

SPEEDIO

DG-1

Deburring Center



Deburring Center

Deburring Center DG-1



Mechanizes manual deburring of die casting material in variable-type variable-volume production

Deburring of die casting material in variable-type variable-volume production is currently performed manually, since using a robot system for this operation is inefficient.

Due to problems such as operator shortages and difficult work environments, the need for mechanization has increased.

The DG-1 Deburring Center has deburring setup functions achieved by Brother's original technology to enable mechanization of manual deburring.

Die casting parts manufacturing processes



Target burrs

Parting line (Flash)



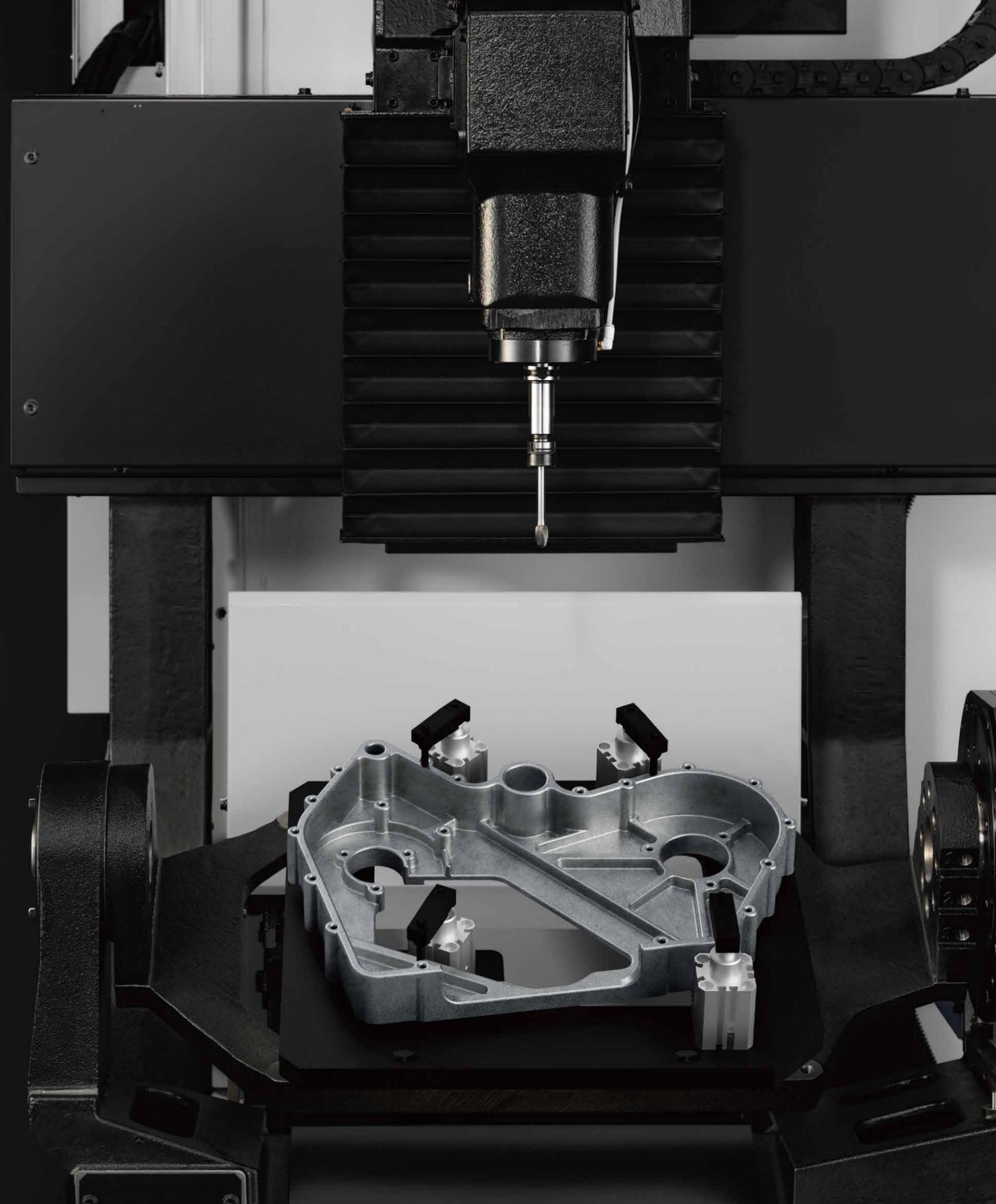
Gate/Overflow



Ejector pin mark



Gap in slide



Brother's original functions greatly improve deburring efficiency

Brother's original deburring setup functions greatly improve deburring efficiency in variable-type variable-volume production, which is currently performed manually.

