brother
at your side

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 ø500 mm.
Increased travels of Y/Z axes enable a wider range of multi-face machining.

Cutting Out the Waste
SPEEDIO

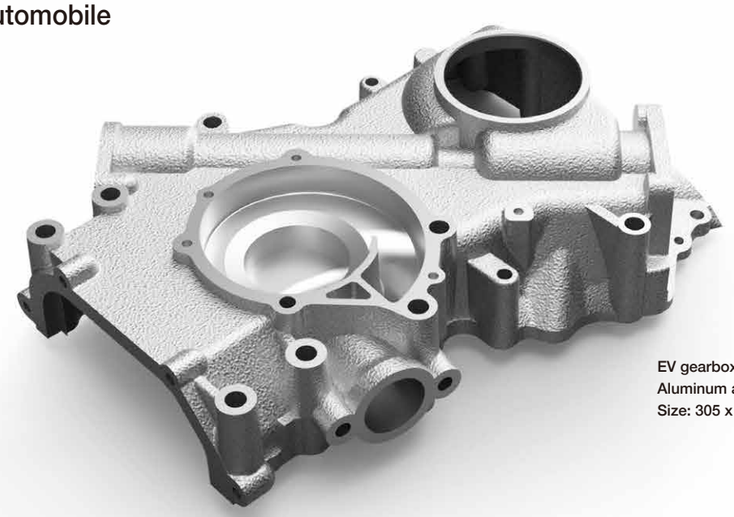
U500 Xd2

Basic specifications	
Max. spindle speed (min^{-1})	12,000 / 16,000 (optional)
Travels (X, Y, Z) (mm)	X500 Y450 Z380
Travels (A, C) (deg.)	A: -30 ~ 120, C: 360
Tool storage capacity (pcs.)	14 / 21 / 28
Rapid traverse rate (X, Y, Z) (m/min)	X / Y / Z 50 / 50 / 56
Indexing speed (A, C) (min^{-1})	A / C 50 / 75
Required floor space (mm)	1,560 × 2,081
Simultaneous 5-axis spec. (5AX)	Available

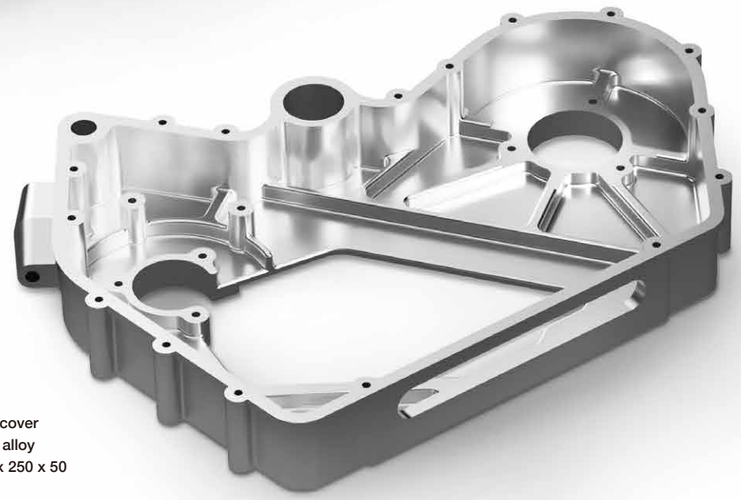
Expands process flexibility to the fullest
Provides a broader range of applications

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: ø350 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 ø500 mm

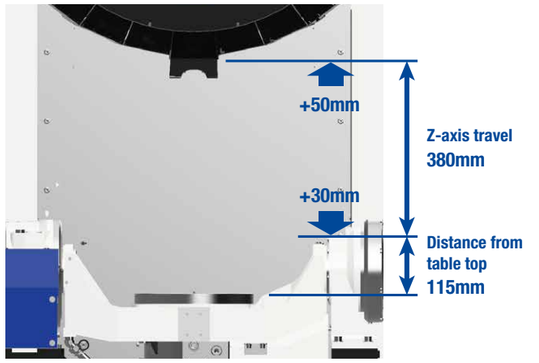
Increased travels of Y/Z axes enable a wider range of multi-face machining.

