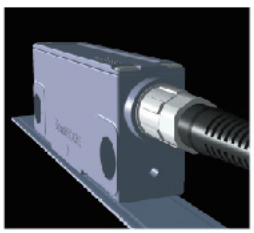





**Simple non-contact structure**

+ Saves space bearingless compact design
+ Can be mounted in proximity to workpieces, enabling easy installation of multiple scales on one axis


Conventional model

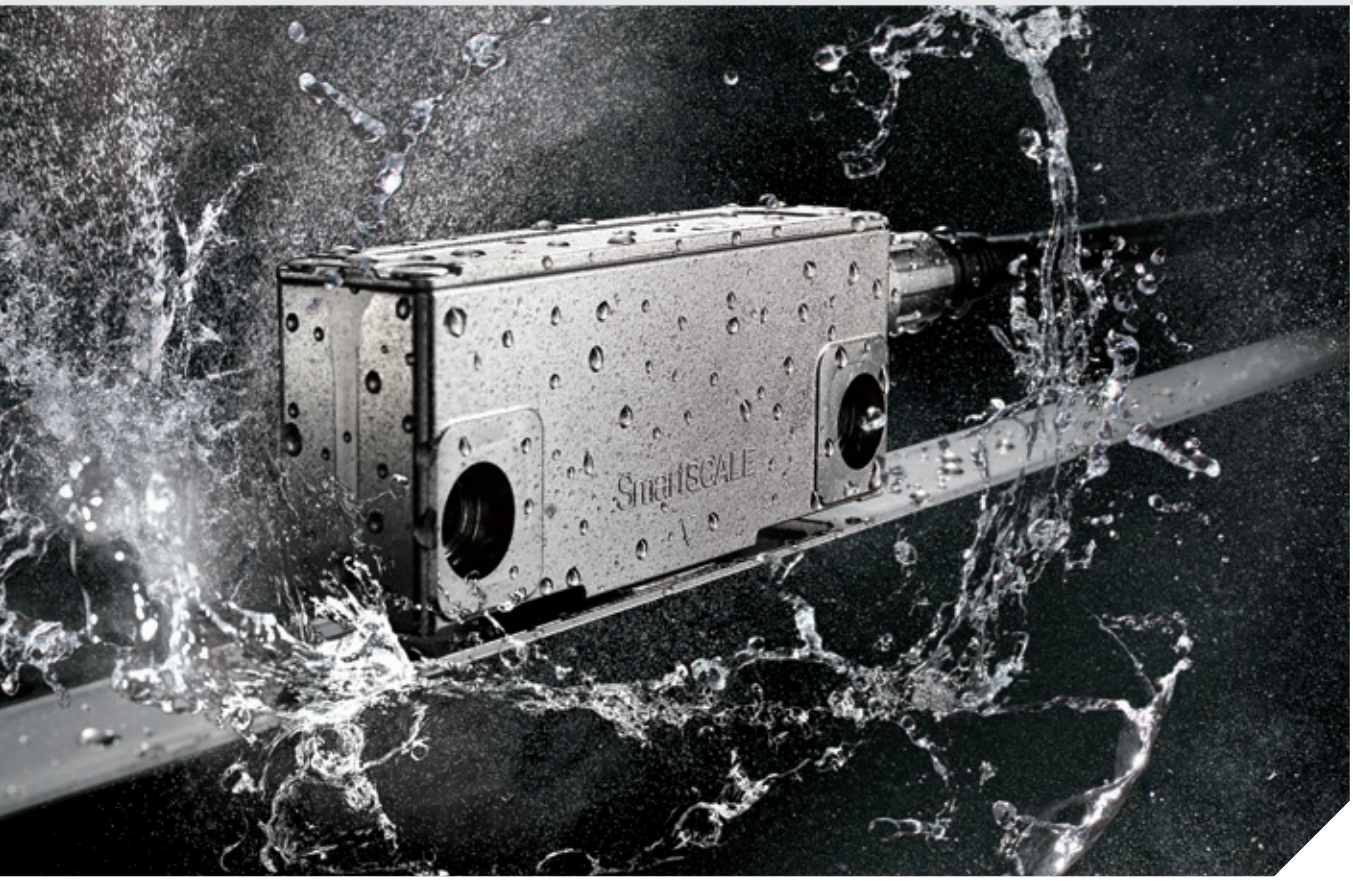



**High resolution of 0.01 µm**

+ Newly developed algorithm employed to improve the high-performance arithmetic processing circuit

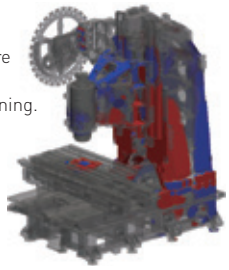
**No air purge necessary thanks to the sealing structure with a protection degree of IP67**

+ The magnetic scale and the detection device surfaces completely covered with a metal cover for even higher durability against coolant and chips

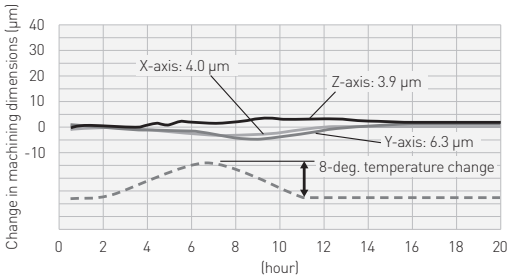



## Environmental thermal displacement control

The casting form was optimized through heat sensitivity analysis so that the front and rear of the column will be in thermal equilibrium. This helps control thermal deformation at the front and rear parts, allowing the casting to be resistant to tilt. Additionally, a cover insusceptible to changes in ambient temperature is also employed to ensure stable accuracy even in long-time machining.



+ Uniform thermal displacement
+ Resistance to changes in ambient temperature
+ High-accuracy long-term machining




● Water-glycol chiller (option) is required.

## Coolant chiller (separate type) <option>

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

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

+ Machining with required accuracy of less than 20 µm
+ High-precision machining that requires a large amount of high-pressure coolant
+ Machining that requires oil-based coolant

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

NVX 5000 2nd Generation

# 3-year Warranty for Greater Peace of Mind High-Performance Spindle with Exceptional Reliability

The high-performance spindles speedMASTER and powerMASTER are equipped with technologies and know-how which the DMG MORI has accumulated to this date.
The speedMASTER achieves a maximum spindle speed of 15,000 min$^{-1}$*1, allowing for overwhelmingly high-speed machining. The powerMASTER ensures a maximum torque of 360 N·m (265.5 ft·lbf) <10%ED>*2 and fully demonstrates its capability in heavy-duty cutting that requires rigidity.
The high-performance spindles with superb cutting abilities and durability contribute to boosting customers' productivity.

*1 No. 40 taper spindle
*2 No. 50 taper spindle



● The photo shows the machine equipped with options.

# Cutting-edge spindle technologies

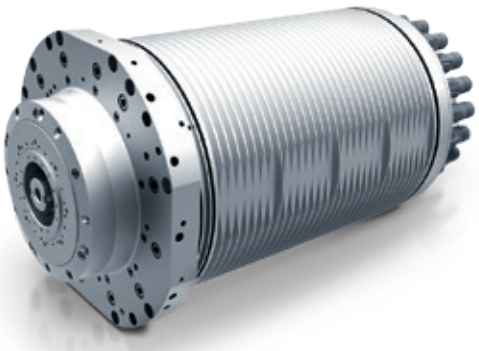
## speedMASTER

+ No. 40 taper spindle achieves overwhelming high-speed machining
+ Stable high-accuracy machining made possible by drastically improved spindle run-out accuracy
+ Unique construction achieves stable machining over the entire rotational range
+ Advanced spindle labyrinth structure prevents coolant from entering the spindle

**No. 40 taper**

+ Type of tool shank: BT40, CAT40, DIN40, HSK-A63
+ Max. spindle speed: 15,000 $min^{-1}$, 12,000 $min^{-1}$ <high torque>, 20,000 $min^{-1}$ <high speed>
+ Output: 30 / 18.5 kW (40 / 24.7 HP) <25%ED / cont>, 37 / 22 kW (50 / 30 HP) <25%ED / cont> {high torque},
  30 / 18.5 kW (40 / 24.7 HP) <25%ED / cont> {high speed}
+ Max. spindle torque: 207.0 N•m (152.7 ft•lbf) <10%ED>, 360 N•m (265.5 ft•lbf) <10%ED> {high torque},
  184.0 N•m (135.7 ft•lbf) <10%ED> {high speed}

## powerMASTER



+ No. 50 taper spindle achieves overwhelming heavy-duty cutting
+ High-speed machining with the maximum spindle speed of 16,000 $min^{-1}$ (option)
+ Thermal expansion compensation by Spindle Growth Sensor <SGS> (option)
+ Advanced spindle labyrinth structure prevents coolant from entering the spindle

**No. 50 taper**

+ Type of tool shank: BT50, CAT50, DIN50, HSK-A100
+ Max. spindle speed: 12,000 $min^{-1}$, 12,000 $min^{-1}$ <high torque>, 16,000 $min^{-1}$ <high speed>
+ Output: 37 / 22 kW (50 / 30 HP) <25%ED / cont>, 37 / 26 kW (50 / 34.7 HP) <25%ED / cont> {high torque},
  35 / 26 kW (46.7 / 34.7 HP) <25%ED / cont> {high speed}
+ Max. spindle torque: 360 N•m (265.5 ft•lbf) <10%ED>, 541 N•m (399.0 ft•lbf) <15%ED> {high torque},
  325 N•m (239.7 ft•lbf) <15%ED> {high speed}

## Spindle: 3-year warranty

Unprecedented level of reliability!