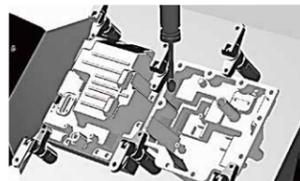
Three features that encourage mechanization of manual deburring

The DG-1 Deburring Center has Brother's original deburring functions. Simple teaching and correction, and automatic path creation enable fast deburring setup. Optimal machine configuration supports a variety of burr types, and achieves high chip evacuation for dry machining, which encourages mechanization of manual deburring.

(1) Fast machining path creation or correction (Brother's original deburring setup functions)



(2) Supports a wide range of deburring operations



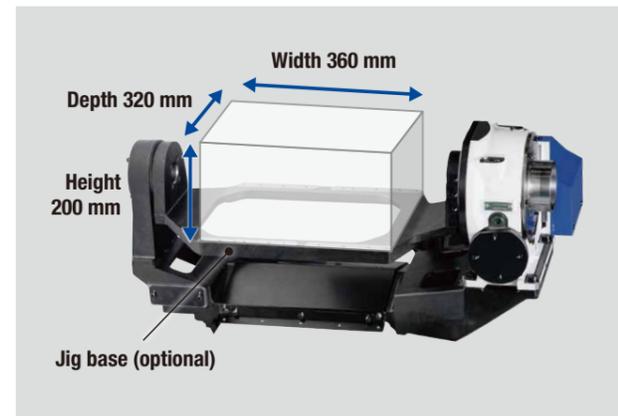
(3) High chip evacuation for dry machining



Jig area

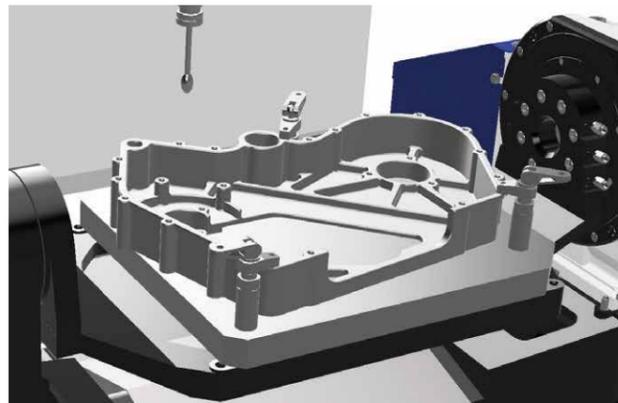
Controlled by four axes, including the rotary table (A axis) of the roller gear cam structure. Ample jig area is secured, enabling highly flexible jig design. A jig base (optional) is available to configure the trunnion jig between the faceplate of the rotary table and the support.

Mounting range when jig base (optional) is selected (reference dimensions)

