

## Press Release

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July 9, 2009

### **Announcing a new model in the NMV Series, ideal for small workpieces! Mori Seiki starts accepting orders for the NMV3000 DCG.**

Mori Seiki Co., Ltd. will start accepting orders for **the NMV3000 DCG** high-precision, 5-axis control vertical machining center from July 9, 2009.

In recent years, the production of various parts that can help improve energy efficiency has been increasing in many industries including automobiles and aircraft. In accordance with this trend, the demand for high-precision, high-efficiency machining of small, complex-shaped workpieces has been growing, and so the need for machine tools that can meet these machining requirements and offer excellent ease of use has also been increasing. In response to this need, Mori Seiki has developed the NMV3000 DCG, the latest model in our NMV Series of high-precision, 5-axis control vertical machining centers.

For the NMV Series, we started with the aim of developing the ideal 5-axis control machine, which combines **high-speed, high-precision machining** and **excellent operability**. The existing models in this series include the NMV5000 DCG (Max. workpiece size:  $\phi$  700 mm x 450 mm, Max. loading capacity: 300 kg) and the NMV8000 DCG (Max. workpiece size:  $\phi$  1,000 mm x 500 mm, Max. loading capacity: 1,000 kg). Both machines employ Mori Seiki's original technologies of DCG (Driven at the Center of Gravity), DDM (Direct Drive Motor) and ORC (Octagonal Ram Construction), and have the Top Box-in-Box construction. By fully utilizing these features, both machines have achieved high-speed, high-precision machining and received high praise from many customers.

The newly released NMV3000 DCG boasts a maximum workpiece size of  $\phi$  350 mm x 300 mm and a maximum loading capacity of 100 kg (150 kg as option). By employing Mori Seiki's original technologies, like the existing models in the series, the NMV3000 DCG achieves **high-speed, high-precision machining**. In regard to operability, we have shortened the distance from the front of the machine to the table to offer even **better accessibility and visibility** than the existing models.

We have also prepared a large-capacity AWC (Automatic Workpiece Changer) and a variety of tool storage capacity options, which allow **long-term, unmanned operation and high-efficiency machining for multi-item, small-lot production**. Customers can choose the ideal specifications for their machining needs.

Mori Seiki will continue to improve our product line-up and to create machines which will satisfy the needs of our customers.

\* DCG, DDM and ORC are trademarks or registered trademarks of Mori Seiki Co., Ltd. in Japan, U.S.A. and other countries.

|              |  |
|--------------|--|
| Type         | High-precision, 5-axis control vertical machining center       |
| Model        | NMV3000 DCG  |
| Market       | Automobiles, aircraft, medical equipment, dies and molds, etc. |
| Orders start | July 9, 2009   |
| Production   | 15 units/month   |

## ■ Features

### 1. High-speed, high-precision machining

This machine uses DCG structure for the drive system on the Y and Z linear axes. By driving the center of gravity of moving parts with two ball screws, which are symmetrically placed, DCG minimizes vibration, and offers improved machining accuracy, shorter machining time and longer tool life. The Top Box-in-Box construction, which eliminates overhang, ensures stable feed even at high speeds. ORC on the Z-axis allows high-precision machining during high-speed travel because it keeps the center of the moving parts always the same position even when the guideways heat up as a result of high-speed travel. DDMs on the B and C rotary axes offer high-speed, high-precision indexing because a DDM that transmits the drive power directly to the axes without using gears has no backlash and improves transmission efficiency. With our original technologies, this machine offers high-precision machining, and achieves roundness of 3.00  $\mu\text{m}$  for the NAS 979, which is the accuracy rating for simultaneous 5-axis control machining.

The standard C-axis rotational speed is 150  $\text{min}^{-1}$ , and the 2,000  $\text{min}^{-1}$  option allows turning as well.

### 2. Superior operability

The NMV Series has been highly praised by customers for its superior operability. The NMV3000 DCG offers much better accessibility and visibility with a distance from the front of the machine to the center of the table of 400 mm, which is shorter than previous models by 100 mm. This machine allows shorter setup times and improves productivity. Also, AWC (Automatic Workpiece Changer) is attached to the side so that it will not interfere with operator's view and access to the inside of the machine. What's more, opening and closing the Y-axis protector at the top of the machine allows large workpieces to be loaded or unloaded smoothly using a crane.

### 3. Long-term unmanned operation and high-efficiency of multi-item, small-lot production

Customers can select a suitable AWC for their workpiece size from three types: 34-station (a maximum workpiece size:  $\phi$  350 mm x 300 mm), 120-station ( $\phi$  200 mm x 150 mm) and 114-station flexible ( $\phi$  200 mm x 150 mm,  $\phi$  350 mm x 300 mm). Customers can also choose their ideal magazine from a wide variety of tool storage capacities (21 tools as standard, and 61, 91, 121, 160, 240, 320 tools as options) to enable long-term unmanned operation and high-efficiency of multi-item, small-lot production.

■ Major Specifications

|  |   |
|--|---|
| Axis travel (X/Y/Z)                      | 500/350/510 mm  |
| (B/C)                                    | +160 to -180/360°   |
| Max. workpiece size                      | φ 350 mm x 300 mm   |
| The distance from floor to table surface | 850 mm  |
| Max. spindle speed                       | 12,000 [20,000] [30,000] [40,000] min <sup>-1</sup>   |
| Spindle drive motor                      | 12,000 min <sup>-1</sup> : 18.5/15 kW (30 min/cont)<br>[12,000 min <sup>-1</sup> : 22/18.5 kW (15 min/cont)] *1<br>[20,000 min <sup>-1</sup> : 22/11 kW (15 min/cont)]<br>[20,000 min <sup>-1</sup> : 22/18.5 kW (15 min/cont)] *1<br>[30,000 min <sup>-1</sup> : 18.5/13 kW (1 min/cont)]<br>[40,000 min <sup>-1</sup> : 7.5/5.5 kW (10 min/cont)] |
| Rapid traverse rate (X/Y/Z)              | 50,000/50,000/40,000 mm/min   |
| Table max. rotational speed (B/C)        | 50/150 [2,000] min <sup>-1</sup>  |
| Tool storage capacity                    | Chain type: 21 [61] [91] [121] tools<br>Rack type: [160] [240] [320] tools  |

[ ] Option

\*1: High-torque specifications



Fig. 1 Exterior

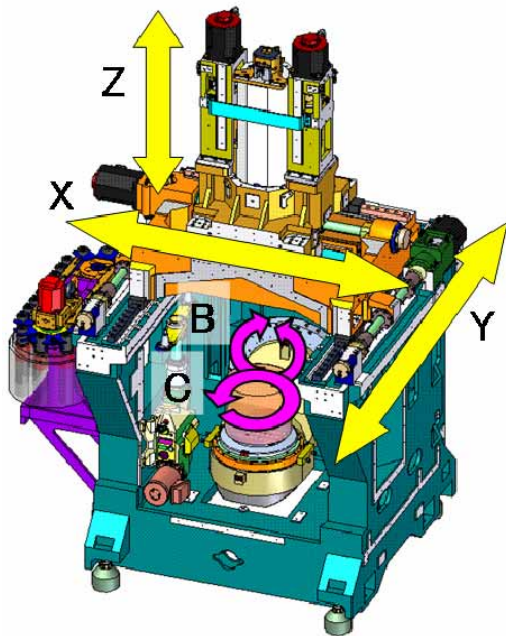


Fig. 2 Axis structure



Fig. 3 AWC specifications



Fig. 4 Machining example (Impeller)