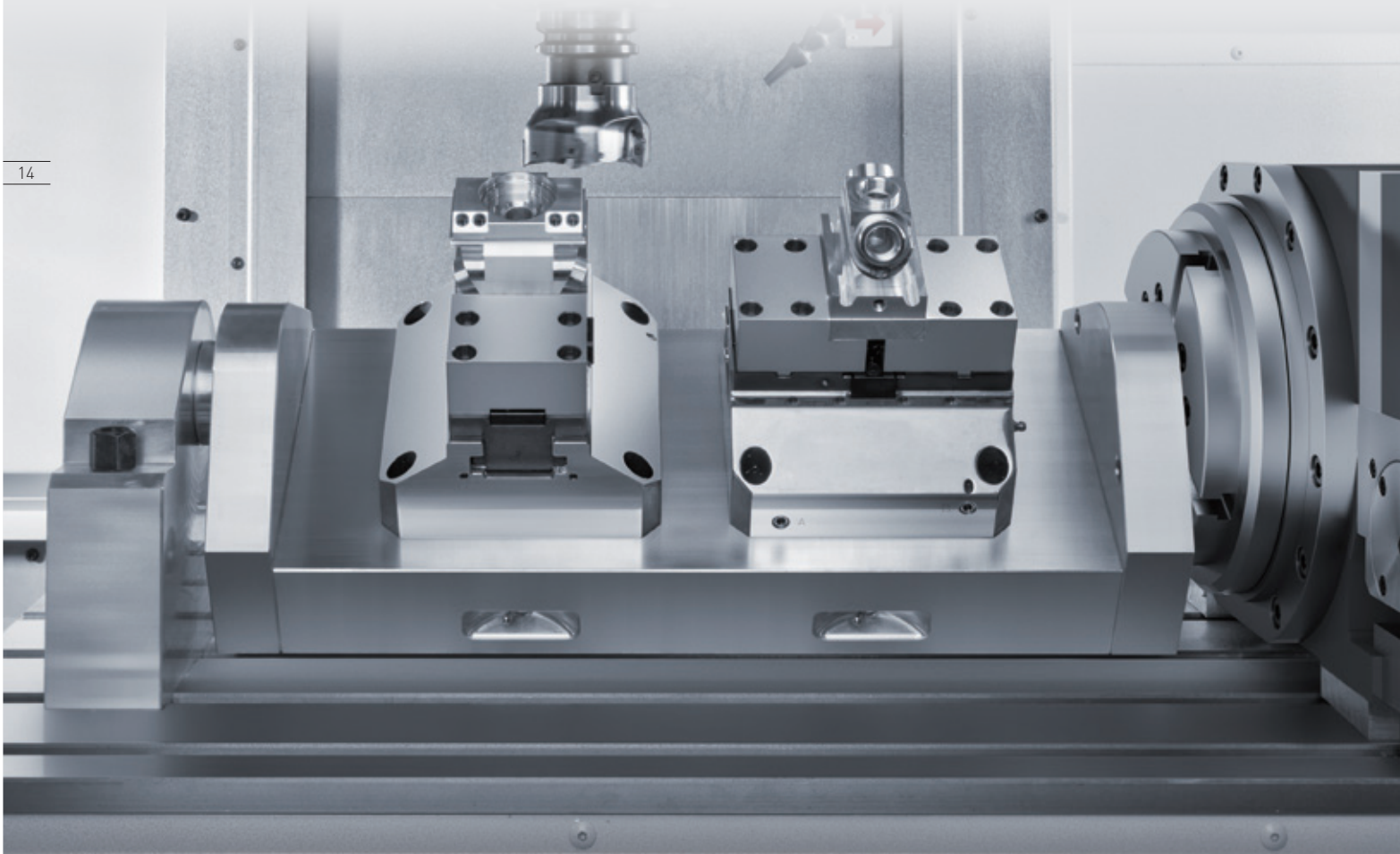

● The standard warranty period varies depending on the region. For details, please consult our sales representative.

NVX 5000 2nd Generation

# DDRT Series: High-efficiency Machining with Additional Axis

The machine can be equipped with the high-speed, high-accuracy DDRT Series (option) rotary table which incorporates a DDM (Direct Drive Motor).
High-efficiency machining using optional axes and high-speed and high-precision indexing realize process integration.

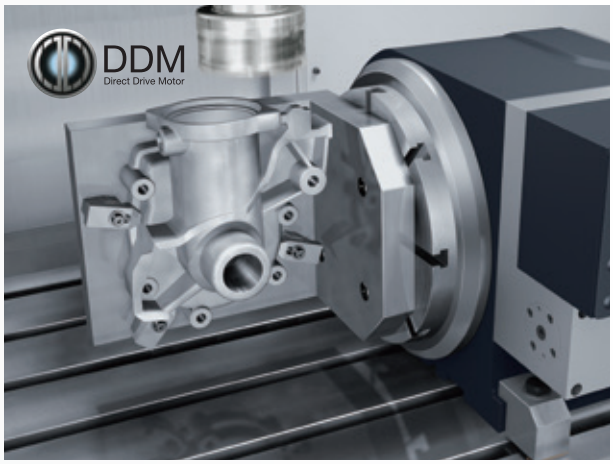
+ Equipped with DDM
+ Zero backlash
+ Achieves high-precision indexing
+ Offers stable machining through powerful clamping
+ Allows high-efficiency machining using optional axes





- The cover protecting the DDRT cable / pipe joints is placed in the interference area on the table.
  So, when machining is performed without DDRT, extra care should be taken to prevent interference between fixtures and the cover.
- For details on the machining ranges, please consult our sales representative.

DDM: Direct Drive Motor




### Direct Drive Motor

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

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

| | | | DDRT-200X | DDRT-260X | DDRT-300 |
|---|---|---|---|---|---|
| Table diameter | | mm (in.) | 200 (7.9) | 260 (10.2) | 300 (11.8) |
| Center height | | mm (in.) | 140 (5.5) | 160 (6.3) | 180 (7.1) |
| Nose hole diameter | | mm (in.) | 65 (2.6) H7 | 75 (3.0) H7 | 95 (3.7) H7 |
| Through hole diameter | | mm (in.) | 50 (2.0) | | |
| Clamp system | | | Air-hydro unit | | Pneumatic |
| Rotational speed of the table | | $min^{-1}$ | 150 | | 120 |
| Repeatability | Unclamped | sec. | 3 | | |
| Positioning accuracy | Clamped | sec. | 5 | | |
| | Unclamped | sec. | 5 | | |
| Mass of machine <rotary table> | | kg (lb.) | 115 (253) | 160 (352) | 200 (440) |
| Maximum work inertia <vertical> | | $kg \cdot m^2$ | 0.678 | | 1.6 |
| Table loading capacity | Vertical load | kg (lb.) | 100 (220) | 150 (330) | 175 (385) |
| Maximum thrust load applicable on the table | Clamp torque | N•m (ft•lbf), F×L | 800 (590.0) | 1,000 (737.6) | |
| | Moment load | N•m (ft•lbf), F×L | 1,500 (1,106.3) | 3,000 (2,212.7) | 4,000 (2,950.2) |



## 5AX-DDRT 200X (High-speed, High-precision CNC Tilting Rotary Table)

CNC tilting rotary table for high-speed, high-precision, simultaneous 5-axis machining.

+ Equipped with DDM
+ High-speed, high-precision machining
+ Low power consumption
+ Lower maintenance than a gear drive system

● When the diameter or length of a tool is measured with the in-machine measuring system (table), the measurable diameter / length may be limited. For details, please consult our sales representative.


5AX-DDRT 200X


Workpiece samples

NVX 5000 2nd Generation

# Accommodating Tools up to 160 mm (6.2 in.)*1 in Diameter and 350 mm (13.7 in.) in Length

The magazine / ATC provide fast and accurate tool changing to minimize the non-cutting time of ATC operation time. A large window is employed to ensure good visibility. The No. 40 taper machine comes with the newest tool magazine / ATC that combine the technologies of the DMG MORI, allowing for the use of a wider range of tools.
Additionally, there are a variety of tool storage capacity options available, including a 90-tool specification*1.

**Tool storage capacity**

+ No. 40 taper: 30, 60, 90 tools
+ No. 50 taper: 30, 60 tools

**Max. tool diameter (without adjacent tools / with adjacent tools)**

+ No. 40 taper: 160 mm (6.2 in.)*2 / 80 mm (3.1 in.)
+ No. 50 taper: 240 mm (9.4 in.)*3 / 120 mm (4.7 in.)

*1 With the No. 40 taper spindle
*2 ø 100 mm (ø 3.9 in.) for speeds of 12,000 $min^{-1}$ or higher.
*3 ø 160 mm (ø 6.2 in.) for speeds of 8,000 $min^{-1}$ or higher.



