brother
at your side

SPEEDIO

U500Xd1

Universal Compact Machining Center

U

Universal Compact Machining Center performs universal indexing, encouraging process integration

Equipped with a newly developed tilting rotary table with a maximum jig area of 500 mm in diameter.
Combination with a 28-tool magazine enables multi-face machining that breaks the conventional concept of #30 machines.

Cutting Out the Waste

SPEEDIO

U500 Xd1

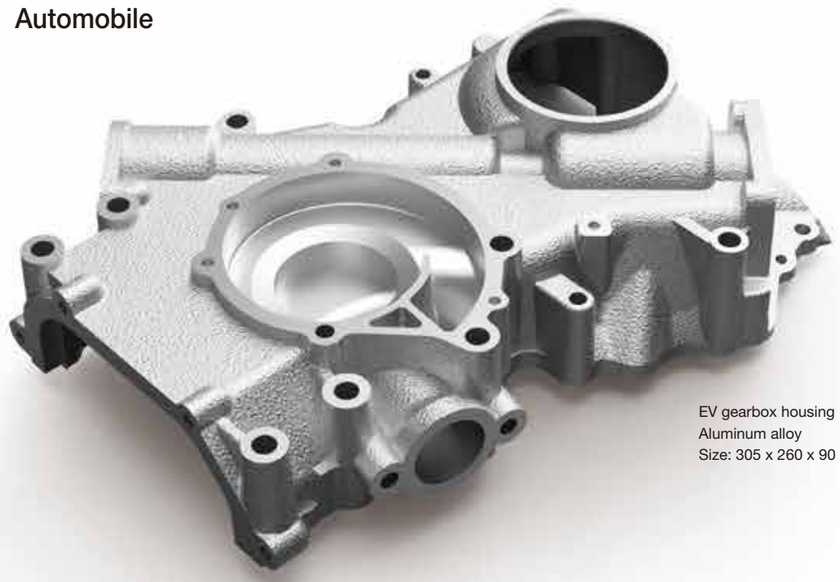
Basic specifications

Max. spindle speed (min^{-1})	10,000 / 16,000 (optional)
Travels (X, Y, Z) (mm)	X500 Y400 Z300
Travels (A, C) (deg.)	A: 120～-30, 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 x 2,026
BT dual contact spindle	Optional
Coolant Through Spindle	Optional

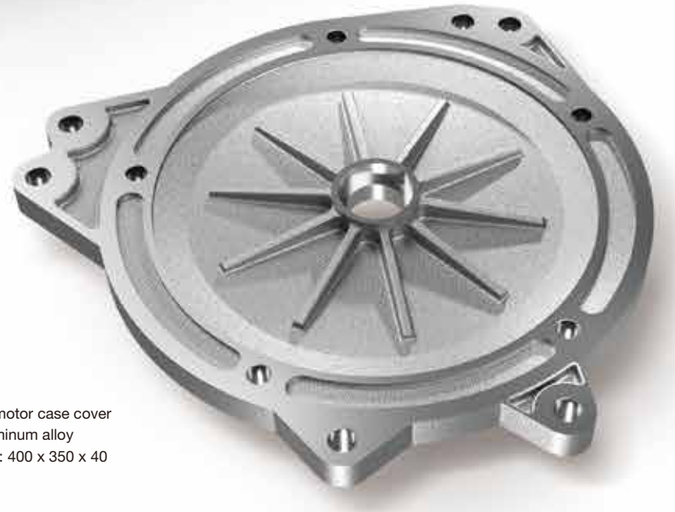
Expands process flexibility to the fullest
Provides a broader range of applications

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.

