DMG MORI

Quote number: 12131165101

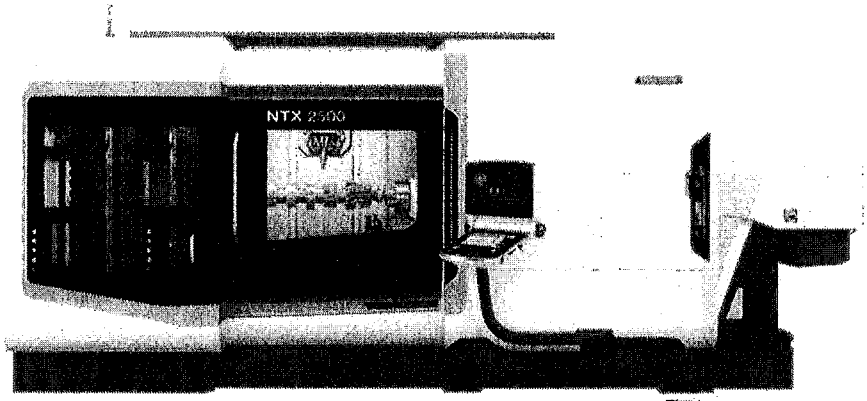
Quotation

for

BSL Industries Ltd

NTX 2000 | 1500 2nd Generation

Serial Number: NTX23200821 - This machine is available on a immediate delivery from European stock, subject to prior.



写真はNTX2000/ 1500.
The photo shows NTX2000/ 1500.

Highlights

- Simultaneous 5-axis machining with the Direct Drive Motor (DDM) on the B-axis.
- The compactMASTER, the world's shortest tool spindle in its class (350 mm), ensures a wide machining envelop to increase productivity.
- Wide range of machining area with the X-axis stroke of 675 mm (-125 - +550 mm) and the Y-axis 300 mm (±150 mm)
- Y-axis stroke of ±40 mm of Turret 2 expands the machining range
- Smallest floor space of 16.5 m2 (5,825 × 2,830 mm) in its class for workpiece sizes of up to φ670 x 1,538 mm
- 6-face machining is available with Spindle 2 to complete the machining of components on one machine.

DMG MORI
NTX 2000 | 1500 2nd Generation

GBP

Basic Machine

J-A01867* NTX 2000 | 1500
Integrated Mill Turn Center
Tool spindle : 12,000/ 20,000 min-1
Axis travel X/ Y/ Z/ B : 675 (-125~+550)/ 300 (±150) / 1,562+164<for ATC> mm/ 240°(±120°)
[26.5 (-4.9~+21.6)/ 11.8 (±5.9)/ 61.4+6.4 <for ATC> in.]
Spindle 1 : 5,000 min-1
Bar work capacity : dia.65 [2.5]

Control

J-008071* Control F31iB5 with CELOS (NTX Gen2)
Control unit: Fanuc F31iB5
Operation system: CELOS (MAPPS)

J-003261* CELOS - ERGOline Touch
It is a machine operation panel with 21.5-inch multi touch screen, which realizes comfortable operability. It documents, visualizes and centrally manages the order, process and machine data, allowing the networking with CAD/CAM and also the function extension using applications. The user-friendly, highly-productive MAPPS system is installed.

Spindle

J-008995 (Spindle 1) Through-spindle Hole Dia.73 mm (2.87 inch.) , 5,000 min-1 (STD) (FANUC)
turnMASTER
Max. spindle speed: 5,000 min-1
Spindle nose type: JIS A2-6
Through-spindle hole diameter: φ73 mm (dia.2.87 inch.)

Spindle drive motor: 15/15/11 kW (20/20/15 HP) (15%ED/30min/cont)
Spindle torque: 421/302/256 Nm (310.51/222.74/188.82 ft·lbf) (15%ED/30min/cont)
MASTER series spindle: Covered by a 3-year warranty service

* further description see attachment

GBP

J-008609	(Spindle 2) Through-spindle Hole Dia.73 mm (2.87 inch.), 5,000 min-1 (FANUC) turnMASTER FANUC specifications Output: 15/15/11 kW (20/20/15 HP) (15%ED/30min/cont) Max. spindle speed: 5,000 min-1 Max. torque: 421/302/256 Nm (310.5/222.7/188.8 ft·lbf) (15%ED/30min/cont) Through-spindle hole diameter: φ73 mm (dia.2.87 inch.) MASTER series spindle: Covered by a 3-year warranty service

