

DMG MORI

High-Precision, High-Efficiency Multi-Axis Turning Center

NZX 4000 | 3000

NZX 4000



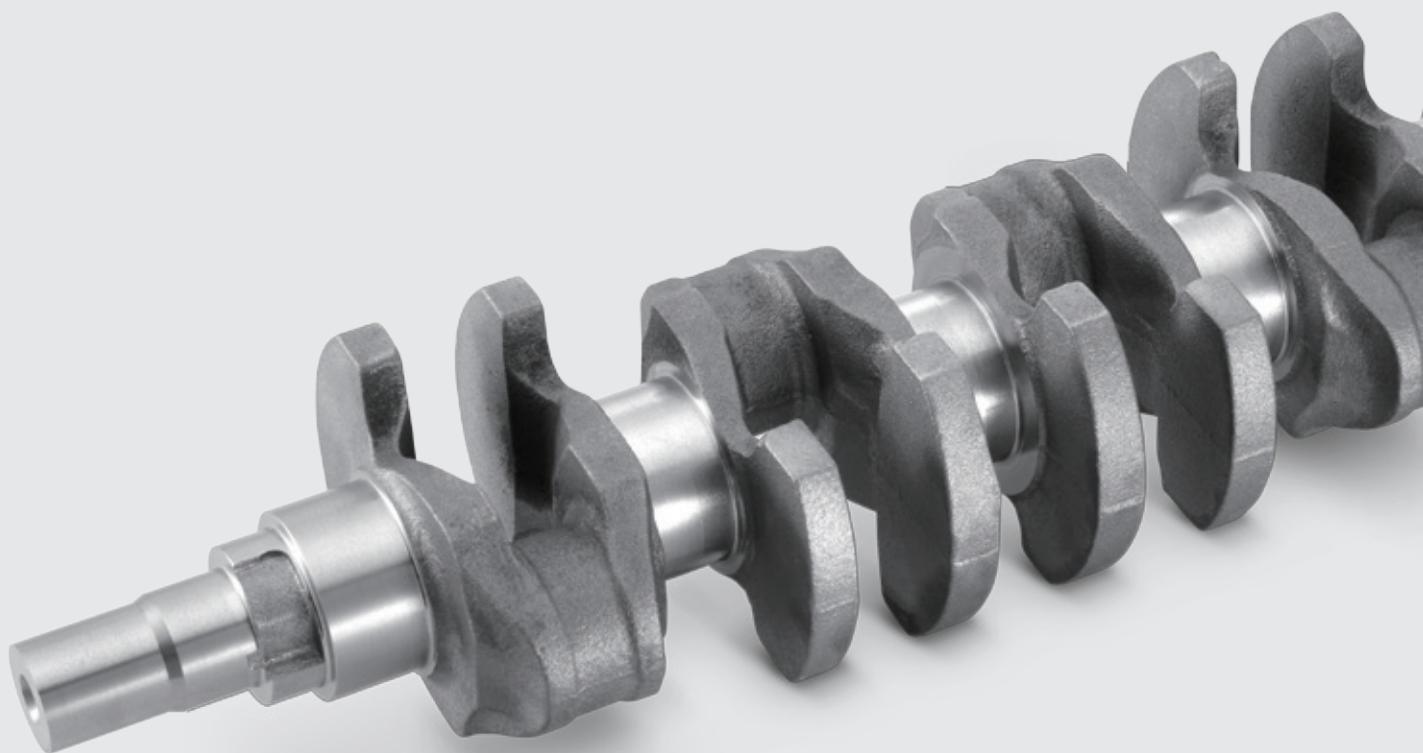
DMGMORI.COM

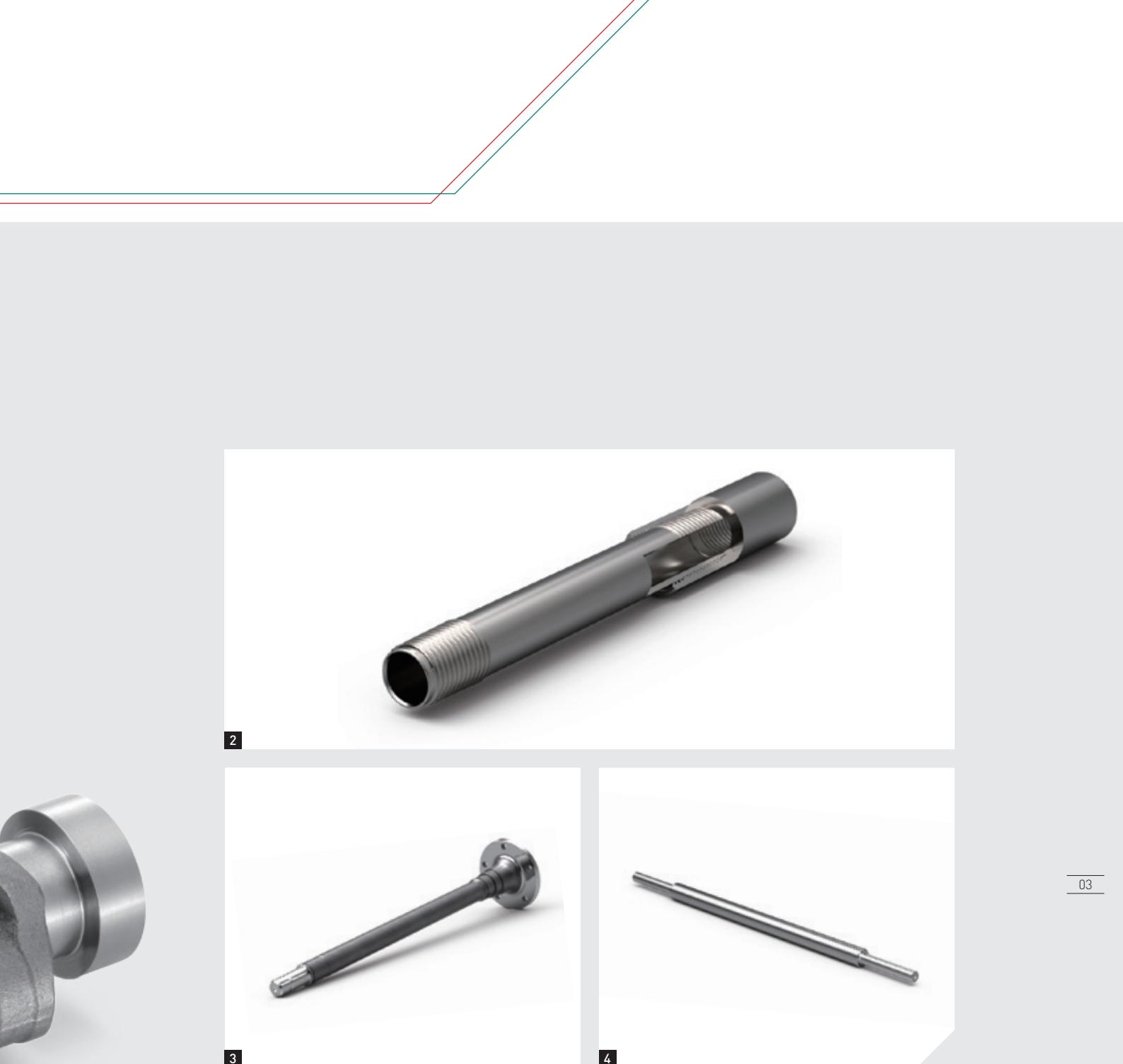
NZX 4000

Outstanding and Flexible Production Capacity

The NZX 4000 is a large multi-axis turning center that is equipped with two turrets and milling capability equivalent to that of a machining center with a No. 40 taper spindle.

The model achieves high productivity and high-accuracy machining of long and large-diameter workpieces. The NZX 4000 offers varieties of through-spindle hole diameters for various workpieces in a wide array of fields, from oil well pipes for the energy industry to large parts for the automotive, shipbuilding and construction machinery industries.





Boats & Ships

1 Crank shaft

Energy

2 Oil well pipe

Automobiles

3 Axle shaft

Industrial machinery

4 Ball screw

NZX 4000

High-efficiency Machining of Long and Large-diameter Workpieces with Two Turrets

Long and large-diameter workpieces such as oil well pipes are indispensable for the oil and energy industries. The NZX 4000 is a machine with high rigidity and high accuracy which are expected for machining of long and large-diameter workpieces, contributing to improvement of customers' productivity. The model comes with an operation system CELOS that enables operators to quickly access all the applications from the home screen. This allows operators to flexibly respond to every conceivable scene in production processes.

Milling <Option>

- + Turret equipped with BMT (Built-in Motor Turret)
- + Milling capacity rivalling machining centers with a No. 40 taper spindle
- + Maximum rotary tool spindle torque:
117 N · m (86.2 ft·lbf) <10%ED>

High rigidity

- + Robust trapezoidal bed with a high resistance to distortion and twisting
- + Stable turning and milling thanks to the wide sideways on all axes

High efficiency

- + Y-axis <Option> valued in its class for Turret 1 for effective process integration
- + Three through-spindle hole variations
< ϕ 145 mm (ϕ 5.7 in.),
Option: ϕ 185 mm (ϕ 7.2 in.), ϕ 285 mm (ϕ 11.2 in.)>

CELOS

- + Consistent administration, documentation and visualization of order, process and machine data
- + Expansion of functions possible by adding applications.
High affinity with existing information infrastructure and software.

Energy-saving

- + Function for energy-saving and Visualization of the effect

NZX 4000

Best Solutions for Your Shop Floor

The NZX 4000 provides solutions for higher machining accuracy, higher production efficiency by automation, better chip disposal, maintainability and setup performance. With various cutting-edge solutions, the NZX 4000 demonstrates its capabilities to the full extent and achieves a higher level of machining.

DMG MORI offers the best solutions that solve your shop issues.

