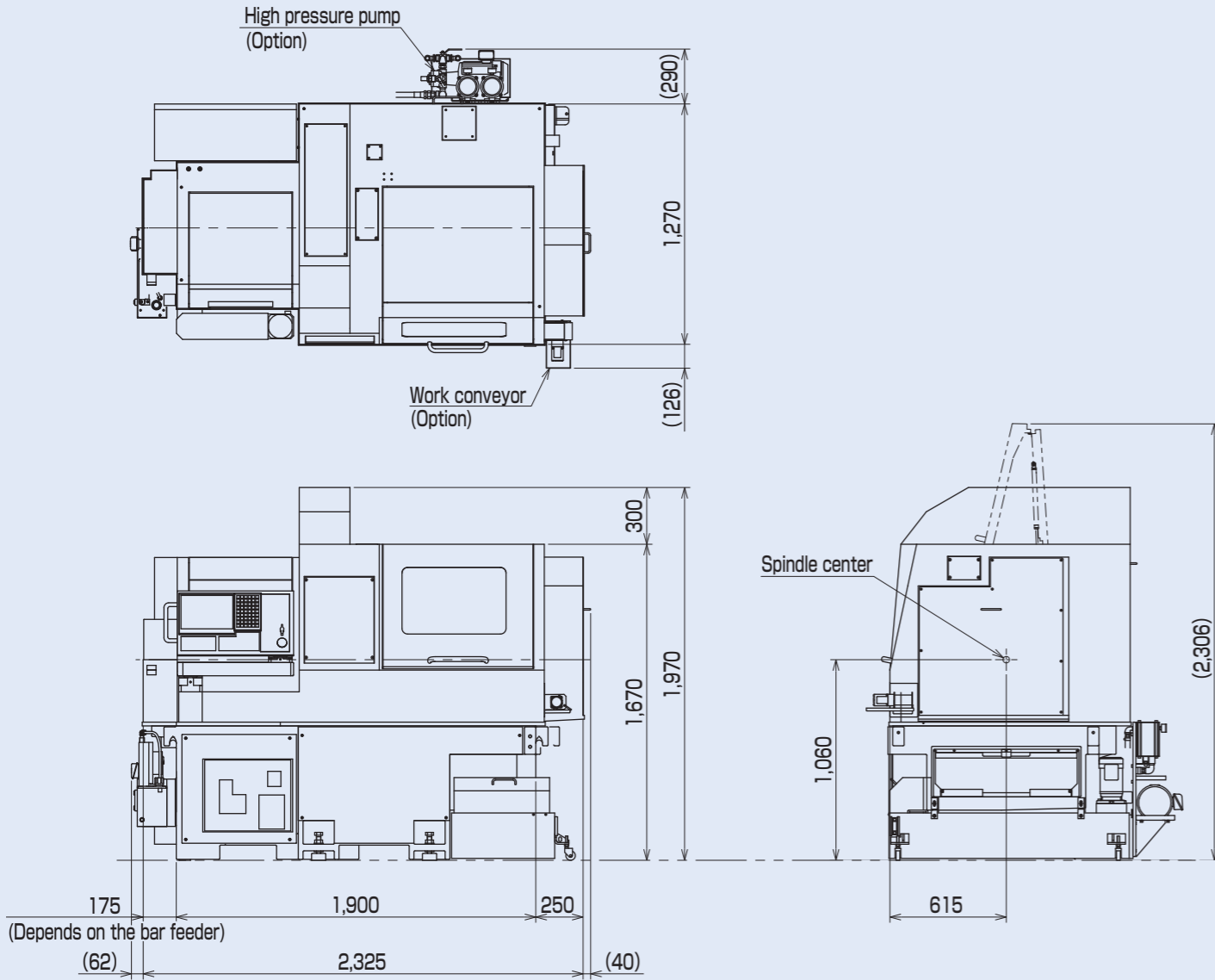


Layout

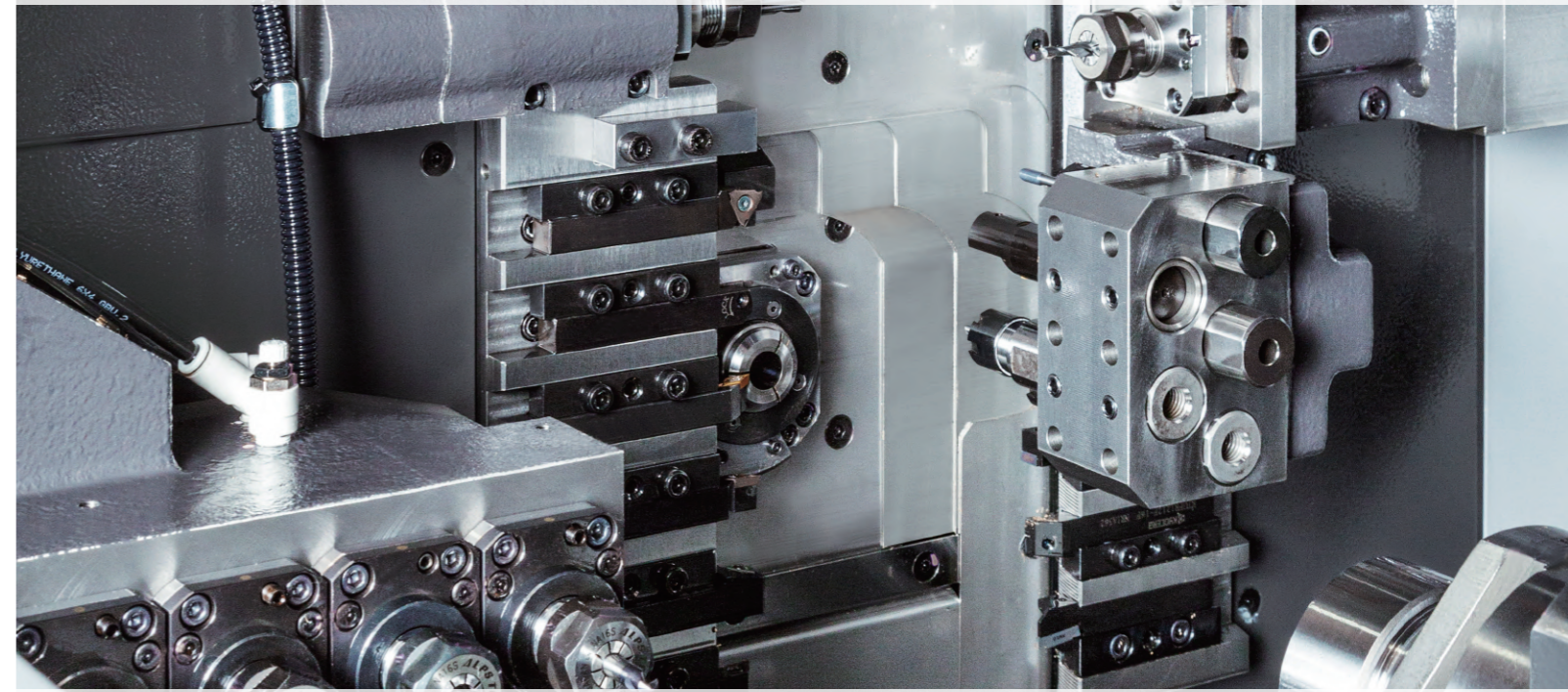


PRECISION TSUGAMI

# TSUGAMI

CNC Precision Automatic Lathe

## Si205A-II Si206A-II



A wide range of options enables ideal tooling for diverse workpieces



Export permission by the Japanese Government may be required for exporting our products in accordance with