Chuck for Main spindle

J-020625	(Spindle 1) KITAGAWA 8-inch Hollow Chuck BB208A621 Three-jaw hydraulic chuck manufactured by Kitagawa Iron Works. Chuck outer diameter: ϕ 210 mm (dia.8.27 inch.) Through-hole diameter: ϕ 66 mm (dia.2.6 inch.) Gripping diameter: Max. ϕ 210 mm (dia.8.27 inch.), Min. ϕ 23 mm (dia.0.91 inch.) Jaw stroke (diameter): 7.4 mm (0.29 inch.) Plunger stroke: 16 mm (0.63 inch.) Max. allowable pull force: 32 kN (7.19 klbf) Max. static gripping force: 99 kN (22.25 klbf) Dynamic gripping force at max. speed: 33 kN (7.42 klbf) Max. allowable speed: 5,000 min-1 Mass: 25 kg (55 lb.) *The data above are information on the chuck body. Since it may be limited by this machine specification, please check the contents of the mounted cylinder set for details.
J-017089	(Spindle 1) Hollow Cylinder Set for KITAGAWA 8-inch Hollow Chuck BB208A621 (Bar work capacity dia. 65 mm (2.56 inch) (Without Chuck Body) Hollow cylinder and draw bar are included as a set. Chuck is not included. Please see the chuck-cylinder combination diagram for the combination with chuck and the specification.

* further description see attachment

GBP

Chuck for Counter spindle

J-020637 (Spindle 2) KITAGAWA 8-inch Hollow Chuck BB208A621
Three-jaw hydraulic chuck manufactured by Kitagawa Iron Works.
Chuck outer diameter: ϕ 210 mm (dia.8.27 inch.)
Through-hole diameter: ϕ 66 mm (dia.2.6 inch.)
Gripping diameter: Max. ϕ 210 mm (dia.8.27 inch.), Min. ϕ 23 mm (dia.0.91 inch.)
Jaw stroke (diameter): 7.4 mm (0.29 inch.)
Plunger stroke: 16 mm (0.63 inch.)
Max. allowable pull force: 32 kN (7.19 klbf)
Max. static gripping force: 99 kN (22.25 klbf)
Dynamic gripping force at max. speed: 33 kN (7.42 klbf)
Max. allowable speed: 5,000 min-1
Mass: 25 kg (55 lb.)
*The data above are information on the chuck body. Since it may be limited by this machine specification, please check the contents of the mounted cylinder set for details.

J-020347 (Spindle 2) Hollow Cylinder Set for KITAGAWA 8-inch Hollow Chuck BB208A621 (Bar Work Capacity φ65 mm (Dia.2.56 inch.)) (Without Chuck Body)
Hollow cylinder and draw bar are included as a set. Chuck is not included. Please see the chuck-cylinder combination diagram for the combination with chuck and the specification.

Equipment for Chucks

J-002276 Chuck Foot Switch (Double) for Spindle 1 and Spindle 2
The switch to clamp or unclamp the chuck by foot. Pushing the lock release plate of each foot switch forward releases the lock and enables the chuck foot switch pedal to be depressed. The chucks for spindle 1 and spindle 2 are clamped or unclamped respectively using their double foot switches.

J-011387 Chuck cylinder stroke check (linear position monitoring) (spindle 1)

J-011388 Chuck cylinder stroke check (linear position monitoring) (spindle 2)

* further description see attachment

GBP

Tool Spindle

J-012437 Standard Tool Spindle, 12,000 min-1, 28/23 kW (FANUC)
compactMASTER
Max. tool spindle speed: 12,000 min-1
Tool spindle output: 28/23 kW (38.1/31.3 HP) (40% ED(2 min)/cont)
Tool spindle torque: 132/95.3 Nm (97.36/70.29 ft·lbf) (40% ED(2 min)/cont)
MASTER series spindle: Covered by a 3-year warranty service

J-020701 Capto C6
This specification uses the Capto C6 tool holder.

J-005482 Tool spindle full indexing specifications (Standard)

Turret

J-016705 Turret 2 Tailstock Function
The center attached to the tool holder on the turret 2 supports a long workpiece during the machining in the simplified manner. It is possible to push the center to not only spindle 1 and but also spindle 2. There is no screen dedicated to thrust force setting (thrust monitoring), with only one type of thrust setting.
*This option is available only for the turret 2 specifications (S,SZ).
*The center and drill socket is not included. Please order them separately by referring to the tooling system diagram.
Using the live center (MT2) (part No:K41016) can prevent the interference due to the turret 2 rotation even when the center is oriented toward spindle 2.

J-008481* 12 Station Bolt-tightened Turret, Milling Specifications (12,000 min-1, 16.9 Nm) (Turret 2) (FANUC)
12-station bolt-tightened turret. BMT (Built-In Motor Turret) is installed with the milling specification, and the oil jacket cooing suppresses heat generation to implement excellent machining accuracy.
Shank height for square tool: 20 mm (0.79 inch.)
Shank diameter for boring bar: φ32 mm (dia.1.26 inch.)
Max. rotary tool spindle speed: 12,000 min-1
Rotary tool spindle output: 5.5/5.5/3.7 kW (7.5/7.5/5 HP) (15%ED/25%ED/cont)
Rotary tool spindle torque: 16.9/13.1/8 Nm (12.46/9.66/5.9 ft·lbf) (15%ED/25%ED/cont)

* further description see attachment

GBP

Tool Magazine

J-009041 Tool Storage Capacity 76 Tools (Capto C6)
Tool capacity: 76 tools
Max. tool diameter
- With adjacent tools: φ70 mm (dia.2.76 inch.)
- Without adjacent tools: φ130 mm (dia.5.12 inch.)
Max. tool length: 400 mm (15.75 inch.)
Max. tool mass: 8 kg (17.6 lb.)
Max. tool moment (from gage line): 7.84 Nm (5.78 ft·lbf)
*For the details, please consult DMG MORI.
<Features>
- It consists of 2 chain magazines.
- The ball screw drive is adopted for the tool transfer between the magazines. (Conventionally, driven by the air cylinder) This reduces the transfer time significantly.
- The tool change window is a automatic door. (With opening/closing button)
- The tool can be detached just by pushing the button. (A dedicated tool is necessary for the conventional machine.)