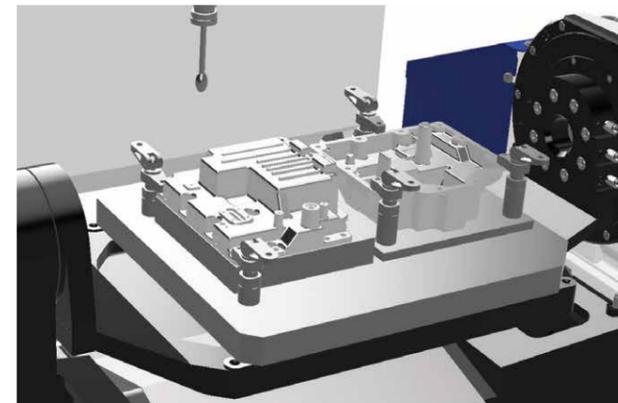


Jig mounting example

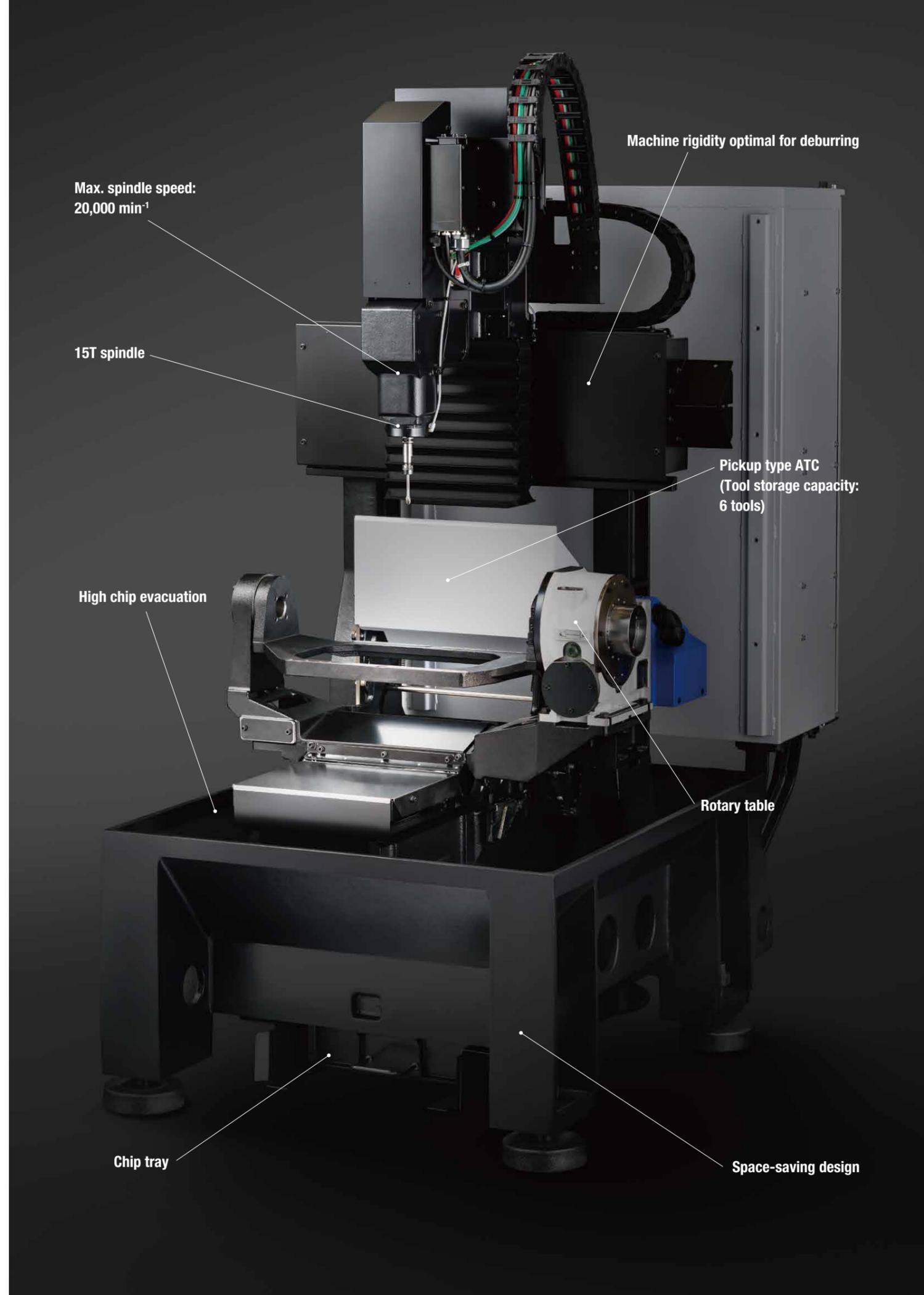
Waste-free machine configuration enables highly flexible jig design, making it easier to mount jigs for large workpieces or jigs for multi-part machining.