the Foreign Exchange and Foreign Trade Law. Please contact our sales office before exporting our products.

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

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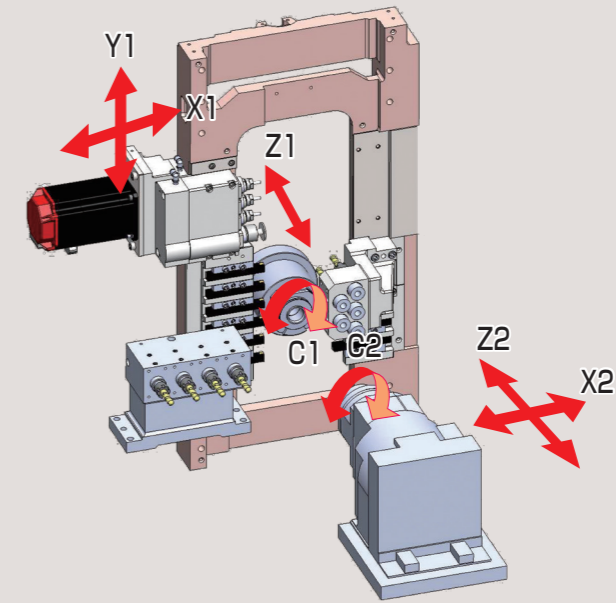
**A wide range of options enables ideal tooling for diverse workpieces**

\*The picture includes options.

