

***SPEEDIO***

**U500Xd2**

Universal Compact Machining Center



# U

## Universal Compact Machining Center Performs universal indexing, encouraging process integration

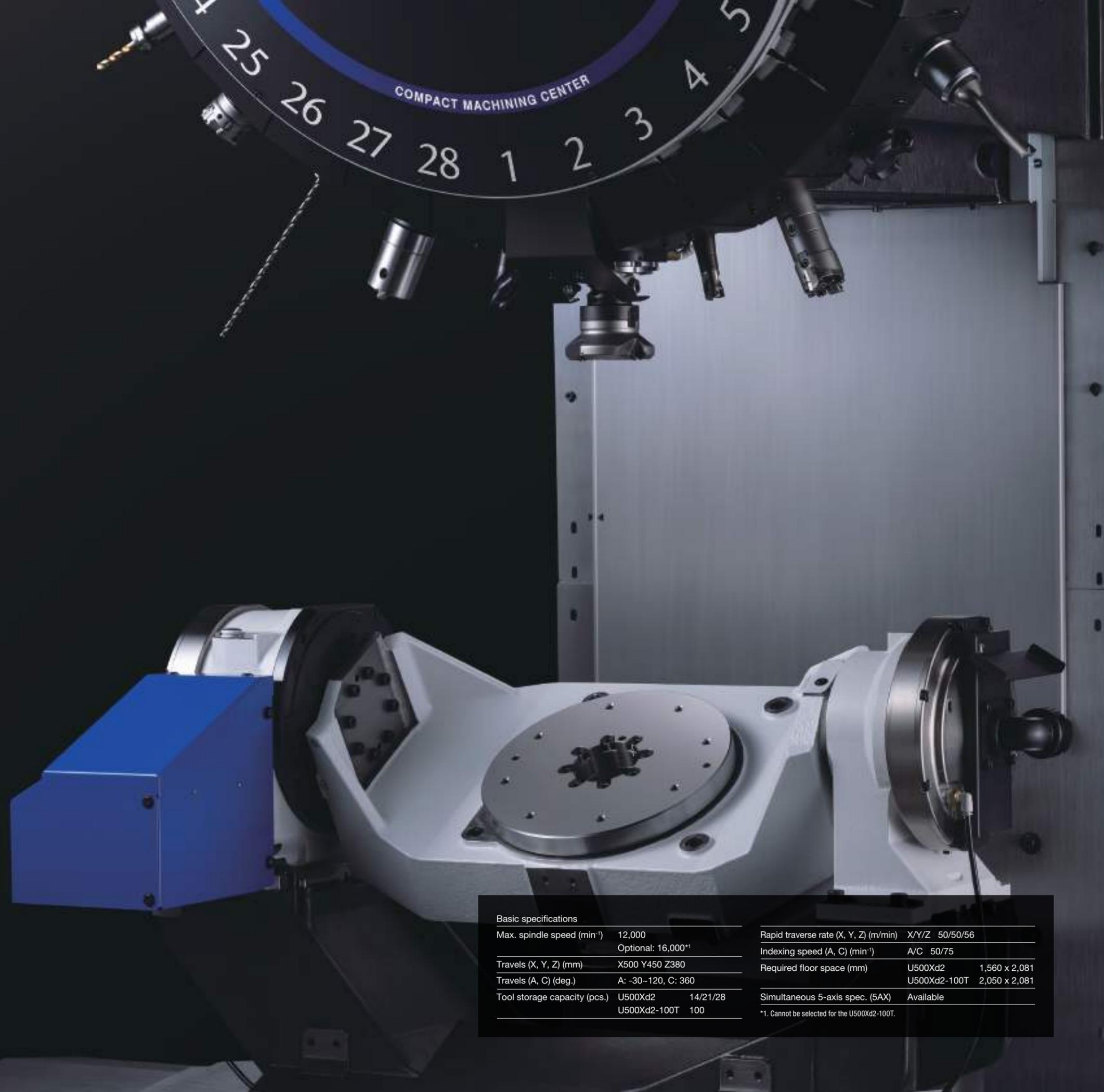
Standard equipped with a tilting rotary table with a maximum jig area of  $\phi 500$  mm.

Increased travels of Y/Z axes and the newly developed 100-tool magazine enable a wider range of multi-face machining.

## Cutting Out the Waste *SPEEDIO*



U500Xd2



### Basic specifications

Max. spindle speed (min <sup>-1</sup> )	12,000 Optional: 16,000*1	Rapid traverse rate (X, Y, Z) (m/min)	X/Y/Z 50/50/56
Travels (X, Y, Z) (mm)	X500 Y450 Z380	Indexing speed (A, C) (min <sup>-1</sup> )	A/C 50/75
Travels (A, C) (deg.)	A: -30~120, C: 360	Required floor space (mm)	U500Xd2 1,560 x 2,081 U500Xd2-100T 2,050 x 2,081
Tool storage capacity (pcs.)	U500Xd2 14/21/28 U500Xd2-100T 100	Simultaneous 5-axis spec. (5AX)	Available

\*1. Cannot be selected for the U500Xd2-100T.

## Expands process flexibility to the fullest Provides a broader range of applications

SPEEDIO's high-speed performance and process integration through multi-face machining enhance productivity at customers' premises more than ever before.

One-clamp operation achieves highly efficient and highly accurate machining in various industries.

### Automobile



EV gearbox housing  
Aluminum alloy  
Size: 305 x 260 x 90



Gearcase cover  
Aluminum alloy  
Size: 350 x 250 x 50



20-inch wheel  
Aluminum alloy  
Size:  $\phi$ 350 x 200



Steering rack housing  
Aluminum alloy  
Size: 350 x 170 x 120

### Aircraft



Aircraft parts  
Aluminum alloy  
Size: 300 x 250 x 100



Turbin blade  
Titanium alloy  
Size: 140 x 80 x 40

### Medical



Bone plate  
Ti-6Al-4V  
Size: 280 x 50 x 3

## Equipped with tilting rotary table with jig area of $\phi 500$ mm Increased travels of Y/Z axes enable a wider range of multi-face machining.

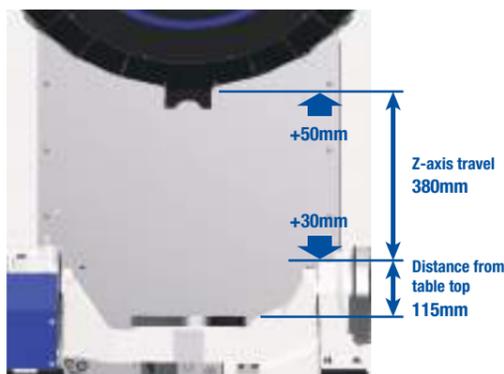
Standard equipped with a high-speed, highly accurate tilting rotary table with ample jig area.

Increased travels of Y/Z axes and using a magazine that can store up to 28 tools further accelerates process integration by one-clamp machining.

### Increased Z-axis travel

The Z-axis travel and the distance between the table top and spindle nose end have been increased to secure ample machining area in the Z direction and improve tool accessibility.

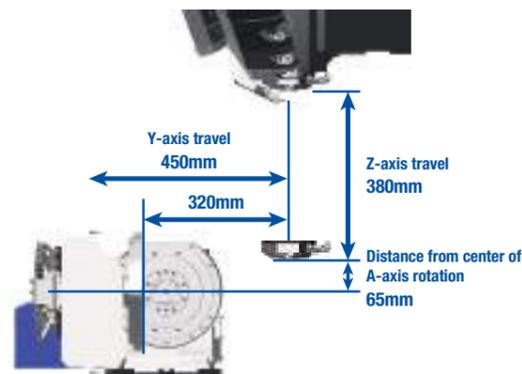
Z-axis travel **300mm** Previous model **▶ 380mm**



### Increased Y-axis travel

The Y-axis travel when the A-axis is at 90 degrees has been increased to 320 mm by increasing the Y-axis travel and shifting the Y-axis travel range from the center of the tilting axis. In addition, tool accessibility has been improved.

