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Press Release

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NZX 4000 Multi-Axis Turning Center for Long, Large-Diameter Workpieces

DMG MORI SEIKI CO., LTD (hereinafter called DMG MORI SEIKI) begins taking orders for the NZX 4000 high-precision, high-efficiency multi-axis turning center on October 20, 2014.
This newest model (with a distance between centers of 3,000 mm) will make its world premiere at JIMTOF2014 to be held October 30 - November 4 at Tokyo Big Sight, featuring the new machine design and the innovative operating system CELOS.

The NZX 4000 is a large multi-axis turning center that boasts a maximum turning diameter of 660 mm and a maximum turning length of 3,000 mm, and incorporates the milling function in Turret 1 as standard. The machine with the Y-axis (Y type) enables various machining processes, including keyway milling, to be performed on one machine, achieving excellent process integration. Designed to offer heavy-duty cutting of long, large-diameter workpieces, the NZX 4000 is the ideal solution for machining shafts for aircraft jet engines, crankshafts for vessels and pipes for the oil and energy industries.

We would like to highlight the main features of the NZX 4000 from the perspectives of: (1) High cutting capability, (2) High precision, (3) CELOS, (4) Operability, (5) Varieties of specifications, (6) Energy saving and (7) Safety.

(1) High Cutting Capability

The NZX 4000 is equipped with a robust trapezoidal bed that is highly resistant to distortion and twisting and slideways 1.5 times as wide as those of the existing model on all axes to improve rigidity. As a result, the machine delivers stable high performance in milling as well as turning. Additionally, the machine employs a beltless, gear-driven, motor-integrated spindle. Despite its compact size, the spindle achieves a high output of 37/30 kW.
Turret 1, which comes standard with the milling function, is equipped with the BMT® (Built-in Motor Turret) and an 11/7.5 kW high-output motor for the rotary tool spindle. Thanks to the construction in which the motor is placed inside the turret, the BMT® minimizes heat generation and vibration while improving milling accuracy and cutting performance, thereby substantially increasing productivity.
With high structural rigidity and a high-output motor, the large multi-axis turning center brings high milling performance and accuracy equal to a machining center.

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(2) High Precision

In order to cool down the main spindle and rotary tool spindle motors, the machine has a mechanism in which an oil jacket is arranged around the stator coil of the spindle motors to allow for forced circulation of cooling fluid, which prevents heat dispersion. In view of the increased use of high-pressure coolant, the spindle labyrinth structure has been enhanced to prevent coolant entry and improve spindle durability.

The NZX 4000 comes standard with the Magnescale ABS magnetic linear scale that achieves high-precision positioning on the X-axis of both Turret 1 and Turret 2. The magnetic linear scale has better vibration- and impact-resistance characteristics than those of an optical scale and is far less affected by condensation or oil which is inseparable from machining operations. It offers high-accuracy measurement with a resolution of 0.01 μm even in a severe environment. What's more, the magnetic linear scale has the same linear expansion coefficient as cast iron used for machine tool components, so it exhibits the same behavior as the machine body on which it is mounted, providing highly stable machining accuracy even in a temperature-fluctuating environment.

(3) CELOS

With a futuristic design and the industry's first touch panel operation, CELOS accelerates the processes from the idea to the finished product. CELOS apps enable the operators to manage production instruction, process and machine data on the screen, thereby bringing efficient and greater productivity. CELOS can connect the shop floor with the administrative division over a network, creating a paperless manufacturing environment. CELOS is also compatible with the PPS (Production Planning and Scheduling) and ERP (Enterprise Resource Planning) systems and can be linked to the CAD/CAM systems. The use of SMART*key*® that comes with the USB memory and user authentication functions enables the users to individually set access privileges to the NC unit and the machine.

(4) Operability

Turret 1 has 12 tool stations, all of which can accommodate rotary tools, while Turret 2 can hold up to 8 turning tools, enabling a total of 20 tools to be mounted in the turrets. The combined use of Turret 1 and Turret 2 allows for simultaneous machining, which results in shorter machining times. The detachable internal step facilitates setup operations such as attaching/removing tools and tool holders.

(5) Varieties of Specifications

The Y-type model is equipped with the Y-axis (stroke: ±70 mm) to offer keyway milling and other types of machining operations for long, large-diameter workpieces. The L-type (turning specification) model whose Turret 1 is designed specifically for turning is also available. We offer customers three choices of through-spindle hole diameter and maximum turning length to select from according to their machining needs: φ145 mm (Type A), φ185 mm (Type B) and φ285 mm (Type C) for the through-spindle hole, and 1,000 mm, 2,000 mm and 3,000 mm for the maximum turning length. We also offer the long boring bar (LBB) specification along with various selections of steady rests and the oil well pipe specification (with a front chuck, rear chuck, workpiece stopper and centering chuck) unique to large lathes, aiming to provide strong support for the oil and energy industries.