Simultaneous operation of main spindle side and back spindle side

# Si205A-II

Standard specification

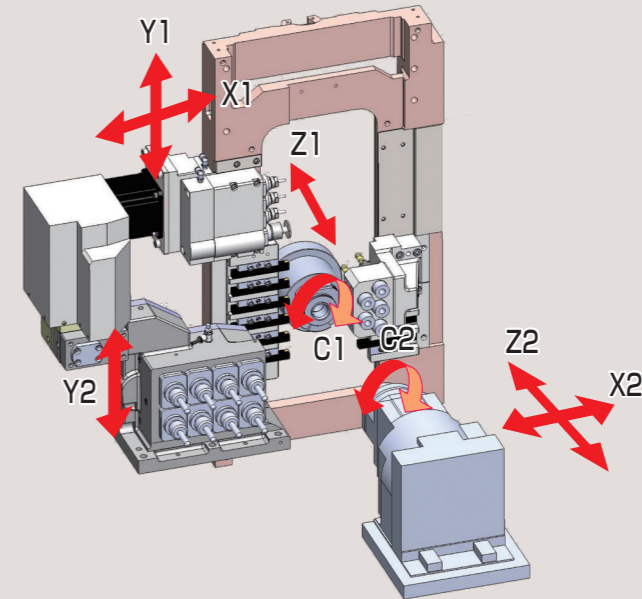


Number of OD tools		9
Number of cross live tools		4 to 7
Number of front tools	Fixed	5 to 7
	Live	0 to 8
Number of back tools	Fixed	9
	Live	0 to 10
Tool storage capacity (Standard/Max.)		27/41