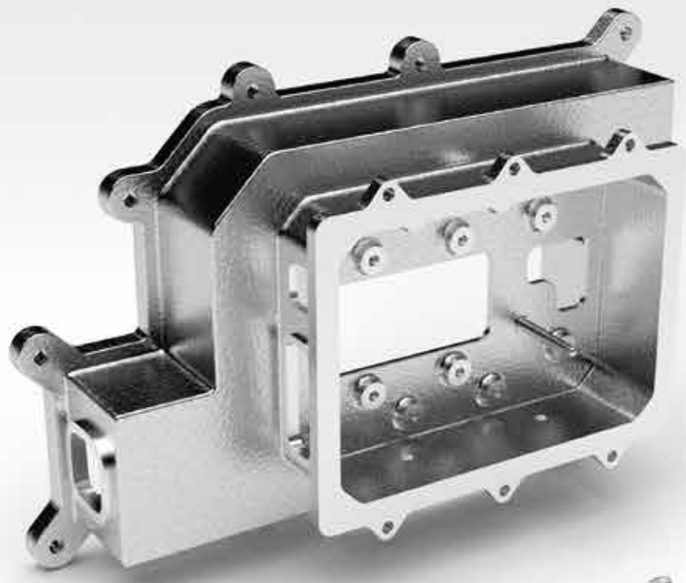
Automobile



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



EV motor case cover
Aluminum alloy
Size: 400 x 350 x 40



EV inverter case
Aluminum alloy
Size: 400 x 280 x 150

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

Aircraft

Aircraft parts
Aluminum alloy
Size: 300 x 250 x 100

Medical

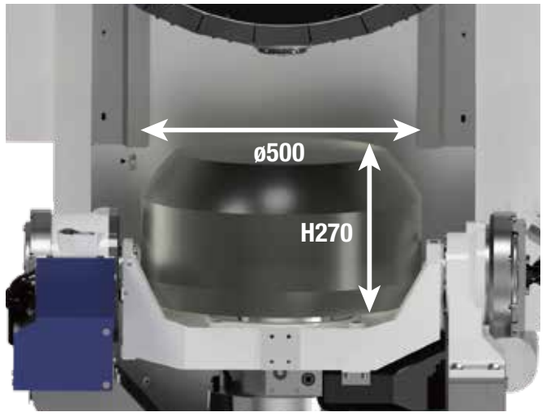
Bone plate
Ti-6Al-4V
Size: 280 x 50 x 3

Equipped with tilting rotary table with jig area of ø500
New structure for process integration with less space

Less space achieved although the machine is equipped with a high-speed and highly accurate tilting rotary table with ample jig area and a newly developed 28-tool magazine.
One-clamp machining encourages process integration.

Tilting rotary table

Provides ample jig area of ø500 x H270 to meet multi-face machining for medium-sized workpieces.



Max. loading capacity **100kg**

28-tool magazine

A newly developed compact drum type 28-tool magazine takes over fast tool change performance.
* A 14-tool magazine or a 21-tool magazine can be also selected.

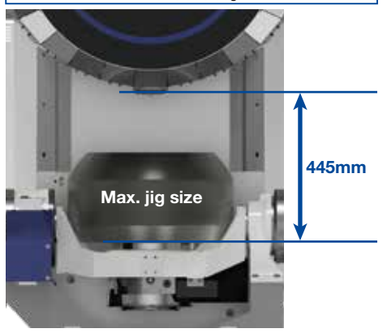
Max. tool weight **4kg***

* Parameter setting needs to be changed.

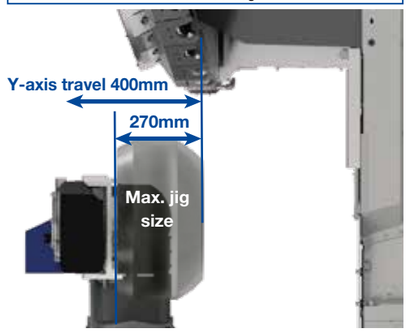
Machining area in Z/Y-axes directions

Ample jig/workpiece/tool area secured in the Z-axis direction. (Distance between table top and spindle nose end: 445 mm)
The Y-axis travel range has been shifted from the center of the tilt axis to secure sufficient machining area when the tilt axis is at 90 degrees. (Y-axis travel when A-axis is at 90 degrees: 270 mm)

A-axis at 0 deg.



A-axis at 90 deg.