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.

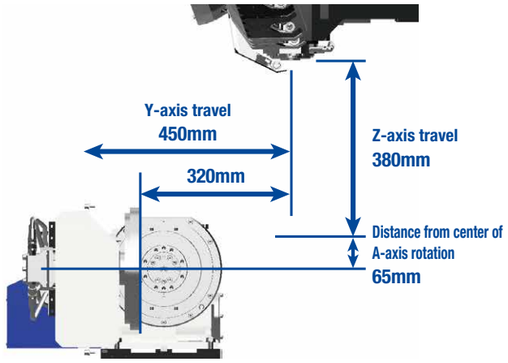
Z-axis travel 300mm Previous model ▶ 380mm



Increased Y-axis travel

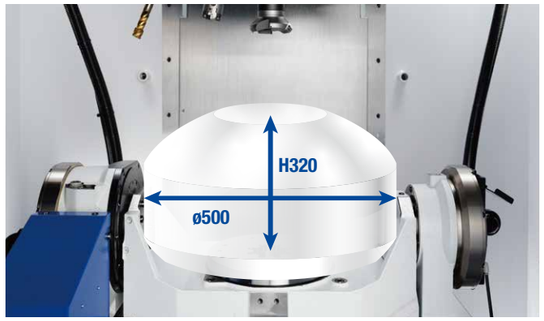
The Y-axis travel when the A-axis is at 90 degrees has been increased to 320 mm by increasing the Y-axis travel and shifting the Y-axis travel range from the center of the tilting axis. In addition, tool accessibility has been improved.

Y-axis travel 400mm Previous model ▶ 450mm



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.