Simultaneous operation of main spindle side and back spindle side with Y axis

# Si206A-II

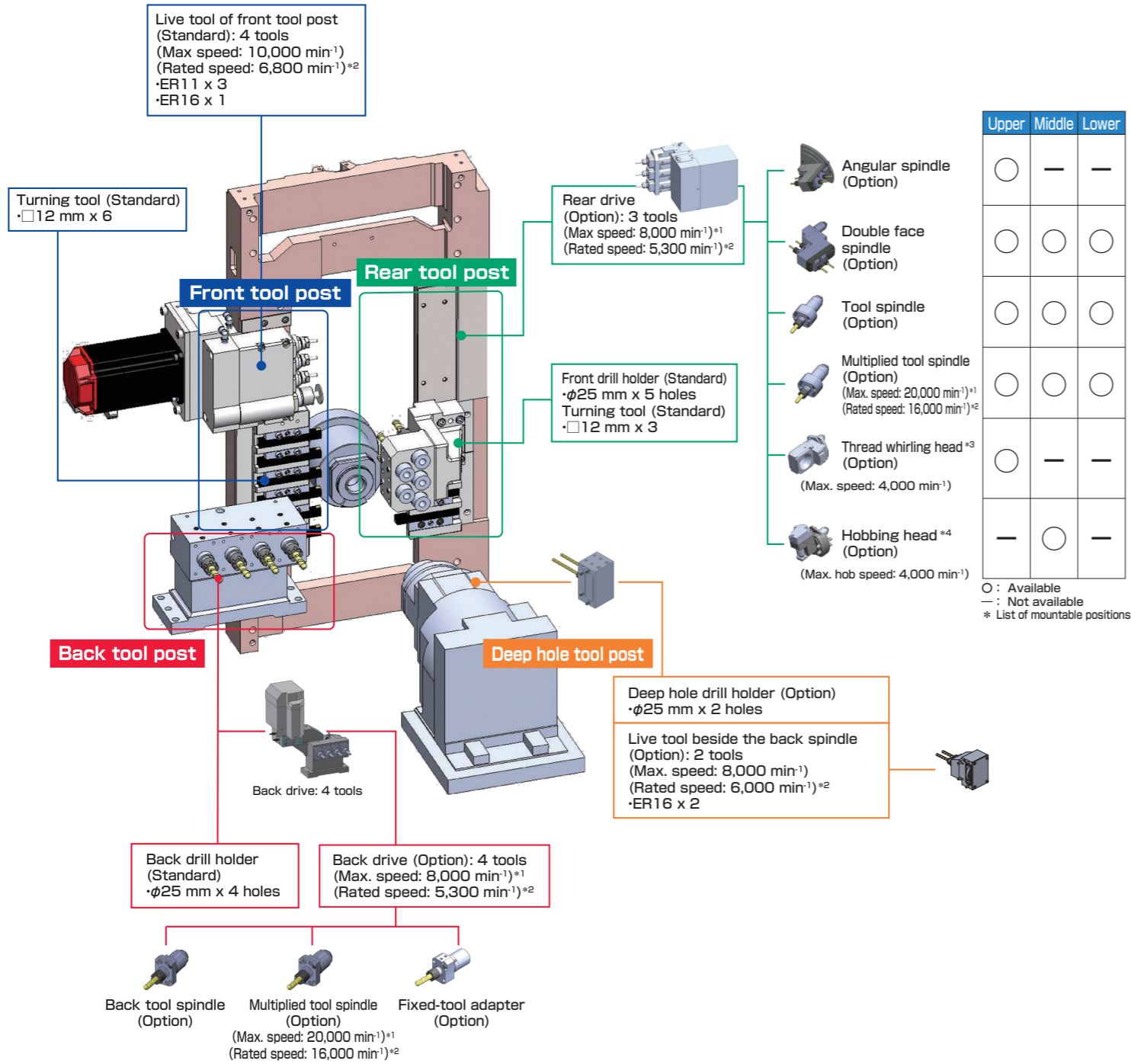
Back tool post with Y-axis specification



Number of OD tools		9
Number of cross live tools		4 to 7
Number of front tools	Fixed	5 to 7
	Live	0 to 8
Number of back tools	Fixed	5 to 13
	Live	0 to 14
Tool storage capacity (Standard/Max.)		31/45

# Modular tooling

Various arrangements of live tools, drill holders, and turning tools enable optimum tool allocation.