Coolant supply / Chip removal

J-G00428 Applicable Coolant Type: Water-Soluble Coolant
If the oil-based coolant is used with the water-soluble coolant specification, it may cause poor accuracy or machine troubles. It is necessary to select the oil-based coolant specification for using the oil-based coolant.

J-009046 Chip Conveyor (Right Discharge, Hinge Type + Drum Filter Type) (/1500)
This chip conveyor is suitable for discharging all types of metal chips other than powdery ones. Long chips are conveyed and discharged using the hinge belt. Fine chips are accumulated on the inner pan and scraped out to the discharge port with the rear side of the belt. The built-in drum filter can reduce the frequency of cleaning inside the tank.
Chip conveying capacity: 1,588 L/h (419.23 gph) (long chips) / 18 L/h (4.75 gph) (short chips)
Max. coolant throughput: 150 L/min (39.6 gpm)

* further description see attachment

GBP

J-G01029	Interface for Super-high-pressure coolant system (7.0 MPa, Variable Pressure Steps, KNOLL/ Interlit, for 2-path system) (Coolant system for Through Spindle (Tool spindle) and Turret 2) Interface for mounting the high-pressure coolant system (separate type). The electrical components and coolant piping are included. The predefined 8 steps of pressure can be selected by the M-code. Max. discharge pressure: 7 MPa (1,015 psi) *The high pressure coolant unit is not included. Standard pressure pump is not included neither. *Please prepare the power source supplied to the high pressure coolant unit separately. *When using the high-pressure coolant system, the machining accuracy may be influenced by a rise in the coolant temperature. Select the coolant chiller and mist collector to reduce the influence on the machining accuracy.
J-004262	Coolant Chiller (Separate Type) The coolant chiller cools coolant in the coolant tank according to a rise in the machine temperature. Controlling the coolant temperature suppresses the rise in temperature of the workpiece and tool and achieves the stable machining accuracy. Be sure to select the coolant chiller when you want to use oil-based coolant. (Please consult DMG MORI.) As the high-pressure coolant system generates significant heat, select the coolant chiller when using the high-pressure coolant system. - Tank capacity: 170 L (44.9 gal)
J-004572	Air Blow for Chuck (Spindle 2) Air is blown to the chuck for removing chips adhering to it. Removing the chips prevents the gripping accuracy from being impaired by the chip pinching. The air blow nozzle is installed on the upper part of chuck. The air blow ON/OFF is controlled by the M codes. *The time until the air blow OFF can be set using the timer. *The spindle can be jogged during the air blow using the parameters.
J-005076	Mist Collector Interface (Duct φ200 mm (dia.7.87 inch.) + Electric Parts for AFS 1600) I/F for mounting the mist collector AFS1600 that collects, absorbs and dehydrates mist, dust particles and oily fumes generated during machining using the filter. The 200 mm (7.87 inch.)-diameter duct and electrical components set are included. The mist collector, duct hose, drain hose and stand are not included. Please arrange them separately.

* further description see attachment

GBP

Measuring / Monitoring

J-017113	Manual in-machine tool presetter (removable type, spindle1 and spindle2) (STD)
J-009026	Full-closed Loop Control for X-axis (Tool Spindle) (Direct Scale Feedback) The magnetic scale is used for the X-axis position sensing of the tool spindle, instead of the axis servomotor pulse encoder. It is not susceptible to ball screw precision error or thermal displacement. The magnetic scale is mounted parallel to the X-axis of the tool spindle, and the coordinates of the position are directly fed back to the NC unit. This enables the higher precision positioning. Resolution: 0.01 µm (Magnescale)
J-009028	Full-closed Loop Control for Y-axis (Tool Spindle) (Direct Scale Feedback) The magnetic scale is used for the Y-axis position sensing of the tool spindle, instead of the axis servomotor pulse encoder. It is not susceptible to ball screw precision error or thermal displacement. The magnetic scale is mounted parallel to the Y-axis of the tool spindle, and the coordinates of the position are directly fed back to the NC unit. This enables the higher precision positioning. Resolution: 0.01 µm (Magnescale)
J-009030	Full-closed Loop Control for Z-axis (Tool Spindle) (Direct Scale Feedback) The magnetic scale is used for the Z-axis position sensing of the tool spindle, instead of the axis servomotor pulse encoder. It is not susceptible to ball screw precision error or thermal displacement. The magnetic scale is mounted parallel to the Z-axis of the tool spindle, and the coordinates of the position are directly fed back to the NC unit. This enables the higher precision positioning. Resolution: 0.01 µm (Magnescale)

