www.dmgmori.com

DMG MORI

High-Precision, High-Efficiency Integrated Turn & Mill Centre

NTX 1000

# NTX 1000 2nd Generation

Turn & Mill
Complete Machining

# High-Precision, High-Efficiency Integrated Mill Turn Centre.


## 5-axis simultaneous machining

+ **Direct Drive** (DDM®-Technology) B-axis for **5-axis simultaneous machining of complex-shaped products** for medical, tooling, aerospace and automotive industries
+ **±120° swivel range** in B-axis and 100 $min^{-1}$ feed rate
+ Capto C5 Turn & Mill spindle with up to 20,000 $min^{-1}$, 12,000 $min^{-1}$ as standard




## Production machining with 2nd tool carrier

+ **Synchronous machining** available with B-axis and optional lower turret with 10 stations
+ **Up to 10 live tools** in the BMT® turret (option) with up to 10,000 $min^{-1}$
+ Machining at the main and counter spindle

## Latest 3D control technology

+ **CELOS** from DMG MORI with **SIEMENS** and ShopTurn 3G:
  _ERGO*line*® Control with 21.5"-Multi-Touch monitor
+ **CELOS** from DMG MORI with **MAPPS** on FANUC 31iB:
  _ERGO*line*® Control with 21.5"-Multi-Touch monitor
  _Multi-Touch operating panel for pioneering operating comfort with unique functionality

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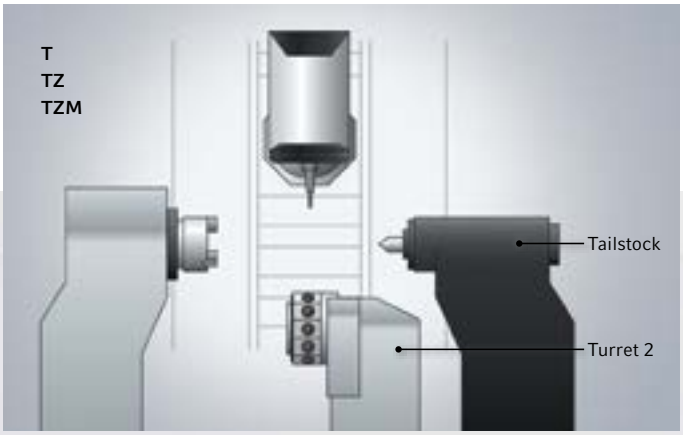
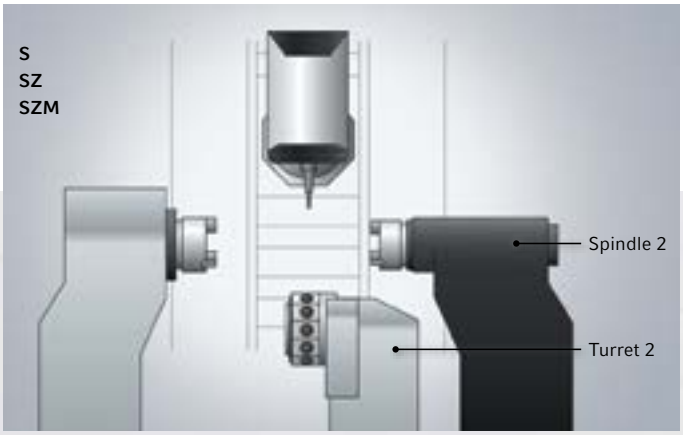
# Smallest footprint in its class at 10.4 m².

