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CNC TAPPING CENTER®

TC-31B

NEW

MACHINING PERFORMANCE

HIGH QUALITY MACHINING

USABILITY

Compact High-Productivity Machine

The TC-31B is a column traverse type machine with a quick table*, and provides high-speed and high-quality productivity in a compact body.

Nonstop machining is possible without any time loss when attaching or removing workpieces.

The TC-31B fully demonstrates its abilities in the machining of a variety of small parts, including IT parts.



*Quick table is a turntable type 2-face pallet changer.

HIGH QUALITY MACHINING
MACHINING PERFORMANCE
USABILITY



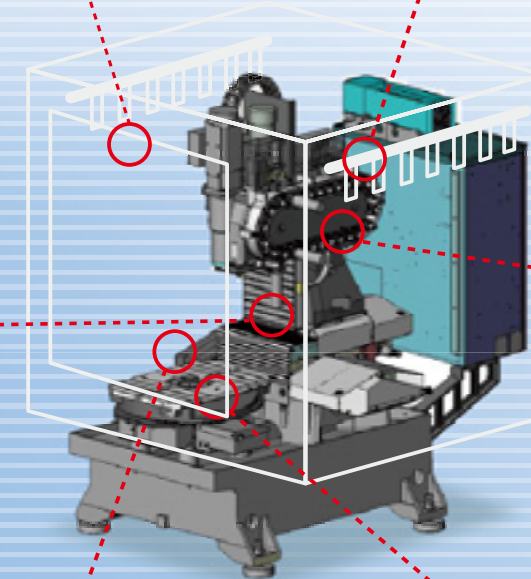
New single door
Wide single door used



Chip shower
Chip shower located at the upper section inside the machine



Operation panel
Angled operation panel



ATC mechanism
Tool storage capacity 26(+1)



Angular telescopic cover
Adoption of angular telescopic cover



Quick table
Adoption of new quick table

CNC TAPPING CENTER TC-31B

Feature 1

HIGH QUALITY MACHINING

After reviewing the machine's structure and using a larger spindle diameter, etc., we have enhanced rigidity and improved machining quality. For example, machining quality of finished surface is superior to former model.

Looks on the surface after cutting by endmill



Former model



TC-31B

S 12,000 min⁻¹ F 1,200mm/min

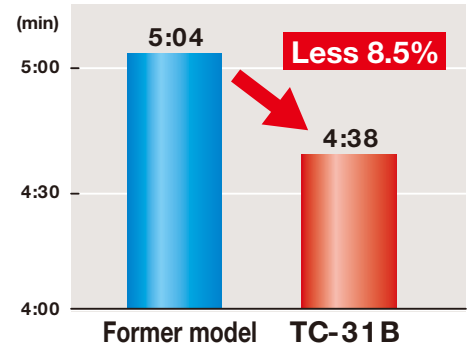
Feature 2

MACHINING PERFORMANCE

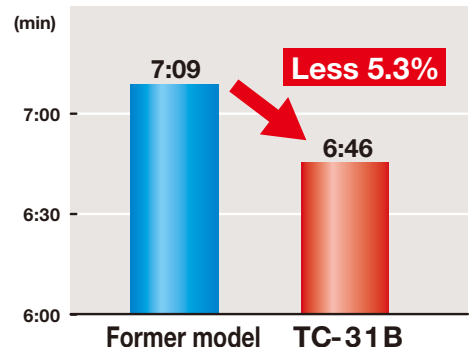
By using the B00 series NC to improve program processing speed and vibration control to improve acceleration, productivity has been improved by 3 to 10% compared to former model.



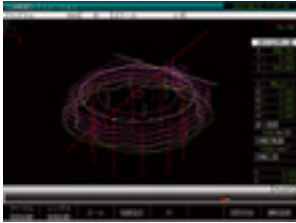
Cycle time (workpiece A)



Cycle time (workpiece B)



Equipped with the B00 series NC, a 12.1-inch color display, and a variety of functions, such as menu programming and high accuracy mode A, the operability and functional capabilities of the TC-31B are even more advanced. In addition, the machine is standard-equipped with practical new functions, such as USB memory interface and maintenance notice function.



