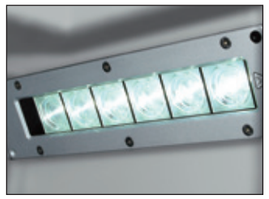
Options

Cross drill
(modular type)

Back tool spindle
(modular type)

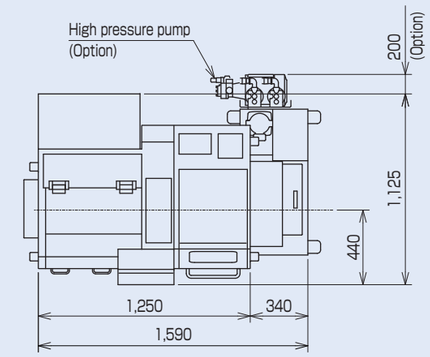


Internal illumination light

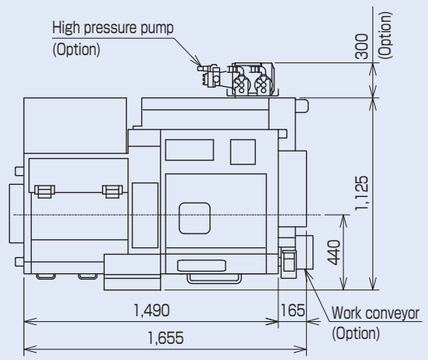
WAVY coolant nozzle system

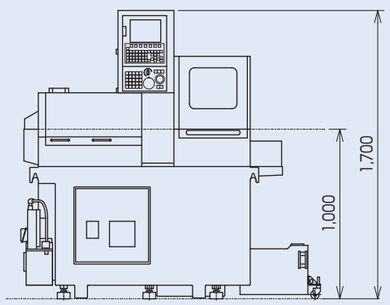
Appearance

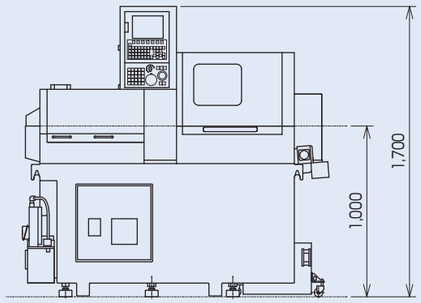
B0123-Ⅲ
B0203-Ⅲ



B0124-Ⅲ/B0204-Ⅲ
B0125-Ⅲ/B0205-Ⅲ
B0126-Ⅲ/B0206-Ⅲ







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The specifications of this catalogue are subject to change without prior notice.

TSUGAMI CORPORATION

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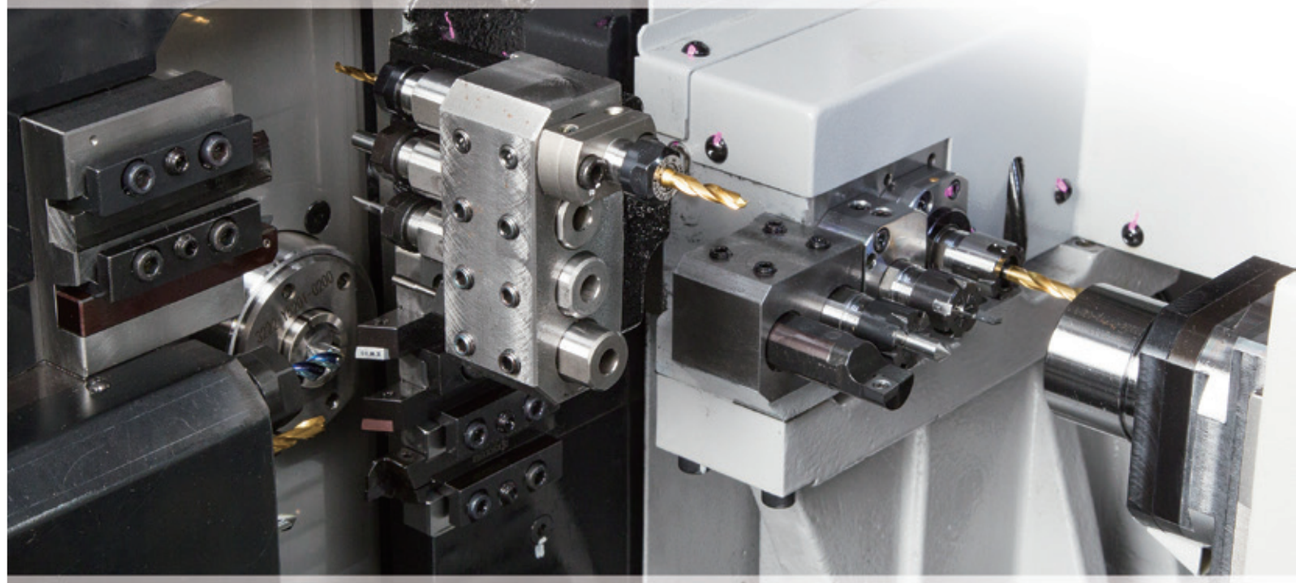
CAT.NO.E114637.SEP.3T(H)