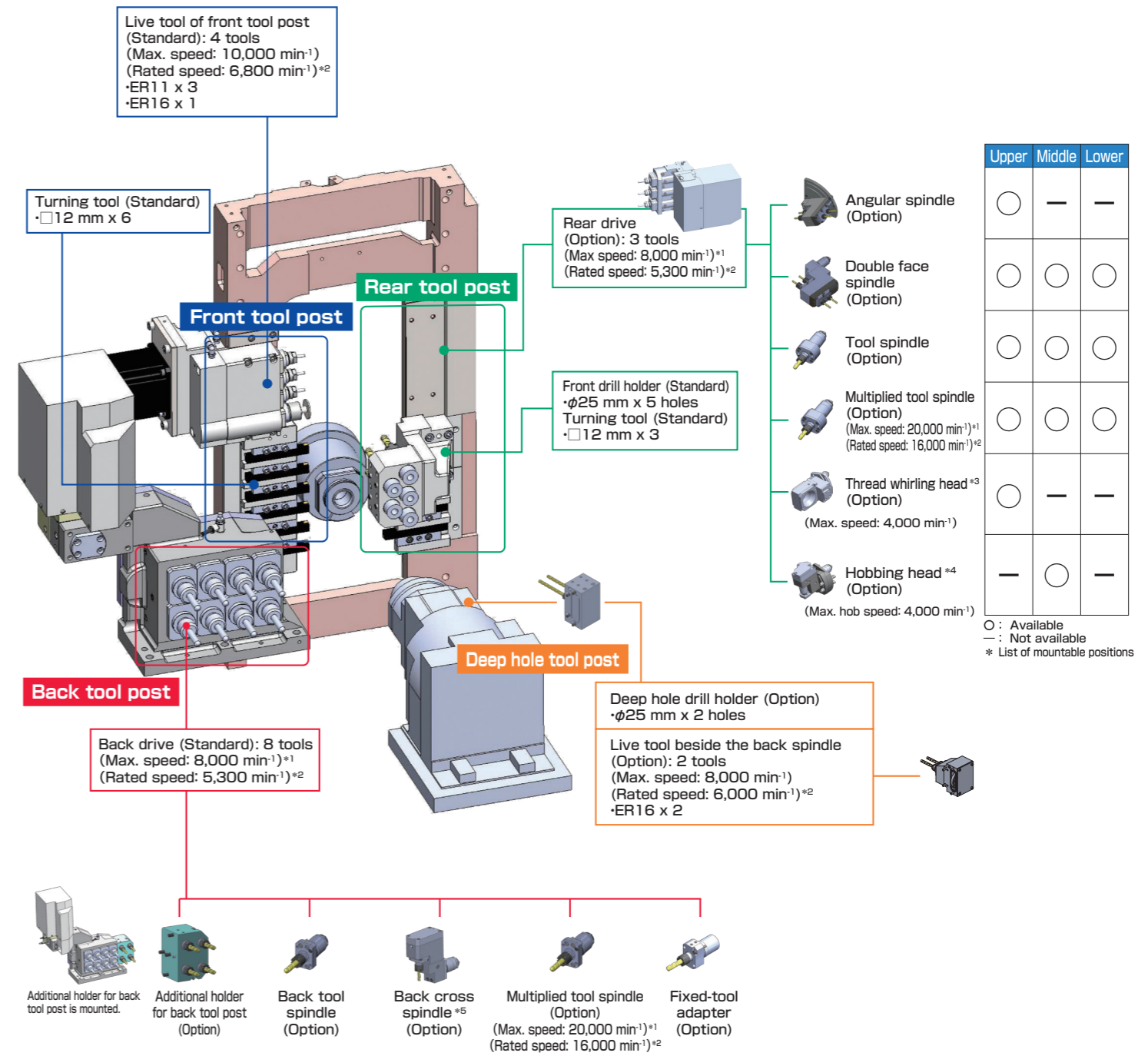


## Si205A-II

\*1 The rotation speed may be limited by the installed options.  
\*2 When the rotation of the spindle exceeds the rated speed, keep the exceeding speed range within 30% of one cycle of the machining process.  
\*3 The middle position is not available for any live tools.  
\*4 Any other live tools cannot be mounted.

		Si205A-II	Si206A-II
<b>Front tool post</b>	Live tool of front tool post: 4 tools	○	○
<b>Rear tool post</b>	Rear drive: 3 tools	Option	Option
<b>Back tool post</b>	Back drill holder	○	—
	Back drive: 4 tools	Option	—
	Back drive: 8 tools	—	○
	Additional holder for back tool post *	—	Option
<b>Deep hole tool post</b>	Deep hole drill holder	Option	Option
	Live tool beside the back spindle: 2 tools	Option	Option

○ : Standard — : Not available  
\* When mounting additional holder for back tool post, deep hole drill holder cannot be used.



## Si206A-II

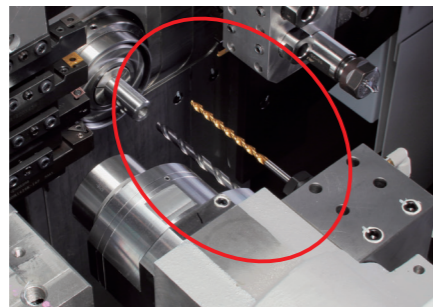
\*1 The rotation speed may be limited by the installed options.  
\*2 When the rotation of the spindle exceeds the rated speed, keep the exceeding speed range within 30% of one cycle of the machining process.  
\*3 The middle position is not available for any live tools.  
\*4 Any other live tools cannot be mounted.  
\*5 Back cross spindle can be mounted on the upper position only.

# Modular tooling and various options support flexible variable-mix, variable-volume production of complicated workpieces.