CELOS
from DMG MORI


10.4 m² footprint
(machine with 38 tool pockets, incl. chip conveyor)
Image: Configuration with double chain for 76 tools




# One machine concept with 6 variants

| Specifications | T | TZ | TZM | S | SZ | SZM |
|---|---|---|---|---|---|---|
| Tool spindle / Spindle 1 | • | • | • | • | • | • |
| Spindle 2 | – | – | – | • | • | • |
| Turret 2 | – | • | – | – | • | – |
| Turret 2 (Milling) | – | – | • | – | – | • |
| Tailstock | • | • | • | – | – | – |

• Standard features – Not applicable



**Improved functionality**
Dismantling of the safety glass from the outside

**Maximum view**
Into the working area for maximum control

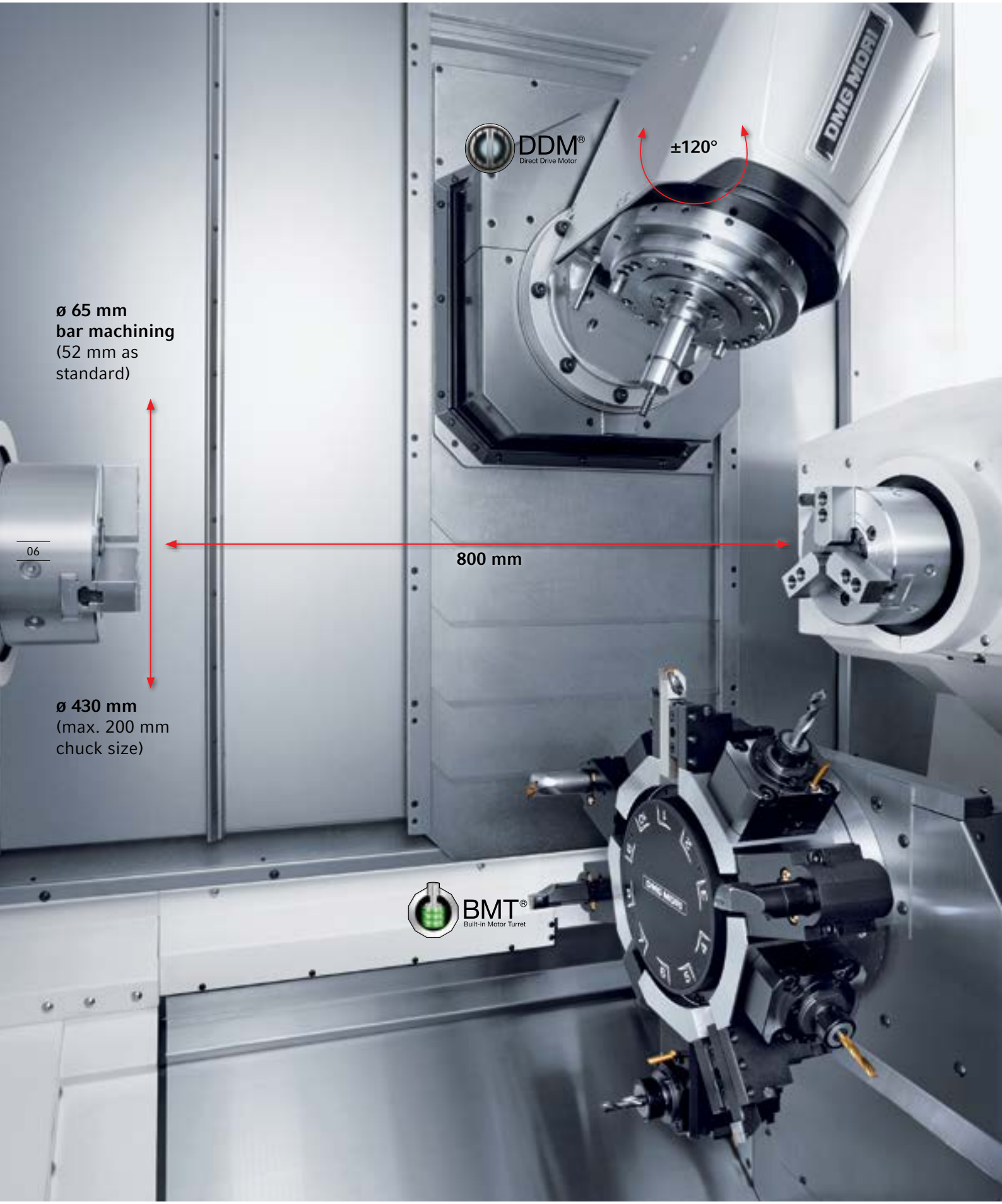
**Retention of value / long-life surfaces**
Premium range built to a high standard for superior scratch resistance and protection against damage