* further description see attachment

GBP

J-004575 In-machine Workpiece Measuring System Radio Signal Transmission Type Touch Sensor (RENISHAW, RMP600)
Using the radio signal transmission type sensor mounted on the tool spindle, the workpiece is positioned and the positions of the fixture and workpiece are measured. The workpiece coordinate values read by the touch sensor are transmitted as a radio signal to the NC unit via the receiver installed inside the machine. The touch sensor is stored in the tool magazine and called to the tool spindle by automatic tool change.
- Measuring direction: +X, -X, +Y, -Y, +Z

Automation

J-004166 Signal Lamp 4 Colors (Red, Yellow, Green, Blue)
The machine status is indicated by the LED color. It is mounted at top front of machine so that it is visible from a distance. The power-saving, maintenance-free LEDs with a viewing angle of 360 degree is adopted. The color specification can be selected from the following two types:
<Type 1 (Standard)>
- Red: Various alarms
- Yellow: The cycle start prohibited
- Green: Automatic mode operation
- Blue: During Operation mode 2/3 being selected
<Type 2>
- Red: Various alarms
- Yellow: Program end (M02/M30)
- Green: Automatic mode operation
*Buzzer function is not included. Please select the "Signal Lamp Buzzer" specification separately.

General Options

J-002210 Multi Dry Filter
It removes moisture and oil content from the compressed air supplied from the compressor. It prevents the pneumatic device malfunctions caused by the moisture and oil in the air. The auto-drain and the filter (IN / OUT) are equipped with gages respectively.
- Filter Unit: T105A-1000MSP (Maeda Shell)

J-G00952 Voltage of Customer Factory 380 V
This machine is shipped with voltage set to 200 V specification. Transformer is necessary. Please order on DMG MORI or make alternative arrangement.
(Caution)
If the setting is incompatible, there is a possibility of trouble such as operation abnormality and alarm occurrence. Be sure to check the supply voltage and frequency of the customer's factory.

* further description see attachment

GBP

J-G00960 Frequency 50 Hz
This machine is shipped with frequency set to 50 Hz specification.
(Caution)
If the setting is incompatible, there is a possibility of trouble such as operation abnormality and alarm occurrence. Be sure to check the supply voltage and frequency of the customer's factory.

J-004471 Setting Unit, MM
The unit to be used for the screen display and program commands is set to "millimeter (mm)".
Turning: "MM" specification for the turret
Horizontal machining center: "MM" specification for the tapped pallet

Technology Cycle

J-015571 Alternating Speed
This technology cycle minimizes vibration during turning by periodically changing spindle speeds on the turning. The cycle is automatically calculated only by setting the fluctuation width in the guidance screen. It is the optimal solution for machining of long, easy-to-chatter workpieces such as shafts.
*Additional necessary NC option : none

J-015575 3D quickSET
It is technology cycle that measures and offsets automatically geometric tolerance of rotary axes easily on a 5-axis machine using a touch probe and a calibration sphere. When the geometric tolerances that can lead to poor-quality workpiece forms is measured, It automatically reflects the measuring result in parameters to offset the tolerance.
*Additional necessary option : In-machine measuring system (spindle)
*For NTX, it is effective not only for 5-axis machining but also for machining using the B-axis.
*Before using it, please check the conditions in the machining chamber to avoid interference.
*For the customers who already own 3D quickSET tool kit, purchasing only software is possible. in this case, please select "3D Quick SET(w/o Calibration Sphere)".

* further description see attachment

GBP

Options for Control

J-007791 Islands, Open Pockets
Islands
- The island shape can be defined in a pocket shape. Even complex tools path can be converted in shorter time.
- Number of island shape definitions: 127
Open pocket
- The island shape can be defined in an open pocket shape.
Definition of the open part allows generation of optimum tool paths by eliminating paths of the parts with no cutting allowance.
- The air cutting is reduced significantly, so that the cycle time can be reduced by approximately 30%.
*It is available only with the milling specification.

J-008657 High-speed Canned Cycle
The screen guidance induces input of the canned cycle arguments. The high-speed cutting can be specified in one program line.
- The machining time is reduced by the high-speed machining.
- The cycle that simplifies complicated programming of high speed machining programming are newly added.
- The programming time is shortened.
- The optimum tool paths are automatically created for the high-speed machining.
- The shapes which require perplexing programs are supported.
- The manual-less screen guidance method is adopted.
The number of pattern: 21 patterns
The number of patterns for programming from the interactive machining menu: 15 patterns

J-G00618 X-axis Direction, JIS/ISO-compliant
The X-axis movement direction is compliant with the JIS/ISO standard.