12.1-inch color display(Standard)
User-friendly screen configuration, including menu screens for graphic drawing and program creation, alarm recovery screens, etc.



USB memory interface(Standard)
USB memory interface is available. Many data can be transferred at high speed. Tape operation is also possible from a USB memory device. Note: USB memory interface cannot be connected directly to the personal computer.



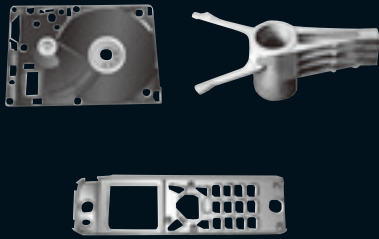
Maintenance notice function(Standard)
Maintenance timing can be set or notified by an alarm.



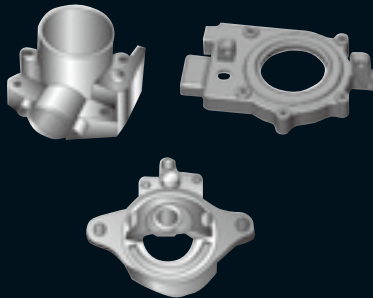
High accuracy mode A(Standard)
High accuracy mode A ensures accurate finishing of minute lines. Vibration control prevents the vibration generated during axis movement. (The figure on the above shows an example when machined at F10,000 mm/min (F394 inch/min).

Example

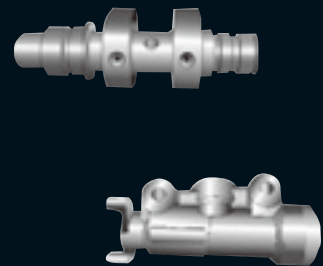
INFORMATION TECHNOLOGY



AUTO MOBILE

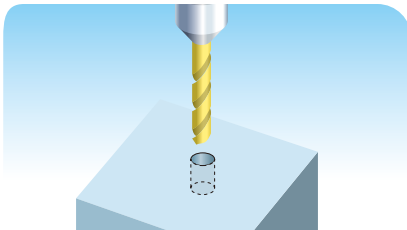


MOTOR CYCLE



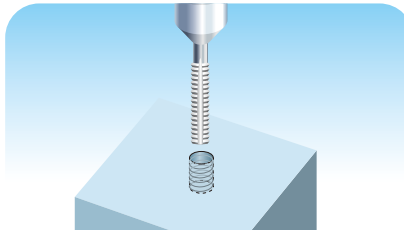
Machining capability

Drilling



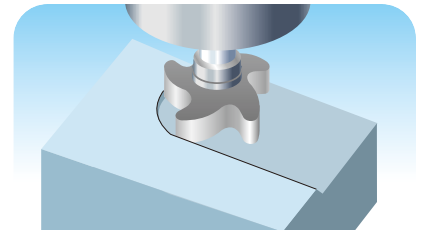
Tool diameter mm(inch)
x Feed mm(inch)/rev

Tapping



Tool diameter mm(inch)
x Pitch mm(inch)