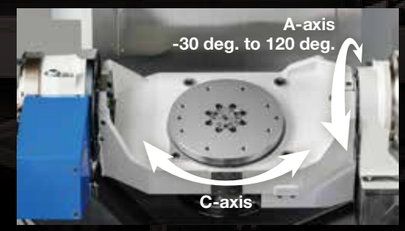


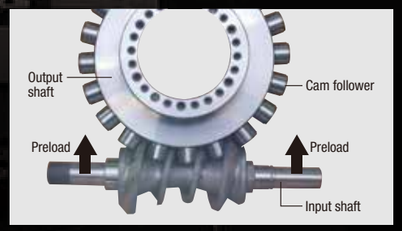
Compact design to save space

Despite a jig area of ø500 and even when a 28-tool magazine is mounted, the machine width is the same as when a 14-tool magazine is mounted.

Equipped with tilting rotary table that uses roller gear cam

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. rotary speed	
A-axis **50min^{-1}**	C-axis **75min^{-1}**

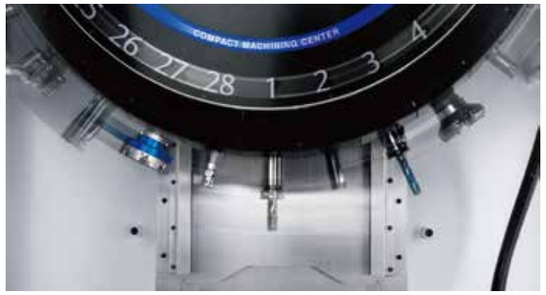
0 to 90-deg. indexing time	
A-axis **0.9s**	C-axis **1.2s**

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 new “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.



28-tool magazine				
Standard tool	Chip-Chip	1.3s	Tool-Tool	0.7s
4 kg tool*	Chip-Chip	1.4s	Tool-Tool	0.8s

* Parameter setting needs to be changed.