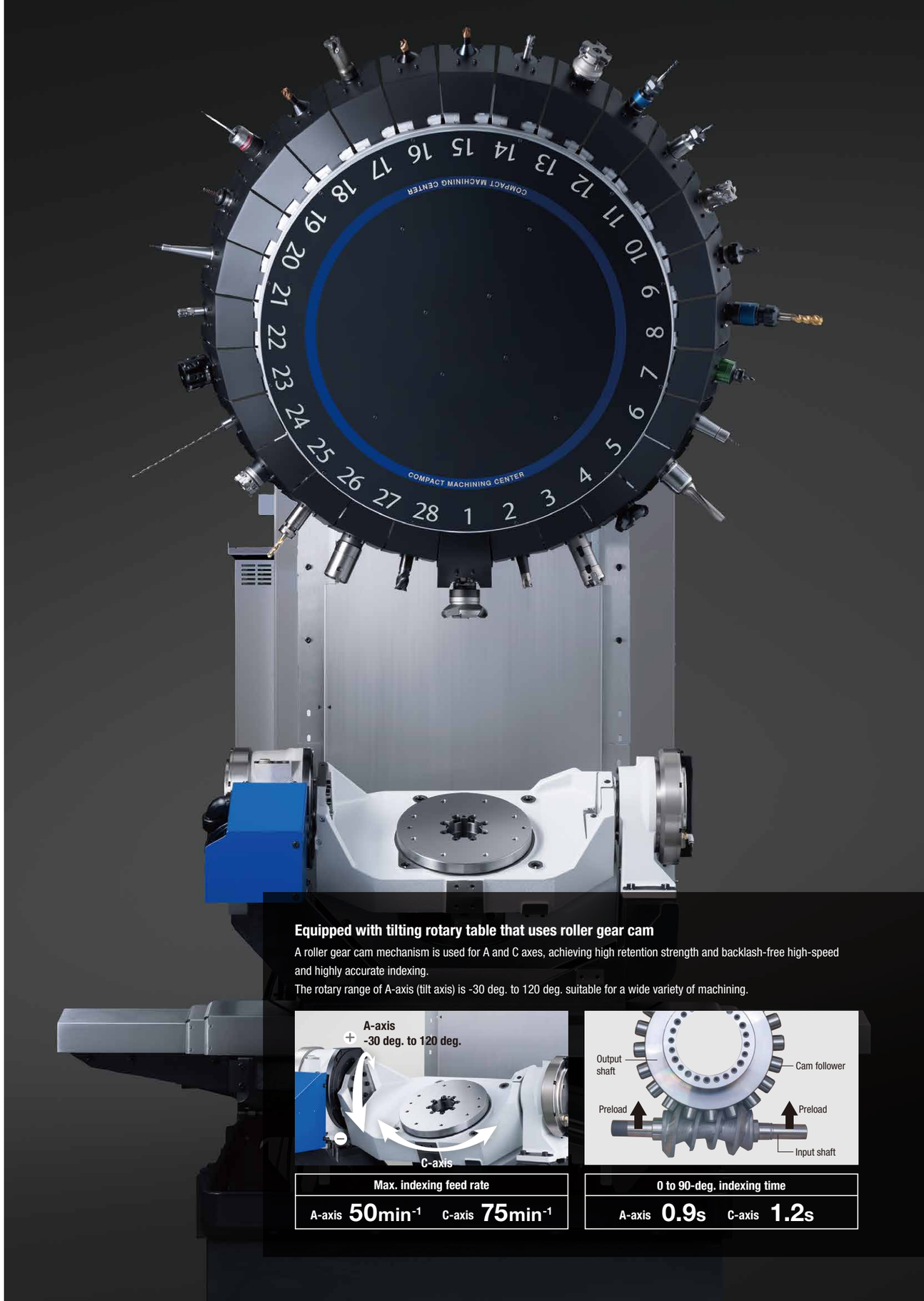
Max. loading weight 100kg

* Refer to the External Dimensions on page 17 for details of the jig area.

28-tool magazine

This is a compact drum type magazine that achieves high-speed tool change. The magazine can be selected from a 14-tool, 21-tool, or 28-tool magazine. The maximum tool weight is 4 kg.

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



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	50min^{-1}
C-axis	75min^{-1}

0 to 90-deg. indexing time	
A-axis	0.9s
C-axis	1.2s

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.

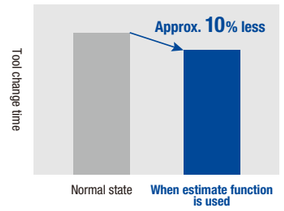
Non-stop ATC

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	0.6s	0.7s	0.8s
Chip-Chip	1.3s	1.4s	1.4s

Magazine load conditions estimate

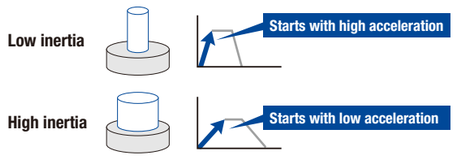
Estimates the inertia and unbalanced load of the tool loaded in the magazine, and sets the optimum value for the acceleration of the magazine axis. In addition, automatically updates the value to the estimated optimum acceleration, even during programmed operation.



<Conditions>
Magazine spec.: 28-tool magazine
Total tool weight: 24 kg (equal load)