PRECISION TSUGAMI

CNC Precision Automatic Lathe

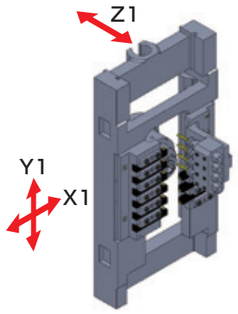
B0123-Ⅲ/B0203-Ⅲ
B0124-Ⅲ/B0204-Ⅲ
B0125-Ⅲ/B0205-Ⅲ
B0126-Ⅲ/B0206-Ⅲ



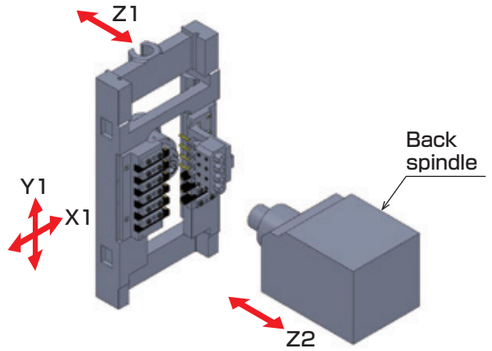
Upgrading best selling machines
Improving performances of software and hardware realizes more stable productivity.

Big profit with small investment
Improving machining accuracy and operability by upgrading best selling machines!

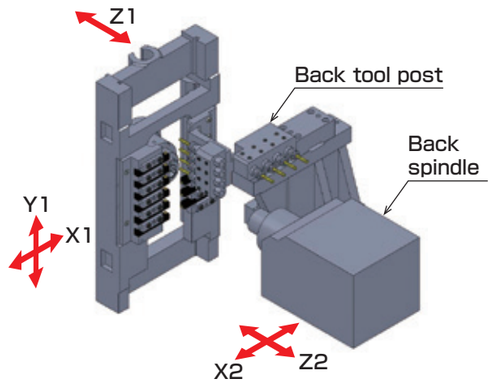
B0123-Ⅲ/B0203-Ⅲ
(without back spindle)



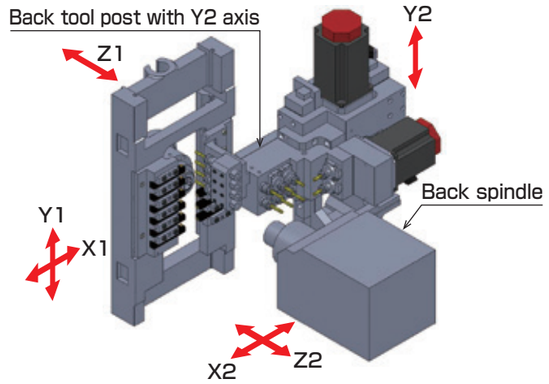
B0124-Ⅲ/B0204-Ⅲ
(with back spindle)



B0125-Ⅲ/B0205-Ⅲ
(Back spindle + Back tool post)