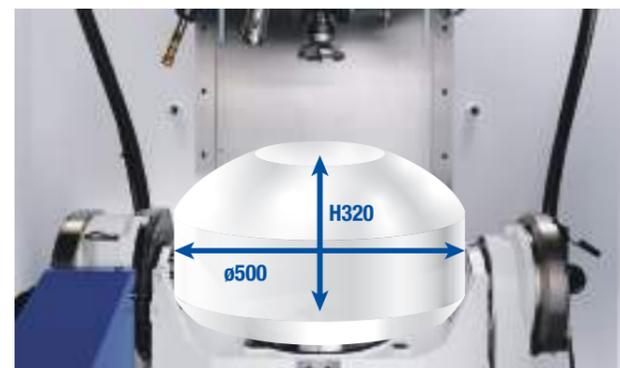
Y-axis travel **400mm** Previous model **▶ 450mm**



\* The A-axis tilts toward the column to expand the jig area and A-axis tilting range. To improve visibility during setup, a swivel-type operation panel can be custom-ordered. Please contact your local distributor for detail.

### Expanded jig area

Increased travels of Y/Z axes provide ample jig area of up to 500 mm in diameter and 320 mm in height. This enables multi-face machining for medium-sized workpieces.



Max. loading weight **100kg**

\* Refer to the External Dimensions on page 21 for details of the jig area.

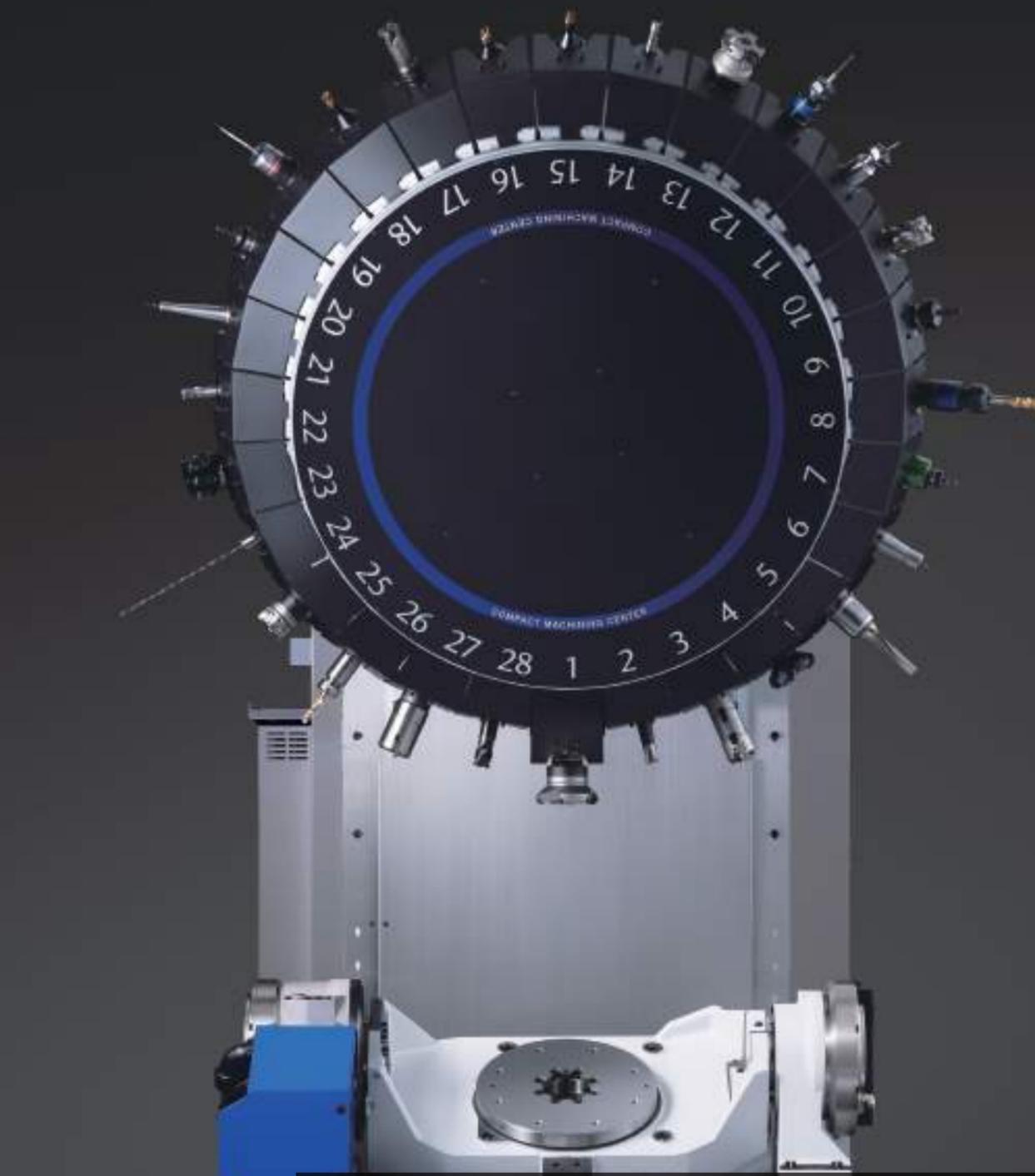
### 28-tool magazine

The 28-tool magazine is a compact turret magazine that achieves high-speed tool change. The maximum tool weight is 4 kg. An extensive range of magazine specifications are available, including 14-tool, 21-tool, 28-tool, and 100-tool\*1.



28-tool magazine	
Max. tool size	<b>110mm</b>
Max. tool weight	<b>4kg</b>
Max. total tool weight	<b>35kg</b>
Tool-Tool	<b>0.7s</b>

\*1. The 100-tool magazine can only be selected for the U500Xd2-100T. See pages 13 to 16 for details.



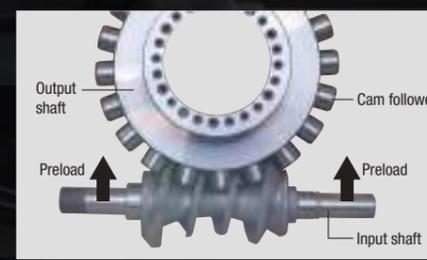
### Equipped with tilting rotary table that uses roller gear cam

A roller gear cam mechanism is used for A and C axes, achieving high retention strength and backlash-free high-speed and highly accurate indexing.

The rotary range of A-axis (tilt axis) is -30 deg. to 120 deg. suitable for a wide variety of machining.



Max. indexing feed rate	
A-axis	<b>50min<sup>-1</sup></b>
C-axis	<b>75min<sup>-1</sup></b>



0 to 90-deg. indexing time	
A-axis	<b>0.9s</b>
C-axis	<b>1.2s</b>

## Untiring pursuit of high productivity

# Reduction in waste by optimizing control through machine/controller integrated development

Pursuing fast acceleration and quick response through machine/controller integrated development and optimizing control with the "CNC-D00" controller drive machine performance to the limit to provide high productivity.

### Non-stop ATC

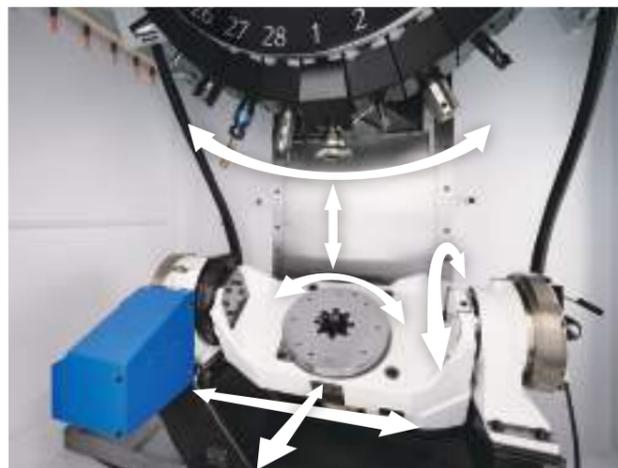
High-speed tool change has been achieved by faster and optimized spindle start/stop, Z-axis up/down, and magazine operation. Tools up to 3 kg can be changed in the shortest time. Tools up to 4 kg can also be changed with minimal increase in time.



	14/21 tools (Standard tools)	28 tools (Standard tools)	28 tools (Heavy tools)
Tool-Tool	<b>0.6s</b>	<b>0.7s</b>	<b>0.8s</b>
Chip-Chip	<b>1.3s</b>	<b>1.4s</b>	<b>1.4s</b>

### Simultaneous operation

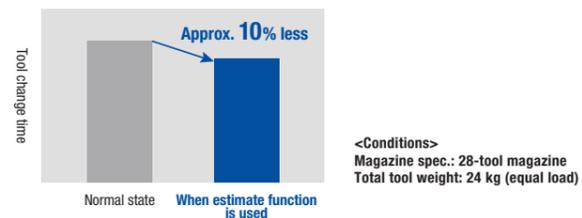
Wasted time has been reduced by simultaneously performing tool change and positioning X/Y and additional axes.