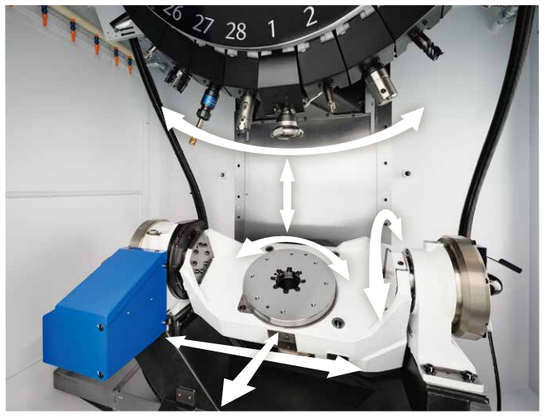
Optimized A/C-axes indexing feed rate

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



Simultaneous operation

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



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**

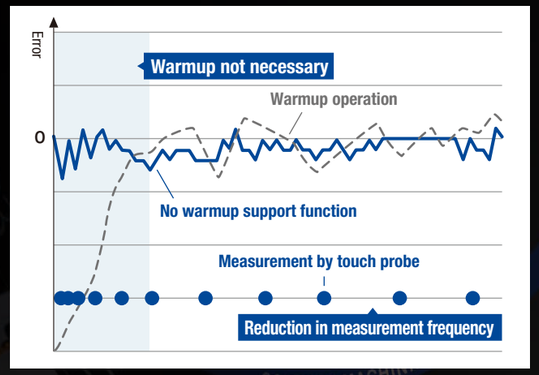
Improved automatic door opening/closing speed

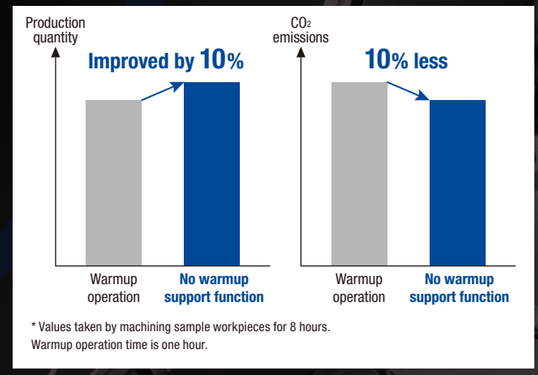
The automatic door opening/closing speed has been improved, enabling significant reduction in setup time.

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

No warmup support function

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.





* Values taken by machining sample workpieces for 8 hours.
Warmup operation time is one hour.

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^{-1} spindle motor

The standard motor specifications have been upgraded from the previous 10,000 min^{-1} to a newly developed 12,000 min^{-1}. 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^{-1} (standard)	Max. torque	40N·m	Max. output	18.9kW
16,000 min^{-1} (optional)	Max. torque	27N·m	Max. output	15.4kW

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

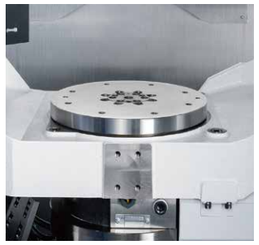
High inertia mode is available for the tilting rotary table so that jigs for heavy or irregular workpieces can be mounted.

*2. Parameter setting needs to be changed.

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	810N·m
C-axis clamp torque *3	560N·m



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

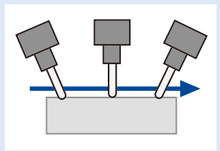
Simultaneous 5-axis machining (U500Xd2-5AX)

Equipped with a variety of functions, including tool center point control and submicron 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).

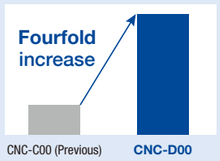
Tool center point control

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

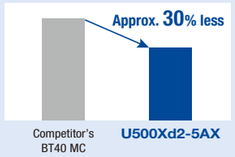
The CPU capacity has been greatly increased to enhance the processing speed of minute line segments by four times the previous controller. This enables high-speed processing of CAM data with small tolerance.



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
Drilling (Tool diameter mm(inch) x Feed mm(inch)/rev)	12,000min^{-1}	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^{-1}	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)
Tapping (Tool diameter mm(inch) x Pitch mm(inch))	12,000min^{-1}	M27 x 3.0 (1-8UNC)	M27 x 3.0 (1-8UNC)	M22 x 2.5 (7/8-9UNC)
	16,000min^{-1}	M22 x 2.5 (7/8-9UNC)	M22 x 2.5 (7/8-9UNC)	M16 x 2.0 (5/8-11UNC)
Facing (Cutting amount cm^3/min (inch^3/min) Cutting width mm(inch) x Cutting depth mm(inch) x Feed rate mm(inch)/min)	12,000min^{-1}	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^{-1}	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.