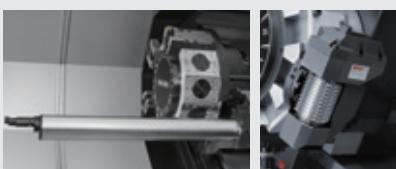
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1 Turret
For various types of machining



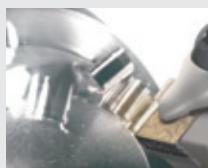
Milling

2 Tool holder
Special holder for various machining



Long boring bar Hob cutting holder

3 Spindle output
For heavy-duty cutting



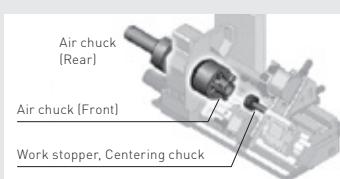
High output
45 / 37 kW [60 / 50 HP] <30 min / cont>
75 / 55 kW [100 / 75 HP] <30 min / cont>

4 Long workpieces
Chatter control

Alternating speed Hydraulic steady rest Hydraulic steady rest (Turret 2)

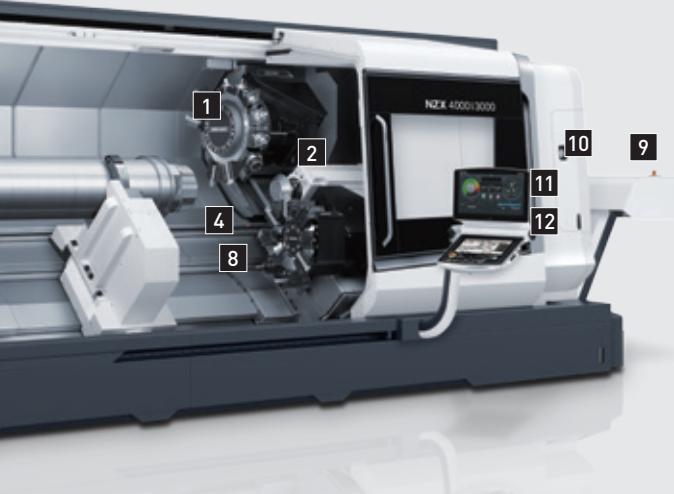
5 Workpiece support
Workpiece support suitable for your workpiece and machining

Hydraulic chuck Air chuck [Front]




6 Better setup performance
Drastically shortened setup time

Automatic in-machine tool presetter Internal steps



07

7

Mass production, automation

Versatility, labor saving,
quick setup changes

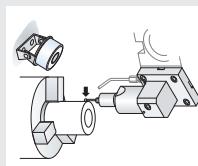


Robot system

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Machining accuracy

Meeting high accuracy requirements



In-machine measuring system



Full closed loop control
<Scale feedback> [Z, Y-axis]

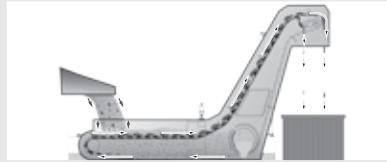


Coolant chiller

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Chip disposal

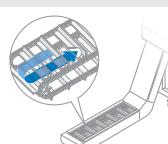
Higher cutting performance



Chip conveyor [Hinge type + Drum filter type]



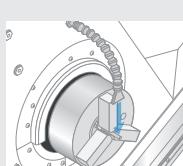
Chip conveyor [Hinge type]



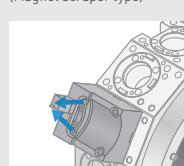
Chip conveyor
(Magnet scraper type)



Coolant gun



Coolant in upper part of chuck



Air blow [Tool tip]



Super-high pressure
coolant system

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Maintenance

Improved production efficiency by preventive maintenance



DMG MORI Messenger



Air dryer



Oil skimmer



Mist collector

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Monitoring

Monitoring of temperature
and flow amount



Electrical cabinet chiller



Coolant flow switch

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Cutting technology

Improving machining efficiency
with Technology Cycles all at once



Efficient Production Package
(High-speed canned cycle)



Multi-threading

NZX 4000

Varieties of Variations

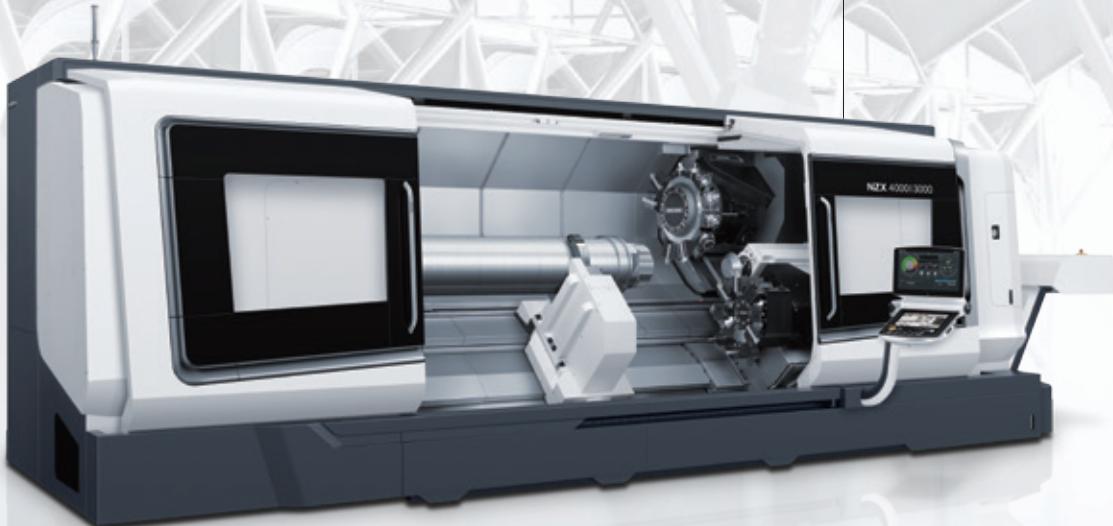
The NZX 4000 offers three types of through-spindle diameters:

$\phi 145$ mm ($\phi 5.7$ in.), $\phi 185$ mm ($\phi 7.2$ in.) and $\phi 285$ mm ($\phi 11.2$ in.).

The model offers the turning specification, milling specification and Y-axis specification, responding to various needs of a wide range of fields. Turret 1 allows for turning, milling and the Y-axis travel, and the Turret 2 for turning.

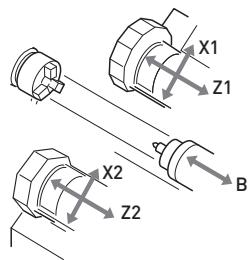
NZX 4000 | 3000

Distance between centers:
3000 type

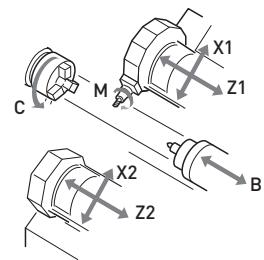


Variations

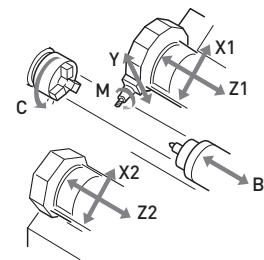
Turning specifications

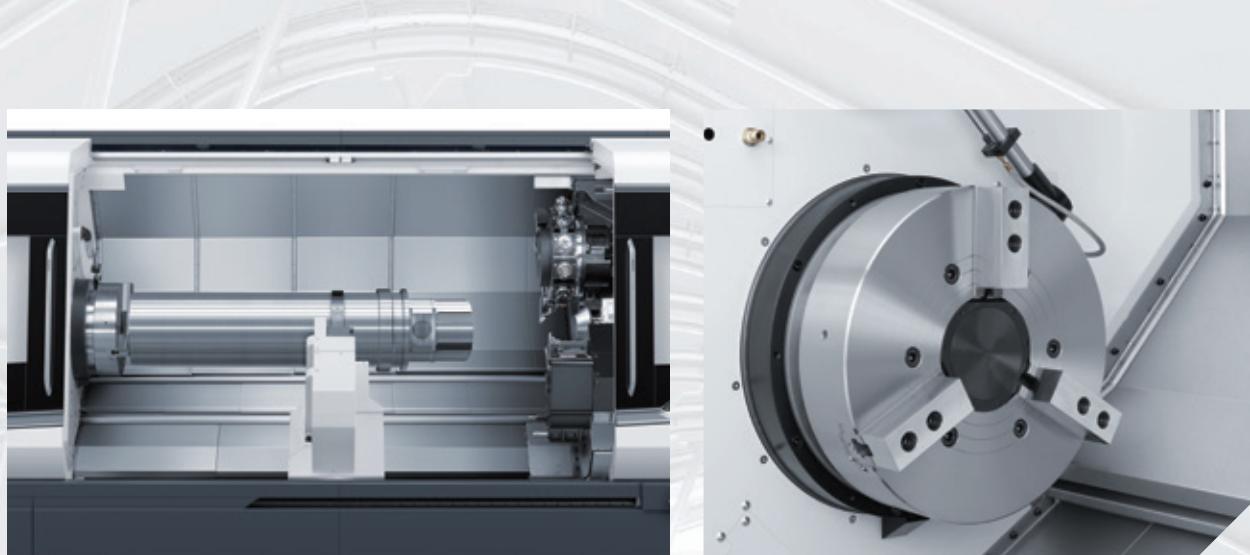


Milling specifications



Y-axis specifications





3 different variations for each of the specifications:
Turning / Milling / Y-axis

Specifications	Through-spindle hole diameter	Variations
Turning specifications	Ø145 mm (Ø5.7 in.)	3 models
	Ø185 mm (Ø7.2 in.)	
	Ø285 mm (Ø11.2 in.)	
Milling specifications	Ø145 mm (Ø5.7 in.)	3 models
	Ø185 mm (Ø7.2 in.)	
	Ø285 mm (Ø11.2 in.)	
Y-axis specifications	Ø145 mm (Ø5.7 in.)	3 models
	Ø185 mm (Ø7.2 in.)	
	Ø285 mm (Ø11.2 in.)	