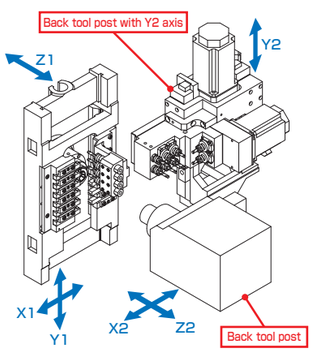


B0126-Ⅲ/B0206-Ⅲ
(Back spindle + Back tool post with Y2 axis)



- More rigid bed and tool post realize more stable production.
- Pursuing operability, improving machining accuracy and reducing cycle time thanks to the newly developed software.
- Improving chip disposal ability.
- Maximum speed of optional cross live tool is increased. (Max. 8,000 min^{-1})
- Optional modular live tool provides frontal or back off-center drilling.
- Optional direct-drive rotary guide bushing provides high speed and accurate machining.
- Guide-bush type or guide-bushless type is selectable according to workpiece.
- Automatic programming system prepared as standard.

Controlled linear axis and functions



	3-axis	4-axis	5-axis	6-axis
Back spindle	–	○	○	○
Back tool post	–	–	○	–
Back tool post with Y2 axis	–	–	–	○

3-axis control Dedicated front side machining only, without back spindle

4-axis control With back spindle, the parted-off side machining is possible. Tool post is mutual use.

5-axis control By the dedicated tool post for back machining, front & back simultaneous machining is possible and more productive than 4-axis control.

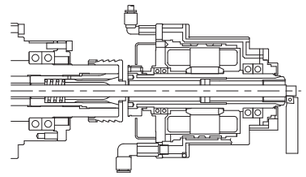
6-axis control Thanks to the Y2 axis on back tool post, milling capability is improved on the back side machining.

Direct-drive rotary guide bushing (option) assures increase of spindle speed.

	Max. speed	Machining length
B0123-Ⅲ/B0124-Ⅲ/B0125-Ⅲ/B0126-Ⅲ	12,000 min^{-1}	170 mm
B0203-Ⅲ/B0204-Ⅲ/B0205-Ⅲ/B0206-Ⅲ	10,000 min^{-1}	170 mm

Improved geometrical accuracy, dimensional accuracy, and surface roughness with high speed and quiet operation.

* The water-soluble coolant is not available.

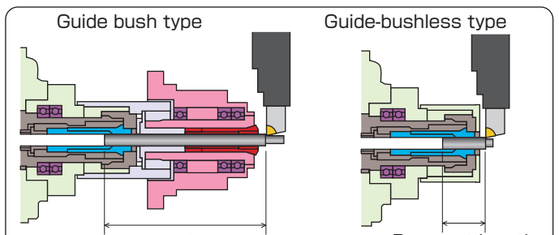

Direct-drive rotary guide bush unit

Optional guide-bush type or guide-bushless type is selectable according to workpieces.

- Stationary guide bushing
- Carrier type rotary guide bushing
- Guide-bushless kit
- Direct-drive rotary guide bushing

●Possible to switch between the guide bushing type and guide-bushing-less type so that most suitable operation for the workpiece length can be chosen.

●The machining with guide-bushless kit does not require ground bar, enabling high speed and high precision machining from cold drawn bars. The shortest possible remnant length is 30 mm.



Remnant length	Carrier type rotary guide bushing	Direct-drive guide bushing	Guide-bushless
B0123-Ⅲ/B0124-Ⅲ/B0125-Ⅲ/B0126-Ⅲ	180 mm + α mm	210 mm + α mm	30 mm + α mm
B0203-Ⅲ/B0204-Ⅲ/B0205-Ⅲ/B0206-Ⅲ			

Enhancement of the software

Shortening cycle time

▶ Maximum speed of the live tool is increased.

Maximum speed of the live tool is 8,000 min^{-1} and reduces cycle time in small hole drilling.

▶ Processing program correct check

By analyzing the program, the modifications is encouraged when a block able to shorten the cycle time is found.

▶ Adopting feed-forward control

Reducing shape errors by the servo system improves the shape accuracy and realizes faster reaching to the commanded position.