Facing

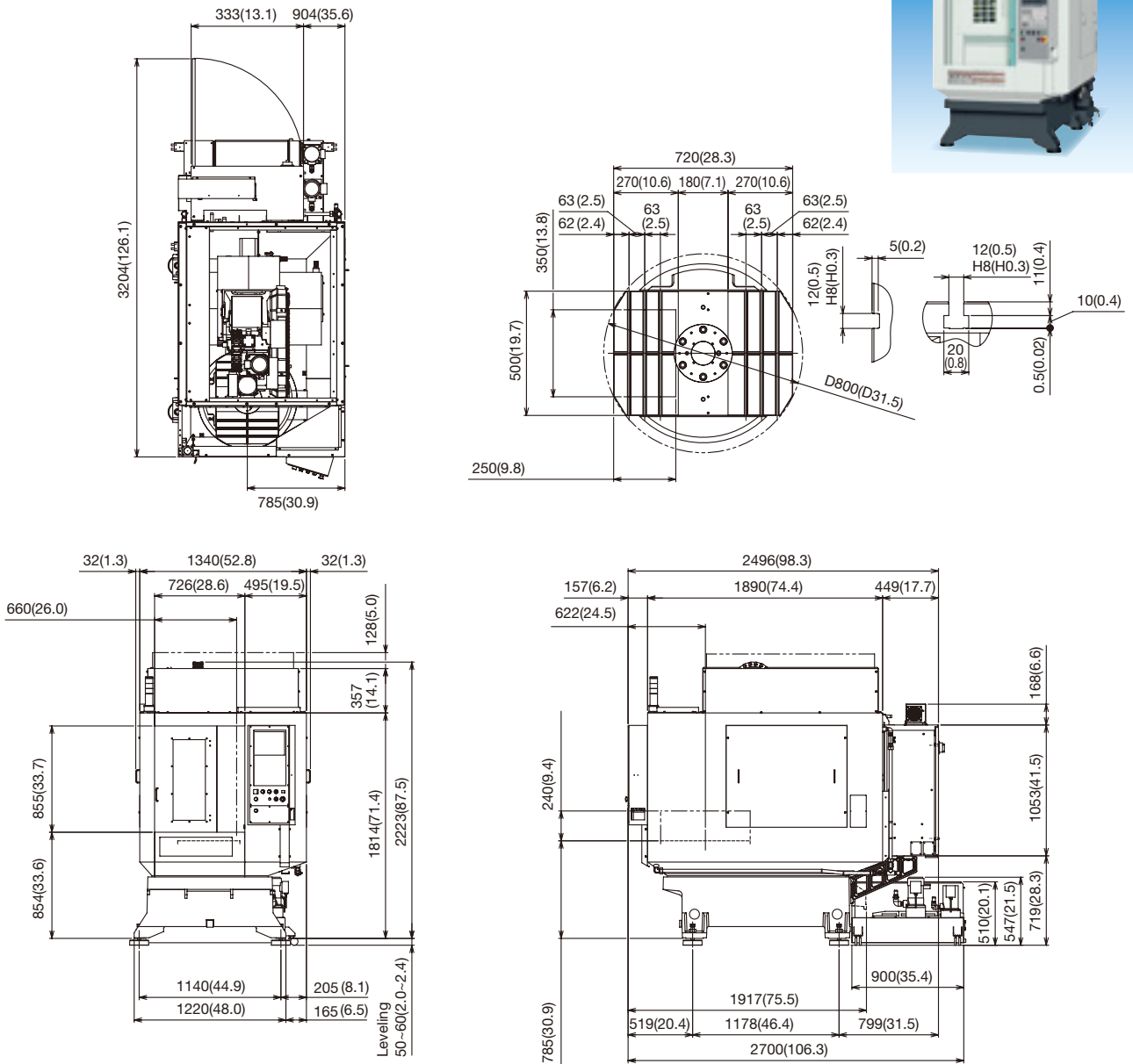


Cutting amount cm3/min(inch3/min): xCutting width mm(inch)
xCutting depth mm(inch) x Feed rate mm/min(inch/min)

Material	16000min ⁻¹		22000min ⁻¹		16000min ⁻¹		22000min ⁻¹	
	ADC	D22(0.87)x0.3(0.012)	D18(0.71)x0.2(0.008)	M22x2.5	M16x2.0	244(9.6):40(1.57)x3.0(0.118)x2040(80.3)	204(12.4):40(1.57)x2.5(0.098)x2040(80.3)	57(3.5):40(1.57)x2.5(0.098)x573(22.6)
FC20	D22(0.87)x0.15(0.006)	D16(0.63)x0.15(0.006)	M18x2.5	M14x2.0	57(3.5):40(1.57)x2.5(0.098)x484(19.1)	39(2.4):40(1.57)x2.0(0.078)x484(19.1)		
S45C	D18(0.71)x0.1(0.004)	D15(0.59)x0.1(0.004)	M12x1.75	M12x1.75				

The date is guaranteed performance, instead of the maximum machining capability.

External dimensions



•Please leave 700mm (27.6) between machines for the maintenance.