Large workpiece (size: 365 x 270 x 45 mm)



Two small workpieces



Great reduction in deburring setup manhours

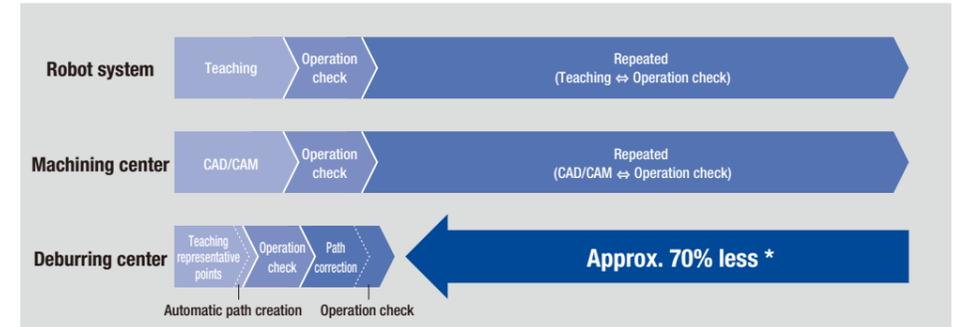
Create simple machining paths in a short time

The machine has Brother's original deburring setup functions, including easy teaching of representative points, intuitive path correction, automatic machining path creation, and automatic machining program conversion.

Fast deburring setup has been achieved, enabling mechanization of deburring in variable-type variable-volume production that is currently performed manually.

Comparison of deburring setup processes

Teaching representative points, automatic path creation, and easy path correction significantly reduce deburring setup time. The machining path can be easily created by profiling the material, eliminating the need for repeated re-teaching or CAD/CAM data correction as is required for robots or machining centers.



* Comparison of setup time using a sample workpiece

STEP1 Teaching representative points

Teaching representative points is conducted by allowing the tool to contact the master workpiece^{*1}. The number of teaching points is less than robots, and there is no need to define straight lines or arcs. For a gentle curve, a machining path can be created automatically by teaching only the start and end points.

*1. Please prepare a cleanly deburred workpiece as a master workpiece.

STEP2 Automatic machining path creation

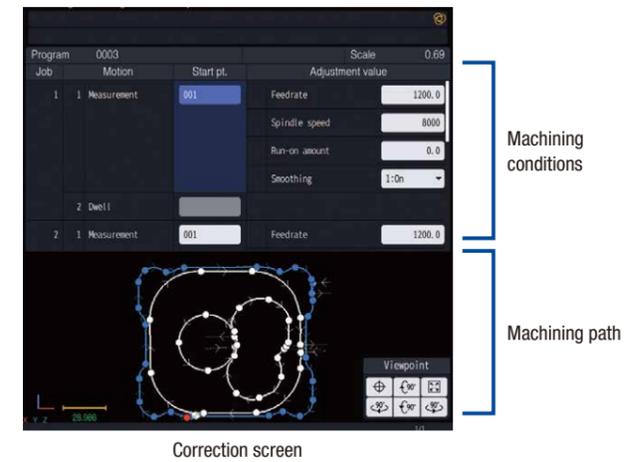
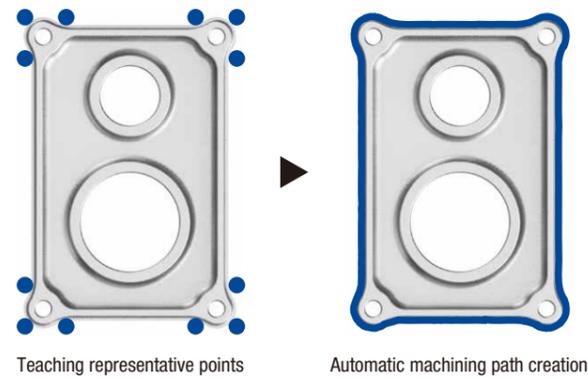
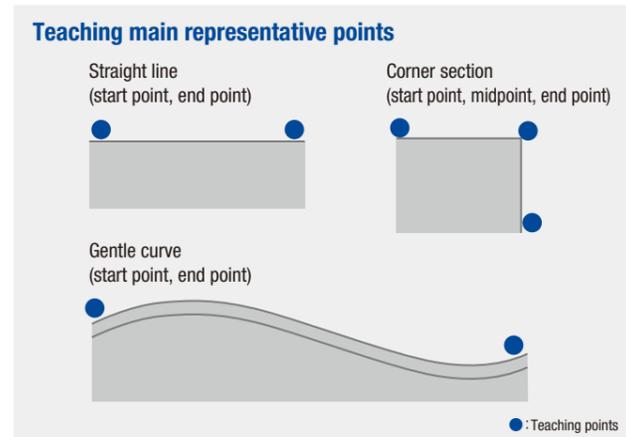
The machining path is created automatically by profiling the master workpiece based on the representative points that have been taught. This requires less correction of the path than robots or machining centers.