Improvement of operability

▶ Adding rapid feedrate override function

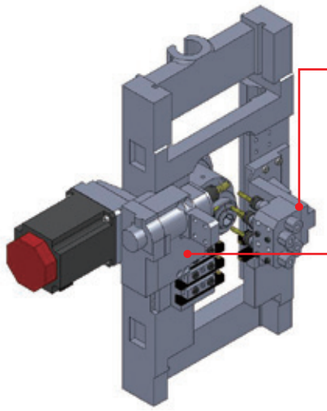
It is possible to debug part program at actual commanded cutting feed.

▶ Tool post interference prevention

Back spindle is positioned after retracting to a position not to interfere. (Back spindle positioning without retraction is also possible.)

Modular type tool spindle (option)

●Cross drill Modular type Option



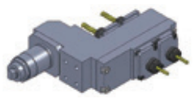
Rear tool post (3220-Y7063)	
Frontal drilling holder	ϕ20 x 4 holes
Turning tool	□12 x 2

Note: With the modular front live tool, the rear tool post becomes exclusive type.

Front live tool (3220-Y7061)	
Max. speed: 8,000 min^{-1}	
Modular type	1 hole
AR11	2
Turning tool	□12 x 3

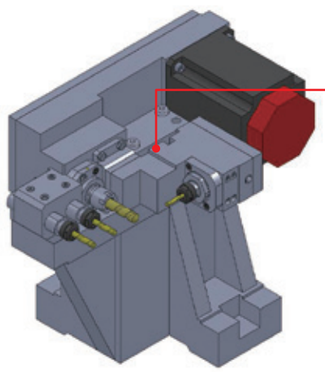
Attachments for modular type (option)

Tool spindle
(3281-T051)



Double face spindle
(3220-Y7065)

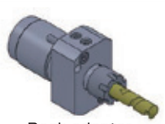
●Back tool post Modular type Option



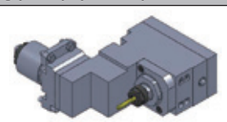
Live tool on back tool post (3220-Y7071) (B0125/205-Ⅲ only)	
Max. speed: 8,000 min^{-1}	
Modular type	2 holes
Drill holder for back machining	ϕ20 x 2 holes

Attachments for modular type (option)

Back tool spindle
(3220-Y7072)



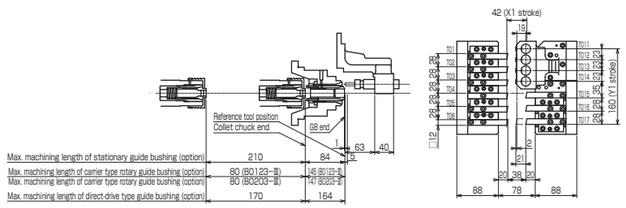
Back adapter
(3220-Y7073)



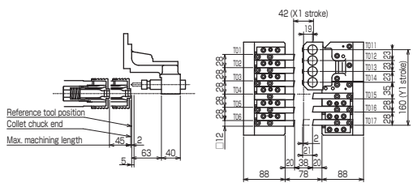
Back cross tool spindle
(3220-Y7074)

Tooling zone

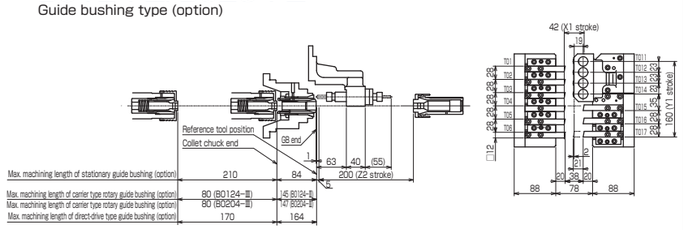
B0123-Ⅲ/B0203-Ⅲ
Guide bushing type (option)



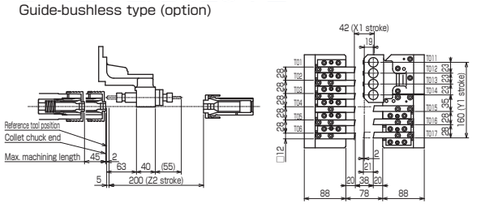
B0123-Ⅲ/B0203-Ⅲ
Guide-bushless type (option)