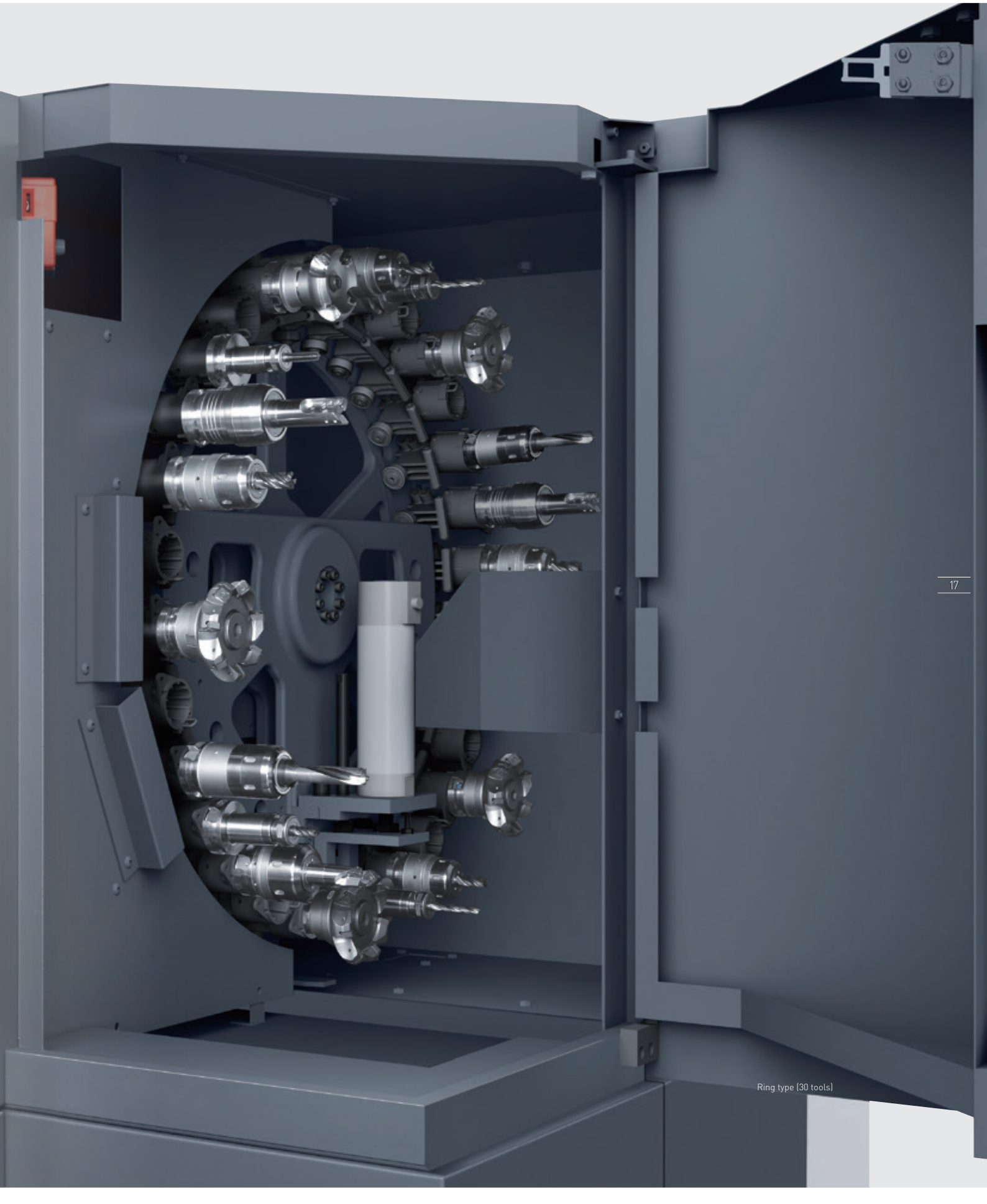
## Reliable tool change

The ATC arm equipped with a holding lever for securing a tool tightly holds a long and heavy tool, offering reliable tool change.
The ATC shutter is provided as standard to prevent chips from entering the magazine.

| Cut-to-cut (chip-to-chip) | | No. 40 taper | | No. 50 taper | |
|---|---|---|---|---|---|
| | | ATC standby mode OFF | ATC standby mode ON | ATC standby mode OFF | ATC standby mode ON |
| Adjacent <DIN> | sec. | 4.38 | 3.06 | 6.40 | 4.41 |
| Farthest <DIN> | sec. | 4.38 | 3.06 | 7.79 | 7.69 |
| <MAS> | sec. | 4.38 | 3.18 | 6.49 | 4.32 |

- The time differences are caused by the different conditions (travel distances, etc) for each standard.
- Depending on the arrangement of tools in the magazine, the cut-to-cut (chip-to-chip) time may be longer.
- ATC standby mode: open the ATC shutter using M code commands beforehand.

| | | No. 40 taper | No. 50 taper |
|---|---|---|---|
| Tool-to-tool | sec. | 1.30 | 2.34 |

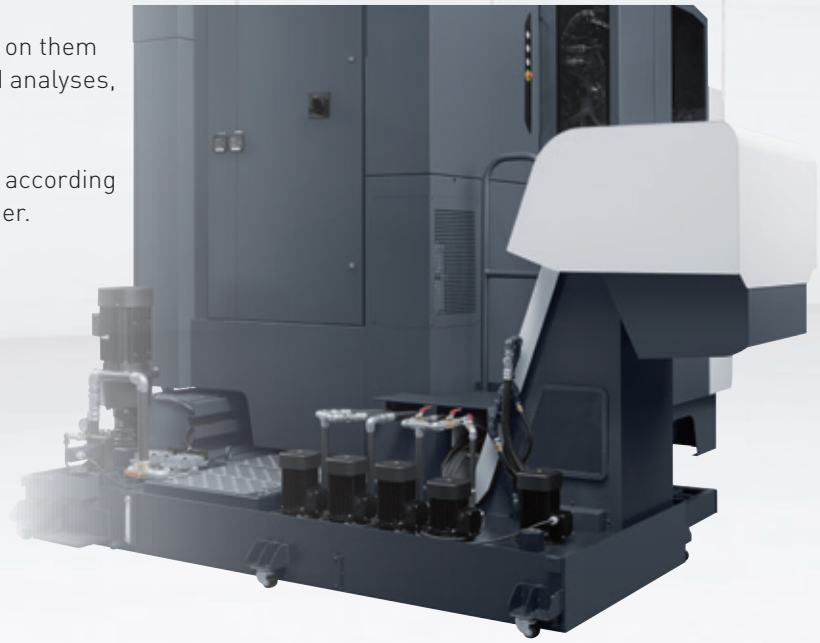


Ring type (30 tools)

NVX 5000 2nd Generation

# Cutting-edge Chip Disposal Solution

Chips can be one of the main causes leading to machining failure and machine stop.
DMG MORI conducted an in-depth study on them by carrying out various experiments and analyses, and achieved outstanding chip disposal performance.
We offer optimal chip disposal solutions according to a machining condition of each customer.





New technology!

## Zero sludge coolant tank* (option)

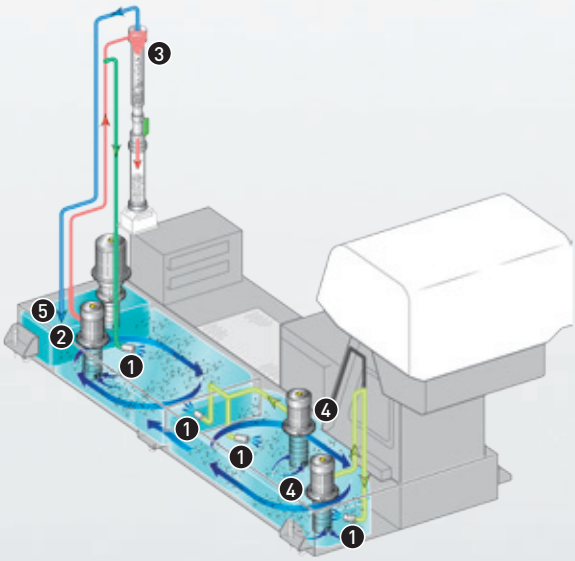
Multiple coolant nozzles are arranged to stir coolant and efficiently collect fine casting sludge with a highly accurate cyclone filter.

+ Reduce cleaning work of the coolant tank dramatically
+ Prevent clogging of pipes / coolant nozzles and pump breakage
+ Expand coolant life

❶ Coolant nozzle
❷ Inlet filter pump
❸ Cyclone filter
❹ Stirring nozzle coolant pump
❺ Clean coolant tank (from cyclone filter)

* It is recommended that the coolant chiller (option) be selected because the coolant temperature is expected to rise according to the specifications and cutting conditions.
● Not compatible with oil-based coolant.

Image of sludge collection




**Click here to watch the video of the zero sludge coolant tank.**

## Through-spindle coolant system (unit on coolant tank) <option>*1*2

+ Coolant to be supplied to the tip through the holes of the spindle and tool
+ Effective for chip removal, cooling of machining points and extension of tool life

*1 Zero sludge coolant tank (option) is essential.
*2 For the No. 50 taper machine, the 60-tool chip bucket is not available.

Unit on coolant tank

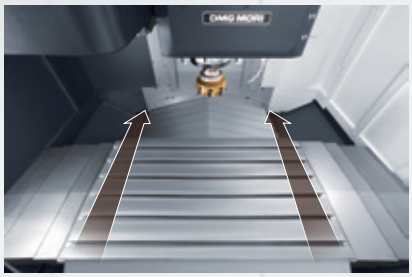
Center through

Side through

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

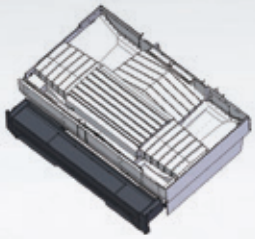
## Chip conveyor (internal, spiral type) <option>

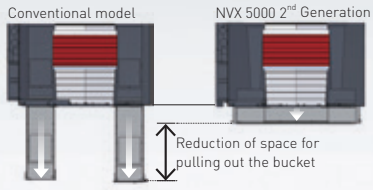
The left and right spiral conveyors carry chips that have fallen under the table to the external chip conveyor, preventing chip accumulation inside of the machine.