### Magazine load conditions estimate\*

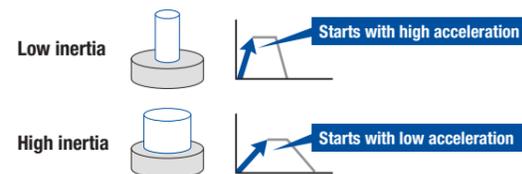
Estimates the inertia and unbalanced load of the tool loaded in the magazine, and sets the optimum value for the acceleration of the magazine axis. In addition, automatically updates the value to the estimated optimum acceleration, even during programmed operation.

\* Cannot be used for tool stockers of the U500Xd2-100T.



### Optimized A/C-axes indexing feed rate

Based on the estimated A/C-axes inertia, the A/C-axes start with optimal acceleration until they reach the indexing feed rate.



### High acceleration/deceleration spindle

Using a low inertia spindle and high acceleration/deceleration spindle motor has achieved faster spindle start/stop.

**Spindle start/stop time 0.2S or less**

### High acceleration Z-axis

As the Z-axis moves frequently, the highest acceleration in its class has been achieved, contributing to reduction in cycle time.

**Z-axis acceleration Max. 2.2G**

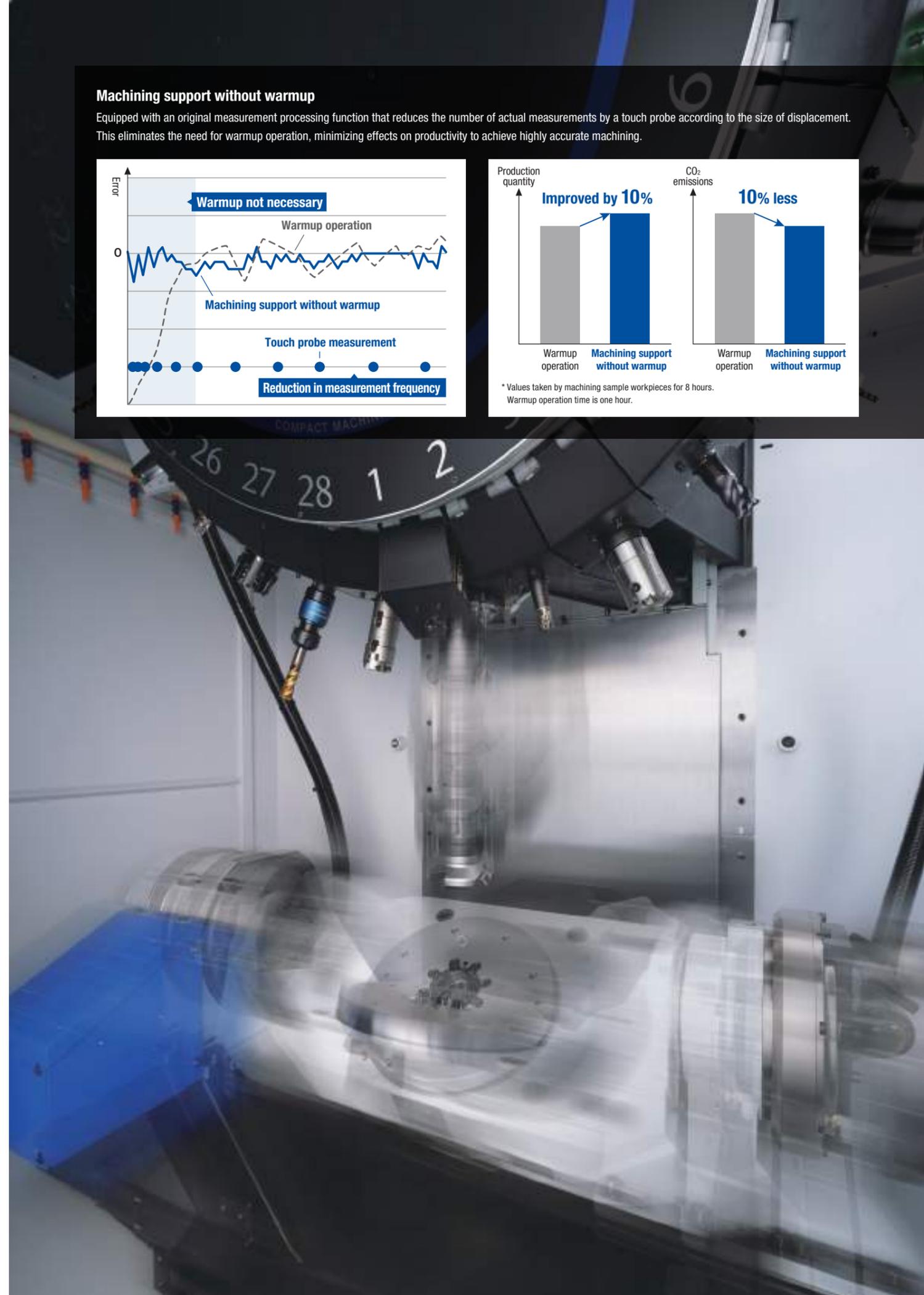
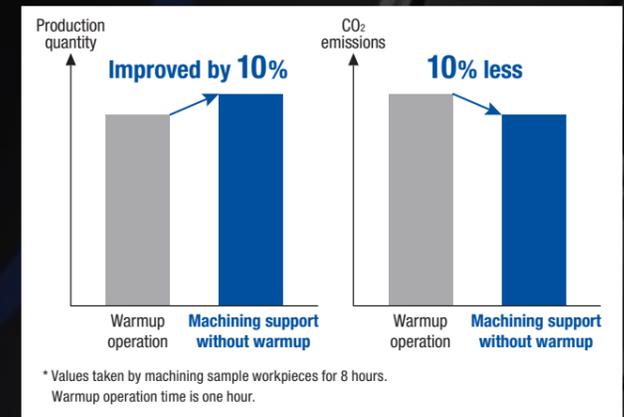
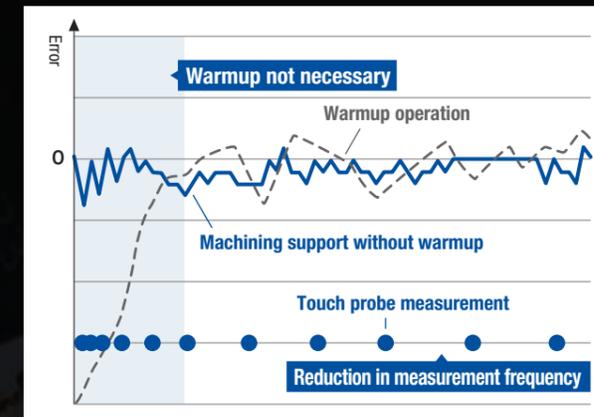
### Improved automatic door opening/closing speed

The automatic door opening/closing speed has been improved, enabling significant reduction in setup time.

**Automatic door opening/closing time 20% less**

### Machining support without warmup

Equipped with an original measurement processing function that reduces the number of actual measurements by a touch probe according to the size of displacement. This eliminates the need for warmup operation, minimizing effects on productivity to achieve highly accurate machining.



# Highly rigid machine structure and highly efficient spindle motor enable a broad range of machining

Reliable and trustworthy machine structure has been achieved.

Equipped with a highly efficient spindle motor that demonstrates sufficient torque from the low- to high-speed range.

Achieves highly efficient machining in various industries, from automobile to general machinery, medical, and aircraft industries.

Tool center point control is provided to support simultaneous five-axis machining.\*1

\*1. Available only on the U500Xd2-5AX

## Newly developed and highly efficient 12,000 min<sup>-1</sup> spindle motor

The standard motor specifications have been upgraded from the previous 10,000 min<sup>-1</sup> to a newly developed 12,000 min<sup>-1</sup>. As spindle torque is maintained in the medium- and high-speed range, this achieves further reduction in machining time when performing highly efficient machining of aluminum or steel at high speed.

12,000 min <sup>-1</sup> (standard)	Max. torque <b>40N·m</b>	Max. output <b>18.9kW</b>
16,000 min <sup>-1</sup> (optional)	Max. torque <b>27N·m</b>	Max. output <b>15.4kW</b>

## High clamp torque

Both A and C axes are provided with high clamp torque, demonstrating high retention strength even in high-load machining. Machining with more stringent cutting conditions is possible, improving production efficiency.