Specifications	Turning specifications	Milling specifications	Y-axis specifications
Through-spindle hole diameter mm (in.)	Ø145 (5.7), Ø185 (7.2), Ø285 (11.2)		
Max. spindle speed min ⁻¹		Through-spindle hole diameter Ø145 mm (5.7 in.): 2,000 Through-spindle hole diameter Ø185 mm (7.2 in.): 1,500 Through-spindle hole diameter Ø285 mm (11.2 in.): 1,000	
Spindle drive motor (30 min / cont) kW (HP)		Through-spindle hole diameter Ø145 mm (5.7 in.): 37/30 (50/40), 45/37 (60/50) Through-spindle hole diameter Ø185 mm (7.2 in.): 37/30 (50/40), 45/37 (60/50), 75/55 (100/75) <Voltage 400 V> Through-spindle hole diameter Ø285 mm (11.2 in.): 37/30 (50/40), 45/37 (60/50), 75/55 (100/75) <Voltage 400 V>	
Number of tool stations	No.1: 12 No.2: 8		No.1: 12 (Rotary tool: 12) No.2: 8
X-axis mm (in.)		No.1: 385 (15.1) No.2: 235 (9.2)	
Travel Y-axis mm (in.)	—		±70 (2.7)
Z-axis mm (in.)		No.1: 3,100 (122.0) No.2: 3,000 (118.1)	

No.1: Turret 1 No.2: Turret 2

NZX 4000

High-rigidity structure ensures stable machining in heavy-duty cutting

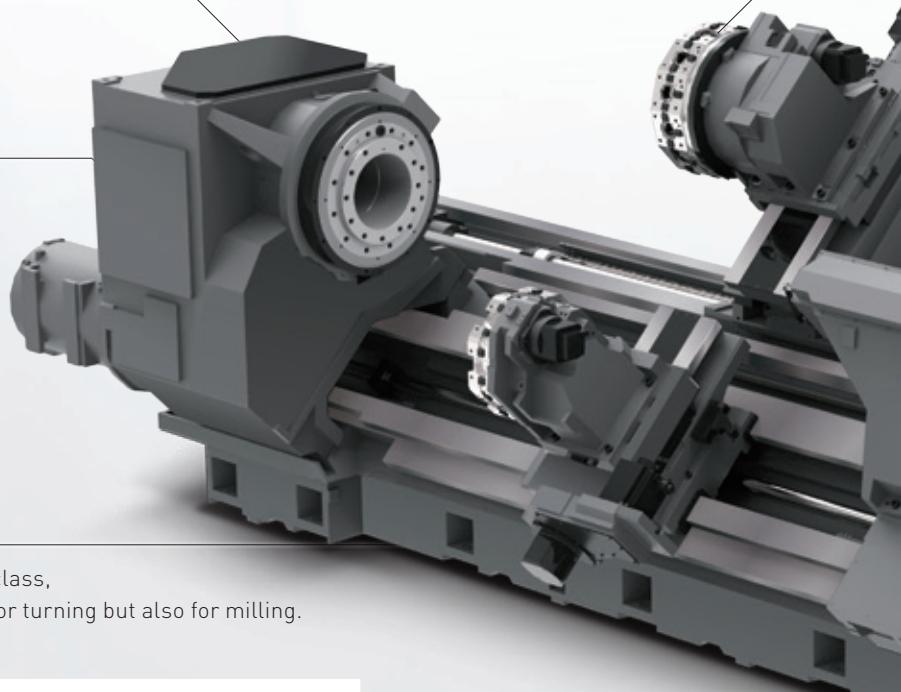
The NZX 4000 drastically improves machine rigidity by employing wide slideways on all axes and a robust trapezoidal bed that is highly resistant to distortion and twisting. The high-rigidity machine body delivers stable machining performance in heavy-duty cutting as well as turning and milling.

In-house manufactured high-rigidity spindles

- + Highly reliable spindles with controlled thermal displacement
- + Beltless drive with a built-in motor
- + High output and high torque via gears

Robust bed

- + Highly rigid, stable heavy-duty cutting with wide slideways.
- + The basic structure using thick trapezoidal bed offers high torsional rigidity.



Guideway width

- + With the largest width of slideways in its class, we have achieved stable cutting not only for turning but also for milling.





Milling turret

<Mill specification, Y-axis specification>

- + Highest output and torque in its class
- + BMT (Built-in Motor Turret) with high energy transmission efficiency controls heat generation and vibration.

BMT: Built-in Motor Turret

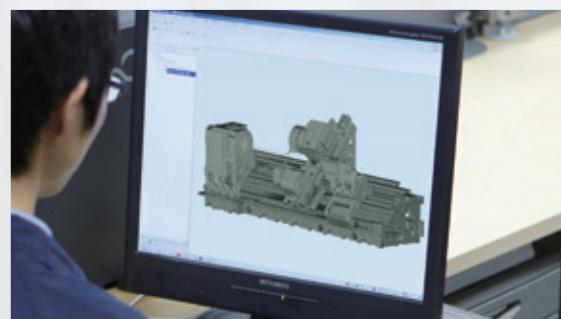
Large-diameter ball screws

- + High-accuracy large diameter ball screw for stable feed

FEM analysis

- + 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



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High-rigidity tailstock

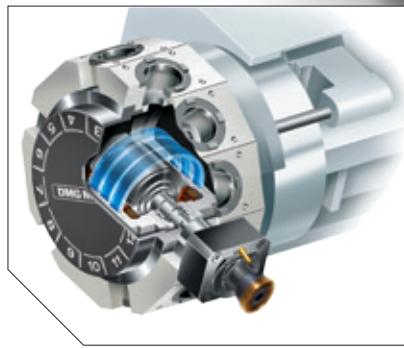
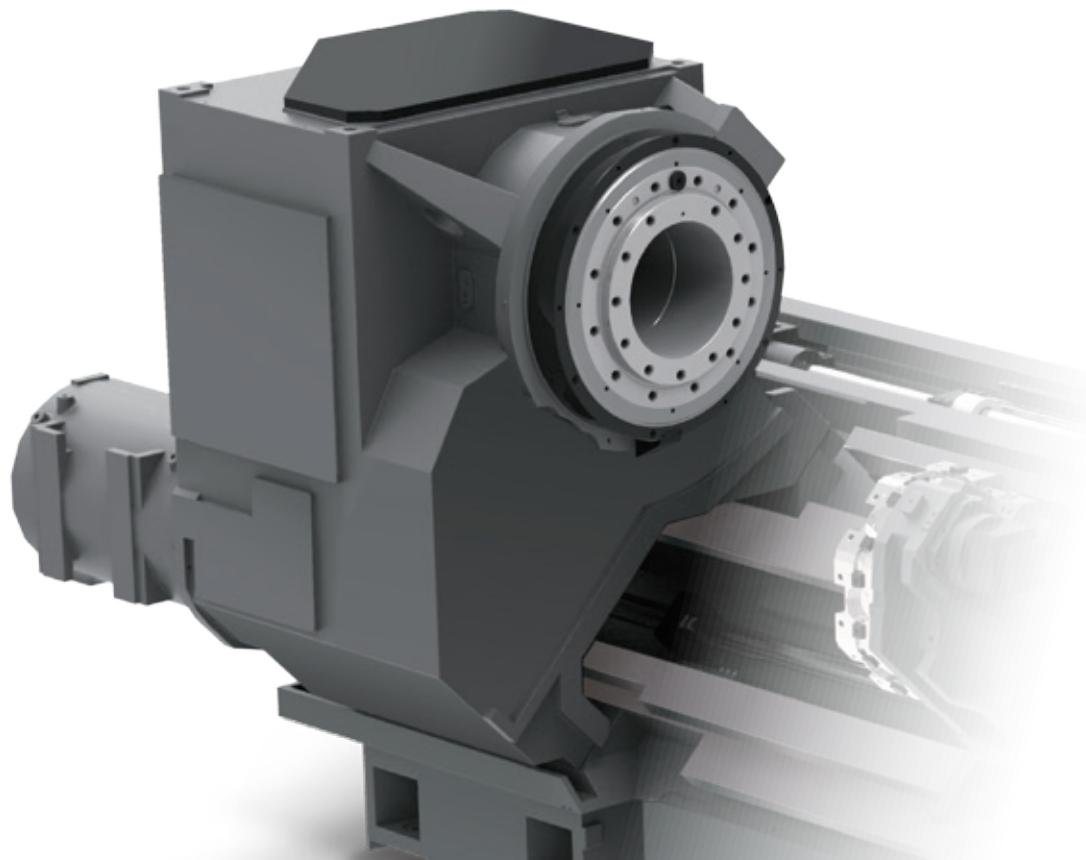
- + Programmable tailstock:
Easy positioning to any predetermined position



NZX 4000

Complete Thermal Displacement Control

Thermal displacement has a great impact on machining accuracy. The major factors include heat generation during machining operation, ambient temperature changes and coolant temperature rises. DMG MORI thoroughly examines each of the factors from every angle, and tackles the issue with the company's original controlling method. For the spindle motor which is the largest heat source, an spiral oil jacket is arranged around the spindle to its rear end to control temperature rise.



Built-in motor turret with oil jacket

<Millling specification, Y-axis specification>

The spiral oil jacket is also arranged around the rotary tool spindle motor on the turret to control thermal displacement caused by a temperature rise, achieving high machining accuracy.



Full closed loop control <Scale feedback>*



- + Superior precision with the Magnescale full closed loop control (Scale feedback)
- + Magnetic measuring system with a high resolution of 0.01 µm
- + Resistance to oil and condensation due to a magnetic detection principle
- + Impact resistance of 450 m/s² (17,716.5 in./s²)
- + Vibration resistance of 250 m/s² (9,842.5 in./s²)
- + Thermal expansion coefficient as cast iron

* X1- / X2-axis: Standard, Y- / Z-axis: Option

Spindle cooling



Oil chiller

The spindle, the largest heat source, employs the structure that maintains a uniform temperature around the spindle. The spindle motor employs an oil jacket, and the front side of the headstock uses cooling oil to control temperature rise around the spindle.

- Temperature-controlled cooling oil is forcibly circulated into the spindle.

Bed with a cover



Since the bed is entirely covered, it is hardly affected by heat from chips at all.