## Chip bucket

Large capacity chip buckets are standard.
Minimized space required for maintenance.






● The chip buckets cannot be cleaned while the machine is running.

+ Tank capacity <NVX 5080>:
  315 L (83.2 gal.) <chip bucket specifications>
  570 L (150.5 gal.)
  <external chip conveyor specifications>

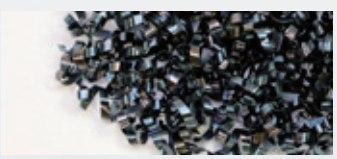
## Shower coolant (option)

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

## External chip conveyor (hinge type + drum filter type)

+ Regardless of shapes or materials, any types of chips including long / short chips can be transferred on one conveyor
+ Suitable for discharging various types of chips

◎: Ideal ○: Suitable

| Workpiece material | Steel | | | Cast iron | Aluminum / non-ferrous metal | | |
|---|---|---|---|---|---|---|---|
| Chip form |  | | |  |  | | |
| Chip size | Long | Short | Powdery | Short | Long | Short | Powdery |
| Scraper type + drum filter type | ○ | ◎ | ○* | ○ | ○ | ◎ | ○* |
| Hinge type + drum filter type | ◎ | ○ | ○* | ○ | ◎ | ○ | ○* |

* It is recommended that the optional zero sludge coolant tank be selected.

● <Chip size guidelines> Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ø 40 mm (ø 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.

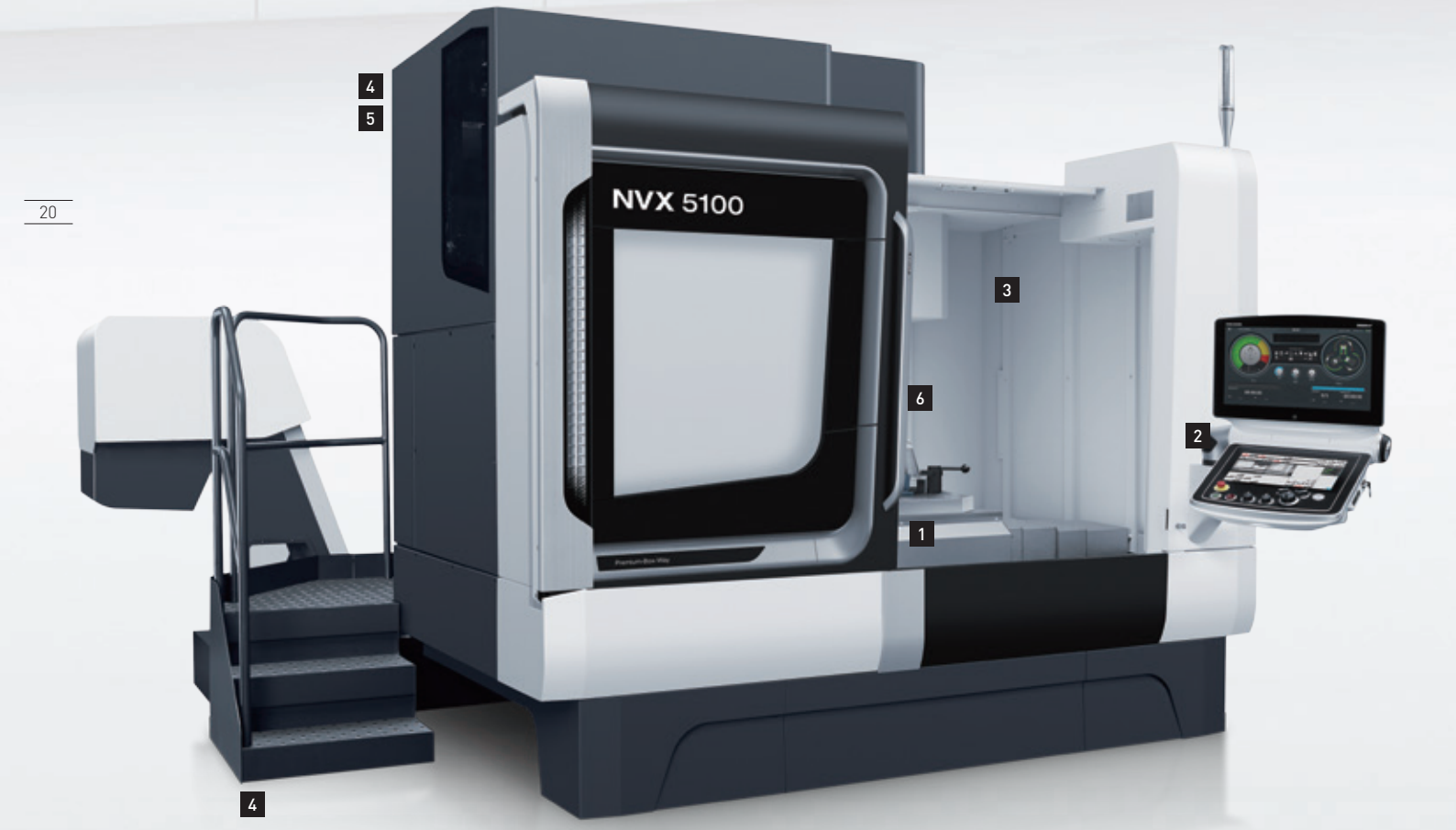
● Please select a chip conveyor to suit the shape of your chips.
When using special or difficult-to-cut material (chip hardness HRC45 or higher), please consult our sales representative.

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

NVX 5000 2nd Generation

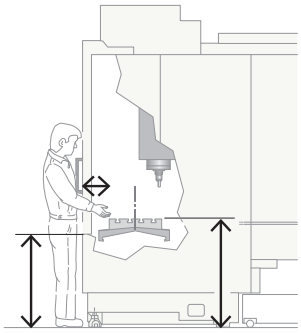
# Pursuit of Usability

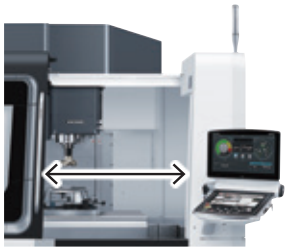
The NVX 5000 2nd Generation employs a sophisticated cover design and is designed taking into account the accessibility to the table and workpiece handling with a crane.
Other features for better workability are also incorporated throughout the machine.  The hydraulic unit and other peripherals requiring periodic maintenance are placed in an easily accessible location to improve maintainability.



## 1 Accessibility

With excellent access to the table and a wide door opening, setup operations such as fixture adjustment can be done smoothly.
The position of the lower end of the front door has been lowered to offer better access to the spindle and table.





+ Distance from table: 248 mm (9.8 in.)
+ Height of table top surface: 900 mm (35.4 in.)
+ The position of the lower end of the front door: 785 mm (30.9 in.)
+ Door opening: 763 mm (30.0 in.) <NVX 5060>
  826 mm (32.5 in.) <NVX 5080>
  1,130 mm (44.5 in.) <NVX 5100>

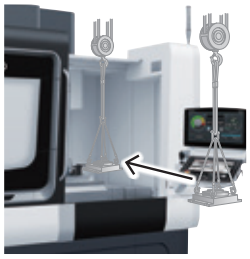
## 2 CELOS / ERGO*line* Touch

The operation panel which can swivel from 0 degree to 100 degrees improves operability and visibility.

+ Swivel angle: 100°

## 3 Loading and unloading with a crane

The ceiling part also opens, allowing easy loading and unloading of workpieces using a crane.



## 4 Easier magazine maintenance

A new magazine has a door and steps for easier operation and maintenance.

- The magazine door and magazine steps are available as options for machines with a No. 40 taper spindle (except for the through-spindle coolant specification). Standard for 60 / 90 tools specifications.

Magazine step

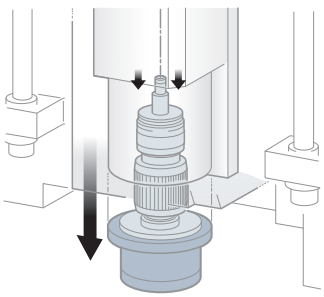
Magazine door

## 5 Centralized layout of devices

Devices which need to be inspected every day are gathered together at the side of the machine.

## 6 Replacement of spindle unit

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



NVX 5000 2nd Generation

# Solution-providing Automation

The key to increase productivity is how to automate processes that have traditionally been handled manually. DMG MORI provides innovative solutions to solve customers' production challenges along with a wide range of automation systems.