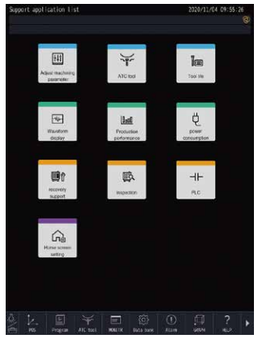
Machining video
Scan or Click

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)

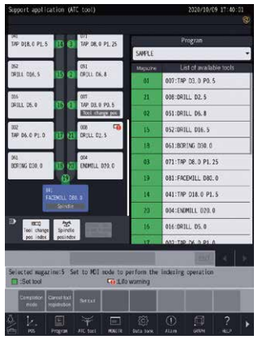
Accessibility and workability

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

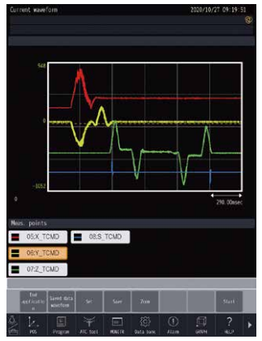
Equipped with functions to easily perform setup, such as an ATC tool app that enables all magazine tool settings to be performed on one screen, menu programming that enables you to create NC programs by following instructions on the screen, and an on-screen help function.



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

DESIGN AWARD 2021

NC function video

Scan or Click

Equipped with functions that support connection with various peripheral equipment or automation

Network

Sending/receiving files or monitoring via FTP or HTTP.
Compatible with OPC UA, a data exchange standard for industrial communication.
In addition to the conventional field bus, data communication is possible via Industrial Ethernet, such as EtherNet/IP and PROFINET.
Production/operation results screens on the machine can be viewed from a PC’s browser.

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. In addition, this option may not be available depending on the shipping destination.

The iF Design Award is an international design award established in 1953 by iF International Forum Design GmbH of Germany.

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 recourses 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.

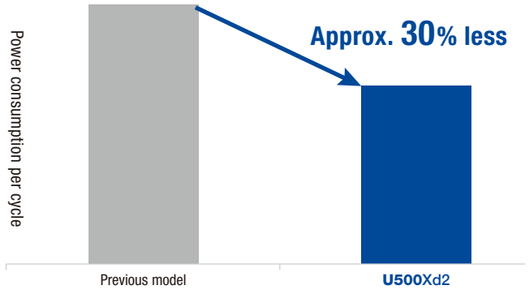
Wasted installation space reduction

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 no warmup support function, 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.

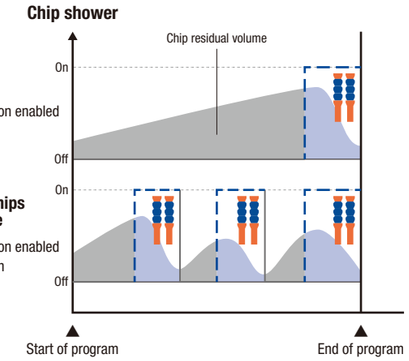


Power consumption 30% less than previous model

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

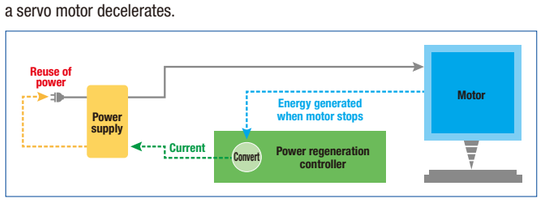
Chip shower energy savings operation

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

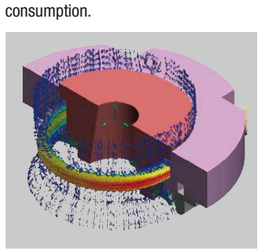
Servomotors, pumps, and other equipment are grouped and displayed according to purpose.
Calculation is possible for each cycle.

Saving air

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

Air purge

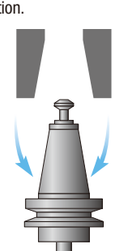
Reinforced the labyrinth structure on the spindle end face to reduce air consumption.