Coolant chiller [Separate type] <Option>



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

**When using oil-based coolant or a super-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.

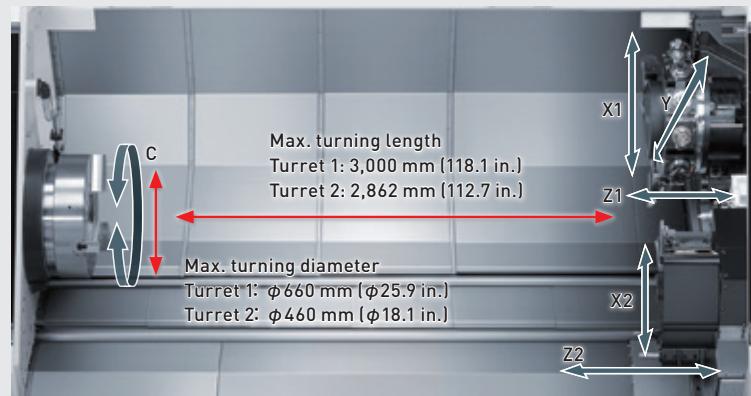
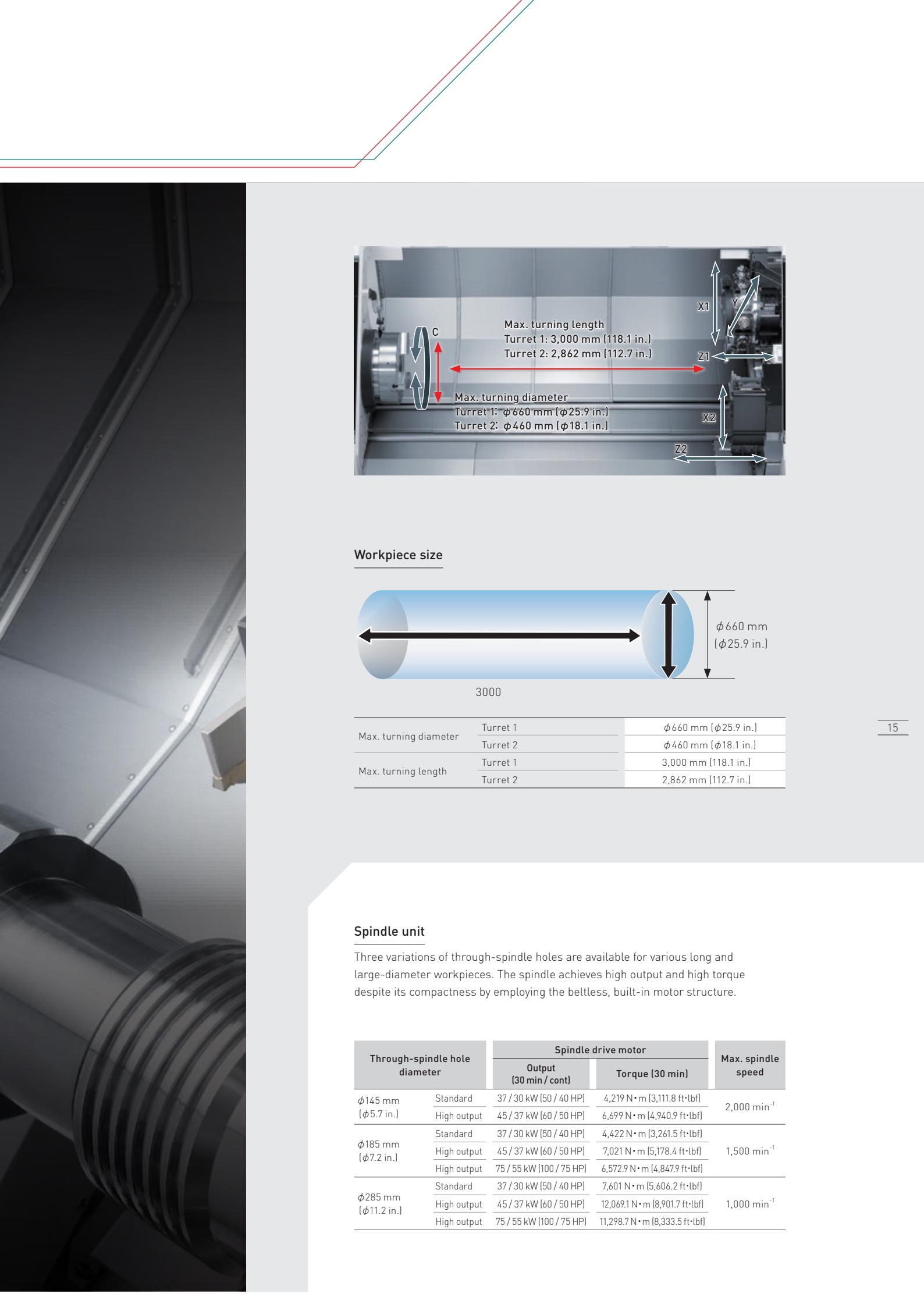
● We cannot guarantee that this unit will completely control the coolant temperature.
It is designed to help prevent oil temperature increases.

A high-contrast, black and white close-up photograph of a precision machine spindle. The image shows a large, circular, multi-hole workpiece being held by a chuck. A long, cylindrical spindle extends from the right side, featuring a flange with several mounting holes. The background is dark and out of focus, emphasizing the metallic textures and precision engineering of the machinery.

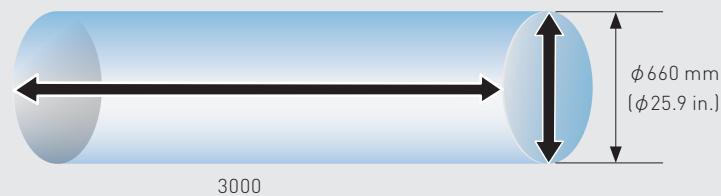
NZX 4000

High-output Spindle Units for Various Workpiece Sizes

The NZX 4000 is equipped with a highly reliable spindle considering thermal displacement control. The robust and beltless built-in motor spindle mechanism ensures high-output and high-torque machining. The model offers three variations of through-spindle hole diameters of $\phi 145$ mm ($\phi 5.7$ in.), $\phi 185$ mm ($\phi 7.2$ in.) and $\phi 285$ mm ($\phi 11.2$ in.) so that customers can choose the optimal spindle according to their needs.



Workpiece size



Max. turning diameter	Turret 1	φ660 mm [φ25.9 in.]
	Turret 2	φ460 mm [φ18.1 in.]
Max. turning length	Turret 1	3,000 mm [118.1 in.]
	Turret 2	2,862 mm [112.7 in.]

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Spindle unit

Three variations of through-spindle holes are available for various long and large-diameter workpieces. The spindle achieves high output and high torque despite its compactness by employing the beltless, built-in motor structure.

Through-spindle hole diameter	Spindle drive motor			Max. spindle speed
	Output (30 min / cont)	Torque (30 min)		
φ145 mm (φ5.7 in.)	Standard	37 / 30 kW (50 / 40 HP)	4,219 N·m (3,111.8 ft·lbf)	2,000 min ⁻¹
	High output	45 / 37 kW (60 / 50 HP)	6,699 N·m (4,940.9 ft·lbf)	
φ185 mm (φ7.2 in.)	Standard	37 / 30 kW (50 / 40 HP)	4,422 N·m (3,261.5 ft·lbf)	1,500 min ⁻¹
	High output	45 / 37 kW (60 / 50 HP)	7,021 N·m (5,178.4 ft·lbf)	
	High output	75 / 55 kW (100 / 75 HP)	6,572.9 N·m (4,847.9 ft·lbf)	
φ285 mm (φ11.2 in.)	Standard	37 / 30 kW (50 / 40 HP)	7,601 N·m (5,606.2 ft·lbf)	1,000 min ⁻¹
	High output	45 / 37 kW (60 / 50 HP)	12,069.1 N·m (8,901.7 ft·lbf)	
	High output	75 / 55 kW (100 / 75 HP)	11,298.7 N·m (8,333.5 ft·lbf)	

NZX 4000

A variety of turrets for multi-axis machining of large-diameter shafts

The 12-station Turret 1 comes with the BMT as standard (Milling specification / Y-axis specification). The built-in motor construction of the BMT eliminates heat-generating power transmission mechanisms, while controlling thermal displacement by jacket cooling.

This leads to higher milling accuracy and cutting forces equivalent to those of a machining center with a No. 40 taper spindle.

Built-in Motor Turret <Mill specification, Y-axis specification>



The built-in structure, in which the motor is placed inside the turret, minimizes heat generation and vibration, improves transmission efficiency and significantly increases cutting power, speed and accuracy.

Turret temperature increases

Compared with conventional machine:
1/10 or less

Vibration amplitude

Compared with conventional machine:
1/3 or less

Effects of the BMT

- + Improved milling power
- + Improved milling accuracy
- + Controls the turret's heat and vibration
- + Reduced energy loss



BMT: Built-in Motor Turret

Turret variations

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Item	Turning specifications	Milling specifications	Y-axis specifications
Number of tool stations	Turret 1	12 tools	0.4 sec.
	Turret 2	8 tools	
Turret indexing time	1-station		
Number of rotary tool stations	Turret 1	12 tools	
Rotary tool spindle drive motor	30 min / cont	11 / 7.5 kW (15 / 10 HP)	
Max. rotary tool spindle speed		3,500 min ⁻¹	

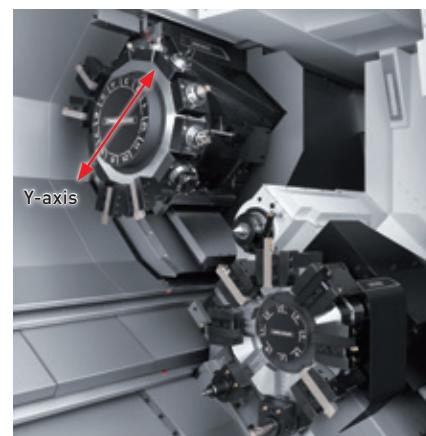
● The milling function is available for only Turret 1.

Y-axis specification

Y-axis for Turret 1 for effective process integration

Turret 1

Travel: ±70 mm (±2.7 in.)



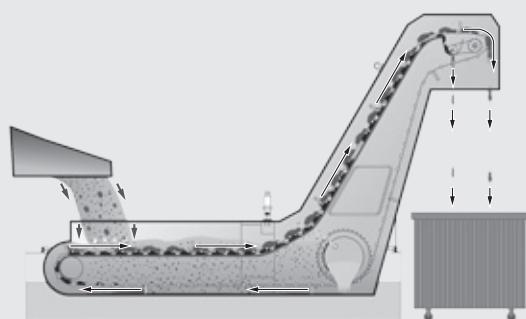
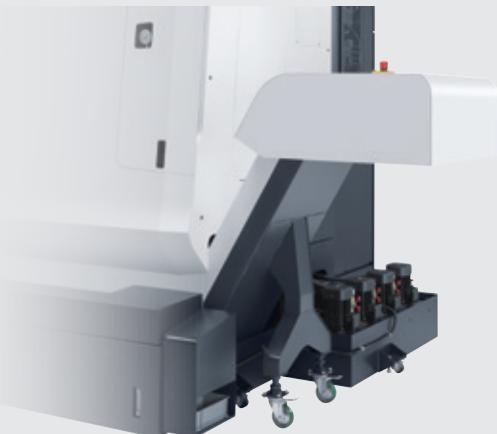
NZX 4000

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.