Quick table (two-surface pallet changer) Specifications

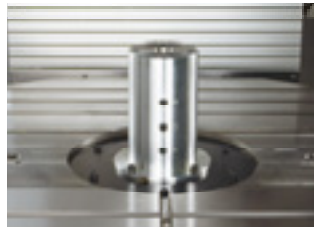
Type	0°/180° turntable system	
Table dimensions	mm (inch)	720x500 (28.4x19.7)
Maximum turning diameter	mm (inch)	D800 (D31.5)
Table height	mm (inch)	240 (9.5)
Table work area size	mm (inch)	500x260 (19.7x10.2) <two surfaces>
Maximum loading capacity	kg (lbs)	80 (176) <one side>: uniform load
Rated table load inertia for turning axis	(kg·m ²)	5.5 <one side>
Table top configuration (two sides)	Y axis: 12H8 3 T slots, pitch 63 Y axis: 12H8 1 keyway, center	
Table turning system	AC servo motor (750W) HR gear (total speed reduction ratio: 1/90)	
Table positioning time	2.3 sec./180°	
Table change repeatability	mm (inch)	0.01 (0.0004") (table center on each side (in the X, Y, and Z axis directions 230 from the center of rotation)

Selective specifications and Optional specifications to Meet a Wide Range of Customer's Requirements



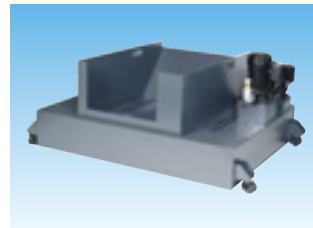
Chip shower

Chip shower pipes are located at the upper section inside the machine for more effective chip removal.



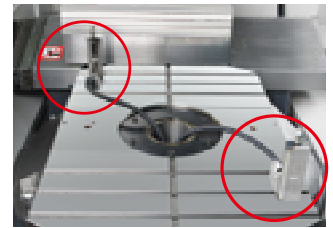
Rotary joint

There are 6 ports for the PT 1/8 lubrication ports.



Coolant unit

Coolant tank can be selected from 50L, 100L, or 150L, depending on the purpose.



Tool breakage detector (touch type)

A touch switch type tool breakage detector is used. This can also be used for automatic tool length measurement. (Can be attached on two faces)



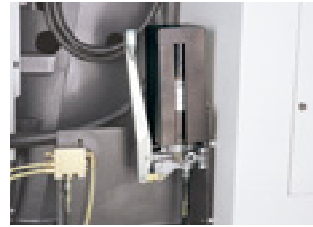
Spindle override

Spindle speed can be changed without changing the program.



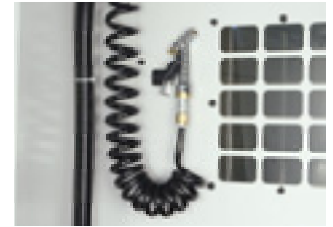
Automatic lubricator

Regularly greases the greasing points on the three axes.



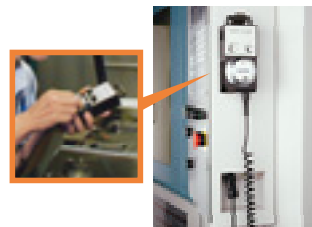
Manual grease lubricator

Operating this lubricator at one of the greasing points greases all greasing points on the three axes.



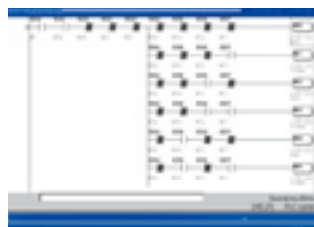
Cleaning gun

This assists cleaning of machined workpieces and the removal of chips in the machine.



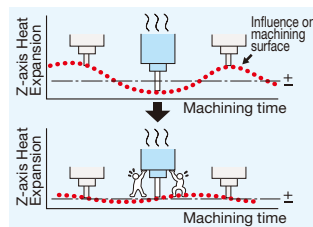
Manual pulse generator

Manual pulse generator with a cable makes operation through the maintenance window easier.



Built-in PLC

Employs ladder language programming (same as commercially available PLC). Ladder programs can be edited or monitored on the NC screen of commercially available PCs.