A-axis clamp torque *3	<b>810N·m</b>
C-axis clamp torque *3	<b>560N·m</b>



\*3. Value of mechanical clamp (at pneumatic 0.5 MPa) plus servo clamp

## 7 MPa Coolant Through Spindle (CTS) (optional)

The CTS option can be selected from 3 MPa or 7 MPa. With this option, the machine can operate to its fullest potential in high-speed drilling or deep-hole drilling.

## High inertia mode \*2

High inertia mode is available for the tilting rotary table so that jigs for heavy or irregular workpieces can be mounted.

\*2. Parameter setting needs to be changed.

## Simultaneous 5-axis machining (U500Xd2-5AX)

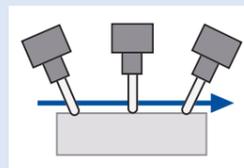
Equipped with a variety of functions, including tool center point control and micron command.

This achieves high-speed and highly accurate simultaneous 5-axis machining in combination with a backlash-free tilting rotary table.

\* Changing to the conversation language is not possible for the simultaneous 5-axis specifications (5AX).

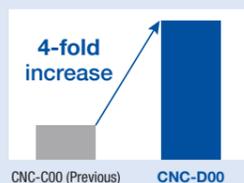
### Tool center point control

Equipped with tool center point control where machining is performed by changing the tool direction relative to the workpiece. Optimal acceleration/deceleration by look-ahead up to 1,000 blocks achieves simultaneous 5-axis machining.



### Processing speed of minute line segments

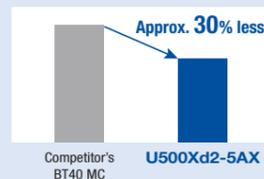
The CPU capacity has been greatly increased to enhance the processing speed of minute line segments by four times the previous controller. This enables high-speed processing of CAM data with small tolerance.



### Productivity improvement

In addition to the compactness of the BT30, the original look-ahead acceleration/deceleration processing maximizes the machine's performance (max. speed and acceleration) to achieve high-speed simultaneous 5-axis machining.

Comparison with cycle time by competitor's BT40 MC Workpiece: Knee joint



### Improvement of A/C-axes tracking

The A/C-axes cutting feed is automatically adjusted based on the estimated inertia to reduce the tracking errors on the A/C-axes, achieving stable three-dimensional machining accuracy.

## Machining capability

		ADC	Cast iron	Carbon steel
<b>Drilling</b>	12,000min <sup>-1</sup>	D32 x 0.2 (1.26 x 0.008)	D28 x 0.15 (1.1 x 0.006)	D25 x 0.1 (0.98 x 0.004)
	16,000min <sup>-1</sup>	D24 x 0.2 (0.94 x 0.008)	D23 x 0.15 (0.91 x 0.006)	D18 x 0.1 (0.71 x 0.004)
<b>Tapping</b>	12,000min <sup>-1</sup>	M27 x 3.0 (1-8UNC)	M27 x 3.0 (1-8UNC)	M22 x 2.5 (7/8-9UNC)
	16,000min <sup>-1</sup>	M22 x 2.5 (7/8-9UNC)	M22 x 2.5 (7/8-9UNC)	M16 x 2.0 (5/8-11UNC)
<b>Facing</b>	12,000min <sup>-1</sup>	1,200:100 x 4.0 x 3,000 (73.2 : 3.94 x 0.16 x 118.1)	74:40 x 3.2 x 573 (4.5:1.57x0.13x22.6)	54:40 x 2.8 x 484 (3.3:1.57x0.11x19.1)
	16,000min <sup>-1</sup>	960:100 x 3.2 x 3,000 (58.6 : 3.94 x 0.13 x 118.1)	64:40 x 2.8 x 573 (3.9:1.57x0.13x22.6)	46:40 x 2.4 x 484 (2.8:1.57x0.09x19.1)

\* Data obtained from tests conducted by Brother.

\* These values are when the A-axis is at 0 degrees and X/Y axes are at their travel center. The above machining capability may not be achieved depending on conditions, including usage environment, tools in use, and coolant.



Machining video



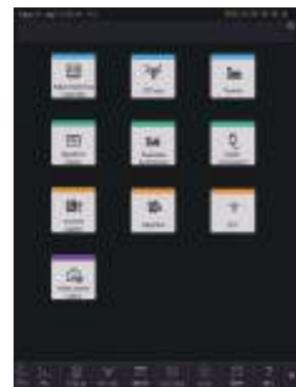
Scan or Click

# Equipped with “CNC-D00” controller Enhanced usability with 15-inch LCD touch panel

Intuitive operation is possible with apps and vertical touch panel screen. Relevant functions are grouped according to purpose, such as setup and machining, leading to efficient operation. Production and operation states are visualized, allowing faster understanding. Waste-free operation is possible in setup, machining adjustment, production, and recovery process, leading to improved work efficiency and operating rate.

### User interface

Equipped with support apps with improved operability and visibility by grouping relevant functions and an easy-to-view display, in addition to several useful accessories (calculator, notebook, file viewer etc.). Operation on conventional screens is possible on the touch panel. With these, usability has been greatly improved.



List of support apps



Conventional screen (position screen)

### Accessibility and workability

Accessibility has been enhanced so that operators can perform setup including workpiece change without any strain.



From front of machine to table  
320mm

### Setup support

Equipped with functions to easily perform setup, such as an ATC tool app that enables all magazine tool settings to be performed on one screen, menu programming that enables you to create NC programs by following instructions on the screen, and an on-screen help function.



ATC tool app

### Machining adjustment support

Equipped with functions to easily perform optimal machining adjustment to improve productivity, such as a machining parameter adjustment app that enables you to easily adjust parameters according to machining details and a machining load waveform display/saving function.



Waveform display app

### Production support

Equipped with functions to improve the operating rate, such as real time tool monitoring to eliminate defects, displaying production performance, power consumption etc. as a graph, and PLC/network functions to meet peripheral equipment and automation requirements.



Production performance app

### Recovery support

Equipped with functions to prevent failure or ensure quick recovery, such as maintenance time notice, displaying details when an alarm occurs, and guidance for recovery/check work.



Recovery support app



### Home screen

Information required for production, such as workpiece counter and tool life, is collected on the home screen. Shortcut keys are provided for screens frequently used so you can open them by one touch.



NC function video



Scan or Click

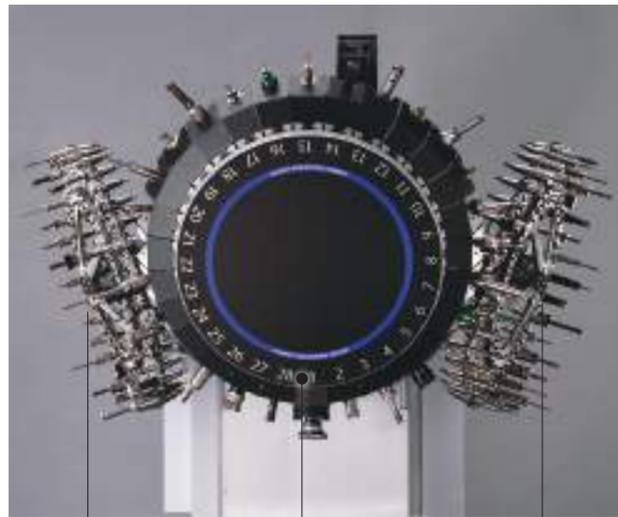
## Newly developed 100-tool magazine\*1 achieves space saving and high productivity

The new 100-tool magazine, featuring the largest storage capacity in the SPEEDIO series, has been developed. \*1

Brother's original mechanism achieves space saving and high productivity.

\*1. Mounted only on the U500Xd2-100T. Conversation language not available on the U500Xd2-100T.

### Newly developed 100-tool magazine (optional)



Left-side tool stocker      Turret magazine      Right-side tool stocker

A tool stocker that can store 36 tools is installed on the right and left sides of the 28-tool turret magazine, enabling storage of 100 tools, the largest capacity in the SPEEDIO series.

Brother's original tool handling mechanism achieves stable tool change.

100-tool magazine spec.	
Turret magazine	: 28 tools
Tool stocker (left/right)	: 36 tools each
Total storage capacity	: 100 tools

The stocker shutter separates the tool stocker from the machining chamber, minimizing the effect of chips on tools.



### Space-saving design

Tool stockers are installed inside the machine to save space while storing 100 tools.