Hinge type + Drum filter type chip conveyor

Handling of different types of chips and coolant filtration (Option)

With the hinge type conveyor for long chips and the cleats (scrapers) on the hinge belt for short and fine chips, the conveyor can handle any type of chip regardless of size and material.

The filter with the low-maintenance automatic washing function ensures high accuracy coolant filtration.

Chip conveyor (Option)

Handles various types of chips and ejects them in a highly efficient way.

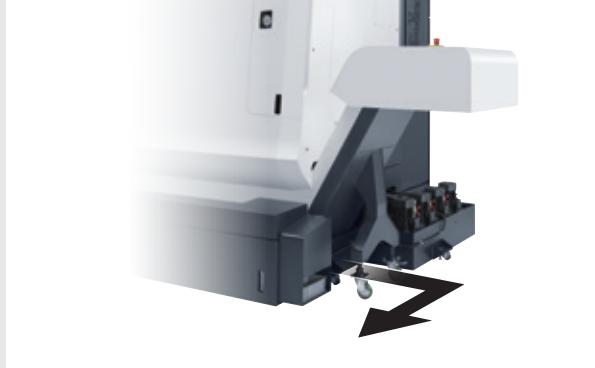
Workpiece material	Steel	20 mm [0.8 in.]	
Chip form	Long	Short	Powdery
Hinge type + Drum filter type	○	○	△*
Hinge type	○	—	—
Magnet scraper type	—	○	△*

* Depending on chip size, chips may pass through the filter and the conveyor and accumulate in the coolant tank. Due to possible effect on machining accuracy, a second filtration device may need to be considered.

● Please consult our sales representative if the chip length exceeds 200 mm [7.9 in.].

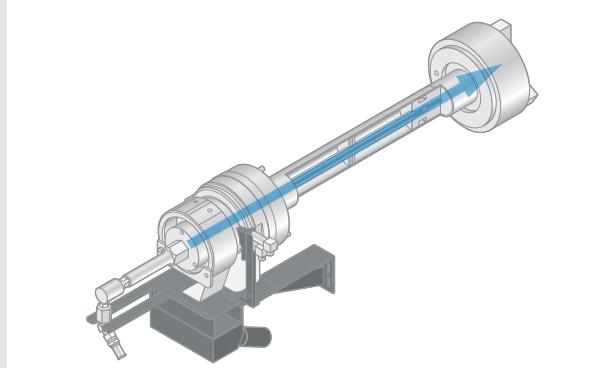
● [Chip size criteria] Powdery: minute particles / Short: 50 mm [2.0 in.] or less in length, $\phi 40$ mm [$\phi 1.6$ in.] or less in diameter [a lump of chips] / Long: over 50 mm [2.0 in.]

The coolant tank pulls out to the front



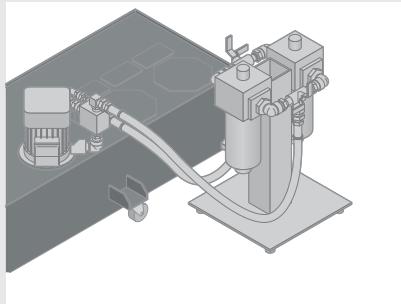
It does not take extra space to clean the coolant tank because it can be pulled to the front when the chip conveyor is moved 250 mm (9.8 in.) to the right.

Through-spindle coolant system (Option)



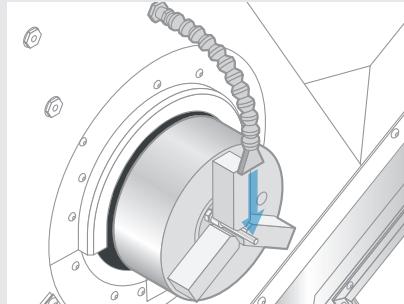
Coolant supplied through the center of the chuck removes chips generated during I.D. machining.

Coolant line filter (Option)



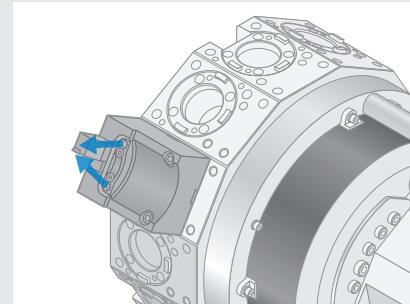
It removes foreign matter in the coolant coming from the coolant pump. The filter clogging detection function is available.

Coolant in upper part of chuck (Option)



Coolant supplied from above the chuck removes chips and minimizes heat generation in the workpiece.

Air blow (Tool tip) (Option)



Air is blown toward the tool tip to blow away chips adhering to the tool.

○: Suitable △: Consideration required —: Not suitable

Cast iron		20 mm [0.8 in.]	Aluminum, non-ferrous metal		20 mm [0.8 in.]
Short	Powdery		Long	Short	Powdery
○	△*		○	○	△*
—	—		—	—	—
○	—		—	—	—

- 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.

NZX 4000

Pursuit of Usability

In order to achieve greater operating efficiency, DMG MORI incorporated various technologies and features throughout the machines focusing on operability and maintainability. We have reduced MTTR (Mean Time To Repair) through an in-depth analysis of customer needs, which include a wide door opening for improved work efficiency and ease of maintenance. Necessary improvements to make daily and periodic inspections easier were also made so that the machines can always run in the best condition.

Wide door opening

A wide door opening improves efficiency of setups.

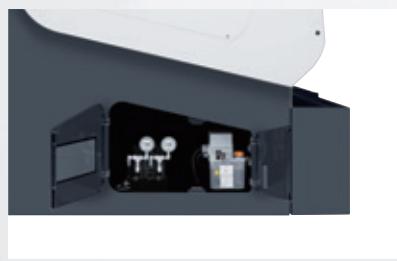


+ Door opening: 3,340 mm (131.5 in.)



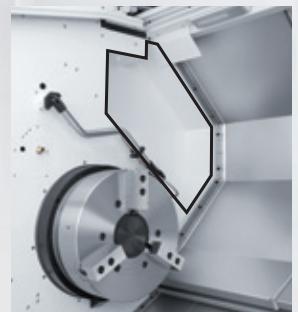
Chuck pressure gage

Easy adjustment on the left side of the machine



Interference prevention pocket

The chuck cover is provided with a pocket to accommodate tool overhang, preventing interference.



Lubricating oil tank (For slideways)

The supply port of the Lubricating oil (for sliding surfaces) tank is placed on the front side of the machine so that oil can be easily supplied.



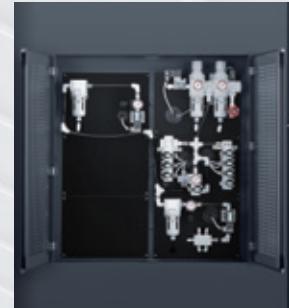
Detachable internal step (Option)

The detachable inner step allows easier setups, such as attaching or removing tool holders and cutting tools to or from the turret.



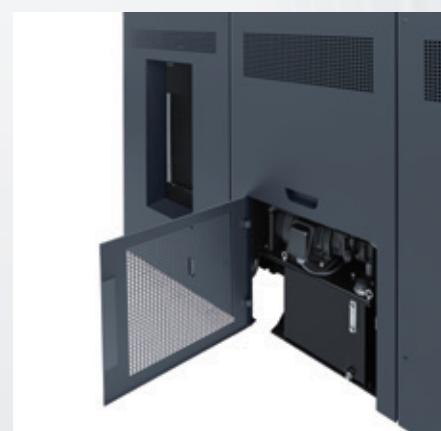
Air devices

All the pneumatic devices are placed on the right side of the machine to secure maintainability.



Oil chiller, Hydraulic unit

The oil chiller and hydraulic unit are arranged at the back of the machine for easy access.



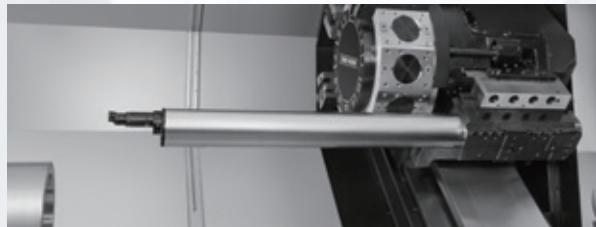
NZX 4000

Solutions Best Matched to Customers' Needs

The NZX 4000 provides solutions suited for machining of long and large-diameter workpieces.

Machining with long boring bars

Long boring bar specifications (Option)



- + The long boring bar allows long, I.D. boring.
<A diameter of $\phi 90$ mm ($\phi 3.5$ in.) and a length of up to 1,000 mm (39.3 in.)>

Milling

<Mill specification, Y-axis specification>

High-output and high-torque BMT (Build-in Motor Turret)

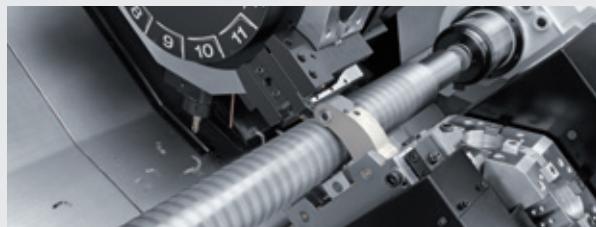


- + Cutting ability equivalent to that of a machining center with a No. 40 taper spindle

BMT: Built-in Motor Turret

Machining of long workpieces

Turret 2 steady rest (Option)



- + The holding position can be flexibly set according to the workpiece length.
- Tools cannot be attached to the station to which the steady rest is mounted and the stations on the both sides.

Steady rests specifications <Option>



- + Connected with Turret 1 for positioning, up to 2 units can be mounted

Holding diameter: $\phi 80$ mm ($\phi 3.1$ in.) - $\phi 390$ mm ($\phi 15.3$ in.)

Machining of oil well pipes

Machining of oil well pipes <Air chuck (Front, Rear), Centering chuck> [Option]

- + The high-accuracy machining can be performed by holding workpieces with the front and rear chucks.