Screen Text Language

J-000080 Screen display English
Language on MAPPS Screen: English
Language on MAPPS Warning Screen: English
Language on NC Screen: English
Language on PC Screen: English

* further description see attachment

GBP

Special constructions

SK001	IoTconnector The IoTconnector allows the use of online services of DMG MORI (e.g. NETservice)
SK002	NETservice The Customer acknowledges responsibility to provide a dedicated LAN Ethernet Communication cable, with 2 designated IP addresses, in the case of Heidenhain TNC control with CELOS it requires 3 designated IP addresses. This allows customer controlled encrypted access to DMG MORI Central Server to enable Netservice to function.
SK003	Machine Data Connector (MDC) A software installed on IoTconnector for uniform machine data interface as an integrated function of the DMG MORI Connectivity Hardware

Special constructions services

SK004	DMG MORI Messenger It monitors the machine operation status in real time regardless of the place or time. It keeps track of the machine status to maintain the high productivity and reduce the machine idle time significantly. Also, it provides analysis results of the machine productivity and rate of operation by specifying an arbitrary period and shift. The analysis results for each machine allows correct calculation of production volume estimate.
SK005	3D Machine Model Data The 3D model data of the machine is provided. The data can be used in the customer's CAD system for various applications such as simulation.
SK006	Transformer
SK007	Knoll interface conversion to suit 70 Bar Coolant Unit
SK008	HYDRAJET MS30-1000 - 70 bar Coolant system (Single Fixed Pressure Setting) (twin cartridge filtration system) (*only for tool / holder with Max. 2mm orifice - over 2mm will result in a reduction of pressure)

* further description see attachment

		GBP
SK009	Chip Bin	
SK010	Machine Mat	
SK011	English Machine manuals	
SK012	English Manuals on CD	
SK013	Dry Anchor	
SK014	Coolant Tubes (x 10 off)	

Total price	**545,162.00**

* further description see attachment

Attachment

Technical Description

J-A01867

Basic machine NTX 2000 | 1500 <2nd Generation>

The specifications below apply to a basic machine without additional options. Specifications in square brackets [ ] are values or features for a machine with additional options.

Capacity

Max. swing of workpiece	mm (in.)	φ700 (27.6)
Swing over cross slide	mm (in.)	φ700 (27.6)
Max. distance between centers	mm (in.)	1,842 (72.5)
Max. turning diameter <Tool spindle>	mm (in.)	φ670 (26.4)
Max. turning diameter <Turret 2>	mm (in.)	[φ315 (12.4)]
Max. turning length	mm (in.)	1,538 (60.6)
Bar work capacity	mm (in.)	φ65 (2.6)

Travel

X1-axis <tool spindle>	mm (in.)	675 (26.6) <-125 – +550 (-4.9 – +21.7)>
Y-axis <tool spindle>	mm (in.)	300 (11.8) <±150 (5.9)>
Z1-axis <tool spindle + ATC travel>	mm (in.)	1,562+164 (61.5 + 6.5)
B-axis <tool spindle>		240 <±120>
A-axis <spindle 2>	mm (in.)	[1,542 (60.7)]
A-axis <tailstock>	mm (in.)	1,542 (60.7)
X2-axis <turret 2>	mm (in.)	[200 (7.9)]
Y2-axis <turret 2>	mm (in.)	[80 (3.1) <±40 (1.6)>]
Z2-axis <turret 2>	mm (in.)	[1,542 (60.7)]

Spindle 1

Max. spindle speed	min^{-1}	5,000
Number of spindle speed ranges	steps	2 <winding>
Type of spindle nose		JIS A_2-6
Through-spindle hole diameter	mm (in.)	φ73 (2.9)
Minimum spindle indexing increment		0.0001°
Spindle bearing inner diameter	mm (in.)	φ120 (4.7)
Spindle torque <15%ED/30 min/cont > <FANUC>	N·m (ft·lbf)	421/302/256 (310.5/222.7/188.8)
Spindle torque <40%ED/cont > <SIEMENS>	N·m (ft·lbf)	365/256 (269.2/188.8)

Spindle 2 <Option>

Max. spindle speed	min^{-1}	[5,000]
Number of spindle speed ranges	steps	[2 <winding>]
Type of spindle nose		[JIS A_2-6]
Through-spindle hole diameter	mm (in.)	[φ73 (2.9)]
Minimum spindle indexing increment		[0.0001°]
Spindle bearing inner diameter	mm (in.)	[φ120 (4.7)]
Spindle torque <15%ED/30 min/cont> <FANUC>	N·m (ft·lbf)	[421/302/256 (310.5/222.7/188.8)]
Spindle torque <40%ED/cont> <SIEMENS>	N·m (ft·lbf)	[365/256 (269.2/188.8)]