**BLACK or WHITE version**
The new DMG MORI design is available in either "BLACK" or in "WHITE" at no extra cost

**User-friendly**
CELOS from DMG MORI with SIEMENS and ShopTurn 3G:
ERGO*line*® Control with 21.5"-Multi-Touch monitor or
CELOS from DMG MORI with MAPPS on FANUC 31iB:
ERGO*line*® Control with 21.5"-Multi-Touch monitor and Multi-Touch control panel

**SMART*key*®**
Personalised user authorisation

**Optimal ergonomics**
Seamless adjustment options for the screen and the keyboard


DDM®
Direct Drive Motor
±120°
DMG MORI
ø 65 mm
bar machining
(52 mm as
standard)
800 mm
ø 430 mm
(max. 200 mm
chuck size)
BMT®
Built-in Motor Turret

NTX 1000 2nd Generation

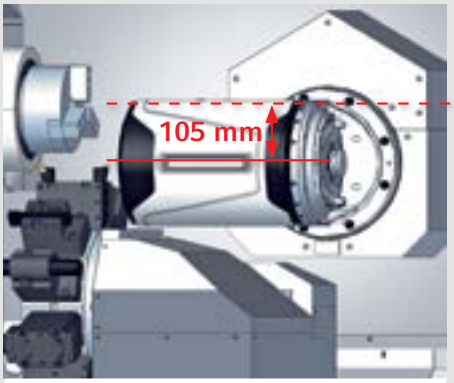
# Largest machining area for workpieces up to 800 mm long and ø 430 mm diameter.

+ **Bar machining of complex workpieces** up to **ø 65 mm,** 52 mm as standard
+ **Optimised working area** with 74 % longer Z-axis travel for workpieces up to 800 mm long and ø 430 mm
+ **Higher production flexibility** due to maximised X-axis stroke up to 105 mm under spindle centre (+350 / –105 mm)
+ **Eccentric machining** with ±105 mm Y-axis travel
+ **Less workpiece interference** due to compact tool spindle optional lower turret
+ **Flexible tool layout** for tools up to 190 mm* long on the lower turret (option) with ø 680 mm swing diameter (see page 12)
+ **Up to 10 live tools on the BMT® turret** (option) with up to 10,000 $min^{-1}$, machining at the main and counter spindles

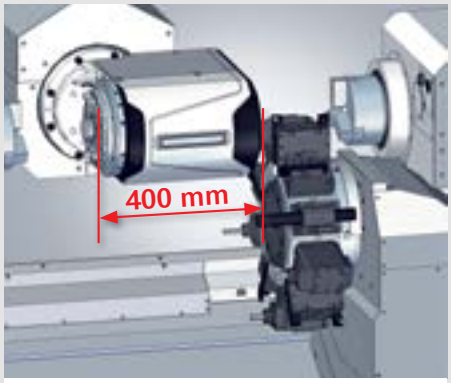
* 190 mm from turret station surface to the tool tip



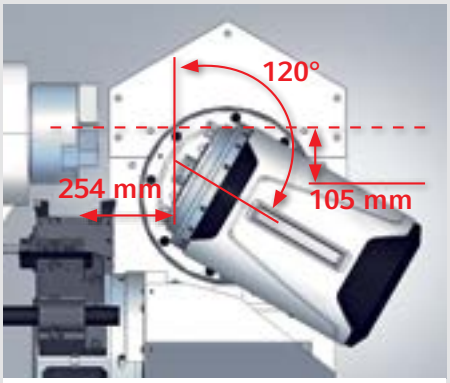
## Synchronous machining with Turn & Mill spindle and lower turret (TZ, TZM / SZ, SZM)




Higher production flexibility due to X-axis stroke up to 105 mm under spindle centre




Turn & Mill spindle is just 400 mm in length, for less interference in the working area




Large working area, up to 254 mm from to tool spindle to chuck face with X = –105 mm and B-Axis +120° possible

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# Maximum precision and temperature stability due to holistic cooling concept.