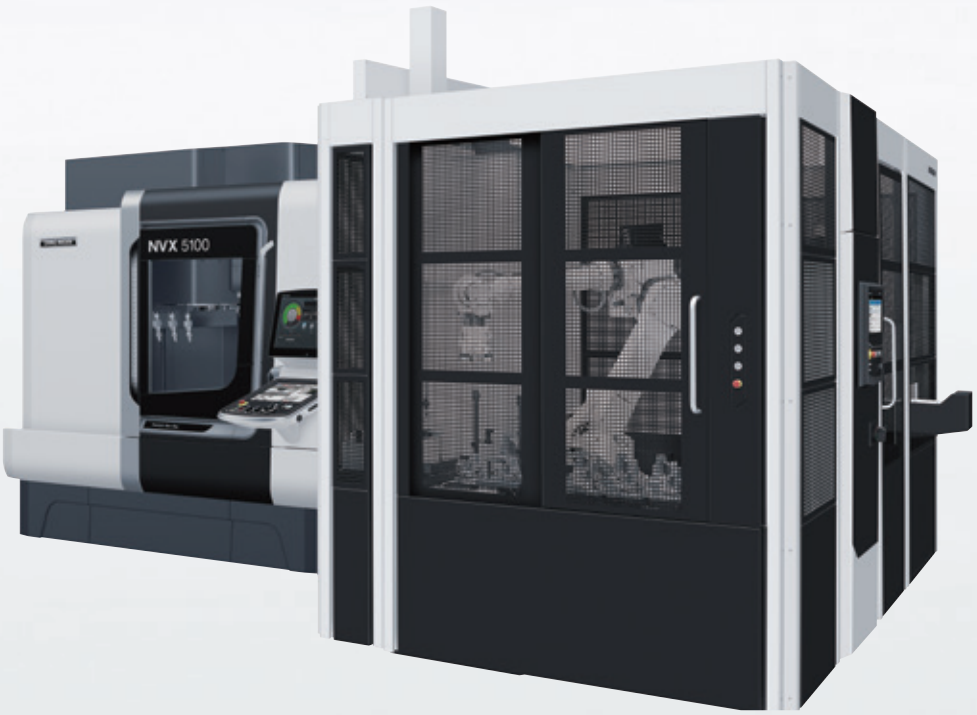
## Robot system MATRIS* (option)

The NVX 5000 2nd Generation brings higher productivity when combined with a robot system. The system consisting of modularized units such as a workpiece stocker and an in-machine measuring system is available. Modularization of units ensures shorter delivery times and stable quality systems, making possible system expansion and layout change after delivery.

* Consultation is required

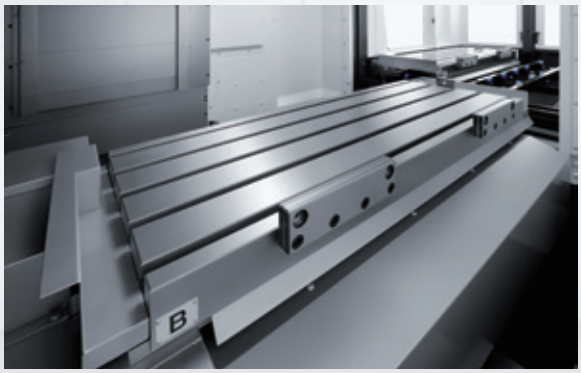
**Robot system consisting of modularized units**

+ Easy system expansion and layout change possible in the future



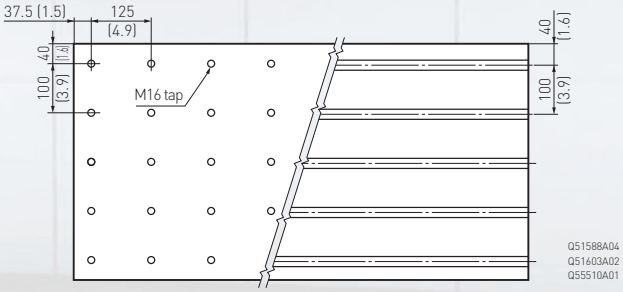
# 2-station APC (shuttle-type)* <option>

The 2-station APC significantly reduces non-cutting time.



**Pallet dimensions**

mm (in.)





+ Pallet size <width × depth>
  <NVX 5060 / NVX 5080 / NVX 5100>:
  700 × 480 / 950 × 480 / 1,200 × 480 mm
  (27.6 × 18.9 / 37.4 × 18.9 / 47.2 × 18.9 in.)
+ Pallet changing time
  <NVX 5060 / NVX 5080 / NVX 5100 >:
  19.2 / 19.7 / 21.5 sec.
+ Pallet loading capacity
  <NVX 5060 / NVX 5080 / NVX 5100 >:
  300 / 500 / 600 kg (660 / 1,100 / 1,320 lb.)

* The APC specification requires the 200 mm (7.9 in.)-high column <option> and the shower coolant <option>.



# MAPPSconnected – Perfect solution for Automation Systems

MAPPSconnected is a system that enables machine monitoring, scheduling and production management to be done on one machine by connecting machines, robots and various peripherals over a network. The effective use of MAPPSconnected helps solve various problems at the time of automation system installation, such as connection with peripheral equipment, system management and cost-related issues.

+ Allow for operation status monitoring of the entire system with simple operation
+ Easy-to-see screen layout enables operators to view all necessary information at a time
+ Compact design contributes to space saving
+ Provide common user interface with CELOS / MAPPS V for smooth and efficient operation
+ Employ the MAPPS operation panel to offer the same long-term maintenance support as the machine

CELOS: Control Efficiency Lead Operation System
MAPPS: Mori Advanced Programming Production System

NVX 5000 2nd Generation

# One Stop Service for Various Needs DMG MORI Qualified Products

The DMG MORI Qualified Products (DMQP) program <option> is designed to certify peripherals that meet DMG MORI standards in quality, performance and maintainability. DMG MORI collaborates with our partners in the world and provides customers with peripherals required for their machining. We take care of the arrangement from selection to installation to support best-quality machining. DMG MORI helps customers improve productivity by offering the total solutions including quality peripherals as well as machine tools.

+ Offer peripheral equipment optimal for each customer at one stop
+ Provide support including connection and setup of machines and peripheral equipment
+ Achieve efficient connections with optimal interfaces



## Four DMQP categories

**Handling**

- Robot system
- Chip conveyor (external)

**Shaping**

- Oil skimmer
- Rotary window
- High-pressure coolant system
- Rotary table
- Mist collector

**Measuring**

- In-machine measuring system (tool)
- Tool presetter
- In-machine measuring system (workpiece)
- Surface roughness measuring system

**Monitoring**

- Electrical cabinet chiller
- Coolant chiller
- Coolant float switch
- Signal lamp

● The options above are examples. For details, please consult our sales representative.

DMQP: DMG MORI Qualified Products

Robot


In-machine measuring system (workpiece)


Tool presetter

Tool balance measuring system

Shrink fit system

Coolant filtration filter

Air dryer

Air compressor


Electrical cabinet chiller

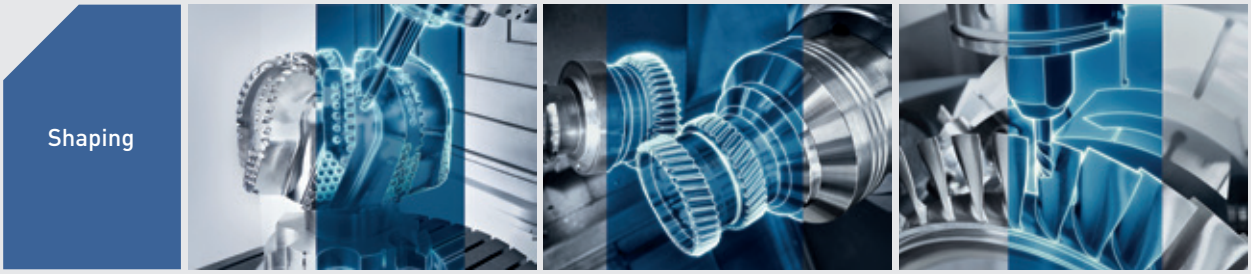
Oil skimmer

Tool

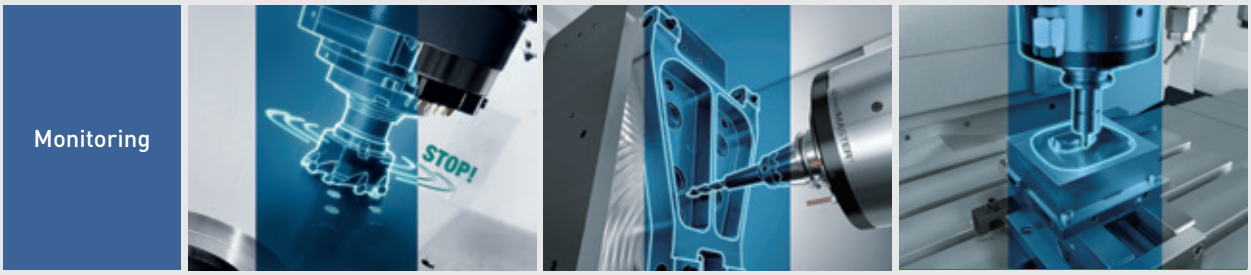
NVX 5000 2nd Generation

# DMG MORI Technology Cycles

Technology Cycles (optional) are complete solutions that achieve complex machining easily in a short time. They enable every operator to easily perform high-quality machining, setups and measurements with general-purpose machine tools and standard tools / fixtures, which used to require specialized machines, programs and tools.









- The availability of the functions differ depending on the machine. For details, please consult our sales representative.
- The above is an image picture.