Simultaneous operation

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

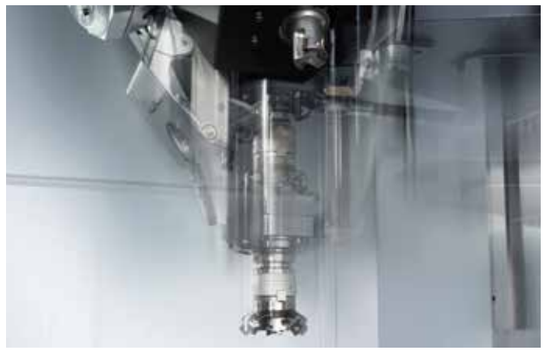
High acceleration/deceleration spindle

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

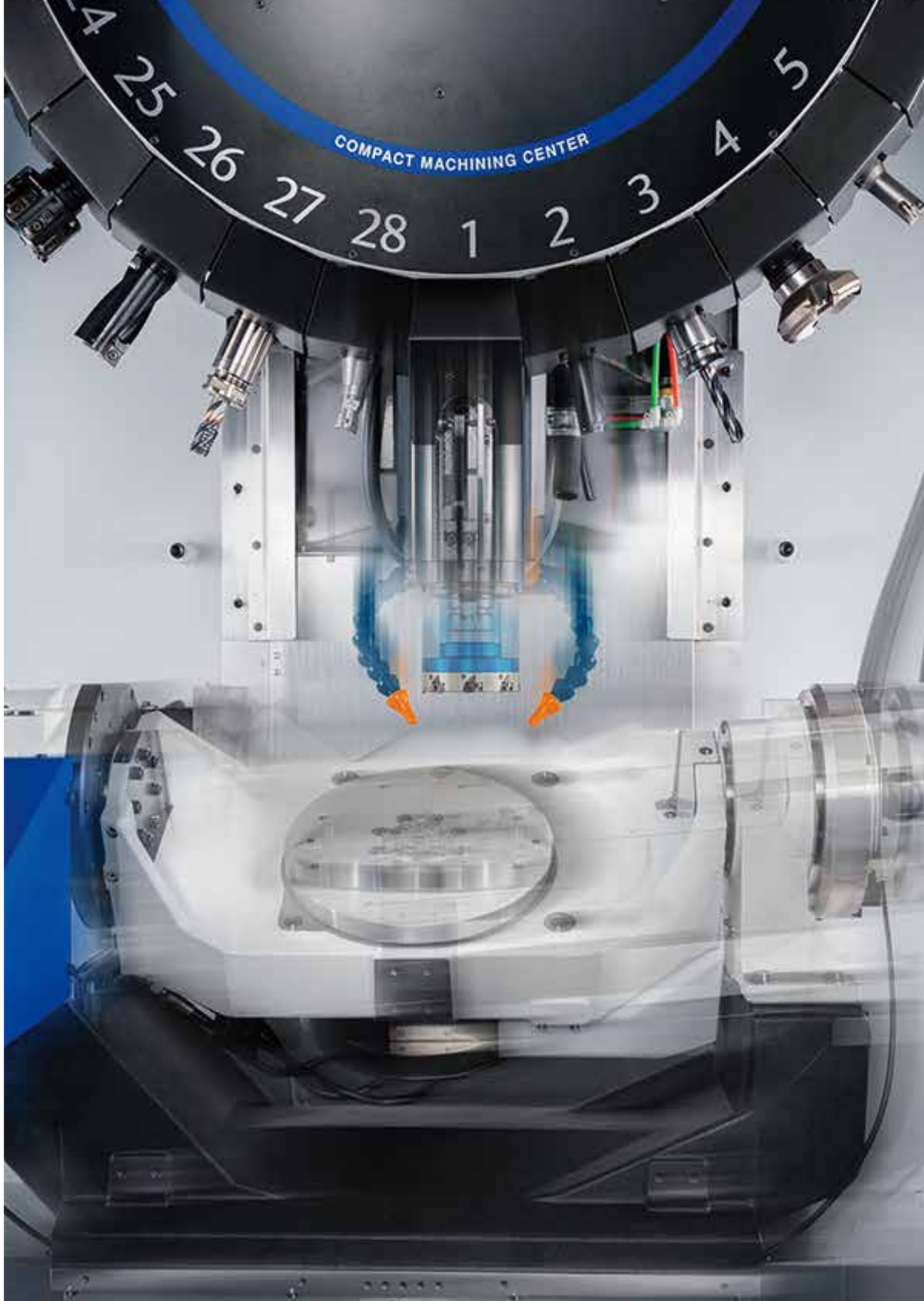
Spindle start/stop time **0.2s or less**

High-speed and 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 together with the Z-axis rapid traverse rate of 56 m/min.



Z-axis acceleration Max. **2.2G** Z-axis rapid traverse rate **56m/min**



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.

XYZ axes based on S500Xd1

The main unit of the machine and XYZ-drive system are based on the bestselling S500Xd1 model. Highly rigid structure and high-speed operation have been achieved.

Highly efficient spindle motor

A spindle motor with high torque in the medium- and high-speed range is used to achieve high-speed and highly efficient machining of aluminum or iron.

10,000 min^{-1} (standard)	Max. torque	40Nm	Max. output	18.9kW
16,000 min^{-1} (optional)	Max. torque	27Nm	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 peck drilling.

High inertia mode

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

* Parameter setting needs to be changed.

Accessibility and workability

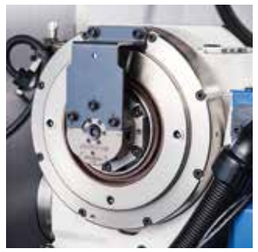
Accessibility has been enhanced so that operators can perform setup including workpiece change without any strain.

From front of machine to table
320mm

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	610Nm
C-axis clamp torque	500Nm



Machining capability

		ADC	Cast iron	Carbon steel
Drilling	10,000min^{-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)
Tool diameter mm(inch) x Feed mm(inch)/rev	16,000min^{-1}	D24 x 0.2 (0.94 x 0.008)	D22 x 0.15 (0.87 x 0.006)	D18 x 0.1 (0.71 x 0.004)
Tapping	10,000min^{-1}	M27 x 3.0 (1-8UNC)	M24 x 3.0 (7/8-9UNC)	M16 x 2.0 (5/8-11UNC)
Tool diameter mm(inch) x Pitch mm(inch)	16,000min^{-1}	M22 x 2.5 (7/8-9UNC)	M18 x 2.5 (5/8-11UNC)	M14 x 2.0 (1/2-13UNC)
Facing	10,000min^{-1}	960 (58.6)	74 (4.5)	54 (3.3)
Cutting amount cm^3/min ($inch^3$/min)	16,000min^{-1}	660 (40.3)	64 (3.9)	46 (2.8)

* 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.