STEP3 Path correction by intuitive operation

The touch panel can be used to instruct correction points, and the machining path and conditions can be corrected by intuitive operation. Since correction is possible for each teaching point or area, re-teaching, such as required for robots, is not necessary.

STEP4 Automatic machining program conversion

Automatically converts the machining path and condition data into a machining program. No programming expertise is required, enabling easy creation of machining programs. Furthermore, advanced programming with macro programs is also possible by editing the automatically created machining program.



Current folder: DBS/				Conversion folder:/			
No.	Size	Comment	Date	No.	Size	Comment	Date
0001	4.12K		24/06/14	0003_JOB01	16.2K	(_DBS/RM0003)	24/06/20 10:54:23
0002	3.44K		24/06/13 22:13:45	0003_JOB02	12.0K	(_DBS/RM0003)	24/06/20 10:54:29
0003	21.5K		24/06/19 18:47:26	0003_JOB03	6.79K	(_DBS/RM0003)	24/06/20 10:54:29
				0003_JOB04	4.47K	(_DBS/RM0003)	24/06/20 10:54:34
				0003_MAIN	239	(_DBS/RM0003)	24/06/20 10:54:39

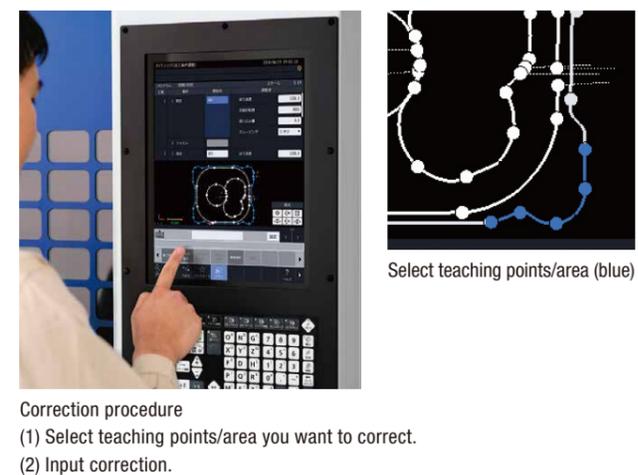
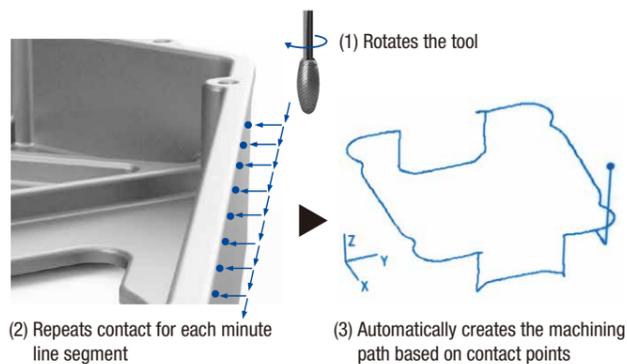
Teaching controller (optional)

Moving direction and speed can be intuitively manipulated to improve the efficiency of teaching representative points.



Machining path creation image

Based on the representative points that have been taught, the machining path is created automatically by rotating the tool and repeating contact with the master workpiece.



Deburring setup video



Scan or Click

Equipped with pickup type ATC

The pickup type ATC can store six tools, and various types of deburring tools can be used. The open/close magazine cover minimizes the impact of chips.

Pickup type ATC	
Tool storage capacity : 6 tools	Tool To Tool : 3.0s



Pickup type ATC

Function that reduces risks of machine breakage in the event of teaching mistakes^{*1}

A low torque function is provided to reduce the machine's travel speed and force. Even if teaching mistakes are made during teaching of representative points or automatic path creation is affected by teaching mistakes, the machine detects abnormal contact and stops.

This function is enabled by pressing the Low Torque key on the operation panel.



*1. This function does not prevent breakage in all collision modes.

Chip evacuation for dry machining

The direct evacuation structure evacuates chips outside the machine. Chips can be easily disposed of by drawing the chip tray from the front of the machine.



Direct evacuation structure



Chip tray (front draw type) *2
*2. Can be changed to rear draw type.