## Efficient Production Package (High-speed canned cycle)

Easy inputting of various machining patterns

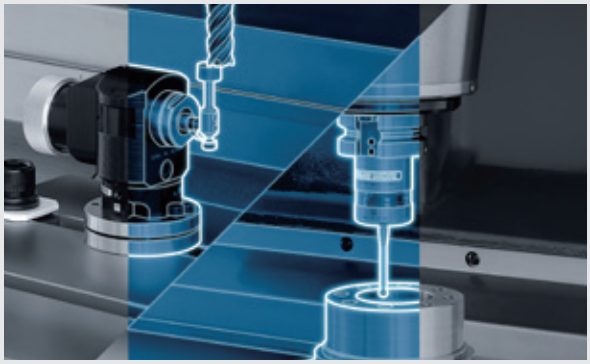
## MVC (Machine Vibration Control)

Selects optimum conditions for preventing chatter

## MPC (Machine Protection Control)

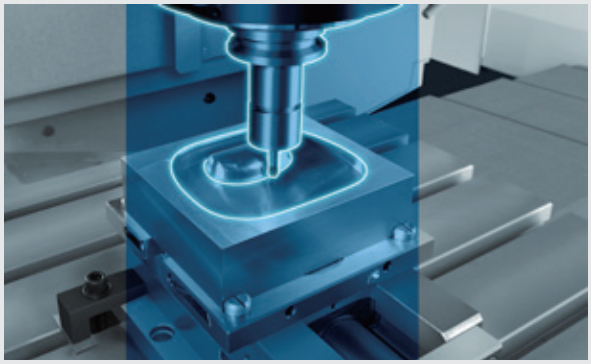

Minimizing load to the spindle when interference occurs

## W setter



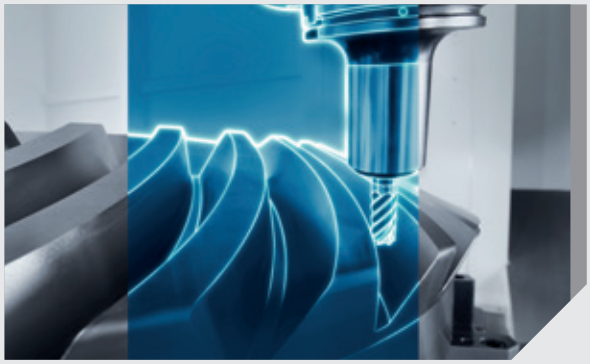
Manual tool measurement and workpiece centering in simple steps

## Easy tool monitoring



Monitoring load of spindle and feed axes

## DMG MORI gearMILL



Integrating gear cutting into milling

NVX 5000 2nd Generation

# From the Idea to the Finished Product

DMG MORI's cutting-edge operation system, CELOS, enables consistent management, documentation and visualization of orders, processes and machine data. CELOS can be extended with apps and is also compatible with your company's existing infrastructures and programs.

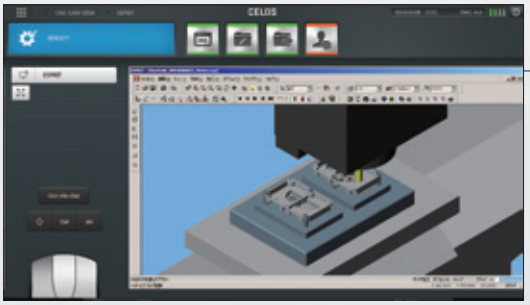
## CELOS APPs facilitate quick and easy operation: three examples »»

**JOB MANAGER**
Systematic planning, administration and preparation of work orders

+ Machine related creation and configuration of new work orders
+ Structured storage of all production related data and documents
+ Easy visualization of job information on drawings, models, tools, fixtures, etc.

**JOB ASSISTANT**
Process-defined orders

+ Menu guided set-up of the machine and conversational processing of production orders
+ Reliable error prevention thanks to windows-based assistance instructions with a mandatory acknowledgement function



**CAD-CAM VIEW**
Visualize workpieces and improve program data

+ Direct remote access to external CAD / CAM workstations
+ Central master data as basis for component viewing
+ Immediate change options for machining steps, NC programs and CAM strategies, directly in the CNC system

CELOS: Control Efficiency Lead Operation System

CELOS

**APP menu:**
Central access to all available applications


# ERGO*line* operation panel with 21.5-inch multi-touch screen and NC unit from Mitsubishi Electric



## STANDARD

Standard user interfaces for all new high technology machines from DMG MORI

## CONSISTENT

Consistent administration, documentation and visualization of order, process and machine data

## COMPATIBLE

Compatible with PPS and ERP systems
Can be networked with CAD / CAM products
Open to trendsetting CELOS APP extensions

PPS: Production Planning and Scheduling System
ERP: Enterprise Resource Planning

NVX 5000 2nd Generation

# Revolutionary Productivity with Cutting-edge Technology DMG MORI's Connected Industries

By making full use of cutting-edge technology, DMG MORI realizes its Connected Industries* to help improve your productivity and profitability significantly. Our Connected Industries is structured in three layers. Centering around the cutting-edge operation system "CELOS," our Connected Industries networks not just individual machines but also production systems and the entire plant. This network will help clearly define your problems, offering the best and customized solutions.

* An industrial society in which new added value will be created through connected humans, machines, and technologies – A new vision for the future of Japanese industries that the Ministry of Economy, Trade and Industry advocates.




AI-based solutions

## MPC (Machine Protection Control)


Early detection of machine and machining problems by visualizing spindle vibration.

+ Minimizing the effect on the machine by stopping the spindle within 0.01 seconds after vibration of a certain level or higher is detected
+ Learning tool-dependent machining vibration in advance to compare the data with the actual value and to determine abnormal vibration at the time of mass-production
+ Diagnosing the spindle bearing status for preventive maintenance

## MVC (Machine Vibration Control)

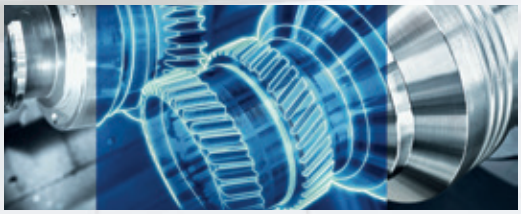
Easy operation just by pressing the button for no-chatter condition (left and right) for the current machining (center).

+ Automatically calculating the optimal cutting conditions to control chatter by detecting it with the sensor mounted on the spindle
+ No advanced skill necessary due to easy operation with a button
+ Capable of reflecting the automatically calculated optimal cutting conditions in the NC program right away

## CELOS Machine Extremely easy-to-use machine

+ This machine is loaded with the cutting-edge operation system CELOS, offering various applications useful for your machining
+ By accumulating machining know-how on the CELOS, all operators are able to make products at the same level of quality
+ Productivity will be improved by streamlining time-consuming and burdensome setups to reduce the operator's workloads
+ Complex machining, which used to require dedicated machines and technical knowledge, is made simpler and faster with Technology Cycles
+ The use of AI prevents the occurrence of machine problems

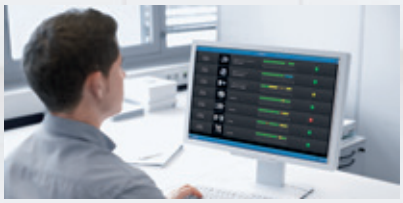
∗ The information needed to machine a workpiece (setups, tools, programs, etc.)



**JOB MANAGER**
Job* preparation / process planning

**JOB SCHEDULER**
Machining preparation

**JOB ASSISTANT**
Machining / checking



## CELOS Manufacturing Connected production processes

+ A CELOS application called "MESSENGER" connects machines in your plant, visualizing the status of machine operation
+ The causes of machine stops will be identified easily, contributing to improved machine operation rates
+ CELOS applications can be upgraded to their latest versions through CELOS Club, allowing for smooth IoT deployment
+ The machine's operational status can be monitored through smartphones and tablets even from outside your plant



## Digital Factory Digitization accelerates connected plants

+ Your plant can be connected to external business partners by the utilization of IoT, significantly streamlining the flow of your entire production system
+ CELOS Club can maximize the ability of CELOS
+ ADAMOS* offers an open platform for IoT

∗ Please consult our sales representative for more detailed information, including the service start time in your country.

CELOS: Control Efficiency Lead Operation System



## CELOS Club


### Continuously supporting your productivity improvements

+ Latest functions always available through version upgrades
+ Centralized machine management and streamlined programming
+ Maximizing operating time
+ CELOS Club Platinum (option)

● Japan only.

MAPPS: Mori Advanced Programming Production System

## WERKBLiQ

### Productivity improvements through cutting-edge machine maintenance services

+ Streamlined maintenance work based on digitized plant equipment information
+ Minimizing down time by promptly identifying the cause of machine stop
+ The integrated management of maintenance procedures and standards eliminates dependency on individual operator skills

● Please consult our sales representative for more detailed information, including the release time in your country.

NVX 5000 2nd Generation

# Unique Energy-saving Function GREENmode

DMG MORI has developed the energy-saving function "GREENmode" to accomplish sustainable development goals (SDGs).