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

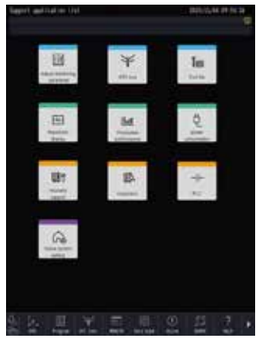
Intuitive operation is possible with new apps and vertical touch panel screen. Relevant functions are grouped according to purpose, such as setup and machining, leading to efficient operation. Production and operation states are visualized, allowing faster understanding. Waste-free operation is possible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

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.

New user interface

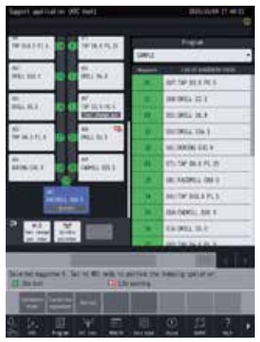
Usability has been greatly improved by grouping relevant functions, creating new support apps that are intuitive with improved operability and visibility, providing useful accessories (calculator, notebook, file viewer etc.), and making operation on conventional screens possible on the touch panel.


List of support apps


Conventional screen (position screen)

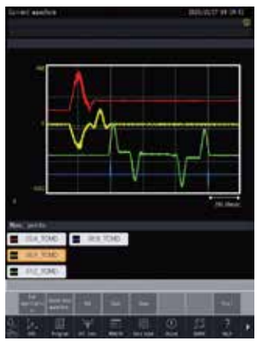
Setup support

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

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.

Built-in PLC

Standard equipped with a PLC function. Program memory and object memory have been increased to enhance the capacity for peripheral equipment. In addition to ladder language, ST language and FBD language can also be used for built-in PLC programming.

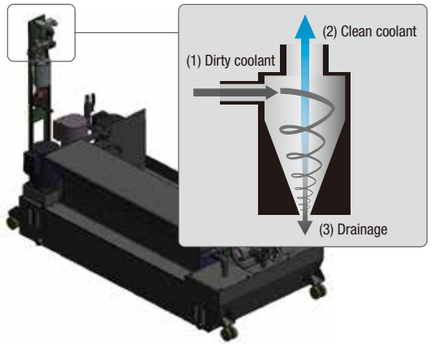
Built-in PLC screen

Earth-friendly machine with reliability that ensures high productivity

High reliability has been achieved by thorough evacuation and efficient handling of chips, and maintenance functions to prevent failures. Low power and air consumption greatly reduces CO_2 emissions, creating an earth-friendly plant environment.

Tank with cyclone filter and no consumables (special option for CTS)

Clean coolant is returned to the clean tank through another tank with a cyclone filter that removes fine chips. Coolant is kept clean this way to reduce the filter change frequency and extend the service life of the pump.



Low power consumption

In addition to the low inertia spindle and highly efficient spindle motor, the machine is equipped with various energy saving functions to lower power consumption.

Power consumption app

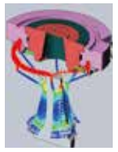
Current and past power consumption can be checked.

Low air consumption

Air related functions have been reviewed and optimized to eliminate any waste, leading to reduction in air consumption.

Air purge

A highly airtight structure achieved through repeated flow rate analysis reduces the amount of air used.



Spindle air blow

Amount of air used is reduced by discharging three times the conventional volume of air only when required.

Reliability and maintenance functions for prevention of defects/failures and quick recovery

To maintain productivity at plants, the machine is equipped with many functions that can prevent possible defects in daily production sites, such as tool abrasion, omission of tool attachment, and re-machining of the same workpiece, and functions that assist with recovery in the case of machine failure or other problems.

ATC tool monitoring

The presence of a spindle tool is checked before and after tool change 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 range.

Maintenance notice

Notifies operators of maintenance related issues in advance, such as greasing time.