\*2. Does not include coolant tank and chip conveyor.

\*3. Compared to BT40 vertical MC with equivalent tool storage capacity.

### High productivity

If the number of tools used in machining is 28 or less, high speed tool change is possible using only the turret magazine, leading to high productivity. Even when using tools in the tool stocker, handling is possible within approximately 5 seconds (1 tool).

In addition, all tools in the turret magazine can be easily changed, reducing setup time.

Turret magazine tool change time	
Tool to Tool:	0.7 s
Chip to Chip:	1.4 s

Tool stocker handling time*4	
Shortest (1 tool)	Approx. 5s
All tool change (28 tools)	Approx. 140s

\*4. Handling time varies depending on the tool attachment position.

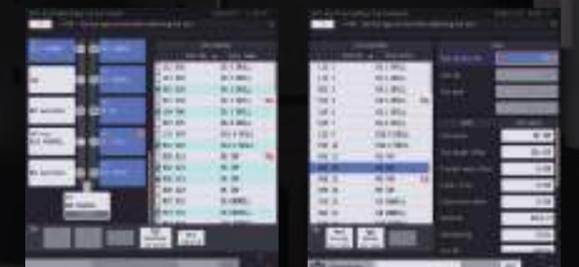


### Tool stocker management function

A function for managing the 100-tool magazine has been added to the ATC tool app.

Tool change operation is intuitive, and tools to be used in the machining program can be moved from the tool stocker to the turret magazine in a batch.

In addition, data of tools in the tool stocker can be easily changed.



Batch tool change

Tool setting screen

# 100-tool magazine\*1 and tilting rotary table increase efficiency of high-mix small-lot production and reduce manpower

In high-mix small-lot production, the magazine that can store up to 100 tools and the tilting rotary table compatible with multi-face machining improve production efficiency and reduce manpower.

\*1. Mounted only on the U500Xd2-100T. Conversation language not available on the U500Xd2-100T.

## 100-tool magazine + ø500 tilting rotary table

For high-mix small-lot workpieces, the 100-tool magazine eliminates the need for frequent tool changes, and the tilting rotary table with a jig area of ø500 mm enables multi-face machining and simultaneous 5-axis machining for a variety of workpieces with one-clip.

### Example of high-mix small-lot workpieces

<p><b>Optical instrument</b></p>  <p>Optical Components ø50 x 20</p>	<p><b>Communication equipment</b></p>  <p>Relay Boxes 160 x 75 x 35</p>	<p><b>Watch</b></p>  <p>Watch case 45 x 50 x 10</p>
<p><b>Semiconductor</b></p>  <p>Transfer equipment parts 133 x 60 x 30</p>	<p><b>Medical instrument</b></p>  <p>Knee joint 65 x 60 x 50</p>	<p><b>Hydraulic/pneumatic equipment</b></p>  <p>Stainless steel valve 75 x 35 x 35</p>

### Combination with pallet changer

Combining the machine with a pallet changer that can store multiple pallets enables longer continuous operation, which improves the efficiency of high-mix small-lot production and saves manpower.

As an example, combination with optional pallet changer PC-1\*2 allows continuous operation for approx. 8 hours for a workpiece with a 12-minute cycle time. In addition, there is no wasted setup change even for a large variety of workpieces, greatly improving production efficiency.

\*2. Available only on the U500Xd2-100T. Available only in Japan.

Example of combination with PC-1 (optional) *2	
Pallet jig size	: 200 mm/width, 200 mm/depth, 200 mm/height
Pallet loading weight	: 15 kg
No. of pallets	: 40
Cycle time	: 12 min/workpiece
<b>Continuous operation time: Approx. 8 hours</b>	



The PC-1 allows a variety of workpieces to be mounted on 40 pallets, enabling continuous operation.



### Making automation and manpower saving easier

#### Side shutter (optional)

Assuming loading/unloading of workpieces from the side by robots, a side shutter has been prepared to make automation easier.

\* A safety fence is required.

#### Chip conveyor (optional)

Two types of chip conveyors are available: scraper type and hinge + scraper type.

\* Chip conveyors can only be selected for the U500Xd2-100T.



# SPEEDIO Blue Technology

Eliminating waste elements at production sites leads to reduction in greenhouse gas emissions, such as carbon dioxide and methane. Brother's optimal and compact design reduces wasted time, resources, and energy during parts machining.

We are striving to reduce environmental impact by conducting product life cycle assessment, which quantitatively evaluates environmental impact at each stage of production, transportation, use, disposal, and recycling.

## SPEEDIO Blue Technology Solves Four Waste Elements at Production Sites

### Wasted time reduction



Wasted time is reduced by minimizing non-cutting time in the machining cycle time and reducing setup time and downtime.

### Wasted resource reduction



Wasted resources are reduced by using machining adjustment support that prevents cutting defects and production support such as real-time monitoring.

### Wasted energy reduction



Optimal design eliminates all waste, including excessive power consumption and air flowrate, achieving industry-leading energy-saving performance.

### Wasted installation space reduction

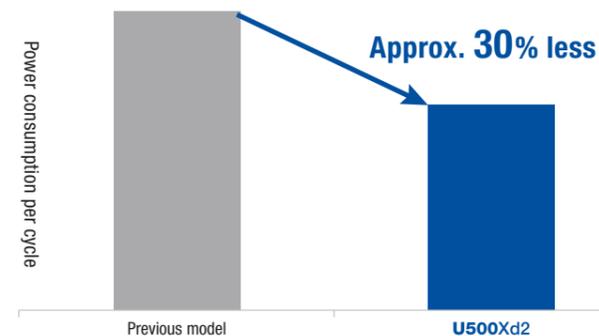


Compact design reduces wasted space with less restrictions on installation locations.

### Wasted energy reduction

#### Saving power

New functions, including chip shower energy savings operation, energy savings mode, and machining support without warmup, have been incorporated to significantly reduce power consumption, compared to the previous model. Together with various energy-saving technologies, such as power regeneration and highly efficient spindle motors, power consumption is overwhelmingly low.

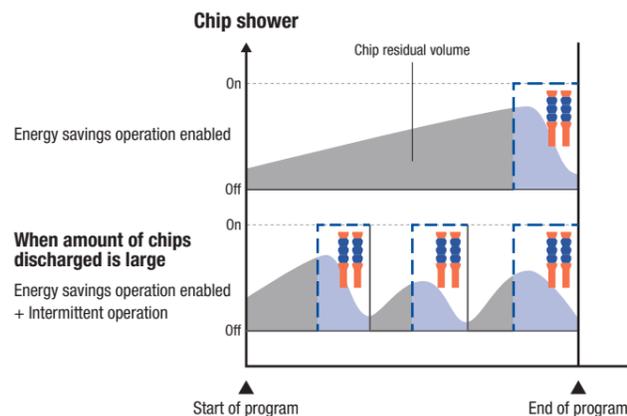


**Power consumption 30% less than previous model**

\* Values taken by running sample program created by Brother with "chip shower energy savings operation" enabled

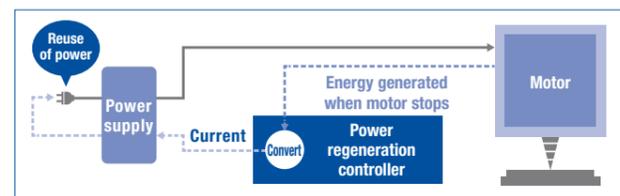
#### Chip shower energy savings operation

This function controls the on/off timing of the chip shower pump. Operation is switched via parameters according to the amount of chips discharged, contributing to energy saving for chip shower pumps that consume significant amounts of power.



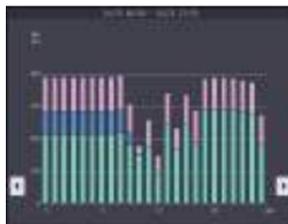
#### Power regeneration system

Equipped with a power regeneration system that recycles energy generated when a servo motor decelerates.



#### Power consumption app

Servomotors, pumps, and other equipment are grouped and displayed according to purpose. Calculation is possible for each cycle.

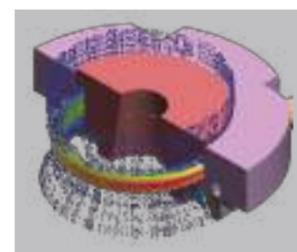


#### Saving air

Air related functions have been reviewed and optimized to eliminate any waste, which results in significant reduction in air consumption, compared to the previous model.