SDGs: Sustainable Development Goals

**The machine's power consumption is reduced by cutting unnecessary standby power and using efficient machining programs to shorten machining time.**

+ Improve cutting conditions to reduce machining time by bringing the best out of machine tools and tools
+ Reduce unnecessary power consumption during stand-by time by shutting off power of the spindle, chip conveyor and coolant pump at a time of machine stop
+ Visualize power consumption and $CO_2$ emission amount



## GREENmode

### GREEN monitoring

+ Visualize power consumption and $CO_2$ emission amount on the CELOS operation screen

### GREEN device

+ High-brightness LED light
+ Accumulator pressure-keeping hydraulic pump
+ Inverter-equipped hydraulic pump

### GREEN idle reduction

+ Shut off the power of the servo motor, spindle and coolant pump at a time of machine stop
+ Turn off the operation panel screen when a machine is not in operation for a certain time

### GREEN control

+ Reduce machining power by energy-saving pecking cycles
+ Quicken standard M codes
+ Simultaneous acceleration / deceleration of the spindle and feed axes
+ Inverter-controlled coolant supply

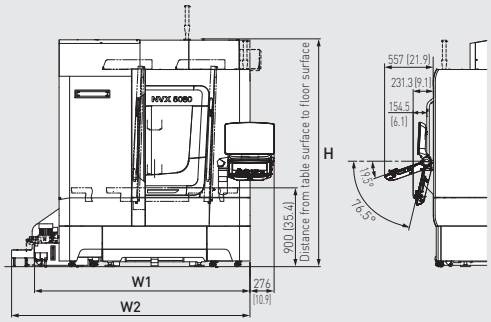
CELOS: Control Efficiency Lead Operation System

# Machine Size

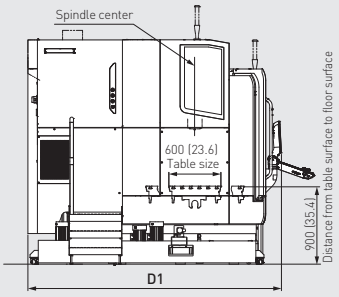
mm (in.)

## Chip bucket specifications

Front view




Side view

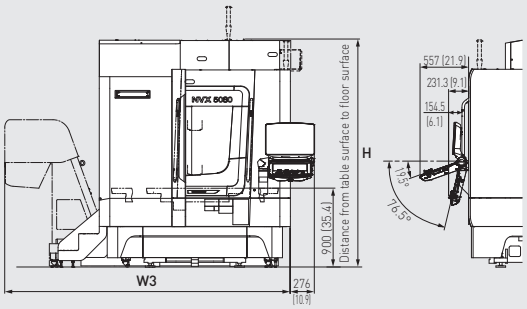



Q55893A01

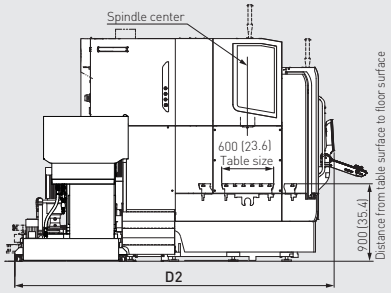
mm (in.)

## External chip conveyor specifications (option)

Front view




Side view




Q55885A01

mm (in.)

| Machine type | | Width | | | Depth | | Height |
|---|---|---|---|---|---|---|---|
| | | Chip bucket specifications | | External chip conveyor specifications | D1 | D2 | H |
| | | W1 | W2 | W3 | | | |
| NVX 5060 | | 2,337 (92.0) | — | 3,128 (123.1) | 2,971 (117.0) | 3,734 (147.0) | 2,601 (102.4) |
| NVX 5080 | 40 | 2,460 (96.9) | — | 3,251 (128.0) | | | |
| NVX 5100 | | 3,018 (118.8) | — | 3,811 (150.0) | | 3,631 (143.0) | |
| NVX 5060 | | — | 3,168 (124.7) | 3,128 (123.1) | | 3,734 (147.0) | |
| NVX 5080 | 50 | — | 3,291 (129.6) | 3,251 (128.0) | | | |
| NVX 5100 | | — | 3,604 (141.9) | 3,811 (150.0) | | 3,631 (143.0) | |

● The magazine door and magazine steps are available as options for machines with a No. 40 taper spindle (except for the through-spindle coolant specification). Standard for 60 / 90 tools specifications.

NVX 5000 2nd Generation

# Machine Specifications

| | | | | NVX 5060 40 | NVX 5080 40 | NVX 5100 40 |
|---|---|---|---|---|---|---|
| **Travel** | | | | | | |
| X-axis travel <longitudinal movement of table> | | | mm (in.) | 600 (23.6) | 800 (31.5) | 1,050 (41.3) |
| Y-axis travel <cross movement of saddle> | | | mm (in.) | 530 (20.9) | | |
| 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.) | 900 × 600 (35.4 × 23.6) | 1,100 × 600 (43.3 × 23.6) | 1,350 × 600 (53.1 × 23.6) |
| Table loading capacity | | | kg (lb.) | 800 (1,760) | 1,000 (2,200) | 1,200 (2,640) |
| **Spindle** | | | | | | |
| Max. spindle speed | | | $min^{-1}$ | 15,000, 12,000 <high torque>, 20,000 <high speed> | | |
| **Feedrate** | | | | | | |
| Rapid traverse rate | | | mm/min (ipm) | X, Y, Z: 30,000 (1,181.1) | | |
| Cutting feedrate | | | mm/min (ipm) | X, Y, Z: 1—30,000 (0.04—1,181.1) {when using high-precision control <look-ahead control>} | | |
| **ATC** | | | | | | |
| Type of tool shank | | | | BT40, CAT40, DIN40, HSK-A63 | | |
| Tool storage capacity | | | | 30, 60, 90 | | |
| Max. tool diameter | With adjacent tools | | mm (in.) | 80 (3.1) | | |
| | Without adjacent tools | | mm (in.) | 160 (6.2)*1 | | |
| Max. tool length | | | mm (in.) | 350 (13.7) | | |
| Max. tool mass | | | kg (lb.) | 8 (17.6), 12 (26.4)*2 | | |
| Tool changing time*3 | Tool-to-tool | | s | 1.30 | | |
| | Cut-to-cut (chip-to-chip) <ATC standby mode OFF> | <DIN> | s | Adjacent: 4.38 Farthest: 4.38 | | |
| | | <MAS> | s | 4.38 | | |
| | Cut-to-cut (chip-to-chip) <ATC standby mode ON> | <DIN> | s | Adjacent: 3.06 Farthest: 3.06 | | |
| | | <MAS> | s | 3.18*4 | | |
| **Motor** | | | | | | |
| Spindle drive motor <25%ED / cont> | 15,000 $min^{-1}$ | | kW (HP) | 30 / 18.5 (40 / 24.7) | | |
| | 12,000 $min^{-1}$ <high torque> | | kW (HP) | 37 / 22 (50 / 30) | | |
| | 20,000 $min^{-1}$ <high speed> | | kW (HP) | 30 / 18.5 (40 / 24.7) | | |
| **Machine size <tool storage capacity: 30 tools>** | | | | | | |
| Machine height | | | mm (in.) | 2,601 (102.4) | | |
| Floor space <width × depth> | | | mm (in.) | 2,337 × 2,971 (92.0 × 117.0)<br>3,128 × 3,734 (123.1 × 147.0)*5 | 2,460 × 2,971 (96.9 × 117.0)<br>3,251 × 3,734 (128.0 × 147.0)*5 | 3,018 × 2,971 (118.8 × 117.0)<br>3,811 × 3,631 (150.0 × 143.0)*5 |
| Mass of machine | | | kg (lb.) | 6,570 (14,454) | 6,710 (14,762) | 7,000 (15,400) |
| **Control unit** | | | | | | |
| Mitsubishi Electric | | | | M730UM, M750UM | | |

*1 ø 100 mm (ø 3.9 in.) for speeds of 12,000 $min^{-1}$ or higher.
*2 For the 30-tool storage capacity specification, the total tool mass is up to 150 kg (330 lb.).
*3 Depending on the arrangement of tools in the magazine, the Cut-to-cut (chip-to-chip) time may be longer.
*4 ATC standby mode: open the ATC shutter using M code commands beforehand.
*5 External chip conveyor specifications

- 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.
- When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.
- Tool changing time: the time differences are caused by the different conditions (travel distances, etc.) for each standard.
- For details, please check the Detailed Specifications.
- The information in this catalog is valid as of January 2019.