Alarm log

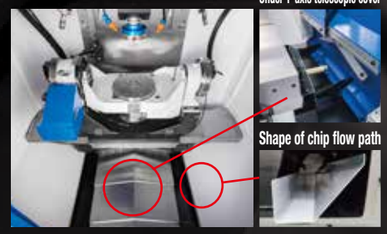
Displays alarm log details to help identify the cause.

Prevention of chip problems

Thorough chip evacuation/removal prevents chip problems, improving reliability.

Improvement of chip evacuation performance

Roof-shape telescopic covers are used for the X/Y-axes to help chips flow smoothly. The shape for the chip flow path from the machining room to the tank was devised to increase the flow speed. Changing the shape under the Y-axis telescopic cover and increasing the flow rate have improved chip evacuation performance by almost two-fold.



Tool washing, air-assisted type (optional)

Air-assisted high discharge pressure and discharge amount steadily remove chips attached to the tool taper. Stable washing power is achieved, without being affected by filter clogging. Expanding the pump capacity is not necessary, leading to higher energy saving.

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)

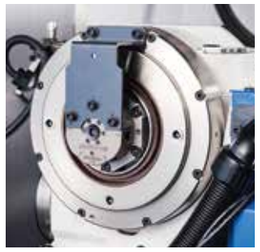
Can be selected from 3.0 MPa or 7.0 MPa. Pump and tank are not included.

Head coolant nozzle

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

Tool washing, air-assisted type

High discharge pressure and flow rate efficiently remove chips attached to the holder. Equipped with a filter clog warning function.



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 pipes are 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 pipes to the ceiling of the machine. Pipes 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.

Work light (right side, left side)

LED lamps are used to extend lamp life and save energy.

- 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 tree 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.

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.

Spindle override

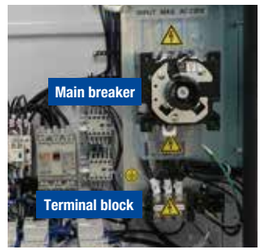
Spindle speed can be changed without changing the program.

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.