#### Air purge

Reinforced the labyrinth structure on the spindle end face to reduce air consumption.



Air flowrate analysis of spindle end face

#### Spindle air blow

Optimized the air blow start/stop timing during tool change to reduce air consumption.



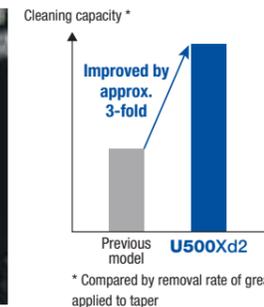
### Wasted resource reduction

The machine is equipped with many functions that can prevent possible defects in daily production sites, such as chip problems, tool abrasion, omission of tool attachment, and re-machining of the same workpiece. These functions contribute to the reduction in wasted resources at production sites.

#### Tool cleaning system (optional)

The number of discharge holes and the angle of these holes have been optimized to significantly increase the discharge flowrate. This has resulted in a threefold increase in cleaning capacity, compared to the previous model. CTS specifications allow the direct pump type where coolant is discharged from the CTS pump to be selected, consuming less air than the air-assisted type.

\* When CTS is not selected, air-assisted tool cleaning is used



#### Stuck chips detection function

Chips caught between the spindle and the holder during ATC are detected without using a sensor. Detecting any stuck chips during ATC prevents the outflow of defects. A retry function is also provided.



#### ATC tool monitoring

Checks the presence of a spindle tool before and after tool change, tool over spindle, positional shift of tool key etc. without using a sensor.



#### Machining load monitoring

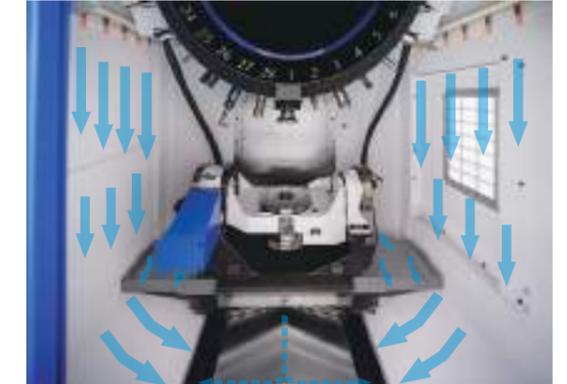
Machining load applied to the spindle is monitored to issue an alarm when the load is not within the preset value.



#### Prevention of chip problems

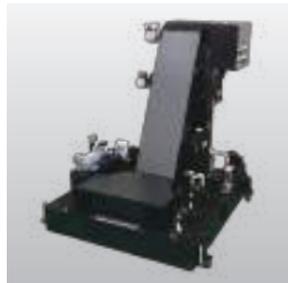
Thorough chip evacuation/removal prevents chip problems, improving reliability. Increasing the number of chip shower nozzles and reviewing the diameter of the piping have improved chip evacuation performance.

Image of chip evacuation flow by chip shower





**Coolant tank**  
Can be selected from 50L, 100L, 150L, or 200L according to the purpose. If you need a CTS spec. higher than 1.5 MPa, this will be custom-built.



**Chip conveyor**  
Two types of chip conveyors are available: scraper type and hinge + scraper type.



**Coolant Through Spindle (CTS)**  
Can be selected from 3.0 MPa or 7.0 MPa. Pump and tank are not included.



**Head coolant nozzle**  
Coolant can reliably be applied to the machining section as the tool and nozzles are set in place.



**Work light (1 or 2 lamps)**  
LED lamps are used to extend lamp life and save energy. \* Installed on the right or left side of the machine.



**Signal light (1, 2, or 3 lamps)**  
LED lamps are used. No maintenance required. Can be tilted to improve visibility.



**Automatic oil lubricator**  
Regularly applies oil to all lubricating points on the three axes.



**Automatic grease lubricator**  
Regularly applies grease to all lubricating points on the three axes. \* Manual greasing is required for the standard specification model.



**Tool cleaning system**  
High discharge pressure and flowrate powerfully removes chips stuck to the holder. Two types are available: air-assisted type and direct pump type where coolant is discharged directly from the CTS pump. \* The direct pump type can only be selected for CTS specifications.



**Rotary joint**  
Six built-in ports are prepared to make jig mounting easier. 6 ports: Hydraulic (7 MPa), Pneumatic (1 MPa)



**Chip shower**  
Chip shower piping is located at the upper section inside the machine for more efficient flow, and flexible shower nozzles can be directed to the side of the machine cover or sections where chips tend to accumulate.



**Fixture shower valve unit**  
Consists of jig washing valves and piping to the ceiling of the machine. Piping from the machine to the required location must be prepared by customers.



**Automatic door with switch panel 10 holes**  
A motor-driven door is used, achieving smooth operation.



**Area sensor**  
Optical area sensors are used. Use area sensors to prevent operators being caught in the automatic door.



**Side shutter**  
Assuming loading/unloading of workpieces from the side by robots, a side shutter has been prepared to make automation easier. \* A safety fence is required.



**Manual pulse generator**  
A cable is provided for the manual pulse generator, making setup easier. Equipped with emergency stop and enable switches.



**Cleaning gun**  
Helps clean the workpiece or chips inside the machine after machining.



**Top cover**  
Shutting the opening on the top prevents coolant or chips splashing outside of the machine. A hole for the mist collector is provided.



**Side door with transparent window**  
Makes setup from the side easier. The machining chamber can be checked through the window. The manual pulse generator can also be operated.



**Side cover with transparent window**  
External light is drawn in to make the inside of the machine brighter and improve visibility. \* Order two covers when needed for both sides.



**Tool breakage detector, touch type**  
A touch switch type tool breakage detector is available. \* Cannot be used for tool length measurement.



**Spindle override**  
Spindle speed can be changed without changing the program.



**Switch panel (8 holes or 10 holes)**  
Various switches, such as automatic door open/close switches, are set in specific locations. The switch panel (8 holes) is also available so that the position of the manual pulse connector can be changed.



**Master on circuit**  
Master on circuit and switch can be attached. \* A switch panel (8 holes or 10 holes) is required separately.

\* The type of coolant may have a significant influence on the machine's lifecycle. It is recommended to use high-lubricity (emulsion type) coolant. Do not use chemical solution type (synthetic type) coolant, as it may cause damage to the machine.

\* When using CTS (Coolant Through Spindle) function, do not use flammable coolant (ex. oil-based type).

● Please read the instruction manuals and safety manuals before using Brother products for your own safety.

When using oil-based coolant or when machining materials which can cause a fire (ex. magnesium, resin), customers are requested to take thorough safety measures against fire.

The types of cutting material, cutting tools, coolant, or lubrication oil may have an influence on the machine's lifecycle.

For further questions, please contact our sales representative.

● Leave 700 mm between machines as maintenance space.

● When exporting our machine, the machine is deemed to be included in the "applicable listed items" controlled by the Foreign Exchange and Foreign Trade Law of Japan. When exporting the machine, please obtain required permissions, including an export license, from the Ministry of Economy, Trade and Industry (METI) or Regional Bureaus of Economy, Trade and Industry before shipment. When re-selling or re-exporting the machine, you may need to obtain permissions from METI, and the government of the country where the machine is installed.

● When exporting our machine, as a machine conforming to Row 2 of Appended Table 1 of Export Trade Control Order, a relocation detection device is installed on the machine depending on the destination country. After relocating the machine with the detection device, the machine is locked and any operation is temporarily impossible. Please inform your local distributor of machine relocation in advance and apply to perform the release operation of relocated machine.