+ **Highest and constant accuracy** without compensation due to thermal control
+ **Patented** (pending) **thermally symmetrical headstock** cooling structure with recirculating coolant
+ **Cooling of all ball screws** and ball screw nuts for the tool spindle, turning and milling spindles incl. the B-axis and the BMT® turret

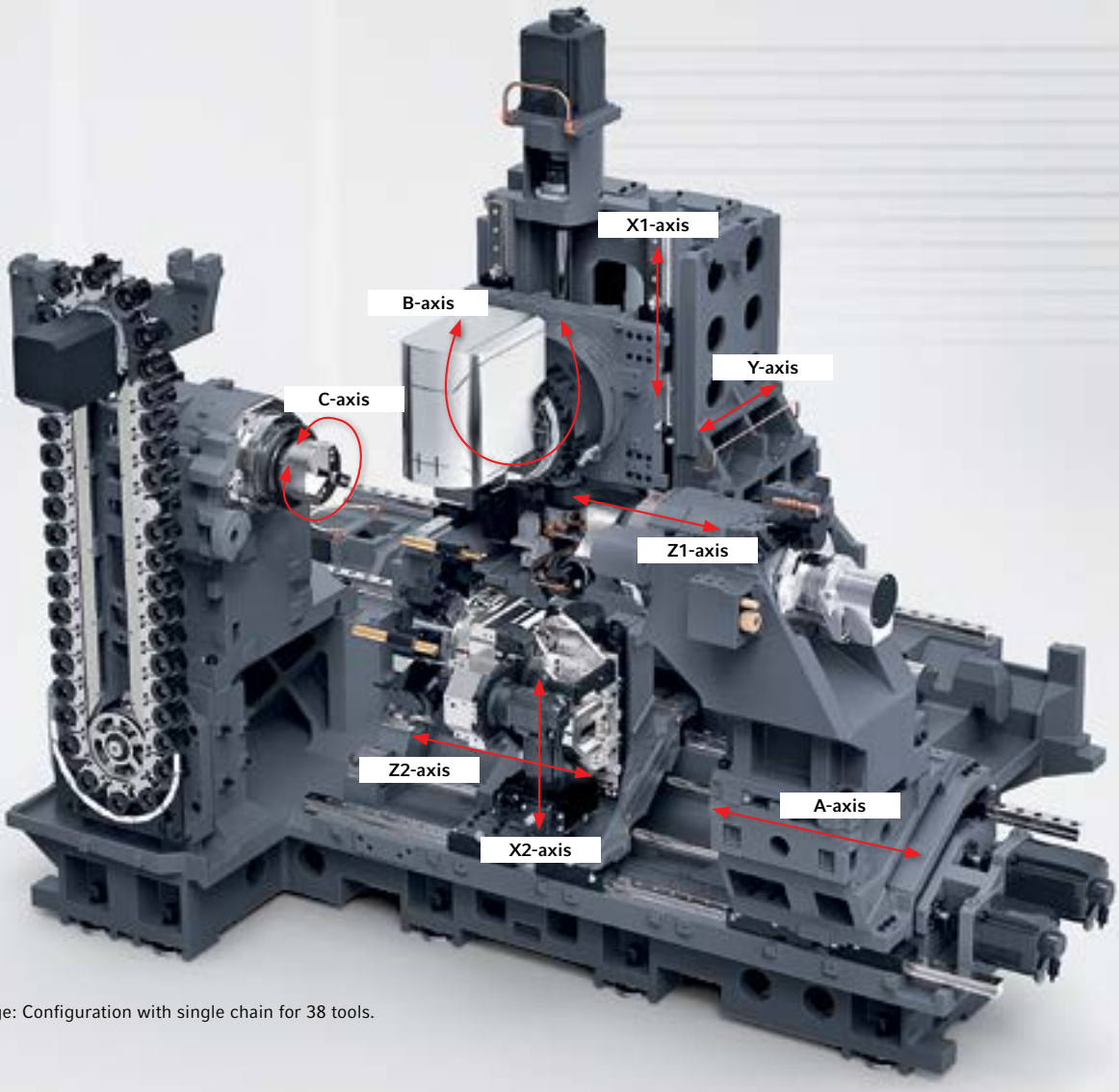



Image: Configuration with single chain for 38 tools.

DMG MORI Components

# Unbeatable precision due to magnetic measuring system with 0.01 µm resolution.

No contamination of the measuring system to oil or water condensation.

+ **Superior precision** with the **Magnescale absolute linear measuring system** featuring a standard resolution of 0.01 µm
+ **High-resolution,** magnetic measuring system
+ **Protective structure,** oil and condensation resistant
+ **Impact resistance** of 450 m/s²