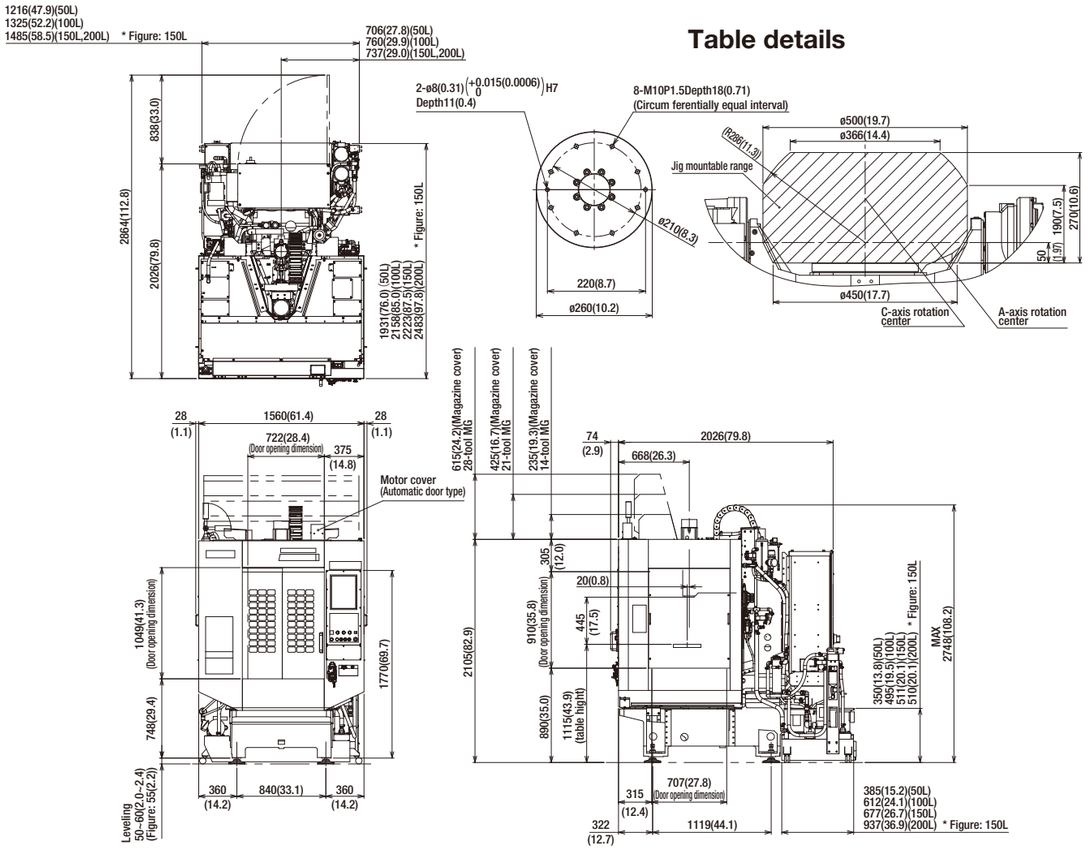
RS232C 25-pin connector

RS232C 25-pin connector can be attached to the side of the control box.

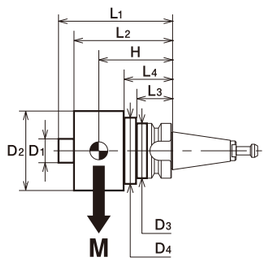
- Coolant tank
  1) Coolant tank, 50L
  2) Coolant tank, 100L
  3) Coolant tank, 150L
  4) Coolant tank, 150L for 1.5 MPa CTS pump with cyclone filter
  5) Coolant tank, 200L for 1.5 MPa CTS pump with cyclone filter
- Coolant through spindle (CTS) piping,Max. 3.0 MPa
- Coolant through spindle (CTS) piping,Max. 7.0 MPa
- Head coolant nozzle
- Rotary joint 6 ports
- Chip shower
- Tool washing, air-assisted type
- 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
- Work light (1 lamp for right side, 1 lamp for left side)
- Signal light (1, 2, or 3 lamps)
- Automatic oil lubricator
- Automatic grease lubricator
- Automatic door with switch panel 10 holes
- Area sensor
- 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

* 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).

U500Xd1



Tool Dimensions



Maximum Spindle Speed	10000min^{-1} / 16000min^{-1}		
Spindle Taper	7 / 24 No.30		
Tool Shank	MAS-BT		
Pull Stud	MAS-P30T-2		
Total for All Magazine Tools	M total 25kg (14 Tools) / 35kg (21 / 28 Tools)		
Maximum tool specification settings	Heavy tool	Standard tool	
Tool Limits	D1 ≦ 40mm L1 ≦ 250mm D2 ≦ 110mm L2 ≦ 160mm D3 ≦ 46mm L3 ≧ 30mm D4 ≦ 80mm L4 ≦ 35mm M ≦ 4kg M×H ≦ 360kg·mm	D1 ≦ 40mm L1 ≦ 250mm D2 ≦ 110mm L2 ≦ 160mm D3 ≦ 46mm L3 ≧ 30mm D4 ≦ 80mm L4 ≦ 35mm M ≦ 3kg M×H ≦ 180kg·mm	D1 ≦ 40mm L1 ≦ 250mm D2 ≦ 55mm L2 ≦ 160mm D3 ≦ 46mm L3 ≧ 30mm M ≦ 2kg M×H ≦ 100kg·mm
Tool Balance Limit	60g·mm	100g·mm	50g·mm
Tool Speed Limit	10000min^{-1}		16000min^{-1}

NC unit specifications

CNC model	CNC-D00	
Control axes	5 axes (X, Y, Z, A, C)	
Simultaneously controlled axes	Positioning	5 axes (X, Y, Z, A, C)
	Interpolation	Linear: 4 axes (X, Y, Z, one 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 (changed by parameter)
	Conversion from conversation program to NC language program available