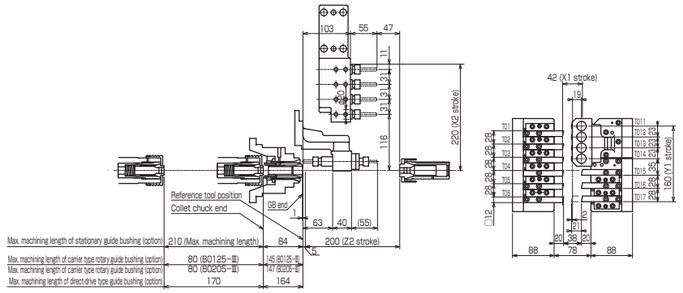
B0124-Ⅲ/B0204-Ⅲ
Guide bushing type (option)



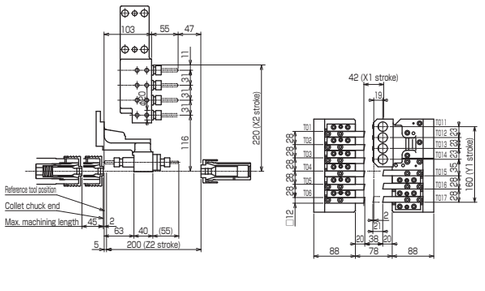
B0124-Ⅲ/B0204-Ⅲ
Guide-bushless type (option)



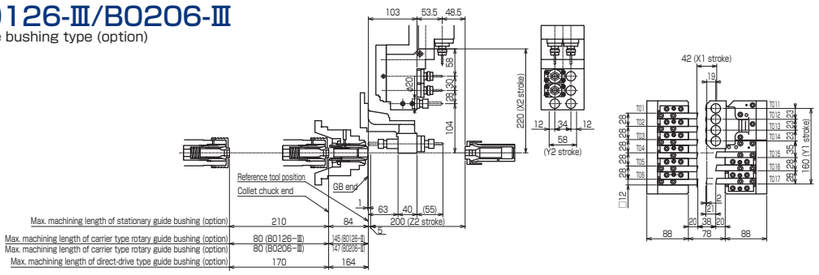
B0125-Ⅲ/B0205-Ⅲ
Guide bushing type (option)



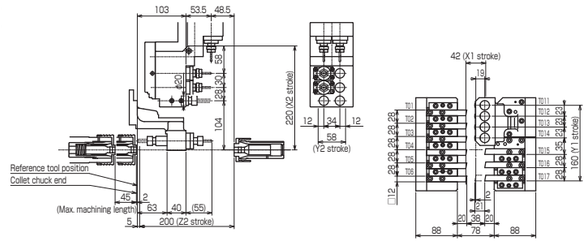
B0125-Ⅲ/B0205-Ⅲ
Guide-bushless type (option)



B0126-Ⅲ/B0206-Ⅲ
Guide bushing type (option)



B0126-Ⅲ/B0206-Ⅲ
Guide-bushless type (option)