Tool spindle <Turret 1>

Number of tool stations	Tool	1
Min. B-axis indexing increment		0.0001°
Tool spindle speed	min^{-1}	12,000 [20,000]
Taper hole of rotary tool spindle		Capto C6 [HSK-A63 (T63)]
Tool spindle bearing inner diameter	mm (in.)	φ70 (2.7)
Tool magazine		38 [76] [114]
Max. tool diameter <with adjacent tools>	mm (in.)	φ70 (2.7)
Max. tool diameter <without adjacent tools>	mm (in.)	φ130 (5.1)
Max. tool length	mm (in.)	400 (15.7)
Max. tool mass	kg (lb.)	8 (17.6) [10 (22)]
Tool changing time <TOOL·TO·TOOL>	sec	1.57

Turret 2 <Option>

Number of tool stations		[12] [10]
Shank height for square tool	mm (in.)	[20 (0.8)] [25 (1)]
Shank diameter for boring bar	mm (in.)	Max. [32 (1.3)] [50 (2)]
Rotary tool spindle speed	min^{-1}	[12,000] [6,000]
Spindle torque:		
- 15%ED/cont	N·m (ft·lbf)	[4.8/2.3 (3.5/1.7)]
- 25%ED/40%ED/cont	N·m (ft·lbf)	[40/35/29 (29.5/25.8/21.4)]

Tailstock

Tailstock spindle diameter	mm (in.)	110 (4.3)
Taper hole of tailstock spindle:		
- Live center		MT5
- Built-in center		[MT4]
Tailstock travel	mm (in.)	1,542 (60.7)

Feedrate

Rapid traverse rate:		
- X-axis	mm/min (ipm)	50,000 (1,968.5)
- Y-axis	mm/min (ipm)	40,000 (1,574.8)
- Z-axis	mm/min (ipm)	50,000 (1,968.5)
- A-axis <Tailstock spindle>	mm/min (ipm)	36,000 (1,417.3)
- A-axis <Spindle 2>	mm/min (ipm)	[36,000 (1,417.3)]
- X2-axis	mm/min (ipm)	[25,000 (984.3)]
- Y2-axis	mm/min (ipm)	[18,000 (708.7)]
- Z2-axis	mm/min (ipm)	[40,000 (1,574.8)]
- B-axis	min^{-1}	100
- C-axis	min^{-1}	250

Motors

Spindle 1 drive motor <15%ED/30 min/cont> <FANUC>	kW (HP)	15/15/11 (20/20/15)
Spindle 1 drive motor <40%ED/cont> <SIEMENS>	kW (HP)	26/22 (34.7/30)
Spindle 2 drive motor <15%ED/30 min/cont> <FANUC>	kW (HP)	[15/15/11 (20/20/15)]
Spindle 2 drive motor <40%ED /cont> <SIEMENS>	kW (HP)	[26/22 (34.7/30)]
Tool spindle drive motor <40%ED (2 min)/cont> <FANUC>	kW (HP)	28/23 [23/22.2]
Tool spindle drive motor <40%ED/cont> <SIEMENS>	kW (HP)	20.2/18.8 [20.2/18.8]
Turret 2 rotary tool spindle drive motor <15%ED/25%ED/cont> <FANUC>	kW (HP)	[5.5/5.5/3.7 (7.5/7.5/5)]
Turret 2 rotary tool spindle drive motor <25%ED/40%ED/cont><FANUC>	kW (HP)	[16/16/11.5 (21.3/21.3/15.3)]
Turret 2 rotary tool spindle drive motor <15%ED/25%ED/cont> <SIEMENS>	kW (HP)	[7.5/5.5/3.7 (10/7.5/5)]
Turret 2 rotary tool spindle drive motor <25%ED/40%ED/cont> <SIEMENS>	kW (HP)	[16/16/11.5 (21.3/21.3/15.3)]

Tank Capacity

Coolant tank capacity	L (gal.)	675 (178.2)

Machine Size

Machine height	mm (in.)	2,750 (108.3)
Floor space <width x depth> <Including a conveyor with the hinge type + drum filter>:		
- Tool storage capacity: 38 tools	mm (in.)	[5,825 x 2,830 (229.3 x 111.4)]
- Tool storage capacity: 76 tools	mm (in.)	[6,205 x 2,830 (244.3 x 111.4)]
- Tool storage capacity: 114 tools	mm (in.)	[6,915 x 2,830 (272.2 x 111.4)]
Mass of machine	kg (lb.)	18,300 (40,260) [18,950 (41,690)] [18,800 (41,360)] [19,450 (42,790)]

J-008071

NC Unit F31iB5

Controlled axes

Controlled axes	Tool spindle <Turret 1> side: X, Z, C, Y, B, A Turret 2 side: X, Y, Z, C <Spindle 2 specification>
Simultaneously controlled axes	Tool spindle <Turret 1> side: X, Z, C, Y, B Turret 2 side: X, Y, Z, C <Spindle 2 specification>
Least input increment	X, Z, Y, A: 0.001 mm (0.0001 in.) B: 0.0001° <full indexing> C: 0.0001°
Max. command value	±999,999.999 mm (±99,999.9999 in.)
Inch/Metric conversion	
Machine lock	
Chamfering ON/OFF	
Software damper	Abnormal load detection