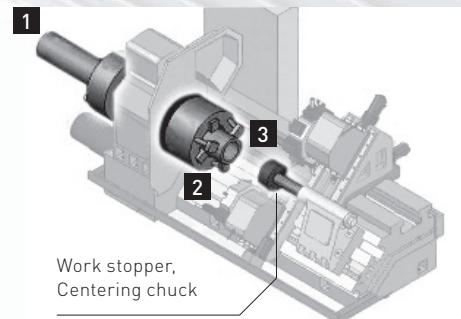
Air chuck (Rear)



Air chuck (Front)



Thread cutting of pipe materials



Easier setups

Manual in-machine tool presetter (Option)



- + This allows highly efficient tool measurement, improving ease of setup.

Internal steps (Option)

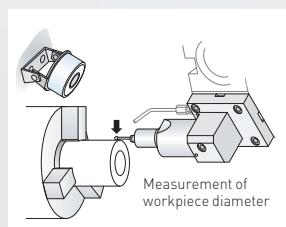


- + Removable to achieve higher safety and outstanding workability inside the machine

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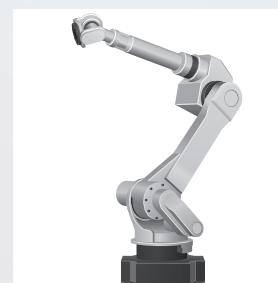
Support for automation

In-machine measuring system (Option)



- + Measurement, input of offset values and re-machining of high-accuracy areas can be automatically done.

Workpiece transfer robot (Consultation is required)



- + Robots achieve high-efficiency workpiece loading / unloading and transfer for a higher productivity

NZX 4000



DMG MORI Qualified Products

One-stop Service for Various Needs

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

Bar feeder

Shaping

Oil skimmer

Rotary window

Super-high pressure coolant system

Hydraulic steady rest

Mist collector

Measuring

In-machine tool presetter

External tool measurement

In-machine measuring system (Workpiece)

Surface roughness measuring system

Monitoring

Electrical cabinet chiller

Coolant chiller

Coolant float switch

Signal lamp

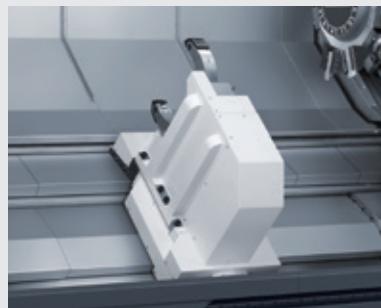
● The options above are examples. For details, please consult our sales representative.

DMQP: DMG MORI Qualified Products

Signal lamp



Hydraulic steady rest



Mist collector



Super-high pressure coolant system



External chip conveyor



Coolant chiller



Air dryer



Air compressor



Oil skimmer



Coolant flow switch



Tool cabinet



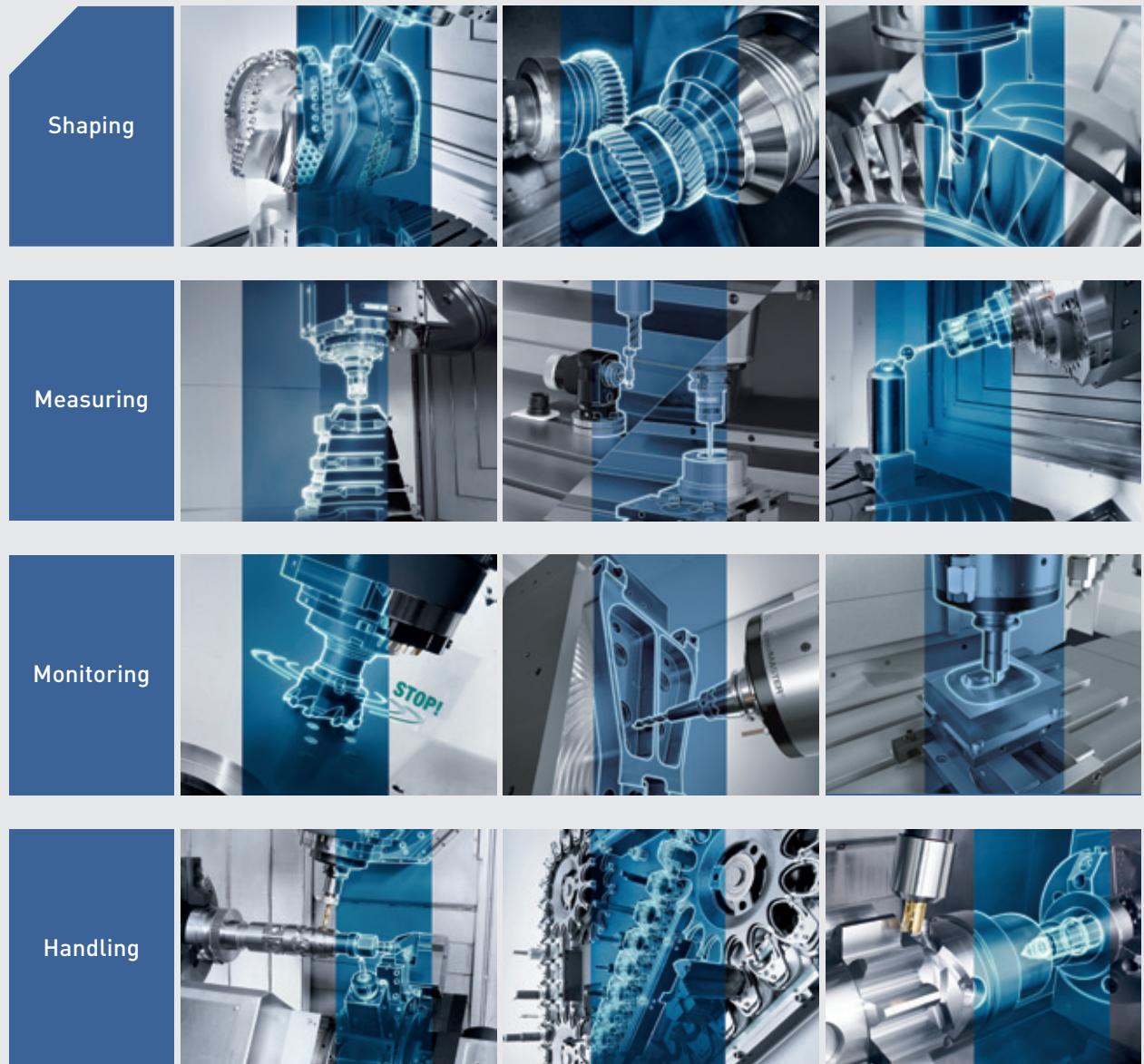
In-machine tool presetter



NZX 4000

DMG MORI Technology Cycles

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



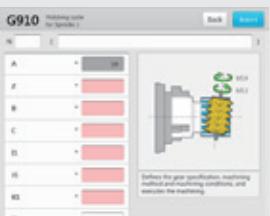
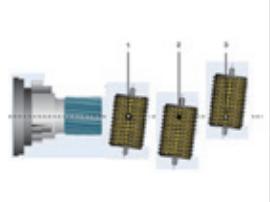
- The availability of the functions differ depending on the machine. For details, please consult our sales representative.
- The above is an image picture.

Respond to Various Technology Cycles

Shaping

Gear hobbing^{*1}



Issue (Before introduction)	Results (After introduction)
 <p>*2</p> <ul style="list-style-type: none">+ A gear machine is needed. After blank machining with a turning machine, gear machining needs to be performed with a gear machine after setup changes+ Want to extend the tool life of expensive hob cutter	 <p>+ Hobbing program can be easily created by conversational input</p>  <p>+ Hob cutter's machining position can be changed, maximizing the tool life</p>  <p>+ Consolidation of machining operations into the general-purpose machine reduces setup time and enhances accuracy such as concentricity due to no setup change</p>

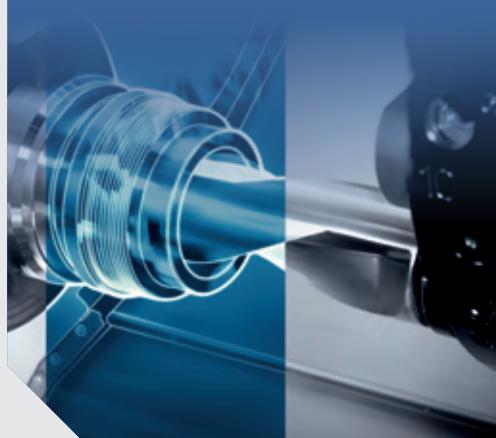
*1 Available only for the Y-axis specification

*2 <Reference> Wikipedia: Hobbing; <https://ja.wikipedia.org/wiki/%E3%83%9B%E3%83%96%E7%9B%A4> [Quoted on September 19, 2018]

Monitoring

Easy tool monitoring

Monitoring load of spindle and traveling axes

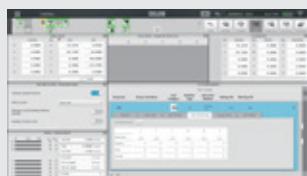


Issue (Before introduction)

- + Abundant experience is needed to set cutting conditions
- + Want to prevent tool breakage and machine failure
- + Difficult to monitor load to the spindle and tools at all times

Results (After introduction)

- + Conditions can be set in advance, enabling digital cutting management not dependent on experience or expertise
- + Can reduce tool breakage and maintenance cost by maximizing the capacities of the tools and machine
- + Load to the traveling axis and spindle during machining is monitored at all times, and the machine stops when abnormal values are detected



Shaping

gearSKIVING*

High-speed gear cutting including internal teeth



Issue (Before introduction)

- + Not sure how to create a program because it involves a special machining technique
- + Require multiple processes with a gear machine and a cutting machine

Results (After introduction)

- + Can easily program a machining technique called gear skiving
- + Internal teeth that cannot be machined by hobbing can be cut
- + Consolidation of processing operations into the general-purpose machine reduces setup time and enhances accuracy such as concentricity due to no setup change



Handling

Alternating speed

Stable machining in which chatter hardly occurs



Efficient High-precision



Issue (Before introduction)

- + Chatter occurs when using tools under its recommended conditions
- + Vibration in deep hole drilling using a long drill should be suppressed

Results (After introduction)

- + Cutting resistance is changed by periodically changing the rotation speed of the spindle. This helps suppress chatter and enhance cutting conditions, which lead to shorter machining time
- + Surface quality is improved