(6) Energy Saving

In an effort to reduce environmental burden and running costs, DMG MORI SEIKI uses energy-efficient parts such as LED lighting. We also work on machine design which enables efficient machine operation aiming at effective energy-saving improvements.

The NZX 4000 has achieved shorter cycle times by optimizing M codes and employing the new function to reduce machining time in canned cycles. We have enhanced energy-saving functions used during automatic operation, such as the function to adjust coolant discharge rate according to machining load and the function to shut off the power of channels in the standby mode.

The operators are able to visually check the energy saving effects on CELOS.

(7) Safety

The NZX 4000 complies with safety standards all over the world, including ISO standards, IEC standards, UL standards and JIS standards.

DMG MORI SEIKI will continue to provide products that are reliable, highly functional and worthy of investment to meet each and every customer's needs.

Type	High-precision, high-efficiency multi-axis turning center
Model	NZX 4000
Market	Oil/energy, aircraft, ship, construction machinery industries, etc.
Order start	October 20, 2014
Monthly production capacity	2 units/month

■Main specifications

Item		NZX 4000		
		Turning	Milling	Y type
		/1000L /2000L /3000L	/1000 /2000 /3000	/1000Y /2000Y /3000Y
Max. turning diameter	(mm)	No.1 : φ660		No.2 : φ460
Max. turning length	(mm)	No.1 : 1,000 </1000>		No.2 : 862 </1000>
		No.1 : 2,000 </2000>		No.2 : 1,862 </2000>
		No.1 : 3,000 </3000>		No.2 : 2,862 </3000>
X-axis travel	(mm)	No.1 : 385		No.2 : 235
Z-axis travel	(mm)	No.1 : 1,100 </1000>		No.2 : 1,000 </1000>
		No.1 : 2,100 </2000>		No.2 : 2,000 </2000>
		No.1 : 3,100 </3000>		No.2 : 3,000 </3000>
Y-axis travel	(mm)	-		±70
Max. Spindle speed	(min^{-1})	A : 2,000	B : 1,500	C : 1,000
Spindle drive motor	(kW)	37/30 (30min/cont.) [45/37 (30min/cont.)] [75/55 (30min/cont.)*]		
Through-spindle hole diameter	(mm)	A : φ145	B : φ185	C : φ285
Max. rotary tool spindle speed	(min^{-1})	3,500		
Rotary tool spindle drive motor	(kW)	11/7.5 (15min/cont.)		
Number of tools on Turret	(tools)	Turret 1 : 12		Turret 2 : 8
Floor space (width x depth)	(mm)	5,690×2,791 </1000> 6,690×3,080 </2000> 8,199×3,080 </3000>		

[ ] Option

Photo 1. Exterior

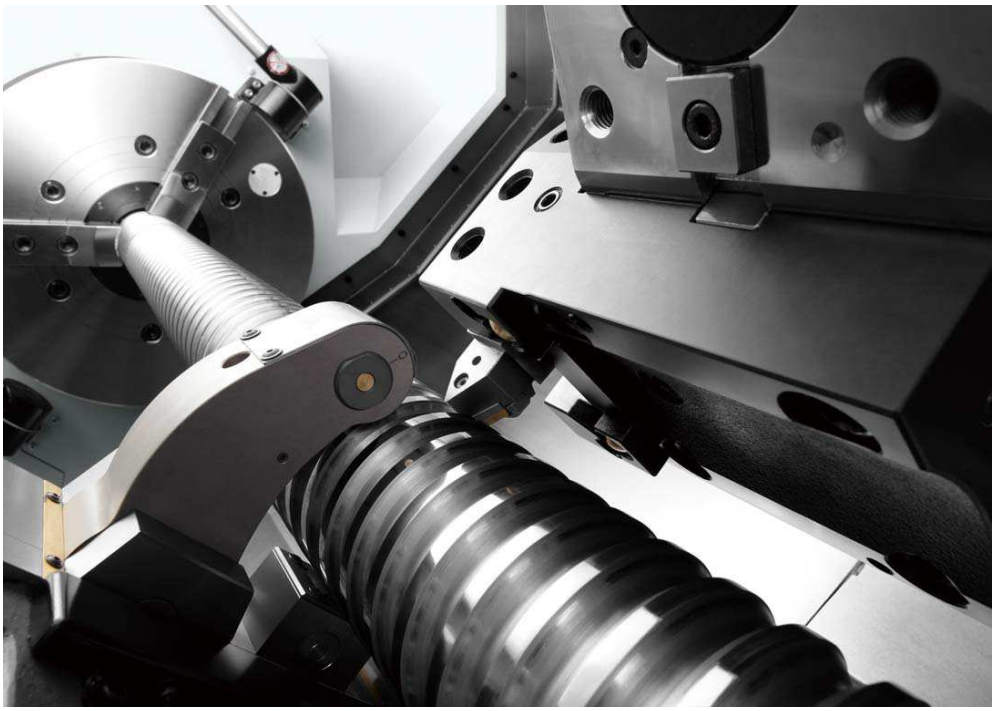

Photo 2. Machining of Ball Screw