- Coolant tank
  - 1) Coolant tank, 50L \*3
  - 2) Coolant tank, 100L \*3
  - 3) Coolant tank, 150L
  - 4) Coolant tank, 150L for 1.5 MPa CTS pump with cyclone filter
  - 5) Coolant tank, 200L for 1.5 MPa CTS pump with cyclone filter
  - 6) Chip conveyor tank, 360L scraper type \*4
  - 7) Chip conveyor tank, 360L scraper type for 1.5 MPa CTS pump with cyclone filter \*4
  - 8) Chip conveyor tank, 415L hinge + scraper type \*4
  - 9) Chip conveyor tank, 415L hinge + scraper type for 1.5 MPa CTS pump with cyclone filter \*4
- Coolant through spindle (CTS) piping, Max. 3.0 MPa
- Coolant through spindle (CTS) piping, Max. 7.0 MPa
- Head coolant nozzle
- Rotary joint (6 ports)
- Chip shower
- Tool cleaning system
- Fixture shower valve unit
- Cleaning gun
- Mesh basket for collecting chips (2 pcs.)
- Top cover
- Side door with transparent window, right side
- Side cover with transparent window, one side

- Folding door (two-door)
- Work light (1 or 2 lamps)
- Signal light (1, 2, or 3 lamps)
- Automatic oil lubricator
- Automatic grease lubricator
- Automatic door with switch panel 10 holes
- Area sensor
- Side shutter
- Switch panel (8 holes or 10 holes)
- Manual pulse generator with enable switch
- Connector and hook for manual pulse generator with enable switch
- Tool breakage detector, touch type
- RS232C 25-pin connector at control box
- Spindle override
- Master on circuit
- Data protection switch, key type
- Grip cover for 14/21/28-tool magazine
- Parts name sticker set
- Breaker handle cover
- Origin alignment mark
- 100V outlet in control box
- Power supply expansion 50A
- Transformer box
- Specified color

- EXIO board assembly
  - 1) EXIO board, input 32/output 32, additional #1
  - 2) EXIO board, input 32/output 32, additional #2
- PLC programming software for D00
- Industrial network
  - 1) CC-Link, master station
  - 2) CC-Link, remote device station
  - 3) PROFIBUS-DP, slave
  - 4) DeviceNet, slave
  - 5) PROFINET, slave
  - 6) EtherNet/IP, slave
- Memory expansion 3 Gbytes \*1
- High accuracy mode BII (Look-ahead 1,000 blocks, smooth path offset)
- Submicron command \*1 \*2
- Interrupt type macro
- Rotary fixture offset
- Feature coordinates setting \*1
- Involute interpolation

\*1. Standard on the U500Xd2-5AX.  
\*2. When the submicron command is used, changing to the conversation language program is disabled.  
\*3. Cannot be selected for the U500Xd2-100T.  
\*4. Can only be selected for the U500Xd2-100T.

\* Please check the external views or interference diagrams provided by Brother when designing jigs or checking for interference.  
 \* Chip conveyors can only be selected for the U500Xd2-100T.  
 \* 150L and 200L coolant tanks can be selected for the U500Xd2-100T, but 50L and 100L cannot be selected.

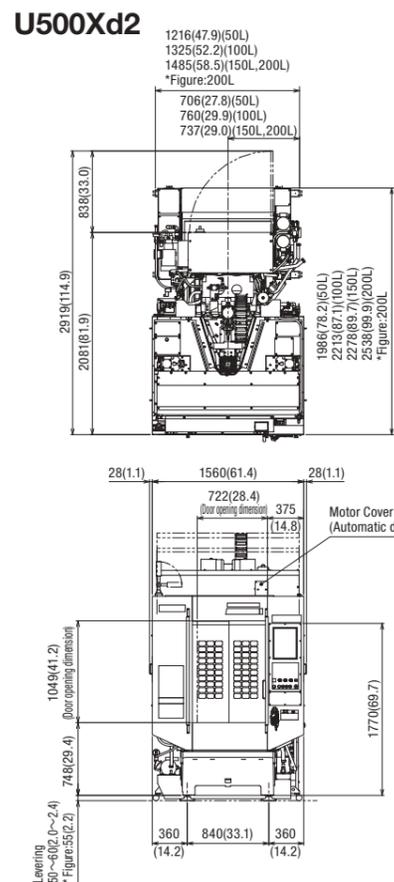
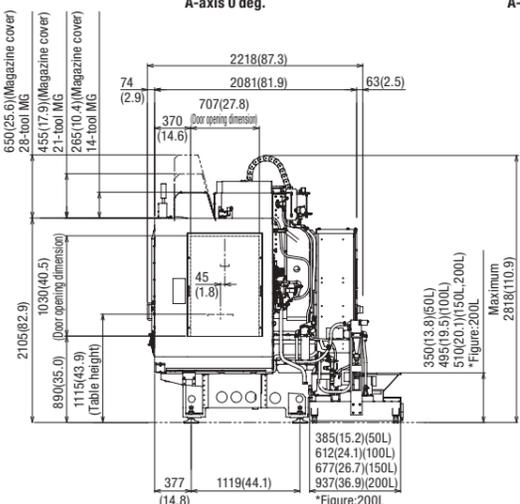
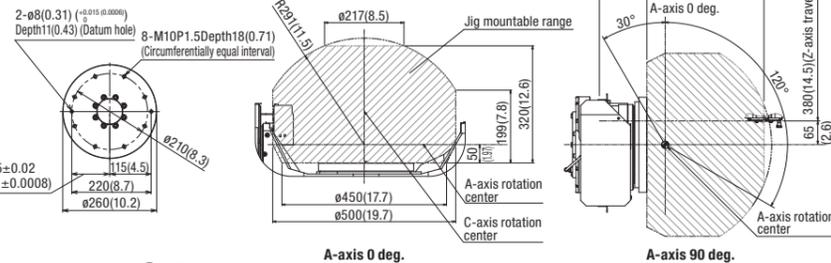
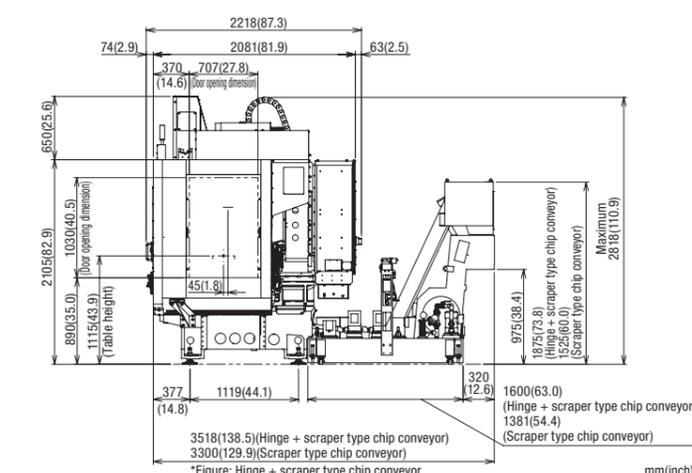
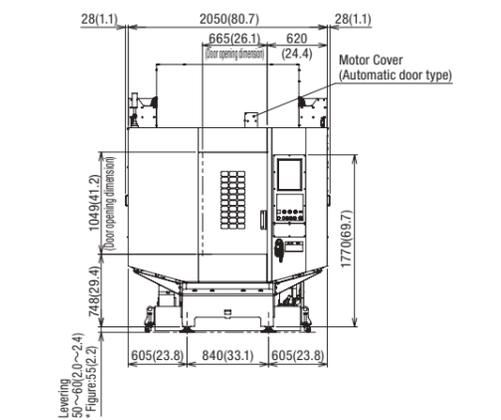


Table details



U500Xd2-100T \* Figure shows when chip conveyor is used.



NC unit specifications

	《U500Xd2》
CNC model	CNC-D00
Control axes	5 axes (X, Y, Z, A, C)
Simultaneously controlled axes (Positioning)	5 axes (X, Y, Z, A, C)
Simultaneously controlled axes (Interpolation)	Linear: 4 axes (X, Y, Z, 1 additional axis) Circular: 2 axes Helical/Conical: 3 axes (X, Y, Z)
Least input increment	0.001 mm, 0.0001 inch, 0.001 deg.
Max. programmable dimension	±999999.999 mm, ±99999.9999 inch
Display	15-inch color LCD touch display
Memory capacity	500 Mbytes, 3 Gbytes (optional) (Total capacity of program and data bank)
External communication	USB memory interface, Ethernet, RS232C (optional)
No. of registrable programs	4,000 (Total capacity of program and data bank)
Program format	NC language, conversation language (changed by parameter) Conversion from conversation language program to NC language program available * Only NC language available on the U500Xd2-100T. Conversation language not available

	《U500Xd2-5AX》
CNC model	CNC-D00v (DB)
Control axes	5 axes (X, Y, Z, A, C)
Simultaneously controlled axes (Positioning)	5 axes (X, Y, Z, A, C)
Simultaneously controlled axes (Interpolation)	Linear: 5 axes (X, Y, Z, 2 additional axes) Circular: 2 axes Helical/Conical: 4 axes (3 linear axes + 1 additional axis, 2 linear axes + 2 additional axes)
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg.
Max. programmable dimension	±999999.9999 mm, ±99999.99999 inch
Display	15-inch color LCD touch display
Memory capacity	3 Gbytes (Total capacity of program and data bank)
External communication	USB memory interface, Ethernet, RS232C (optional)
No. of registrable programs	4,000 (Total capacity of program and data bank)
Program format	NC language * Conversation language not available

\* "Control axes" and "Simultaneously controlled axes" indicate the maximum number of axes, which will differ depending on the shipping destination or machine specifications.  
 \* Ethernet is a registered trademark of Xerox Corporation in the United States.