Operation

Dry run	
Single block	
Jog feedrate	0 – 5,000 mm/min (0 – 196.9 ipm) <20 steps>
Manual reference position return	
Manual pulse handle feed	Manual pulse generator 1 unit x1, x10, x50, x100 (Per pulse)

Interpolation functions

Nano interpolation	
Positioning	
Exact stop mode	
Cylindrical interpolation	
Helical interpolation	Circular interpolation + linear interpolation <max. 2 axes>
Threading, synchronous cutting / Feed per revolution	
Multiple thread cutting	
Thread cutting retract	
Continuous thread cutting	
Reference position return	
Reference position return check	
2nd reference position return	
3rd reference position return	Used with ATC
Polar coordinate interpolation	

Feed functions

Rapid traverse rate override	0 – 100% <20 levels>
Feed per minute	
Feed per revolution	
Tangential speed constant control	
Feedrate override	0 – 200% <20 levels in 10% increments>
Override cancel	
AI contour control I <Look-ahead control>	

Program input

Optional block skip (Block delete)	
Program number/program name	32 arbitrary characters
Sequence number	5 digits N code
Decimal point input	Decimal point programming or electronic calculator type decimal point programming can be set using parameters.
Diameter / radius programming (X-axis)	Radius programming is possible with parameters
Plane selection	
Rotary axis designation	C, B
Rotary axis roll-over	
Coordinate system setting / Maximum spindle speed setting	
Local coordinate system setting	
Machine coordinate system selection	
Workpiece coordinate system selection	
Programmable data input	
Sub-program call	Up to 10 nestings
Addition of custom macro common variables	Total 600 variables (#100 - #199, #500 - #999)
Hole machining canned cycle	
Hole machining canned cycle for NT	
Single canned cycle	
Multiple canned cycle	
Multiple canned cycle II	Pocket profile, zigzag thread cutting
3-D coordinate conversion	
F15 format	
Dynamic diameter / radius switching	
Absolute / incremental programming	X (U), Z (W), C (H), Y (V), B, A

Miscellaneous functions/Spindle speed functions

Miscellaneous function <M function>	4 digits M code
Auxiliary function lock	
Multiple M cords in single block <Multi M code function>	Available for specific M codes
Spindle speed function <S function>	5 digits S code
Spindle speed override	50 – 150% <10% increments>
Spindle 1 orientation	
Spindle 2 orientation <Spindle 2 specification>	
Rotary tool spindle orientation	
Spindle synchronized control <Spindle 2 specification>	
Constant surface speed control	
Synchronous tapping	Tool spindle

Tool functions/Tool offset functions

Tool functions	Tool spindle <Turret 1> side: 4 digits T code Turret 2 side: 4 digits T code
Number of tool offsets	Tool spindle <Turret 1> side: 240 sets Turret 2 side: 64 sets
Y-axis offset	
Tool nose radius offset	
Tool geometry offset / Tool wear offset	
Corner circular interpolation	
Tool management system (Available on Turret 2)	

Editing

Background editing
Undo / Redo function <MAPPS>
Line number display <MAPPS>
Program protect

Setting and display

Status display	
Clock function	
Actual position display	
Program comment display	190 characters
Parameter setting display	
Message list display	
Sensor information display	Power consumption
Message history display	
Running time / Parts count display	
Actual feedrate display	
Self-diagnosis	Includes alarm display, I/O signal diagnosis and ladder diagram
Operation panel: Display section	21.5-inch + 15.6-inch TFT color LCD

Data input/output

I/O interface	USB memory
6 GB Program storage area (Storage area for user data including NC program)	Files up to 10 MB in size can be edited

3D interference checking function

3D interference checking	
Machine model for interference checking (Special designs require additional consultation)	In-machine covers with standard designs, tool spindle, spindles, turrets, workpiece discharge unit

High-speed / High-precision / 5-axis machining functions

Interpolation functions
- Nano smoothing
Feed functions
- AI contour control II
Program input
- Tilted working plane command
Tool functions / Tool offset functions
- Tool center point control
- 3-D cutter compensation
- SVC function
- Workpiece position error compensation
Data input / output
- Ethernet: 10 / 100 / 1000BASE-T Access to user memory area by Ethernet function with MORI-SERVER Software

Standard Equipment

Spindle

- Spindle drive motor is 15/15/11 kW (20/20/15 HP) <15%ED/30 min/ cont.> and max. spindle speed is 5,000 min^{-1}. <spindle 1> <NTX2000>
- Spindle drive motor is 18.5/18.5/15 kW (24.7/24.7/20 HP) <25%ED/50%ED/ cont.> and max. spindle speed is 4,000 min^{-1}. <spindle 1> <NTX2500>
- Spindle drive motor is 30/25 kW (40/33.3 HP) <30 min/ cont.> and max. spindle speed is 3,000 min^{-1}. <spindle 1> <NTX3000>

Tailstock

- Tailstock spindle - Live center specifications: MT5 <without center>

Tool spindle specification

- B-axis is 0.0001° indexing spec.