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Shaping

Multi-threading

Cutting special thread



Efficient



Issue (Before introduction)

- + Hope to cut special thread shapes
- + Hope to simplify complicated programming

Results (After introduction)

- + Easily create various thread shapes by conversational programming
- + Create a machining program of a special shape thread on the machine without CAD / CAM



Triangle



Round



Square



Buttress



Trapezoidal



Shaping

Excentric machining

Easy programming of excentric machining



Efficient High-precision

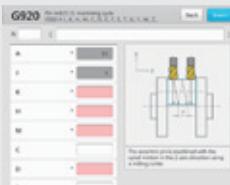


Issue (Before introduction)

- + Hope to perform excentric machining processes on one machine
- + Expensive jigs for excentric machining are necessary

Results (After introduction)

- + Reduce setup time by consolidating machining operations performed with a special machine into a general-purpose machine
- + Complicated program for excentric machining can be created using the conversational programming style
- + Compatible with both turning and milling to achieve efficient machining
- + Require no eccentric machining jigs



Handling

Multi-tool

Maximizing number of tools & minimizing non-cutting time



Efficient



Issue (Before introduction)

- + Multiple tools are required to handle various machining operations
- + More than one tool is mounted to one station in some cases, making their management complex
- + Including spare tools, it is necessary to prepare more tools than the number of turret stations

Results (After introduction)

- + Tool compensation setting and life management can be easily performed for multiple tools of each station
- + Operator can set optimum tool information for each tool and maximize the number of tools
- + Prevent tool breakage and enhance production efficiency by switching to spare tools according to the operating time of the set tool

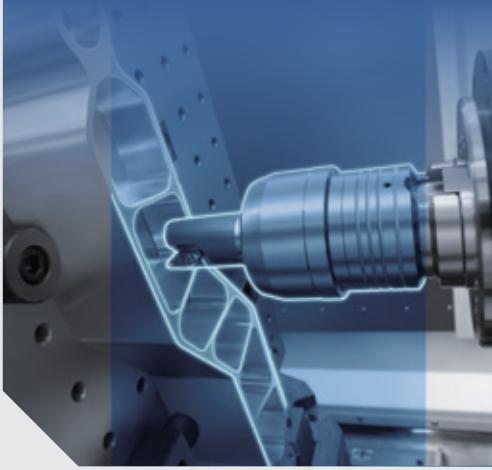


Shaping

Efficient Production Package (High-speed canned cycle)

Easy inputting of various machining patterns

Efficient Safe High-precision

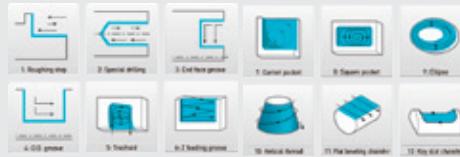


Issue (Before introduction)

- + Taking much time to create programs for complicated shapes and many holes
- + Mistakes resulting from large quantity of calculation

Results (After introduction)

- + A program will be automatically created just by entering a complex shape in a conversational style
- + Safe cutting is ensured by confirming cutting details using the simulation function
- + Optimal tool path and cutting conditions enhance cutting quality



Handling

Retraction cycle

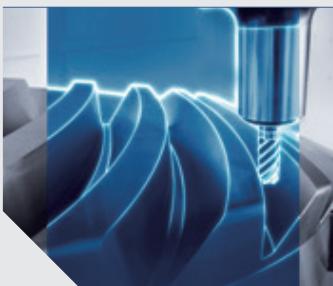


Automation allows for easy return to the zero return position without errors

- + Operational efficiency is enhanced, as one button push will enable return to the zero return position in the preset order
- + Can customize the order of axes to be moved according to the condition
- + Enhance efficiency of setup operation
- + Reduce the risk of accident

Shaping

DMG MORI gearMILL*



Integrating gear cutting into Turning / Milling

- + PC software for gear cutting
- + All processes of Turning, Milling, and gear cutting are done on one machine
- + Investment cost can be reduced by use of commercially available tools and generalpurpose machines

* Available only for the milling or Y-axis specification.



Efficient

Safe



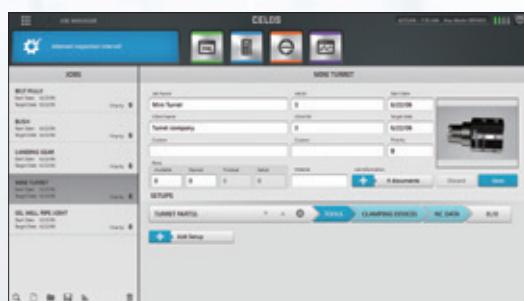
Efficient High-precision

NZX 4000

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

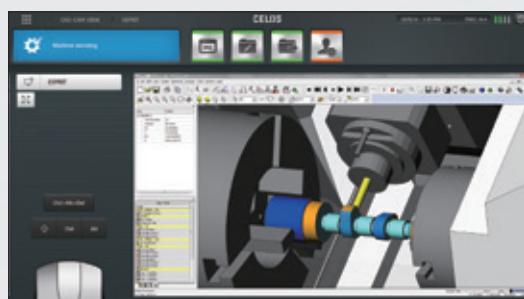
- + Machine related creation and configuration of new work orders
- + Structured storage of all production related data and documents
- + Easy visualization of job information on drawings, models, tools, fixtures, etc.



JOB ASSISTANT

Process-defined orders

- + Menu guided set-up of the machine and conversational processing of production orders
- + Reliable error prevention thanks to windowsbased 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 |

APP MENU:

Central access to all available applications



ERGOline Control
with 21.5-inch
multi-touch-screen
and MITSUBISHI

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

NZX 4000

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.

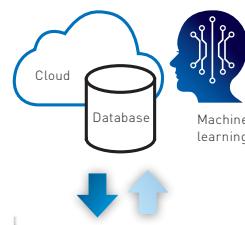
* An industrial society in which new added value will be created through connected humans, machines, and technologies – A new vision for the future of Japanese industries that the Ministry of Economy, Trade and Industry advocates.



AI-based thermal displacement compensation (Ultra Thermal Precision)

Research is underway toward the practical use of thermal displacement compensation based on AI-based information analysis.

- + In order to improve machining accuracy, AI estimates and compensates thermal displacement by learning the information received from the sensors mounted on the machine.
- + The speed of learning is effectively improved by accumulating data from multiple machines in a single server for integrated data management.



The speed of learning is increased by accumulating data from multiple machines in the DMG MORI's server for integrated data management.

Machine status monitoring

Various machine data generated by sensors can be easily checked on the CELOS.

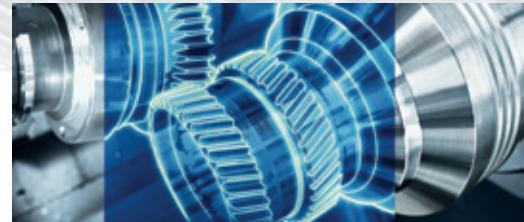


Each monitoring value is displayed in an easy-to-understand manner.

CELOS Machine Extremely Easy-to-Use Machine

- + This machine is loaded with the cutting-edge operating 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.)



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

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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 Club



Continuously supporting your productivity improvements

- + Latest functions always available through version upgrades
- + Centralized machine management and streamlined programming

● Japan only.

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.

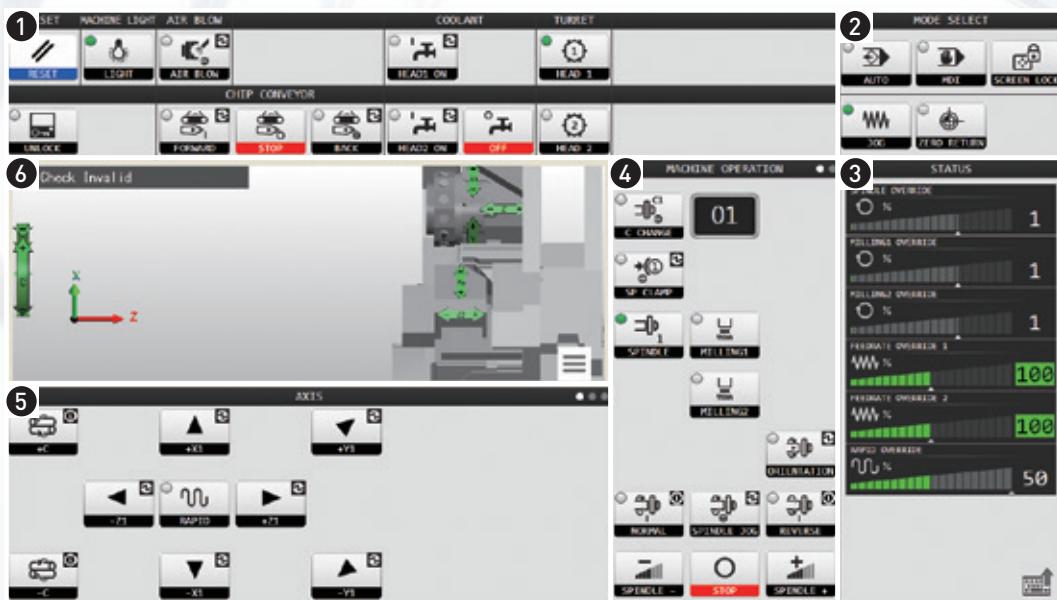
NZX 4000

High-Performance Operation System MAPPS V

MAPPS V is a smart operation system mounted on CELOS.
It enables operators to easily control machine operation with touch operation.



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



Lower Touch Panel Screen Layout

- ① Individual function operation area : Displays function buttons at all times regardless of the operation mode.
- ② Operation mode selection area : Displays mode selection buttons at all times.
- ③ Status display area : Displays the override status.
- ④ Machine operation area : Displays buttons related to spindle / turret operation and optional functions over multiple pages.
- ⑤ Mode-by-mode operation area : Displays buttons related to axis feed, zero return or automatic operation over multiple pages. The available buttons will change depending on the mode selected.
- ⑥ In-machine display area : Displays the image showing the controlled axes and their travel directions.