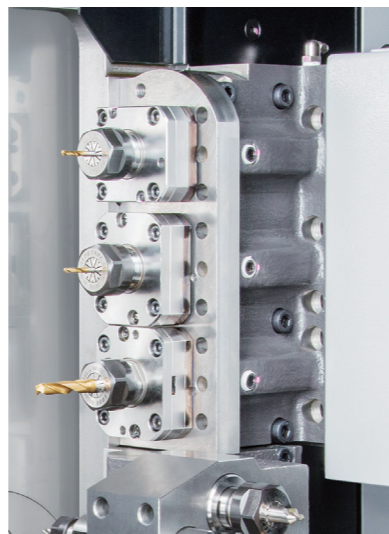
Rear tool post drive and deep hole drill holder are available. (Option)

■ Deep hole drill holder (Option)

Drill holder hole dia.	φ25 mm x 2 holes
Max. machinable length	100 mm



Deep hole drill holder

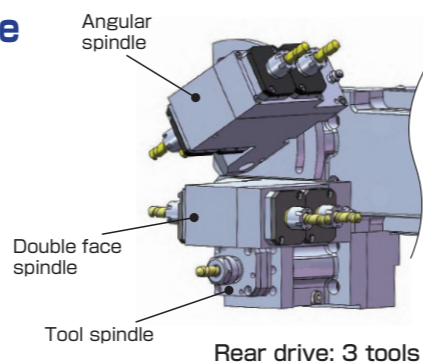


Rear drive: 3 tools

## Tool post for the variable-mix, variable-volume production of complicated workpieces

- Rear drive (Option): 3 tools
- Modular type live tools can be installed in 3 positions.

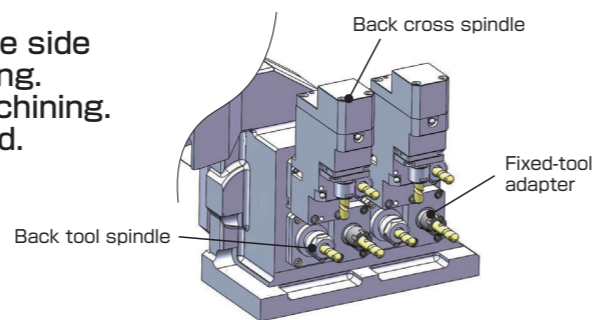
Modular type live tools (Option)	
Tool spindle	
Double face spindle	
Angular spindle	
Thread whirling head	



Rear drive: 3 tools

- Back drive: 8 tools (Si206A-II)
- Enables the simultaneous operation of back spindle side complex machining with main spindle side machining.
- Meets the needs of back spindle side complex machining.
- Maximum 8 modular type live tools can be installed.

Modular type live tools (Option)	
Back tool spindle	
Back cross spindle	
Multiplied tool spindle	
Fixed-tool adapter	



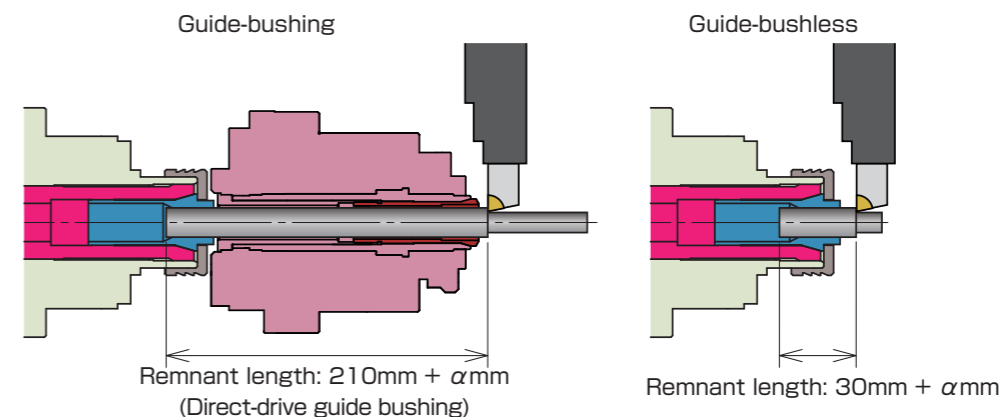
Back drive: 8 tools

## Direct-drive rotary guide bushing provides high-speed and accurate machining. (Option)

- Max. speed: 10,000 min<sup>-1</sup> (Rated speed: 8,000 min<sup>-1</sup>)
  - Max. machining length: 210mm
- Direct-drive rotary guide bushing with built-in motor has no belts or other devices which cause vibration during high speed machining. Stable geometrical accuracy, dimensional accuracy, and surface roughness are ensured.