+ **Vibration resistance** of 250 m/s²
+ **Thermal expansion** coefficient as cast iron



**Packages for higher accuracy (option) due to direct scales by Magnescale**

+ Tool spindle for X1, Y1 and Z1
+ Turret for X2 and Z2

**Highest rigidity**

+ Constant stiffness due to rigid guideways and large ball screws:
  Guideways: 45 mm for X1 / Y1 / Z1 / X2 / Z2 and A
  Ball screws: ø 45 mm for X1 / Z1, ø 36 mm for Y1 / Z2 / A and ø 32 mm for X2
+ Less backlash due to column slideway with precise roller guides
+ Increased static stiffness

NTX 1000 2nd Generation

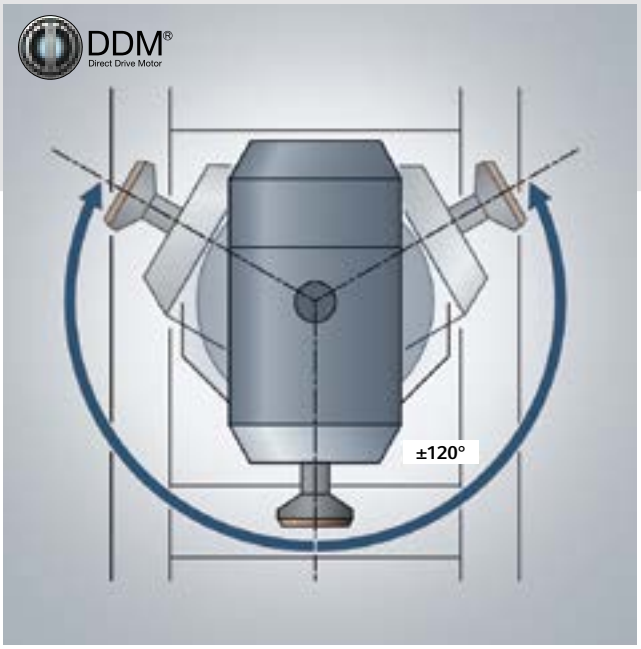
# Integrated 6,000 min$^{-1}$ spindle for the highest machining performance.


1


2

**1:** Main spindle with 6,000 min$^{-1}$, or optional strengthened model rated with 5,000 min$^{-1}$
2: 6 sided complete machining due to counter spindle (option) with 6,000 min$^{-1}$