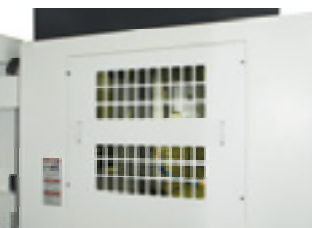
Automatic thermal distortion compensation system

This system predicts the elongation of each axis based on the movement of the spindle and XYZ-axes, and compensates for thermal distortion. No sensors are required. Machining time is not affected.



[OUTER INDEX] switch

This switch enables operation of the outer index table.



Side cover (acrylic board type)

External light is taken in to make the inside of the machine brighter and improve visibility.



Top cover

A top cover is available for when using a mist collector.



Work light (1,2 lamps)

Work light with built-in inverter is used, providing longer life.



Indicator light (1, 2 or 3 lamps)

The bulb will never blow, making it completely maintenance free.

Machine specifications

Item			TC-31B	
			16,000min ⁻¹ specifications	22,000min ⁻¹ specifications
CNC unit model			CNC-B00	
Travels	X axis	mm (inch)	350 (13.8)	
	Y axis	mm (inch)	250 (9.8)	
	Z axis	mm (inch)	350 (13.8) (Including ATC80 (3.15))	
	Distance between table top / spindle nose end	mm (inch)	200~550 (7.9~21.7)	
Table	Work area size	mm (inch)	500 × 270 (19.7 × 10.6) <one side>	
	Max. loading capacity (uniform load)	kg (lbs)	80 (3.1) <one side>	
Spindle	Spindle speed	(min ⁻¹)	16~16,000	22~22,000
	Speed during tapping	(min ⁻¹)	MAX.6,000	MAX.8,000
	Tapered hole		7/24 tapered no.30	
Feed rate	Rapid traverse rate XYZ-area	m/min (inch/min)	50 × 50 × 50 (1,969 × 1,969 × 1,969)	
	Cutting feed rate	mm/min (inch/min)	1~20,000 (0.04~787)	
ATC unit	Tool shank type		MAS.BT30	
	Pull stud type		MAS.P30T-2	
	Tool storage capacity*1	pcs.	26 (+1)	
	Max. tool length	mm (inch)	200 (7.9)	
	Max. tool diameter*2	mm (inch)	D55 (2.1) <Max. tool diameter D125 (4.9)>	
	Max. tool weight*3	kg (lbs)	3.5 (7.7) <total weight 55 (121.3)>	
	Tool selection	sec.	Double arm method random closest path	
Electric motor	Main spindle motor (10 min / continuous)*4	kW	7.4/4.9	11.2/6.4
	Feed spindle motor	kW	1.5 (X,Y,Z)	
Power source	Power supply		AC200V±10%,50/60Hz±1Hz	
	Power capacity	kVA	12.4 (25.9)	15.3 (33.1)
	Air supply	Working air pressure Required flow	MPa L/min	0.4~0.6 100 (at atmospheric pressure)
Machining dimensions	Machine height	mm (inch)	2,283 (89.8)	
	Required floor space (with control unit door open)	mm (inch)	1,404 × 3,204 (55.3 × 126.1)	
	Machine weight (including control unit splash guard)	kg (lbs)	2,300 (5,071)	
Accuracy*5	Positioning accuracy	mm (inch)	0.005/300 (0.0002/11.8)	
	Repeatability	mm (inch)	±0.003 (±0.00012)	
Standard accessories			1 operating manual, 4 anchor bolts, 4 leveling plates, 1 splash guard with manual door, 1 set of fuses.	

*1 When all tools are small tools *2 The tools storage capacity, tool change time, etc., will vary when using large tools
 *3 Actual tool weight varies according to the configuration and center of gravity. The figures shown here are for reference only.
 *4 Spindle motor output differs depending on the spindle speed. *5 Measured in compliance with JIS B6201-1987.