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

Machine specifications

Item			U500Xd1 / U500Xd1 RD *8
CNC Unit			CNC-D00
Travels	X axis	mm(inch)	500 (19.7)
	Y axis	mm(inch)	400 (15.7)
	Z axis	mm(inch)	300 (11.8)
	A axis	deg.	120~-30
	C axis	deg.	360
	Distance between table top and spindle nose end	mm(inch)	145~445 (5.7~17.5)
Table	Work area size	mm(inch)	ø260 (ø10.2)
	Max. loading capacity(uniform load)	kg(lbs)	100 (220)
	Max. table load inertia	kg·m^2(lb·inch^2)	1.8 (6151) [2.6 (8885) *9]
Spindle	Spindle speed	min^{-1}	10,000min^{-1} specifications: 1~10,000 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.	1.2 / 1.3 (14 or 21 tools / 28 tools)
Electric motor	Main spindle motor (10min/continuous) *2	kW	10,000min^{-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	10,000min^{-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	55
Machining dimensions	Height	mm(inch)	2,748 (108.2)
	Required floor space [with control unit door open]	mm(inch)	1.560 x 2,026 [2,864] (61.4 x 79.8 [112.8])
	Weight	kg(lbs)	2,650 (5,843)
Accuracy *3	Accuracy of bidirectional axis positioning(ISO230-2:1988)	mm(inch)	X, Y, Z axis: 0.006~0.020 (0.00024~0.00079) A, C axis: 28 sec or less
	Repeatability of bidirectional axis positioning(ISO230-2:2014)	mm(inch)	X, Y, Z axis: Less than 0.004 (0.00016) 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.)

NC functions

Operation	Dry run
	Machine lock
	Program restart
	Rapid traverse override
	Cutting feed override
	Background editing
	Screen shot
	Operation level
	External input signal key
	Shortcut keys
	<Optional>
	Spindle override
Programming	Absolute / Incremental
	Inch / Metric
	Coordinate system setting
	Corner C / Corner R
	Rotational transformation
	Synchronized tap
	Subprogram
	Graphic display
Measurement	Automatic workpiece measurement *1
	Tool length measurement
High speed and high accuracy	Machining parameter adjustment
	High-accuracy mode AIII
	High-accuracy mode BI (look-ahead 160 blocks)
	Backlash compensation
	<Optional>
	High accuracy mode BII
	(Look-ahead 1,000 blocks, smooth path offset)

Monitoring	Machining load monitoring
	ATC tool monitoring
	Overload prediction
	Waveform display / Waveform output to memory card
	Heat expansion compensation system II (X, Y, and Z axes)
	Production performance display
	Tool life / Spare tool
Maintenance	Tap return function
	Status log
	Alarm log
	Operation log
	Maintenance notice
	Motor insulation resistance measurement
	Tool washing filter with filter clogging detection
	Battery-free encoder
	Brake load test
Automatic / Network	Computer remote
	OPC UA
	Auto notification
	Built-in PLC (LD/ST/FBD)
	<Optional>
	CC-Link, master station
	CC-Link, remote device station
	PROFIBUS-DP, slave
	DeviceNet, slave
	PROFINET, slave
	EtherNet/IP, slave

Energy saving	Automatic power off
	Standby mode
	Automatic coolant off
	Automatic work light off
	Chip shower off delay
Support apps	Adjust machine parameters
	ATC tool
	Tool life
	Waveform display
	Production performance
	Power consumption
	Recovery support
	Inspection
	PLC
Accessories	File viewer
	Notebook
	Calculator
	Register shortcut
	Display off

Functions limited to NC language	Menu programming
	Local coordinate system
	Expanded workpiece coordinate system
	One-way positioning
	Inverse time feed
	Programmable data input
	Tool length compensation
	Cutter compensation
	Scaling
	Mirror image
	External sub program call
	Macro
	Operation in tape mode
	Multiple skip function
	<Optional>
	Submicron command *2
	Interrupt type macro
	Rotary fixture offset
	Fixture coordinates setting
	Involute interpolation
Functions limited to conversation	Operation program
	Schedule program
	Automatic tool selection
	Automatic cutting condition setting
	Automatic tool length compensation setting
	Automatic cutter compensation setting
	Automatic calculation of unknown number input
	Machining order control

*1. Measuring instrument needs to be prepared by users.
*2. When the submicron command is used, changing to the conversation program is disabled.

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Figures in brackets ( ) are the country codes.

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