Teaching controller

Controller with a cable, used for moving axes or teaching representative points of a deburring shape. Equipped with emergency stop and enable switches.

* A manual pulse generator option is not available.



Jig base

Used to configure the trunnion jig between the faceplate of the rotary table and the support. Positioning pin holes are provided.



Rotary joint

Pneumatic 6-port rotary joint built into the rotary table. Pneumatic piping to the rear of the machine is included with this option.



Jig control valve unit

Valve set for jig control, composed of 3 valves, 3 pressure switches, and 3 select switches. Please prepare piping separately.

* The switch panel (10 holes) is not included.



Side cover with transparent window, single side

Allows external light into the inside of the machine to make it brighter, making the machining chamber easier to see.

* When needed for both sides of the machine, please order two covers.



Automatic door with switch panel (10 holes)

A motor-driven door is used, achieving smooth operation.

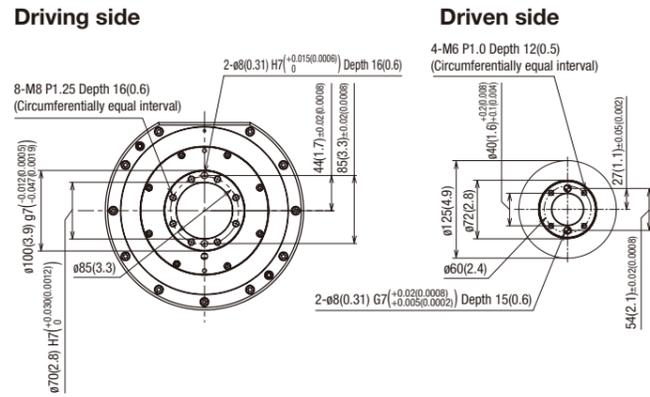
- Please read the instruction manuals and safety manuals before using Brother products for your own safety.
- This machine is exclusively for dry machining of aluminum alloy. Do not use the machine for other materials.
- Dust collectors, vacuum cleaners, and air blowers must not be used due to the risk of fire or explosion. Take adequate safety measures against fire and explosion.
- Machine life may be affected, depending on machining materials, tools, etc. 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.

- Teaching controller
- Jig base
- Rotary joint 6 ports
- Jig control valve unit (3-row)
- Side cover with transparent window, single side
- Work light (1 or 2 lamps)
- Signal light (1, 2, or 3 lamps)
- Automatic door with switch panel (10 holes)
- Switch panel (10 holes)
- Tool breakage detector, touch type
- Spindle override
- Specified color

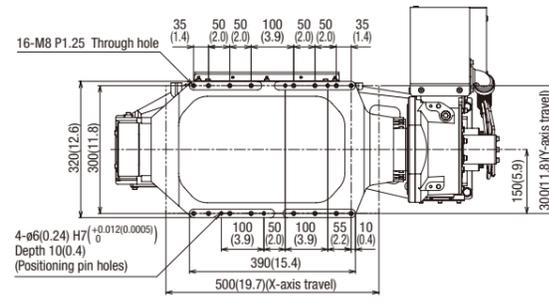
- Transformer box
- EXIO board assembly
 - 1) EXIO board, input 32/output 32, additional #1
 - 2) EXIO board, input 32/output 32, additional #2
- PLC programming software for D00
- Industrial network
 - 1) CC-Link, master station
 - 2) CC-Link, remote device station
 - 3) PROFIBUS DP, slave
 - 4) DeviceNet, slave
 - 5) PROFINET, slave
 - 6) EtherNet/IP, slave