| | | | NVX 5060 50 | NVX 5080 50 | NVX 5100 50 |
|---|---|---|---|---|---|
| **Travel** | | | | | |
| X-axis travel <longitudinal movement of table> | | mm (in.) | 600 (23.6) | 800 (31.5) | 1,050 (41.3) |
| Y-axis travel <cross movement of saddle> | | mm (in.) | 530 (20.9) | | |
| 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.) | 900 × 600 (35.4 × 23.6) | 1,100 × 600 (43.3 × 23.6) | 1,350 × 600 (53.1 × 23.6) |
| Table loading capacity | | kg (lb.) | 800 (1,760) | 1,000 (2,200) | 1,200 (2,640) |
| **Spindle** | | | | | |
| Max. spindle speed | | $min^{-1}$ | 12,000, 12,000 <high torque>, 16,000 <high speed> | | |
| **Feedrate** | | | | | |
| Rapid traverse rate | | mm/min (ipm) | X, Y, Z: 30,000 (1,181.1) | | |
| Cutting feedrate | | mm/min (ipm) | X, Y, Z: 1—30,000 (0.04—1,181.1)<br>{when using high-precision control <look-ahead control>} | | |
| **ATC** | | | | | |
| Type of tool shank | | | BT50, CAT50, DIN50, HSK-A100 | | |
| Tool storage capacity | | | 30, 60 | | |
| Max. tool diameter | With adjacent tools | mm (in.) | 120 (4.7) | | |
| | Without adjacent tools | mm (in.) | 240 (9.4)*1 | | |
| Max. tool length | | mm (in.) | 350 (13.7) | | |
| Max. tool mass | | kg (lb.) | 20 (44) | | |
| Tool changing time*2 | Tool-to-tool | s | 2.34 | | |
| | Cut-to-cut (chip-to-chip) <ATC standby mode OFF> | <DIN> s | Adjacent: 6.40 Farthest: 7.79 | | |
| | | <MAS> s | 6.49 | | |
| | Cut-to-cut (chip-to-chip) <ATC standby mode ON> | <DIN> s | Adjacent: 4.41 Farthest: 7.69 | | |
| | | <MAS> s | 4.32*3 | | |
| **Motor** | | | | | |
| Spindle drive motor <25%ED / cont> | 12,000 $min^{-1}$ | kW (HP) | 37 / 22 (50 / 30) | | |
| | 12,000 $min^{-1}$ <high torque> | kW (HP) | 37 / 26 (50 / 34.7) | | |
| | 16,000 $min^{-1}$ <high speed> | kW (HP) | 35 / 26 (46.7 / 34.7) | | |
| **Machine size <tool storage capacity: 30 tools>** | | | | | |
| Machine height | | mm (in.) | 2,601 (102.4) | | |
| Floor space <width × depth> | | mm (in.) | 3,168 × 2,971 (124.7 × 117.0)<br>3,128 × 3,734 (123.1 × 147.0)*4 | 3,291 × 2,971 (129.6 × 117.0)<br>3,251 × 3,734 (128.0 × 147.0)*4 | 3,604 × 2,971 (141.9 × 117.0)<br>3,811 × 3,631 (150.0 × 143.0)*4 |
| Mass of machine | | kg (lb.) | 7,540 (16,588) | 7,680 (16,896) | 7,900 (17,380) |
| **Control unit** | | | | | |
| Mitsubishi Electric | | | M730UM, M750UM | | |

*1 ø 160 mm (ø 6.2 in.) for speeds of 8,000 $min^{-1}$ or higher.
*2 Depending on the arrangement of tools in the magazine, the Cut-to-cut (chip-to-chip) time may be longer.
*3 ATC standby mode: open the ATC shutter using M code commands beforehand.
*4 External chip conveyor specifications
- 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 flange tool when cutting at 10,000 $min^{-1}$ or higher.
- When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.
- Tool changing time: the time differences are caused by the different conditions (travel distances, etc.) for each standard.
- For details, please check the Detailed Specifications.
- The information in this catalog is valid as of January 2019.

NVX 5000 2nd Generation

# Standard & Optional Features

●: Standard features ○: Options
—: Not applicable

| | | | NVX 5060 / NVX 5080 / NVX 5100 | |
|---|---|---|---|---|
| | | | 40 | 50 |
| **Spindle** | | | | |
| Type of tool shank | No. 40 | BT40 | ● | — |
| | | CAT40 | ○ | — |
| | | DIN40 | ○ | — |
| | | HSK-A63 | ○ | — |
| | No. 50 | BT50 | — | ● |
| | | CAT50 | — | ○ |
| | | DIN50 | — | ○ |
| | | HSK-A100 | — | ○ |
| 15,000 min$^{-1}$ | | | ● | — |
| 12,000 min$^{-1}$ | | | — | ● |
| 20,000 min$^{-1}$ <high speed> | | | ○ | — |
| 12,000 min$^{-1}$ <high torque: 360 N•m (265.5 ft•lbf)> | | | ○ | — |
| 12,000 min$^{-1}$ <high torque: 541 N•m (399.0 ft•lbf)> | | | — | ○ |
| 16,000 min$^{-1}$ <high speed> | | | — | ○ |
| **Magazine** | | | | |
| Tool storage capacity | | 30 tools | ● | ● |
| | | 60 tools | ○ | ○ |
| | | 90 tools | ○ | — |
| **Coolant** | | | | |
| Coolant gun | | Machining side | ○ | ○ |
| | | Setup station side (2 setup stations) | ○ | ○ |
| Through-spindle air specifications (only for air) | | | ○ | ○ |
| Through-spindle coolant / air (switching specifications) <through-spindle coolant system is necessary required separating> | | | ○ | ○ |
| Through-spindle coolant / air / semi-dry (switching specifications)*1 | | | ○ | ○ |
| Through-spindle coolant / semi-dry (switching specifications)*1 | | | ○ | ○ |
| Through-spindle coolant system (unit on coolant tank)*2*4 center through | | 1.5 MPa (217.5 psi) <water-soluble> | ○*3 | ○*3 |
| | | 7.0 MPa (1,015 psi) <water-soluble> | ○*3 | ○*3 |
| Through-spindle coolant system (separate type) center through | | Interface <7.0 MPa (1,015 psi), KNOLL> | ○ | ○ |
| | | Interface <7.0 MPa (1,015 psi), Chip braster> | ○ | ○ |
| Through-spindle coolant system (unit on coolant tank)*2*4 side through | | 1.5 MPa (217.5 psi) <water-soluble> | ○*3 | ○*3 |
| | | 7.0 MPa (1,015 psi) <water-soluble> | ○*3 | ○*3 |
| Through-spindle coolant system (separate type) side through | | Interface <7.0 MPa (1,015 psi), KNOLL> | ○ | ○ |
| | | Interface <7.0 MPa (1,015 psi), Chip braster> | ○ | ○ |
| Coolant chiller (separate type) for standard coolant system | | | ○*3 | ○*3 |
| Mist collector AFS-1600*5 | | Including stand | ○*3 | ○*3 |
| | | Interface | ○ | ○ |
| Mist collector HVS-220 | | Including stand (cannot be used in Europe) | ○ | ○ |
| | | Interface | ○ | ○ |
| Mist collector SMG-150 | | On-machine installation | ○ | ○ |
| | | Interface | ○ | ○ |
| Mist collector CRM-H22-S22 | | Including stand | ○ | ○ |
| | | Interface | ○ | ○ |

● : Standard features ○ : Options
— : Not applicable

| | | | NVX 5060 NVX 5080 NVX 5100 | |
|---|---|---|---|---|
| | | | 40 | 50 |
| **Chip disposal** | | | | |
| Air blow | Tool tip <when the tool tip air blow is regularly used, air supply of more than 350 L/min (92.4 gpm) is separately required> | | ● | ● |
| Chip conveyor (internal, spiral type) + chip conveyor (external, scraper type + drum filter type) | | | ○ | ○ |
| Chip conveyor (internal, spiral type) + chip conveyor interface (external, scraper type + drum filter type) | | | ○ | ○ |
| Chip conveyor (internal, spiral type) + chip conveyor (external, hinge type + drum filter type) | | | ○ | ○ |
| Chip conveyor (internal, spiral type) + chip conveyor interface (external, hinge type + drum filter type) | | | ○ | ○ |
| Zero sludge coolant tank*6 | | | ○ | ○ |
| **Measurement** | | | | |
| In-machine measuring system (table)*7 | Touch sensor (tool length only) | (M) | ○ | ○ |
| | Touch sensor (tool length + diameter) | (R) | ○ | ○ |
| | Touch sensor + tool setter function (tool length only) | (M) | ○ | ○ |
| | Touch sensor + tool setter function (tool length + diameter) | (R) | ○ | ○ |
| | Laser sensor (tool length + diameter) | (B) | ○ | ○ |
| In-machine measuring system (spindle)*7*8 | Touch sensor (radio signal transmission type) | (B) | ○ | ○ |
| | Touch sensor (radio signal transmission type) + surface roughness gage | (B) | ○ | ○ |
| | Touch sensor (optical signal transmission type) OMP60 | (R) | ○ | ○ |
| | Touch sensor (optical signal transmission type) OMP600 | (R) | ○ | ○ |
| | Touch sensor (optical signal transmission type) OMP60 + workpiece setter function | (R) | ○ | ○ |
| | Touch sensor (optical signal transmission type) OMP600 + workpiece setter function | (R) | ○ | ○ |
| **Other** | | | | |
| Signal lamp | 4 colors (LED type: red, yellow, green, blue) | | ○ | ○ |
| Manual pulse generator (separate type) | | | ○ | ○ |

*1 Semi-dry device (Kuroda Precision or BLUEBE) <option> required.
*2 Zero sludge coolant tank (option) is essential.
*3 DMQP (DMG MORI Qualified Products)
*4 For the No. 50 taper machine, the 60-tool chip bucket is not available.
*5 Not compatible with oil-based coolant. If using oil-based coolant, select the HVS-220.
*6 It is recommended that the coolant chiller (option) be selected because the coolant temperature is expected to rise according to the specifications and cutting conditions.
*7 The specifications vary depending on the manufacturers. (M: made by Magnescale R: made by RENISHAW B: made by BLUM)
*8 Equipped with the high-speed spindle for which the spindle bearing uses a ceramic ball. So the energization type touch sensor cannot be used.

- DMQP: Please see Page 24 for details.
- For details, please check the Detailed Specifications.
- The information in this catalog is valid as of January 2019.
- Specifications, accessories, safety device and function are available upon request.
- Some options are not available in particular regions. For details, please consult our sales representative.

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

**<Precautions for Machine Relocation>**

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



+ If you have any questions regarding the content, please consult our sales representative.

+ The information in this catalog is valid as of January 2019. Designs and specifications are subject to changes without notice.

+ The machines shown in the catalog may differ from the actual machines. The location and the size of the nameplates may also differ from the actual machines, or the nameplates may not be attached to some machines.

+ DMG MORI is not responsible for differences between the information in the catalog and the actual machine.

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