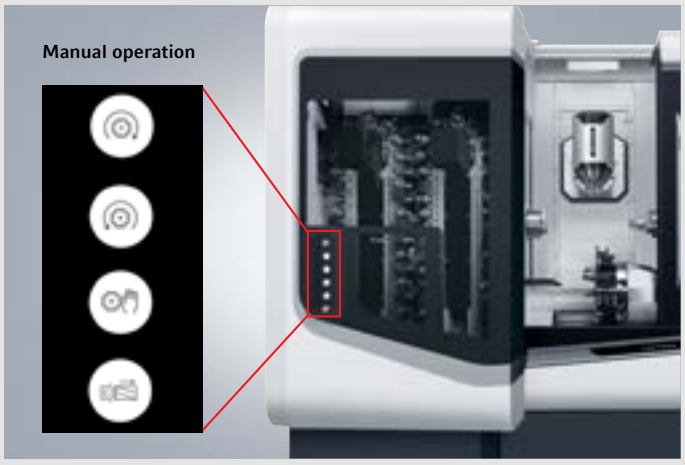
| Type | | Main spindle (standard)<br>Counter spindle (option) | Main spindle (option) |
|---|---|---|---|
| Speed | min$^{-1}$ | 6,000 | 5,000 |
| Bar capacity | mm | 52 | 65 |
| Spindle bore | mm | 61 | 73 |
| Chuck size (max.) | mm | 200 | 200 |
| | | (JIS A2-5) | (JIS A2-6) |


## Direct Drive (DDM®-Technology) B-axis for 5-axis simultaneous machining

+ ±120° swivel range and 100 $min^{-1}$ feed rate
+ Turn & Mill spindle with 12,000 $min^{-1}$, 20,000 $min^{-1}$ optional
+ Capto C5, HSK-A50 optional






Simplified tool loading directly from the front of the machine; picture shows option with 76 tools, 38 tools as standard

| Vertical chain magazine with up to 76 tool pockets | |
|---|---|
| Number of tools | 38 / 76 (option) |
| Max. tool diameter (free / occupied pockets) | ø 130 / ø 70 mm |
| Max. tool length (diameter ≤70 mm / >70 mm) | 250 / 210 mm |
| Max. tool weight | 5 kg |


NTX 1000 2nd Generation

# Synchronous machining with B-axis and BMT® turret with up to 10,000 min$^{-1}$

## HIGHLIGHTS

+ **10 station lower turret*** for machining operations at the main and counter spindles
+ **Tools up to 190 mm long** on the lower turret with ø 680 mm swing diameter
+ **TZ and SZ variant,** up to 10 fixed tools for turning and drilling
+ **TZM and SZM variant,** up to 10 live tools on the BMT® turret with up to 10,000 min$^{-1}$

* option




## BMT® Built-in Motor Turret – with an integrated drive motor

+ **Cutting performance** comparable to a milling machine
+ **The BMT® effect**
  _ Improved milling performance and precision through the built-in drive directly in the turret for optimal transfer efficiency
  _ Minimal heating and vibration of the turret, temperature variation < 0.5 µm

NTX 1000 2nd Generation

# CELOS – From the idea to the finished product.

CELOS from DMG MORI enables consistent administration, documentation and visualisation of order, process and machine data. CELOS can be extended with APPS and is also compatible with your company's existing infrastructures and programs.




## APP selector

Central access to all available applications.

CELOS with 21,5" ERGO*line*®

and SIEMENS

**Uniform**

Standard user interfaces for all new high-tech machines from DMG MORI.

**Continuous**

Consistent administration, documentation and visualisation of order, process and machine data.

**Compatible**

Compatible with common PPS and ERP systems. Can be networked with CAD / CAM products. Trendsetting CELOS APP extensions.

# CELOS APPS

+ **JOB MANAGER:** Systematic planning, administration and preparation of orders
+ **JOB ASSISTANT:** Process orders efficiently
+ **CAD / CAM VIEW:** Visualise workpieces and optimise program data
+ **TECH CALCULATOR:** Calculate technology data, measurements and values
+ **DOCUMENTS:** Digital library with full text search
+ **ORGANIZER:** Calendar and note functions
+ **NETSERVICE:** Qualified support via internet-based remote diagnostics
+ **MACHINE CHECK:** Controlled maintenance and repairs for machines
+ **ENERGY SAVING:** Automated energy management
+ **SETTINGS:** Customisation and personalisation
+ **STATUS MONITOR:** View machine status in real time
+ **CONTROL:** Machine control with a touch-operated system


## Multi-Touch

Operating panel for pioneering operating comfort with unique functionality.