Standard Specifications of Machine

	Item	B0123-Ⅲ	B0124-Ⅲ	B0125-Ⅲ	B0126-Ⅲ	B0203-Ⅲ	B0204-Ⅲ	B0205-Ⅲ	B0206-Ⅲ
Machining capacity, Machining range	Working barstock diameter	ϕ3 to ϕ12 mm		ϕ3 to ϕ12 mm		ϕ3 to ϕ20 mm	ϕ3 to ϕ20 mm	ϕ3 to ϕ20 mm	
	Max. machining length	210 mm (Stationary guide bushing), 80 mm (Carrier type rotary guide bushing) 45 mm (Guide-bushless), 170 mm (Direct-drive rotary guide bushing)					210 mm (Stationary guide bushing), 80 mm (Carrier type rotary guide bushing) 45 mm (Guide-bushless), 170 mm (Direct-drive rotary guide bushing)		
	Max. main spindle drilling diameter	ϕ7		ϕ7		ϕ10	ϕ10	ϕ10	
	Max. main spindle tapping diameter	M6 x 1		M6 x 1		M10	M10	M10	
	Max. back spindle chucking dia.	—	ϕ12	ϕ12		—	ϕ20	ϕ20	
	Max. back spindle drilling diameter	—	ϕ7	ϕ7		—	ϕ8	ϕ8	
	Max. back spindle tapping diameter	—	M8	M8		—	M8	M8	
	Max. cross drilling diameter	ϕ6 (option)		ϕ6 (option)		ϕ6 (option)	ϕ6 (option)	ϕ6 (option)	
	Max. cross tapping diameter	M5 x 0.8 (option)		M5 x 0.8 (option)		M5 x 0.8 (option)	M5 x 0.8 (option)	M5 x 0.8 (option)	
	Max. tool spindle slotting cutter diameter	ϕ30 (option)		ϕ30 (option)		ϕ30 (option)	ϕ30 (option)	ϕ30 (option)	
	Max. back drilling diameter	—		ϕ6 (option)	ϕ6	—	—	ϕ6 (option)	ϕ6
	Max. back tapping diameter	—		M5 (option)	M5	—	—	M5 (option)	M5
Machine capability	Main spindle speed	200 to 12,000 min^{-1}		200 to 12,000 min^{-1}		200 to 10,000 min^{-1}	200 to 10,000 min^{-1}	200 to 10,000 min^{-1}	
	Back spindle speed	—	200 to 12,000 min^{-1}	200 to 12,000 min^{-1}		—	200 to 12,000 min^{-1}	200 to 12,000 min^{-1}	
	Rotary guide bushing speed	200 to 8,000 min^{-1}: Carrier type rotary guide bushing 200 to 12,000 min^{-1}: Direct-drive guide bushing		200 to 8,000 min^{-1}: Carrier type rotary guide bushing 200 to 12,000 min^{-1}: Direct-drive guide bushing		200 to 8,000 min^{-1}: Carrier type rotary guide bushing 200 to 10,000 min^{-1}: Direct-drive guide bushing	200 to 8,000 min^{-1}: Carrier type rotary guide bushing 200 to 10,000 min^{-1}: Direct-drive guide bushing	200 to 8,000 min^{-1}: Carrier type rotary guide bushing 200 to 10,000 min^{-1}: Direct-drive guide bushing	
	Tool spindle speed	200 to 8,000 min^{-1} (option)		200 to 8,000 min^{-1} (option)		200 to 8,000 min^{-1} (option)	200 to 8,000 min^{-1} (option)	200 to 8,000 min^{-1} (option)	
	Total tool storage capacity (standard)	13	17	21	25	13	17	21	25
	Tool size	12 mm x 12 mm x 85 mm		12 mm x 12 mm x 85 mm		12 mm x 12 mm x 85 mm	12 mm x 12 mm x 85 mm	12 mm x 12 mm x 85 mm	
	Rapid traverse rate	32 m/min (X1: 24 m/min)		32 m/min (X1: 24 m/min)	32 m/min (X1: 24 m/min,Y2: 15 m/min)	32 m/min (X1: 24 m/min)	32 m/min (X1: 24 m/min)	32 m/min (X1: 24 m/min)	32 m/min (X1: 24 m/min,Y2: 15 m/min)
	Controlled axes (linear axes)	3-axis	4-axis	5-axis	6-axis	3-axis	4-axis	5-axis	6-axis
Motors	Main spindle	1.5/2.2 kW		1.5/2.2 kW		2.2/3.7 kW	2.2/3.7 kW	2.2/3.7 kW	
	Back spindle	—	1.5/2.2 kW	1.5/2.2 kW		—	1.5/2.2 kW	1.5/2.2 kW	
	Linear axis	0.5 kW (X1, Y1, Z1)	0.5 kW (X1,Y1,Z1,Z2)	0.5 kW (X1,X2,Y1,Z1,Z2)	0.5 kW (X1,X2,Y1,Y2,Z1,Z2)	0.5 kW (X1,Y1,Z1)	0.5 kW (X1,Y1,Z1,Z2)	0.5 kW (X1,X2,Y1,Z1,Z2)	0.5 kW (X1,X2,Y1,Y2,Z1,Z2)
	Cross/back live tool (option)	0.75 kW (option)		0.75 kW (option)		0.75 kW (option)	0.75 kW (option)	0.75 kW (option)	
	Coolant pump	0.25 kW		0.25 kW		0.25 kW	0.25 kW	0.25 kW	
	Lubricating oil pump	3 W		3 W		3 W	3 W	3 W	
Power supply and others	Power source requirement	7 kVA	10 kVA	11 kVA		7 kVA	10 kVA	11 kVA	12 kVA
	Net weight	1,500 kg	1,950 kg	2,000 kg	2,050 kg	1,500 kg	1,950 kg	2,000 kg	2,050 kg
	Compressed air requirement	0.4 MPa or above				0.4 MPa or above	0.4 MPa or above		
	Air discharge rate	30 NL/min				30 NL/min	30 NL/min		
	Coolant tank capacity	115 L	120 L			115 L	120 L		
	Width x depth x height	1,590 x 1,125 x 1,700	1,655 x 1,125 x 1,700			1,590 x 1,125 x 1,700	1,655 x 1,125 x 1,700		