Air flowrate analysis of spindle end face

Spindle air blow

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

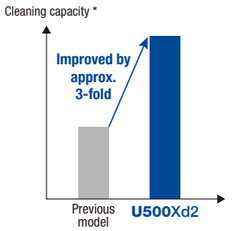


Wasted resource reduction

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.
When CTS is selected, coolant for tool cleaning is discharged from the CTS pump, consuming less air than air-assisted tool cleaning.
* When CTS is not selected, air-assisted tool cleaning is used



* Compared by removal rate of grease applied to taper

Chip detection function

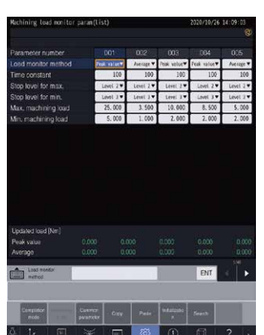
Chips caught between the spindle and the holder during ATC are detected without using a sensor. Detecting any chips caught during ATC prevents the outflow of defects.

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.

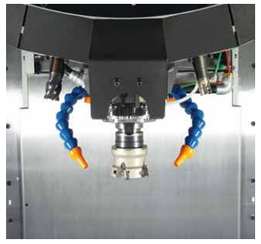
Image of chip evacuation flow by chip shower

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.

Coolant Through Spindle (CTS)

Can be selected from 3.0 MPa or 7.0 MPa. Pump and tank are not included.

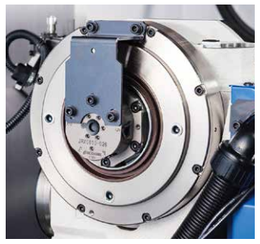


Head coolant nozzle

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

Tool cleaning system

High discharge pressure and flowrate powerfully removes chips stuck to the holder. When CTS is selected, direct pump tool cleaning is used, where coolant is discharged directly from the CTS pump. For other specifications, air-assisted tool cleaning is used.



Rotary joint

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

Chip shower

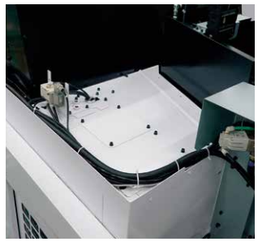
Chip shower piping is located at the upper section inside the machine for more efficient flow. Increasing the number of nozzles and reviewing the diameter of the piping have improved chip evacuation performance.

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.

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 room 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.

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.

* 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.

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.

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. In addition, this option may not be available depending on the shipping destination.

Manual pulse generator

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

Tool breakage detector, touch type

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

Spindle override

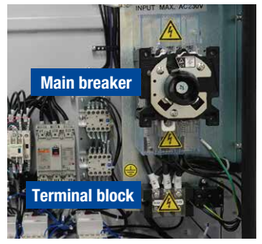
Spindle speed can be changed without changing the program.

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.



Power supply expansion 50A

The capacity of the main breaker can be increased from 30A to 50A. The size of the relevant wiring increases accordingly. A terminal block for external equipment power supply is provided under the main breaker.

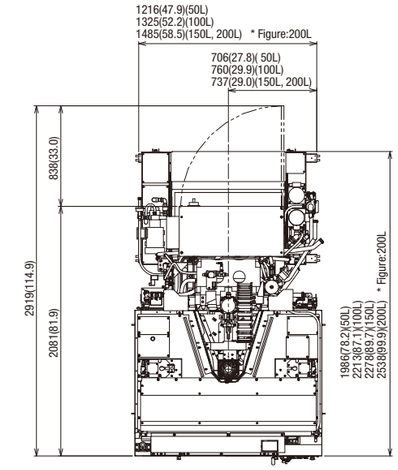
- Coolant tank
  1) Coolant tank, 50L
  2) Coolant tank, 100L
  3) Coolant tank, 150L
  4) Coolant tank, 150L for 1.5 MPa CTS pump with cyclone filter
  5) Coolant tank, 200L for 1.5 MPa CTS pump with cyclone filter
- Coolant through spindle (CTS) piping, Max. 3.0 MPa
- Coolant through spindle (CTS) 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

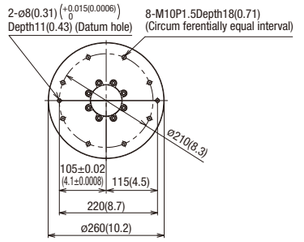
*1. Standard on the U500Xd2-5AX.
*2. When the submicron command is used, changing to the conversation language program is disabled.