- Memory expansion 3 Gbytes
- Interrupt type macro
- Rotary fixture offset

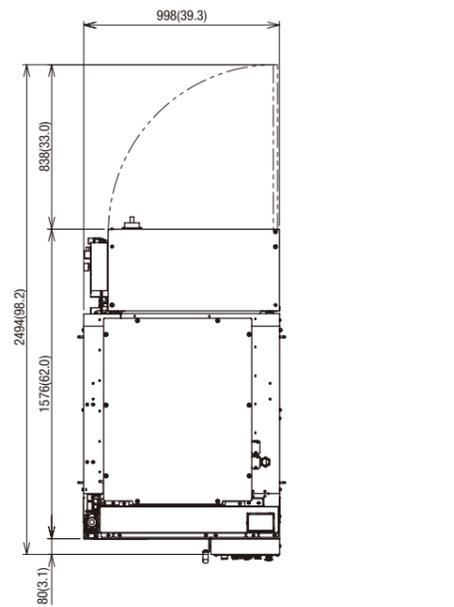
Table details



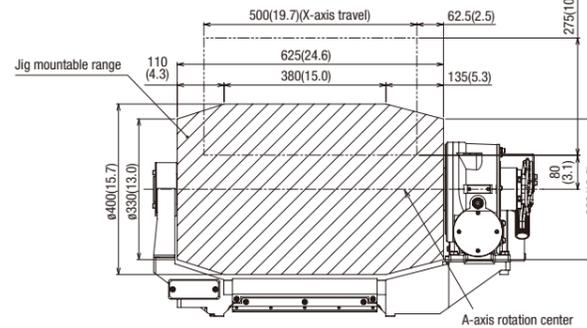
Jig base (optional)



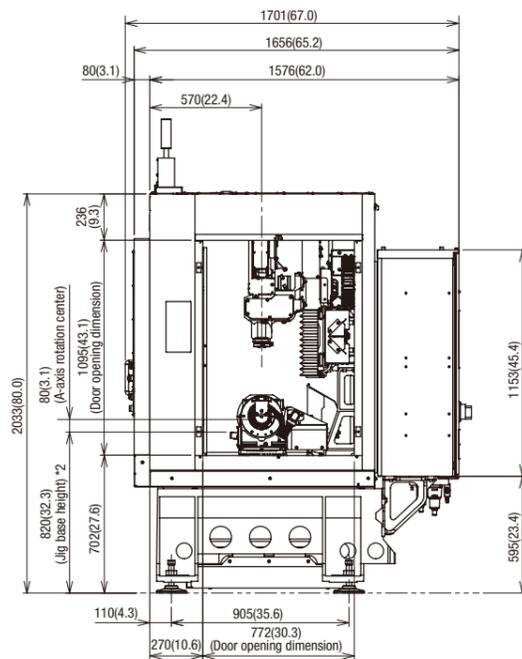
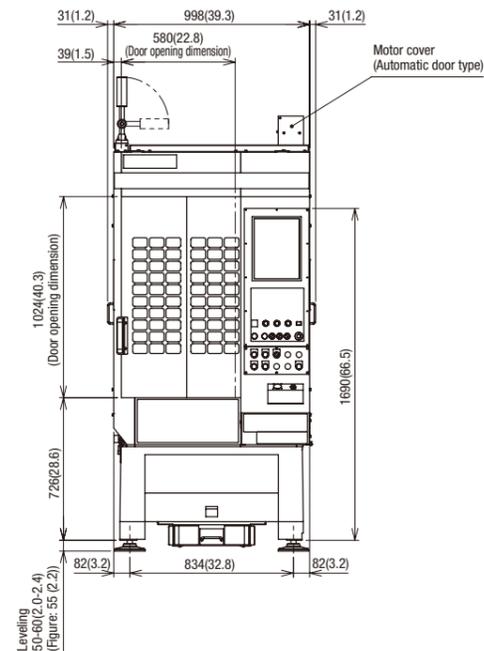
External dimensions



Jig area *1



*1. Jig area when the jig base and tool breakage detector are not mounted. Please check the external views or interference diagrams provided by Brother when designing jigs or checking for interference.



*2. Dimensions of the top surface of the jig base (optional) when the A-axis is at 0 deg.