CELOS with
21,5" ERGO*line*®
and MAPPS on FANUC

NTX 1000 2nd Generation

# Technical Data

| | | T | TZ | TZM | S | SZ | SZM |
|---|---|---|---|---|---|---|---|
| **Working area** | | | | | | | |
| **Max. swing diameter** | mm | 450 | | | | | |
| Max. turning diameter (B-axis / Turret) | mm | 430 / 274 | | | | | |
| Max. turning length | mm | 800 | | | | | |
| Distance main spindle to tailstock / counter spindle | mm | 1,050 | | | | | |
| **Main spindle [option]** | | | | | | | |
| Integrated spindle motor with C-Axis (0.0001°) | $min^{-1}$ | 6,000 [5,000] | | | | | |
| Spindle bore-ø | mm | 61 [73] | | | | | |
| Max.chuck* size | mm | 200 | | | | | |
| **Counter spindle*** | | | | | | | |
| Integrated spindle motor with C-Axis (0.0001°) | $min^{-1}$ | – | – | – | 6,000 | 6,000 | 6,000 |
| Spindle bore-ø | mm | – | – | – | 61 | 61 | 61 |
| Max.chuck* size | mm | – | – | – | 200 | 200 | 200 |
| **B-Axis with Turn & Mill spindle [option]** | | | | | | | |
| Tool taper | | Capto C5 [HSK-A50] | | | | | |
| Speed | $min^{-1}$ | 12,000 [20,000] | | | | | |
| Swivel range B-axis | ° | ±120 | | | | | |
| Feed rate B-axis | $min^{-1}$ | 100 | | | | | |
| **Turret [option]** | | | | | | | |
| Number of tools (driven) | # | – | 10 | 10 (10) | – | 10 | 10 (10) |
| Max. speed for live tools | $min^{-1}$ | – | – | 10,000 | – | – | 10,000 |
| **Top slide for B-axis** | | | | | | | |
| X / Y / Z | mm | 455 (–105) / ±105 / 800 (+155 for ATC) | | | | | |
| Rapid traverse X / Y / Z | m/min | 40 / 40 / 50 | | | | | |
| **Slide for turret** | | | | | | | |
| X / Z | mm | – | 160 / 730 | 160 / 820 | – | 160 / 730 | 160 / 730 |
| Rapid traverse X / Z | m/min | – | 28 / 36 | 28 / 36 | – | 28 / 36 | 28 / 36 |
| **Slide for counter spindle** | | | | | | | |
| A | mm | – | – | – | 820 | 820 | 820 |
| Rapid traverse A | m/min | – | – | – | 36 | 36 | 36 |
| **Tailstock [option]** | | | | | | | |
| Travel (Servo motor) | mm | 820 | 820 | 820 | – | – | – |
| Tailstock taper | MT | 4 (supported) / [3 (built-in)] | | | – | – | – |
| **Machine size** | | | | | | | |
| Footprint incl. Chip conveyor | $m^2$ | 10.4 | | | | | |
| Discharge height chip conveyor | mm | 901 | | | | | |
| Machine height | mm | 2,495 | | | | | |
| Machine weight | kg | 9,500 | 10,000 | 10,000 | 9,500 | 10,000 | 10,000 |