Note 1: Machining capacity is based on JIS S45C or equivalent.
Note 2: Stationary guide bushing, guide-bushless, carrier type rotary guide bushing and direct-drive rotary guide bushing are optional.

NC Specifications

	B0123-Ⅲ/B0203-Ⅲ	B0124-Ⅲ/B0204-Ⅲ	B0125-Ⅲ/B0205-Ⅲ	B0126-Ⅲ/B0206-Ⅲ
NC unit	FANUC Oi Mate-TD	FANUC Oi-TD		FANUC 32i-B
Controlled axes	X1, Z1, Y1	X1, Z1, Y1, Z2	X1, Z1, Y1, X2, Z2	X1, Z1, Y1, X2, Z2, Y2, C1, C2
Least input increment	0.001 mm (X1/X2 axis in diameter)			
Least command increment	X1/X2: 0.0005 mm, other axes: 0.001 mm			
Maximum programmable value	±8 digits			
Interpolation method	Linear, circular			
Rapid traverse rate	32 m/min (X1,Y1: 24 m/min)			32 m/min (X1,Y1,Y2: 24 m/min)
Feedrate	1 to 6,000 mm/min			
Feedrate override	0 to 150% in 10% increments			
Dwell	G04 0 to 99999.99			
ABS/INC command	X, Y, Z: absolute U, V, W: incremental			X, Y, Z, C: absolute U, V, W, H: incremental
Tool offset pairs	Main: 64, Back: 64 (B0123-Ⅲ, B0203-Ⅲ Main only)			99
LCD/MDI	8.4" color LCD			10.4" color LCD
Display language	Japanese/English			
Part program storage size	512 Kbytes (equivalent to 1,280 m tape length)	1 Mbyte (equivalent to 2,560 m tape length) *sum of main and back spindle NCs		64 Kbytes (equivalent to 80 m for each path system)
Registerable programs	400	800 *sum of main and back spindle NCs		63 *sum of main and back spindle NCs
Miscellaneous functions	M5-digits			
Spindle function	S5-digits			
Tool function	T4-digits			

Standard Accessories

Item	B0123-Ⅲ B0203-Ⅲ	B0124-Ⅲ/125-Ⅲ B0204-Ⅲ/205-Ⅲ	B0126-Ⅲ B0206-Ⅲ
Automatic programming system	○	○	○
Tool height compensation	○	○	○
Tool life counter	○	○	○
Periodic maintenance screen	○	○	○
Main spindle adapter	○	○	○
Back spindle adapter	—	○	○
Door interlock	○	○	○
Coolant level detector	○	○	○
Spindle cooling unit	○	○	○
Standard tools	○	○	○
Transit clamps	○	○	○
4-hole drill post	○	○	○
Retractable coolant nozzle	○	○	○
Automatic power shut off	○	○	○
Automatic cut-off function/Automatic facing function	○	○	○
C-axis control for main/back spindles	—	—	○