Machine specifications

Item	Deburring Center DG-1	
CNC Unit	CNC-D00	
Travels	X axis	500 (19.7)
	Y axis	300 (11.8)
	Z axis	275 (10.8)
	A axis	360
Table	Distance between A-axis rotation center and spindle nose end	80~355 (3.1~14.0)
	Max. loading capacity	50 (110)
Spindle	Max. table load inertia	0.7 (2,392)
	Spindle speed	1~20,000
Feed rate	Tapered hole	7/24 tapered No.15
	Rapid traverse rate (XYZ axes)	40 x 40 x 40 (1,575 x 1,575 x 1,575)
ATC unit	Cutting feed rate	X, Y, Z axis: 1~30,000 (0.04~1,181) *6
	Indexing feedrate (A)	100
Tool change time *4	Tool shank type	JBS4002-15T
	Pull stud type *3	JBS4002-15P (45°)
Electric motor	Tool storage capacity	6
	Max. tool length	150 (5.9)
Power source	Max. tool diameter	32 (1.2)
	Max. tool weight *1	0.4 (0.9)
Machine dimensions	Tool selection method	Pickup method
	Tool To Tool	3.0
Standard accessories	Chip To Chip	4.3
	Main spindle motor (continuous) *2	2.1
Power supply	Axis feed motor	X, Y, Z axis: 0.32 A axis: 0.9
	Power capacity (continuous)	AC 200 to 230 V±10%, 3-phase, 50/60Hz±2%
Air supply	Regular air pressure	3.8
	Required flow	0.4~0.6 (recommended value 0.5MPa *5)
Machine dimensions	Height	2,033 (80.0)
	Required floor space [with control unit door open]	998 x 1,656 [2,494] (39.3 x 65.2 [98.2])
Weight	Weight	1,200 (2,646)
	Instruction Manual (DVD 1 set), leveling bolts (4 pcs.), leveling plate (4 pcs.), Chip tray, Top cover	

*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. Brother specifications apply to the pull studs. *4. Measured in compliance with JIS B6336-9 and MAS011-1987. *5. 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. *6. Value when using high accuracy mode B and tool center point control.

NC unit specifications

CNC model	CNC-D00	Display	15-inch color LCD touch display	
Control axes	4 axes (X, Y, Z, A)	Memory capacity	500 Mbytes, 3 Gbytes (optional) (Total capacity of program and data bank)	
Simultaneously controlled axes	Positioning	4 axes (X, Y, Z, A)	External communication	USB memory interface, Ethernet
	Interpolation	Linear: 4 axes (X, Y, Z, A)	No. of registrable programs	4,000 (Total capacity of program and data bank)
		Circular: 2 axes	Program format	NC language
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg.	* "Control axes" and "Simultaneously controlled axes" indicate the maximum number of axes.		
Max. programmable dimension	±999999.9999 mm, ±99999.99999 inch	* Ethernet is a registered trademark of Xerox Corporation in the United States.		

NC functions

Operation	Dry run	Tool center point control (Lock-ahead 1,000 blocks)	PROFIBUS DP, slave	NC language functions	Menu programming
	Machine lock	Monitoring	DeviceNet, slave		Local coordinate system
Monitoring	Program restart	Low torque function	PROFINET, slave	Energy saving	Expanded workpiece coordinate system
	Rapid traverse override	Overload prediction	EtherNet/IP, slave		Automatic power off
Maintenance	Cutting feed override	Waveform display / Waveform output to memory card	Automatic work light off	Standby mode	Inverse time feed
	Background editing	Production performance display	Support apps	Deburring program	Programmable data input
Programming	Screen shot	Tool life / Spare tool	Adjust machine parameters	Adjust machine parameters	Tool length compensation
	Operation level	Status log	Alarm log	Alarm log	Cutter compensation
Automatic / Network	External input signal key	Operation log	Waveform display	Waveform display	Scaling
	Shortcut key	Maintenance notice	Production performance	Production performance	ATC tool
High speed and high accuracy	<Optional> Spindle override	Motor insulation resistance measurement	Power consumption	Power consumption	Mirror image
	Absolute / Incremental	Battery-free encoder	Recovery support	Recovery support	External sub program call
High accuracy	Inch / Metric	Brake load test	Inspection	Inspection	Macro
	Coordinate system setting	Computer remote	PLC	PLC	Tape operation / FTP load operation
High accuracy	Corner C / Corner R	Auto notification	File viewer	File viewer	Multiple skip function
	Rotational transformation	Built-in PLC (LD/ST/FBD)	Notebook	Notebook	Submicron command
High accuracy	Subprogram	<Optional>	Calculator	Calculator	<Optional>
	Graphic display	CC-Link, master station	Register shortcut	Register shortcut	Interrupt type macro
High accuracy	High-accuracy mode All	CC-Link, remote device station	Display off	Display off	Rotary fixture offset
	High-accuracy mode B1 (Lock-ahead 160 blocks)				

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Figures in brackets () are the country codes.

Specifications may be subject to change without any notice.

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

<https://machinetool.global.brother/>