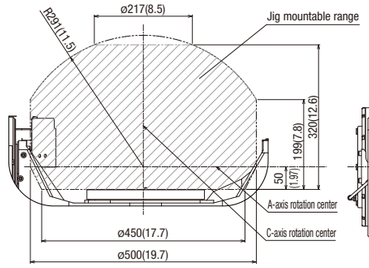
U500Xd2

Table details

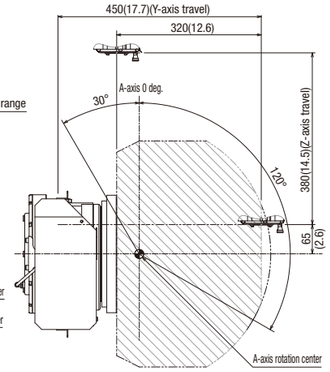
* Please check the external views or interference diagrams provided by Brother when designing jigs or checking for interference.



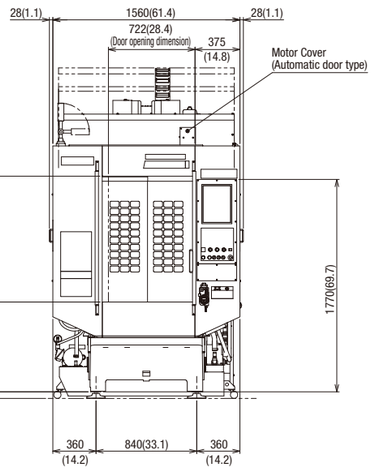


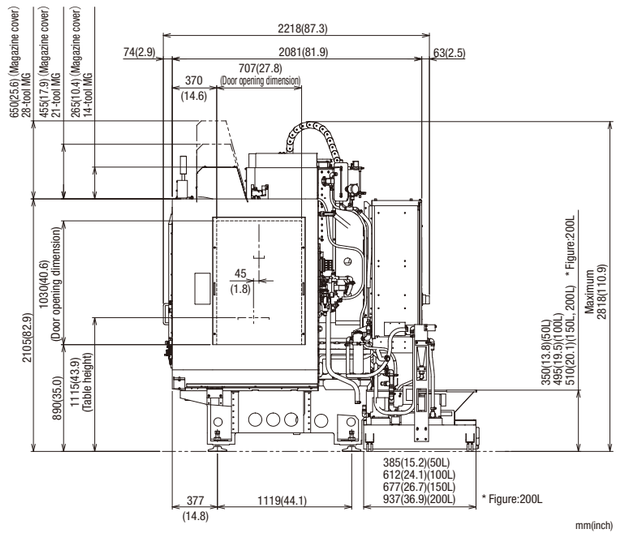


A-axis 0 deg.



A-axis 90 deg.





mm(inch)