NZX 4000

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 cutting 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 CO₂ emission amount

GREENmode

GREEN monitoring

- + Visualize power consumption and CO₂ emission amount on the CELOS operation screen



GREEN device

- + High-brightness LED light

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

- + Quicken standard M codes
- + Inverter-controlled coolant supply



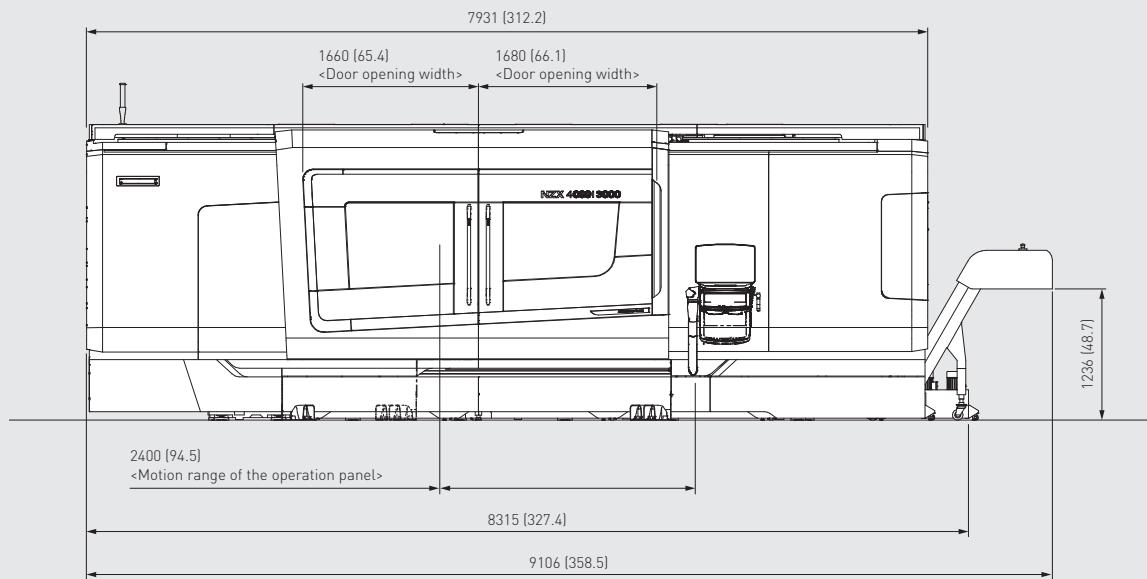
NZX 4000

Machine size

NZX 4000 | 3000

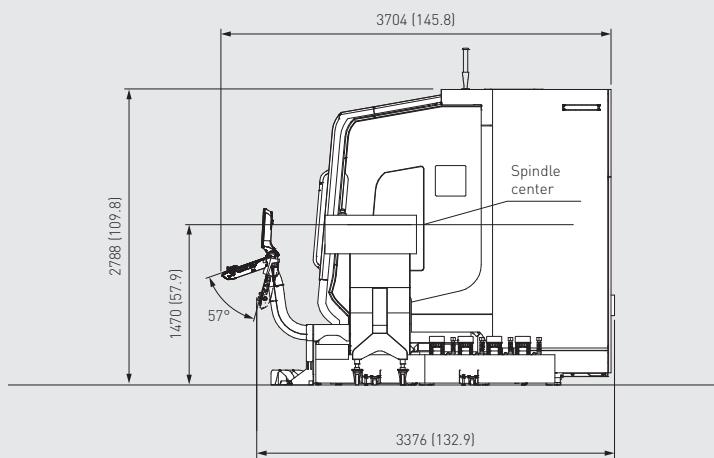
mm (in.)

Front view



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Side view



Q56277A01

NZX 4000

Machine specifications

NZX 4000 3000					
Basic specification		T1	T2	S	TS
Optional specifications	—			MCI	
Capacity					MCI Y1
Swing over bed	mm (in.)			930 [36.6]	
Max. turning diameter	mm (in.)			No.1: $\phi 660$ [$\phi 25.9$] No.2: $\phi 460$ [$\phi 18.1$]	
Travel					
X-axis travel	mm (in.)			No.1: 385 [15.1] No.2: 235 [9.2]	
Y-axis travel	mm (in.)	—			± 70 [± 2.7]
Z-axis travel	mm (in.)			No.1: 3,100 [122.0] No.2: 3,000 [118.1]	
Spindle					
Max. spindle speed	min ⁻¹			Through-spindle hole diameter $\phi 145$ [$\phi 5.7$]: 2,000 Through-spindle hole diameter $\phi 185$ [$\phi 7.2$]: 1,500 Through-spindle hole diameter $\phi 285$ [$\phi 11.2$]: 1,000	
Spindle nose				Through-spindle hole diameter $\phi 145$ [$\phi 5.7$]: A _z -11 Through-spindle hole diameter $\phi 185$ [$\phi 7.2$]: A _z -15 Through-spindle hole diameter $\phi 285$ [$\phi 11.2$]: A ₁ -20	
Turret					
Turret type				No.1: 12-station No.2: 8-station	
Shank height for square tool	mm (in.)			32 [1.3]	
Max. rotary tool spindle speed	min ⁻¹	—			No.1: 3,500
Feedrate					
Rapid traverse rate	mm/min (ipm)			X-axis: 20,000 [787.4] Z-axis: 24,000 [944.9]	X-axis: 20,000 [787.4] Z-axis: 24,000 [944.9] Y-axis: 10,000 (393.7)
		min ⁻¹		C-axis: 100	
Tailstock					
Tailstock travel	mm (in.)			3,000 [118.1]	
Taper hole of tailstock spindle	mm (in.)			$\phi 150$ [$\phi 5.9$], MT5 [Built-in center]	
Motors					
Spindle drive motor (30 min / cont)	kW (HP)			Through-spindle hole diameter $\phi 145$ mm [$\phi 5.7$ in.]: 37 / 30 [50 / 40], 45 / 37 [60 / 50] Through-spindle hole diameter $\phi 185$ mm [$\phi 7.2$ in.]: 37 / 30 [50 / 40], 45 / 37 [60 / 50], 75 / 55 [100 / 75] <Voltage 400 V> Through-spindle hole diameter $\phi 285$ mm [$\phi 11.2$ in.]: 37 / 30 [50 / 40], 45 / 37 [60 / 50], 75 / 55 [100 / 75] <Voltage 400 V>	
Rotary tool spindle drive motor (50%ED / cont)	kW (HP)	—			No.1: 11 / 7.5 (15 / 10)
Machine size					
Machine height [From floor]	mm (in.)			2,788 [109.8]	
Floor space (Width × Depth)	mm (in.)			8,315 × 3,376 [327.4 × 132.9], 9,106 × 3,376 [358.5 × 132.9] [Including a chip conveyor]	
Mass of machine	kg (lb.)			31,000 (68,200)	
Control unit					
MITSUBISHI				M730UM	

No.1: Turret 1 No.2: Turret 2

- 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.
- Machine size: The actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.
- The information in this catalog is valid as of June 2019.

<input checked="" type="checkbox"/> : Standard	<input type="checkbox"/> : Option
<input checked="" type="checkbox"/> T1 : Turret 1	<input type="checkbox"/> M1 : Milling (Turret 1)
<input checked="" type="checkbox"/> T2 : Turret 2	<input type="checkbox"/> Y1 : Y-axis (Turret 1)
<input checked="" type="checkbox"/> S : Spindle	
<input checked="" type="checkbox"/> TS : Tailstock	
The basic model is equipped with T1 , T2 , S and TS .	

NZX 4000

Standard & optional features

●: Standard
○: Option

NZX 4000 | 3000

Spindle	
Through-spindle hole diameter φ145 mm (φ5.7 in.)	2,000 min ⁻¹ : 37 / 30 kW (50 / 40 HP) <30 min / cont> 2,000 min ⁻¹ : 45 / 37 kW (60 / 50 HP) <30 min / cont> <High output>
Through-spindle hole diameter φ185 mm (φ7.2 in.)	1,500 min ⁻¹ : 37 / 30 kW (50 / 40 HP) <30 min / cont> <Standard> 1,500 min ⁻¹ : 45 / 37 kW (60 / 50 HP) <30 min / cont> <High output> 1,500 min ⁻¹ : 75 / 55 kW (100 / 75 HP) <30 min / cont> <High output>
Through-spindle hole diameter φ285 mm (φ11.2 in.)	1,000 min ⁻¹ : 37 / 30 kW (50 / 40 HP) <30 min / cont> <Standard> 1,000 min ⁻¹ : 45 / 37 kW (60 / 50 HP) <30 min / cont> <High output> 1,000 min ⁻¹ : 75 / 55 kW (100 / 75 HP) <30 min / cont> <High output>
Turret	
12-station, bolt-tightened turret	Turret 1
8-station, bolt-tightened turret	Turret 2
Tailstock	
Tailstock spindle built-in center (MT5)	φ150 mm (φ5.9 in.)
Fixture / Steady rest	
Steady rest	Servo motor driven
Coolant	
Coolant system	●
High pressure	800 / 1,100 W (50 / 60 Hz) 1 MPa (145.0 psi) / 1.5 MPa (217.5 psi)
Super-high pressure coolant system (Separate type)* ¹	7.0 MPa (1,015.0 psi)
Mist collector	HVS-220* ² (Including frame) AFS1600* ³ (Including frame)
Chip disposal	
Chip conveyor	Right discharge, Hinge type Right discharge, Magnet scraper type Right discharge, Hinge type + Drum filter type
Measurement	
Manual in-machine tool presetter (Removable)	Turret 2
Manual in-machine tool presetter (Pivoting type)	Turret 1, 2
Automatic in-machine tool presetter (Pivoting type)	Turret 1, 2
In-machine measuring system wireless touch sensor	MARPOSS
Improved accuracy	
Full closed loop control <Scale feedback> (X-axis)	Turret 1, Turret 2
Full closed loop control <Scale feedback> (Z-axis)	Turret 1, Turret 2
Full closed loop control <Scale feedback> (Y-axis)	
Automation	
EtherNet/IP interface	○
Robot interface	EtherNet/IP
Other	
Signal lamp	4 colors (LED type: Red, Yellow, Green, Blue)
Chuck foot switch	1 foot switch 2 foot switches

* DMQP (DMG MORI Qualified Products)

*¹ When super-high-pressure coolant system is used, a coolant chiller is recommended. For details, please consult our sales representative.

*² For oil based coolant only (Not available in Europe)

*³ For water-soluble coolant

● DMQP: Please see Page 24 for details.

● The information in this catalog is valid as of June 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.

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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 June 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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