* option

NTX 1000 2nd Generation

# Options

| | SIEMENS | FANUC |
|---|---|---|
| **Main spindle** | | |
| 6,000 min⁻¹ // ø 61 mm spindle bore | • | • |
| 5,000 min⁻¹ // ø 73 mm spindle bore | ○ | ○ |
| Hydraulic chuck ø 150 mm | ○ | ○ |
| Hydraulic chuck ø 200 mm | ○ | ○ |
| **Tailstock** | | |
| Live centre specification (MT 4), without centre | • | • |
| Live centre MT 4 | ○ | ○ |
| Built in centre (MT 3), with centre | ○ | ○ |
| Tailstock drilling (for live centre only) | ○ | ○ |
| Foot switch for tailstock | ○ | ○ |
| Air blow for tailstock | ○ | ○ |
| **Counter spindle** | | |
| 6,000 min⁻¹ // ø 61 mm spindle bore | ○ | ○ |
| Hydraulic chuck ø 150 mm | ○ | ○ |
| Hydraulic chuck ø 200 mm | ○ | ○ |
| **Turn & Mill spindle** | | |
| 12,000 min⁻¹ // Capto C5 | • | • |
| 20,000 min⁻¹ // Capto C5 | ○ | ○ |
| **Tools** | | |
| Vertical chain, 38 pockets | • | • |
| Vertical chain, 76 pockets | ○ | ○ |
| HSK-A50 | ○ | ○ |
| In-process measuring (Touch probe for Turn & Mill spindle) | ○ | ○ |
| Automatic measuring in machine tool (for Turn & Mill spindle and lower turret) | ○ | ○ |
| **2nd tool carrier** | | |
| Lower turret with 10 tool pockets | ○ | ○ |
| Lower turret with live tools (details see page 12) | ○ | ○ |
| **Package for higher accuracy** | | |
| Direct scales by Magnescale: X1 / Y1 / Z1 (Slide for tool spindle) | ○ | ○ |
| Direct scales by Magnescale: X2 / Z2 (Slide for lower turret) | ○ | ○ |
| Direct scales by Magnescale: A (Slide for counter spindle) | ○ | ○ |
| **Coolant / Chip disposal** | | |
| Water soluble coolant system | • | • |
| Oil soluble coolant system | ○ | ○ |
| 635 Watt (50 Hz) internal coolant supply // 410 l coolant tank (Turn & Mill spindle) | • | • |
| 35 bar internal coolant supply // 543 (410 + 133) l coolant tank (Turn & Mill spindle) | ○ | ○ |
| 70 bar internal coolant supply // 543 (410 + 133) l coolant tank (Turn & Mill spindle) | ○ | ○ |
| Coolant for lower turret (live tool specification only) | ○ | ○ |
| Oil mist seperator | ○ | ○ |
| Hinge or scraper type chip conveyor (right discharge) | ○ | ○ |
| Hinge or scraper type chip conveyor + drum filter (right discharge) | ○ | ○ |
| Air blow through chuck (spindle 1) | ○ | ○ |
| Air blow through chuck (Turn & Mill spindle) | ○ | ○ |
| Coolant gun | ○ | ○ |

• Standard ○ Option

| | SIEMENS | FANUC |
|---|---|---|
| **Bar machining / Automation** | | |
| Automatic power off device | • | • |
| Automatic door | ○ | ○ |
| Bar loader interface | ○ | ○ |
| Transfer conveyor (bar loader specification) | ○ | ○ |
| Workpiece stopper (in spindle) | ○ | ○ |
| Robot interface | ○ | ○ |
| **Control** | | |
| CELOS from DMG MORI with SIEMENS and ShopTurn 3G:<br>ERGO*line*® Control with 21.5"-Multi-Touch monitor | • | – |
| CELOS from DMG MORI with MAPPS on FANUC 31iB:<br>ERGO*line*® Control with 21.5"-Multi-Touch monitor and Multi-Touch operating panel | – | • |

• Standard ○ Option



5-axis simultaneous machining with Direct Drive B-axis (DDM®), ±120° swivel range and 100 $min^{-1}$ feed rate

## 2-year warranty, twice the peace of mind.

For machines delivered outside of Japan, parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year. Please contact our sales representative for details.


**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 SEIKI or its distributor representative. DMG MORI SEIKI 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 SEIKI and its distributor representative shall have no obligation to re-enable such Equipment. DMG MORI SEIKI 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, contact our sales representative.
_ The information in this catalog is valid as of October 2014. 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 SEIKI is not responsible for differences between the information in the catalog and the actual machine.

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