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

	《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 expansion	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
CNC Unit			CNC-D00	CNC-D00v(DB)
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	
	Distance between table top and spindle nose end	mm(inch)	115~495 (4.5~19.5)	
Table	Work area size	mm(inch)	ø260 (ø10.2)	
	Max. loading capacity (uniform load)	kg(lbs)	100 (220)	
	Max. table load inertia	kg·m²(lb·inch²)	1.8 (6,151) [2.6 (8,885) *9]	
Spindle	Spindle speed	min⁻¹	12,000min⁻¹ specifications: 1~12,000 16,000min⁻¹ specifications (Optional): 1~16,000	
	Speed during tapping	min⁻¹	MAX. 6,000	
	Tapered hole		7/24 tapered No.30	
	BT dual contact spindle (BIG-PLUS)		Optional	
	Coolant Through Spindle (CTS)		Optional	
Feed rate	Rapid traverse rate (XYZ-area)	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⁻¹	A axis: 50 C axis: 75 (60 *9)	
ATC unit	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)	
	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 21or 28 tools>	
	Tool selection method		Random shortcut method	
Tool change time *5	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)	
Electric motor	Main spindle motor (10min/continuous) *2	kW	12,000min⁻¹ specifications: 10.1/7.0, 16,000min⁻¹ 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 source	Power supply		AC 200 to 230 V±10%, 3-phase, 50/60Hz±2%	
	Power capacity(continuous)	kVA	12,000min⁻¹ specifications: 9.5 16,000min⁻¹ specifications (optional): 9.5	
	Air supply Regular air pressure	MPa	0.4~0.6 (recommended value 0.5MPa *6)	
	Air supply Required flow	L/min	52	
Machine dimensions	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])	
	Weight	kg(lbs)	2,650 (5,843)	
Accuracy *3	Accuracy of bidirectional axis positioning (ISO230-2:1988) (ISO230-2:2014)		X, Y, Z axis: 0.006~0.020mm (0.00024~0.00079 inch) A, C axis: 28 sec or less	
	Repeaability 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 plate (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 needs to be changed. (Tool indexing time is changed.) *11. The value does not include the coolant tank.

NC functions

Operation	Dry run		<Optional>		DeviceNet, slave		One-way positioning
	Machine lock		High accuracy mode BII		PROFINET, slave		Inverse time feed
	Program restart		(Look-ahead 1,000 blocks, smooth path offset)		EtherNet/IP, slave		Programmable data input
	Rapid traverse override	Monitoring	Machining load monitoring	Energy saving	Automatic power off		Tool length compensation
	Cutting feed override		ATC tool monitoring		Standby mode		Cutter compensation
	Background editing		Overload prediction		Automatic coolant off		Scaling
	Screen shot		Waveform display / Waveform output to memory card		Automatic work light off		Mirror image
	Operation level		Heat expansion compensation system II (X, Y, and Z axes)		Chip shower off delay		External sub program call
	External input signal key		Production performance display		Chip shower energy savings operation		Macro
	Shortcut keys		Tool life / Spare tool		Energy savings mode		Tape operation / FTP load operation
	<Optional>		Chip detection function	Support apps	Adjust machine parameters		Multiple skip function
	Spindle override	Maintenance	Tap return function		ATC tool		<Optional>
Programming	Absolute / Incremental		Status log		Tool life		Submicron command *2 *4
	Inch / Metric		Alarm log		Waveform display		Interrupt type macro
	Coordinate system setting		Operation log		Production performance		Rotary fixture offset
	Corner C / Corner R		Maintenance notice		Power consumption		Feature coordinates setting *4
	Rotational transformation		Motor insulation resistance measurement		Recovery support		Involute interpolation
	Synchronized tap		Tool washing filter with filter clogging detection		Inspection	Functions limited to conversation language *5	Operation program
	Subprogram		Battery-free encoder		PLC		Schedule program
	Graphic display		Brake load test		No warmup support function		Automatic tool selection
Measurement	Automatic workpiece measurement *1	Automatic / Network	Computer remote	Accessories	File viewer		Automatic cutting condition setting
	Tool length measurement		OPC UA		Notebook		Automatic tool length compensation setting
High speed and high accuracy	Machining parameter adjustment		Auto notification		Calculator		Automatic cutter compensation setting
	High-accuracy mode AIII		Built-in PLC (LD/ST/FBD)		Register shortcut		Automatic calculation of unknown number input
	High-accuracy mode BI (Look-ahead 160 blocks)		<Optional>		Display off		Machining order control
	Backlash compensation		CC-Link, master station	Functions limited to NC language	Menu programming		
	Tool center point control *3		CC-Link, remote device station		Local coordinate system		
	(Look-ahead 1,000 blocks)		PROFIBUS-DP, slave		Expanded workpiece 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.

Please check here for detailed information
and the latest information of the base.

https://machinetool.global.brother/

Specifications may be subject to change without any notice.

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The information in this catalogue is current as of August 2024. ver.2408