Tool magazine

- Tool storage capacity is 38 tools. <Chain-type>

ATC, automatic tool changer

- Type of tool shank C6

Coolant

- Water-soluble coolant unit <800 W, 50 Hz/1,100 W, 60 Hz>
- Through-spindle coolant system <Tool spindle> <800 W, 50 Hz/1,100 W, 60 Hz>

Measurement

- Manual in-machine tool presetter <spindle 1>, Removable type

Safety features

- Full cover
- Impact resistant viewing window
- Door interlock system
- Low hydraulic pressure detecting switch
- Low air pressure detecting switch

Others

- Automatic power-off system
- Chuck foot switch <single> <controlled by pedal>
  Double foot switch is obliged to use with EN regulation compliance machine for security reason.
- Built-in worklight
- Leveling block
- Hand tools
- One set of operation and programming manuals

J-003261
CELOS to facilitate machine operation.

Can be networked with CAD / CAM products.
Open to forward-looking CELOS APP extensions.
Uniform interface for all the new high-tech machines from DMG MORI SEIKI.
Integrated management, documentation and visualization of order, process - and machine data.

Screen / Panel:	21.5 "ERGOline Touch ® control with multi touch screen Multi touch machine control panel for pioneering operating comfort Stepless adjustment of screen and machine control panel Display of access permission
SMARTkey ®:	Personalized authorization of the operator. Customized access rights to the control and the machine. Internal USB memory
APP SELECTOR:	Central selection mask for direct access by means of intuitive touch control and access to all available applications, divided into five major groups: Production, Accessories, Support, Monitoring, Configuration
APPs "Production": CONTROL:	MAPPS system with touch screen operation 6 function window-set for easy access to the machine information. Machine operation scene-based automatic window-set change allows users to access the necessary information for each operation easily
JOBMANAGER:	Systematic planning, managing and preparing orders Machine-related creation and configuration of new orders Structured storage of all production-relevant data and documents

	Simple visualization of jobs including NC programs and resources
JOB ASSISTANT:	complete jobs / processing of orders Menu driven set-up of the machine and processing of Production orders in the dialog Reliable error prevention through notes with binding acknowledgement function
APPs " accessories": TECH CALCULATOR:	calculating of technology data, dimensions and values Material - and process-dependent calculation process optimized Data for example for speed, feed, or spindle load Standards-conforming discovery defined dimensions, Providing data/dimensions as required by the standards for example, for Fits or thread Scientific calculator
CAD-CAM-VIEW:	visualizing of workpieces and optimizing of program data Direct remote access to external CAD/CAM-computer Central master data as the basis of the part visualization Immediate change options for processing steps NC programs and CAM strategies directly to the control
DOCUMENTS:	Digital library of full-text search Clear library structure for easy and quick orientation Digital storage of all machine-relevant manuals, Documentations and customer data Full text search and bookmark feature for recurring Lookup fields
ORGANIZER:	Calendar, and memo functions User-defined messaging functions Individual messages with SMART key ® Identification
APPs " support": NETSERVICE:	Qualified support through Web-based remote diagnosis Remote communication with the service of DMG MORI SEIKI directly at the control unit Online troubleshooting and technical support via Internet Highest data security through VPN access
MACHINE CHECK:	Controlled maintenance and repair of the machine Process-based login system for maintenance with control function Preventative service and maintenance planning
APPs "Monitoring": STATUS MONITOR:	Machine status in real time Visualization of machine condition (spindle load,...) Displaying job information with quantity, lot size and Term to maturity Maintenance messages and warnings Energy return feed display

APPs " configuraton":

ENERGY SAVING:	Automated energy management Categorized balance display for different machine States (Hold, ready for operation, processing) Programmatic Shutdown, WarmUp and StandBy functions for Machine, pneumatic, screen and lighting of workroom Utilization - and time-based process analysis as base of the Consumption optimization
SETTINGS:	Individualization and personalization SMART key ® -based user and rights management Individual APP customization General system settings

J-008481
12 Station Bolt-Tightened Turret, milling specifications (12,000 min-1, 16.9 Nm) (Turret 2) (FANUC)

The number of standard sets as follows. Please refer to the tooling system diagram for details.
*[ ] inch specification

O.D. cutting holder	T00224 (□20) (height:70) [T00234 (□3/4") (height:70)]	1
O.D. double cutting holder	T00228 (□20) (height70) [T00250 (□3/4") (height:70)]	1
Boring bar holder	T10115 (dia. 32) [T10119 (dia. 1 1/4")]	2
Throw-away drill holder	T13132 (dia. 32) [T13135 (dia. 1 1/4")]	1
Boring bar sleeve	T20118 (dia. 16) [T20119 (dia. 5/8")]	1
Boring bar sleeve	T20120 (dia. 20) [T20121 (dia. 3/4")]	1
Boring bar sleeve	T20122 (dia. 25) [T20123 (dia. 1")]	1
Throw-away drill socket	T22052 (dia. 20) [T22053 (dia. 3/4")]	1
Pipe	P40145(dia. 6)	2
Lid	F75054	12