Optional

- Coolant unit
 - ① Coolant unit 100L (with chip shower, valve and 250W+250W pumps)
 - ② Coolant unit 150L (with chip shower, valve and 250W+400W pumps)
- Tool breakage detector (touch type)
- Cleaning gun
- Automatic lubricator
- Manual grease lubricator
- Work light (1, 2 lamps)
- Indicator light (1, 2, or 3 lamps)
- Automatic door
- Area sensor
- Specified color
- Manual pulse generator
- B-axis connection unit
- Outer indexer turn switch
- Automatic work measurement software
- Spindle override
- Ceiling cover
- Side cover (transparent board type)
- Simple rotary joint (6ports for the PT1/8 lubrication ports)
- Expansion memory (Approx. 120 Mbytes)
- RS232C 9-pin to 25-pin (front of control box)
- Built-in PLC
 - PLC Function, ladder editing
- Extension I/O board (EXIO board)
 - ① EXIO board standard assy
 - ② EXIO board PNP assy
 - ③ Additional EXIO board standard assy
 - ④ Additional EXIO board PNP assy
- Automatic heat expansion compensation system
- Automatic thermal distortion Compensation system
- Helical / conical interpolation
- Switch panel (8 holes type)
- PLC programming software Windows® 2000,XP
- Door for exchanging tool

Windows® is a trademark or registered trademark of Microsoft Corporation in the United States and / or other countries.
 * Please contact your Brother dealer for details.

NC Unit specification

CNC model	CNC-B00		Display	12.1-inch color LCD
Control axes	7 axes (X, Y, Z, 4 additional axes)		Program capacity	Approx. 5,000 m (Approx. 2 Mbytes)
Simultaneously controlled axes	Positioning	5 axes (X, Y, Z, A, B)	External communication	RS232C 1ch, Ethernet, USB memory interface
	Interpolation	Linear : 4 axes (X, Y, Z, one additional axis) Circular : 2 axes Helical / conical interpolation : 3 axes (X, Y, Z)	No. of registrable programs	1,024
Least input increment	0.001 mm, 0.0001 inch, 0.001 deg.		Program format	NC language, conversation (changed by parameter), conversion from conversation program to NC language program available
Max. programmable dimension	±9999.999 mm 999.9999 inch			
NC function	<ul style="list-style-type: none"> ● Absolute / incremental ● Inch / metric ● Corner C / Corner R ● Rotational transformation ● Synchronized tap ● Coordinate system setting ● Dry run ● Restart ● Backlash compensation ● Pitch error compensation ● Rapid traverse override ● Cutting feed override ● Alarm history 	<ul style="list-style-type: none"> ● Status log ● Machine lock ● Computer remote ● High-accuracy mode ● Tool length measurement ● Tool life management / spare tool ● Background editing ● Graphic display ● Subprogram ● Expanded workpiece coordinate system (NC) ● Helical / conical interpolation (optional) ● Scaling (NC) ● Mirror image (NC) 	<ul style="list-style-type: none"> ● Menu programming (NC) ● Program compensation (NC) ● Tool length compensation (NC) ● Cutter compensation (NC) ● Operation program (conv.) ● Schedule program (conv.) ● Automatic tool selection (conv.) ● Automatic cutting condition setting (conv.) ● Automatic tool length compensation setting (conv.) ● Automatic cutter compensation setting (conv.) ● Automatic calculation of unknown number input (conv.) ● Machining order control (conv.) ● Macro function (system variables)(NC) 	<ul style="list-style-type: none"> ● Automatic power off ● Servomotor off standby mode ● Chip shower off display ● Automatic coolant off ● Automatic work light off ● Local coordinate system (NC) ● One-way positioning (NC) ● Operation in tape mode (NC) ● Heat expansion compensation system (optional)

*Functions with(NC)and(conv.)are available only for NC language programming and conversational programming respectively.

- Carefully read the instruction manual and safety manual before operation to ensure our product is used safely. When using oil-based coolant or machining materials that may ignite (e.g. magnesium, plastic), employ sufficient safety measures to prevent fire. Please consult our sales personnel for any inquiries.
- Please be sure to read the instruction manual and safety manual before using the machine to ensure safe operation. When using oil-based coolant or machining workpieces that may ignite (e.g. magnesium, resin), take adequate safety measures to prevent fire. Please consult our sales personnel if you need to clarify any points.



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Above specifications may be subject to change without any notice.