Machine specifications

Item	U500Xd2 U500Xd2 RD *8 U500Xd2-5AX U500Xd2-5AX RD *8		U500Xd2-100T U500Xd2-100T RD *8 U500Xd2-5AX/100T U500Xd2-5AX/100T RD *8	
	《U500Xd2》 CNC-D00		《U500Xd2-5AX》 CNC-D00v (DB)	
CNC Unit				
Travels	X axis	mm(inch)	500 (19.7)	
	Y axis	mm(inch)	450 (17.7)	
	Z axis	mm(inch)	380 (15.0)	
	A axis	deg.	-30~120	
	C axis	deg.	360	
Table	Distance between table top and spindle nose end	mm(inch)	115~495 (4.5~19.5)	
	Work area size	mm(inch)	ø260 (ø10.2)	
	Max. loading capacity (uniform load)	kg(lbs)	100 (220)	
Spindle	Max. table load inertia	kg·m <sup>2</sup> (lb·inch <sup>2</sup> )	1.8 (6.15) [2.6 (8.885) *9]	
	Spindle speed	min <sup>-1</sup>	12,000min <sup>-1</sup> specifications: 1~12,000 16,000min <sup>-1</sup> specifications (Optional): 1~16,000	
Feed rate	Speed during tapping	min <sup>-1</sup>	MAX. 6,000	
	Tapered hole		7/24 tapered No.30	
	BT dual contact spindle (BIG-PLUS)		Optional	
	Coolant Through Spindle (CTS)		Optional	
ATC unit	Rapid traverse rate (XYZ axes)	m/min(inch/min)	50 x 50 x 56 (1,969 x 1,969 x 2,205)	
	Cutting feed rate	mm/min(inch/min)	X, Y, Z axis: 1~30,000 (0.04~1,181) *7	
	Indexing feedrate (A and C)	min <sup>-1</sup>	A axis: 50 C axis: 75 (60 *9)	
Tool change time *5	Tool shank type		MAS-BT30	
	Pull stud type *4		MAS-P30T-2	
	Tool storage capacity	pcs.	14 / 21 / 28	
	Max. tool length	mm(inch)	250 (9.8)	
Electric motor	Max. tool diameter	mm(inch)	110 (4.3)	
	Max. tool weight *1	kg(lbs)	3.0 (6.6) [4.0 (8.8) *10] / tool, <TOTAL TOOL WEIGHT: 25 (55.1) for 14 tools, 35 (77.2) for 21 or 28 tools>	
	Tool selection method		Random shortcut method	
Power source	Tool To Tool	sec.	0.6 / 0.7 (14 or 21 tools / 28 tools)	
	Chip To Chip	sec.	1.3 / 1.4 (14 or 21 tools / 28 tools)	
Machine dimensions	Main spindle motor (10min/continuous) *2	kW	12,000min <sup>-1</sup> specifications: 10.1 / 7.0, 16,000min <sup>-1</sup> specifications (optional): 7.4 / 5.1	
	Axis feed motor	kW	X, Y axis: 1.0 Z axis: 2.0 A axis: 0.9 C axis: 0.55	
	Power supply		AC 200 to 230 V±10%, 3-phase, 50/60Hz±2%	
Accuracy *3	Power capacity (continuous)	kVA	12,000min <sup>-1</sup> specifications: 9.5, 16,000min <sup>-1</sup> specifications (optional): 9.5	
	Air supply	MPa	0.4~0.6 (recommended value 0.5MPa *6)	
Standard accessories	Required flow	L/min	52	
	Height	mm(inch)	2,818 (110.9)	
	Required floor space *11 [with control unit door open]	mm(inch)	1,560 x 2,081 [2,919] (61.4 x 81.9 [114.9])	
Machine dimensions	Weight	kg(lbs)	2,650 (5,843)	
	Accuracy of bidirectional axis positioning (ISO230-2:1988)		X, Y, Z axis: 0.006~0.020mm (0.00024~0.00079 inch)	
Accuracy *3	(ISO230-2:2014)		A, C axis: 28 sec or less	
	Repeatability of bidirectional axis positioning (ISO230-2:2014)		X, Y, Z axis: Less than 0.004mm (0.00016 inch) A, C axis: 16 sec or less	
Standard accessories	Instruction Manual (DVD 1 set), leveling bolts (4 pcs.), leveling plates (4 pcs.)			

\*1. Actual tool weight differs depending on the configuration and center of gravity. The figures shown here are for reference only. \*2. Spindle motor output differs depending on the spindle speed. \*3. Measured in compliance with ISO standards and Brother standards. Please contact your local distributor for details. \*4. Brother specifications apply to the pull studs for CTS. \*5. Measured in compliance with JIS B6336-9 and MAS011-1987. \*6. Regular air pressure varies depending on the machine specifications, machining program details, or use of peripheral equipment. Set the pressure higher than the recommend value. \*7. When using high accuracy mode B. \*8. The machine needs to be equipped with a relocation detection device depending on the destination. Machines equipped with a relocation detection device come with "RD" at the end of the model name. \*9. When using high inertia mode. Parameter setting needs to be changed. \*10. Parameter setting must be changed. (Tool indexing time will change.) \*11. The value does not include the coolant tank. \*12. Value for turret magazine plus tool stocker \*13. Value for turret magazine

NC functions

Operation	Dry run	Monitoring	Energy saving	Support apps	Accessories	Functions limited to conversation language *5
Machine lock	Machine lock	High accuracy mode BII	Automatic power off	Adjust machine parameters	File viewer	Automatic tool selection
Program restart	Program restart	Program restart	Standby mode	ATC tool	Notebook	Automatic cutting condition setting
Rapid traverse override	Rapid traverse override	Machining load monitoring	Automatic coolant off	Tool life	Calculator	Automatic tool length compensation setting
Cutting feed override	Cutting feed override	ATC tool monitoring	Automatic work light off	Chip shower off delay	Register shortcut	Automatic calculation of unknown number input
Background editing	Background editing	Overload prediction	Chip shower energy savings operation	Chip shower energy savings operation	Display off	Machining order control
Screen shot	Screen shot	Waveform display /	Energy savings mode	Energy savings mode	Menu programming	
Operation level	Operation level	Waveform output to memory card			Local coordinate system	
External input signal key	External input signal key	Automatic thermal distortion compensation (X, Y, and Z axes)				
Shortcut keys	Shortcut keys	Production performance display				
<Optional>	<Optional>	Tool life / Spare tool				
Spindle override	Spindle override	Stuck chips detection function				
Absolute / Incremental	Absolute / Incremental	Tap return function				
Inch / Metric	Inch / Metric	Status log				
Coordinate system setting	Coordinate system setting	Alarm log				
Corner C / Corner R	Corner C / Corner R	Operation log				
Rotational transformation	Rotational transformation	Maintenance notice				
Synchronized tap	Synchronized tap	Motor insulation resistance measurement				
Subprogram	Subprogram	Tool cleaning filter with filter clogging detection				
Graphic display	Graphic display	Battery-free encoder				
Automatic workpiece measurement *1	Automatic workpiece measurement *1	Brake load test				
Tool length measurement	Tool length measurement	High-accuracy mode AIII				
Battery-free encoder	Battery-free encoder	High-accuracy mode BI				
Machining parameter adjustment	Machining parameter adjustment	(Look-ahead 160 blocks)				
High speed and high accuracy	High speed and high accuracy	Backlash compensation				
Computer remote	Computer remote	Tool center point control *3				
OPC UA	OPC UA	<Optional>				
Auto notification	Auto notification	CC-Link, master station				
Built-in PLC (LD/ST/FBD)	Built-in PLC (LD/ST/FBD)					
Display off	Display off					
Menu programming	Menu programming					
Local coordinate system	Local coordinate system					

\*1. Measuring instrument needs to be prepared by users. \*2. When the submicron command is used, changing to the conversation language program is disabled. \*3. Available only on the U500Xd2-5AX. \*4. Standard on the U500Xd2-5AX. \*5. Conversation language not available on the U500Xd2-5AX

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Figures in brackets ( ) are the country codes.

Specifications may be subject to change without any notice.

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