NC standard accessories

Item	B0123-Ⅲ B0203-Ⅲ	B0124-Ⅲ/125-Ⅲ B0204-Ⅲ/205-Ⅲ	B0126-Ⅲ B0206-Ⅲ
Chasing function	○	○	○
Continuous thread cutting	○	○	○
Manual pulse generator	○	○	○
Memory card input/output interface	○	○	○
Back ground editing	○	○	○
Run time & parts number display	○	○	○
Custom macro	○	○	○
Constant surface speed control	○	○	○
Spindle synchronous control (rotation/phase/tracing)	—	○	○
Tool geometry/wear offset	○	○	○
Programmable data input	○	○	○
Chamfering & corner R	○	○	○
Tool nose radius compensation	○	○	○
HRV control	○	○	○
Multiple repetitive cycle	○	○	○
Extended program editing	○	○	○
Canned drilling cycle	○	○	○
Rigid tap (main spindle, back spindle)	○ *	○	○
Spindle speed fluctuation detection	○	○	○
Cut-off detection (speed differential type)	—	○	○

*: B0123-Ⅲ/B0203-Ⅲ: Main spindle only

Options

Item	B0123-Ⅲ B0203-Ⅲ	B0124-Ⅲ/125-Ⅲ B0204-Ⅲ/205-Ⅲ	B0126-Ⅲ B0206-Ⅲ
Stationary guide bushing	○	○	○
Carrier type rotary guide bushing	○	○	○
Direct-drive guide bushing	○ *3	○	○
Guide-bushless kit	○	○	○
Main spindle C axis control (Brake is provided as option separately.)	○	○	Standard*1
Back spindle C axis control (Brake is provided as option separately.)	—	○	Standard*2
Spindle 15° index	○	○	○
Main spindle brake	○	○	○
Back spindle 15° index	—	○	○
Back spindle 1° index	—	○	○
Cross drill (1 pos. cartridge)	○	○	○
2-spindle cross drill	○	○	○
3-spindle cross drill	○	○	○
4-spindle cross drill	○	○	○
0.1μm resolution	○	○	○
Coolant oil temperature controller	○	○	○
X2-axis touch switch	—	○ *2	○
Back drive	—	○ *2	Standard
Tool spindle	—	○	Standard
Back cross tool spindle	—	○ *2	Standard
Mist collector	○	○	○
High pressure pump unit	○	○	○
M code oil blow	○	○	○
Work catcher	Standard	○	○
Work conveyor	—	○	○
Front discharge	—	○	○
Rear discharge	—	○	○
Chip conveyor	—	○	○
Cut-off detection (Touch switch type)	○	○	○
Signal indicator	○	○	○
Adapter for non-round bar (main spindle)	○	○	○

Item	B0123-Ⅲ B0203-Ⅲ	B0124-Ⅲ/125-Ⅲ B0204-Ⅲ/205-Ⅲ	B0126-Ⅲ B0206-Ⅲ
Adapter for non-round bar (back spindle)	—	○	○
Collet chuck with carbide lining	○	○	○
WAVY coolant nozzle	○	○	○
Tool set gauge	○	○	○
Spindle liner	○	○	○
Part program storage size 128 Kbytes	—	—	○
Part program storage size 256 Kbytes	—	—	○
Part program storage size 512 Kbytes	—	—	○
G code system B/C	—	—	○
Direct drawing dimension program	Standard	Standard	○
Variable-lead thread cutting	Standard	Standard	○
Thread cutting cycle retract	Standard	Standard	○
Number of registerable programs expansion #1	—	—	○
Standard program storage size: 120 programs	—	—	○
128 KB: 250 programs	—	—	○
256 KB: 500 programs	—	—	○
512 KB: 1000 programs	—	—	○
Polar coordinate interpolation	○	○	○
Cylindrical interpolation	○	○	○
Display language	○	○	○
Coolant flow switch	○	○	○
Automatic fire extinguisher	○	○	○
Illumination lamp	○	○	○
Bar feeder interface	○	○	○
Manual handle retrace function	—	○	○
Live tool rigid tapping	○	○	○
RS232C input/output interface	○	○	○
Inch/metric conversion	○	○	○
Abnormal load detection	○	○	○

*1: Brake is optional.
*2: B0125-Ⅲ/B0205-Ⅲ only
*3: Change NC controller to Fanuc Oi-TD.