



- **compactMASTER, the smallest tool spindle on integrated mill turn centers\***

- Standard spec.: Max torque 132 N·m, max spindle speed 12,000 min<sup>-1</sup>
- Direct Drive Spindle (DDS) that directly transmits turning force to achieve higher cutting performance and reduction in maintenance frequency and failure risk
- Drastically improved machining efficiency thanks to the compact structure and the shortest whole length of 350 on all integrated mill turn centers\* to minimize interference with Turret 2 while making a 90° turn, and availability of Spindle 1 and Spindle 2.
- Expanded X-axis stroke from the spindle center to 125 mm in the negative direction to ensure machining on the linear axis

\*Integrated mill turn centers sold by DMG MORI

- **High-performance Turret 2\* with Y-axis function**

- New Y-axis with a travel of  $\pm 40$  mm that enables wider varieties of milling with Turret 2 to drastically improve productivity
- The built-in-motor turret that minimizes heat generation and vibration during milling for better transmission efficiency contributes to drastically higher cutting capability, speed, surface quality and accuracy
- Synchronized machining with the tool spindle and Turret 2 + Y-axis enables hobbing, which used to be impossible only with the tool spindle because of high load

\*Option

## 2. Chip Disposal Solution

- Efficient chip disposal and high-accuracy coolant filtering with the external chip conveyor\* equipped with a drum filter with higher disposal capability than that of the conventional model
- Coolant for flowing chips as standard to improve chip flow directly below the spindle
- Functions effective for chip disposal, cooling of machining points and expansion of tool life
  - “Through-spindle Coolant Unit (tool spindle)” for supplying coolant for tool tips through tool spindles and tools
  - Through-spindle Coolant Unit (spindle)\*\* for supplying coolant from inside the turning spindle chuck. Effective for chip disposal in I.D. machining
  - “Coolant Unit above the Chuck\*\*” for supplying coolant from above the chuck to control heat generation of workpieces and chip accumulation on workpieces and chucks
  - “Tool Tip Air Blow\*\*” for preventing chip adhesion by spraying air over tool tips

\*Option

## 3. High Accuracy and High Rigidity

- The DMG MORI's original technology “Cooling water circulation inside the machine” for the spindle and motor, which are heat generation sources, controls thermal displacement and achieves high-accuracy machining.
- Magnescale's rotary scale on the rotary B- and C-axis as standard
- Full closed loop control (Magnescale's SmartSCALE) that ensures high-accuracy machining on the linear axis (option).
- Thorough FEM analysis of the machine body structure achieves 20% higher rigidity than that

of the conventional model.

- The roller guides with a large contact surface and high durability allows for a smooth travel of moving units and high rigidity.
- The roller guides on the front column surface achieve higher rigidity than that of the conventional model by doubling the number of sliders from two to four.

#### **4. Workability and Maintainability**

- The tool magazine placed in front of the machine enables operators to check tools at the operating position and replace tools in front of the machine.
- With one push of a button on the exterior cover next to the magazine door, tools inside the magazine can be taken out.
- The position of the operation panel (CELOS) can be slid up to 900 mm for higher workability for setups.
- Better access to the spindle because the lowest end of the door opening is lowered to 800 mm from 990 mm.
- Wide door opening of 1,400 mm\* for better visibility
- Equipment requiring a daily inspection is arranged at one place to improve maintainability.

\*NTX 2500 2<sup>nd</sup> Generation

#### **5. Automation System**

- High-quality automation systems that solve diversifying production issues available in a short delivery time

##### **Gantry loader system**

High-speed mass production system that completes a series of processes from material supply to ejection of finished products on one system.

##### **Bar feeder system**

System combined with the workpiece unloader to perform integrated machining of bar materials. No workpiece attaching/detaching device nor turnover unit is necessary.

##### **Workpiece unloader**

On-machine traveling system that receives a finished workpiece from Spindle 2 and ejects it outside the machine. The hand type and the receiver type are available according to workpieces.

- Various options to support automation

##### **On-machine measuring system**

Measuring system to measure finished workpieces with a touch sensor on the tool spindle.

##### **Automated on-machine tool presetter**

Tool presetter to measure tools automatically on machine to simplify setup work. Tool breakage detection is also possible.

### 3D quickSET

Tool kit to correct deviation from the rotation center of the rotary axis, and positional deviation caused by thermal displacement and machine change over years

- The “DMG MORI One Stop Service” provides customers with comprehensive support for shop automation, including not only machine bodies, but also transfer units, peripheral equipment, production management systems, machining technology, fixtures and measurement.

DMG MORI will continue to provide products that are more reliable, highly functional and worthy of investment for customers in an utmost effort to meet customer needs.

|              |   |
|--------------|---|
| Machine type | High-accuracy, high-efficiency integrated mill turn center  |
| Model name   | NTX 2000 2 <sup>nd</sup> Generation<br>NTX 2500 2 <sup>nd</sup> Generation<br>NTX 3000 2 <sup>nd</sup> Generation |
| Market       | Aircraft, medical, automotive, industrial machinery   |
| Order start  | April 2018  |

\*Price for the Spindle 2 specification (S spec.)

#### ■ Main machine specifications

| Item  |                      | NTX 2000<br>2 <sup>nd</sup> Generation                        | NTX 2500<br>2 <sup>nd</sup> Generation | NTX 3000<br>2 <sup>nd</sup> Generation |
|---|----------------------|---|--|--|
| Chuck size (Spindle 1/Spindle 2)                  | (Inch)               | 8/8   | 10/10                                  | 12/10                                  |
| Tool spindle travel (X1/Y1/Z1)                    | (mm)                 | 675 (-125 ~ +550) / 300 (±150) / 1562+164 (ATC travel)        |  |  |
| Tool spindle B-axis swivel range                  | (°)                  | 240(±120 <sup>*1</sup> / -30 ~ +210 <sup>*2</sup> )           |  |  |
| Max. turning diameter                             | (mm)                 | Tool spindle $\phi$ 670 / [Turret 2 $\phi$ 315] <sup>*3</sup> |  |  |
| Max. turning length                               | (mm)                 | 1,538   | 1,530                                  | 1,519.3                                |
| Bar work capacity                                 | (mm)                 | $\phi$ 65   | $\phi$ 80                              | $\phi$ 102                             |
| Max tool spindle speed                            | (min <sup>-1</sup> ) | 12,000<br>[20,000 (High-speed spec.)]                         |  |  |
| Number of tool stations on Turret 2 <sup>*3</sup> | (tool)               | 12 [10]   |  |  |
| Max tool diameter (With/without adjacent tool)    | (mm)                 | $\phi$ 70 / $\phi$ 130  |  |  |
| Max tool mass                                     | (kg)                 | 8 [10]  |  |  |
| Footprint (width x depth)                         | (mm)                 | 5,825 × 2,830   |  |  |
| NC unit   |                      | FANUC F31iB5<br>SIEMENS 840D sl                               |  |  |

[ ]Option

<sup>\*1</sup> FANUC spec. only <sup>\*2</sup> SIEMENS spec. only <sup>\*3</sup>Turret 2 spec. only



NTX 2500 2<sup>nd</sup> Generation (Exterior)



NTX 2500 2<sup>nd</sup> Generation (Inside the machine)