## Guide-bushing type or guide-bushless type is selectable. (Option)

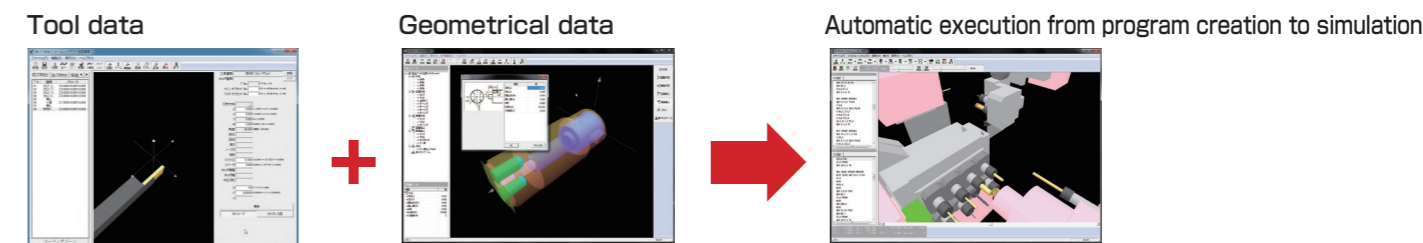
- Guide bushing and guide-bushless are switchable by user. Optimal machining is possible according to product accuracy or length.
- The guide-bushless does not require ground bars, and enables high precision machining from cold-drawn bars.



# Creates programs easily and quickly for complicated workpieces.

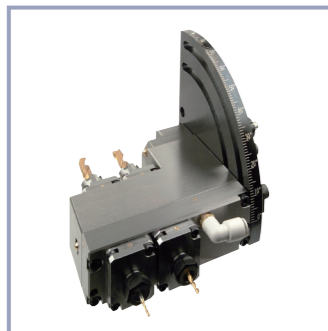
## Minimized tool change time with the optimized tool path by PC-based automatic programming software.

The program created by the automatic programming software allows an optimum matching of all paths and shortens the cycle time. The 3D simulation enables the user to check the operations of main/back spindles from any angle. With TSUGAMI's know-how (machining process and cutting conditions), high quality and standardized programs can be created.



Input the tool data and the geometrical data.

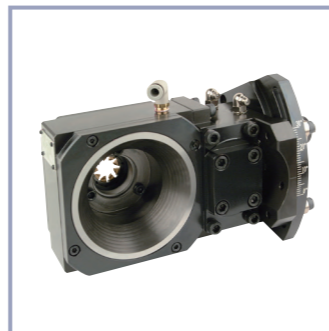
# Options



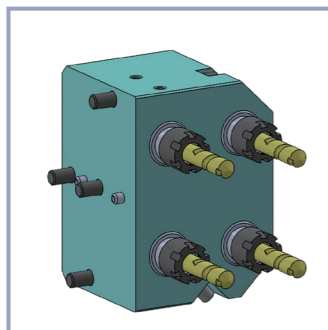
**Angular spindle**  
Used for inclined drilling.



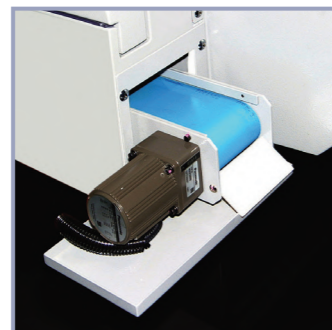
**Back cross spindle**  
Used for cross drilling of back side.  
(Not available for Si205A-II.)



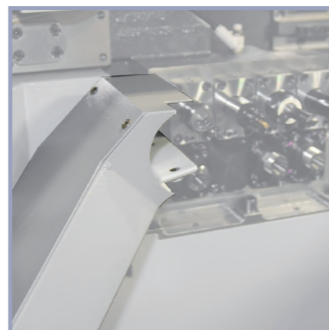
**Thread whirling head**  
Used for machining of bone screws and long screws.



**Additional holder for back tool post**  
φ25 mm x 4 holes can be added for multi-process machining on the back spindle side.  
\*When mounting additional holder for back tool post, deep hole drill holder cannot be used.  
(Not available for Si205A-II.)



**Work conveyor**  
After receiving the discharged workpiece from the back spindle with the work catcher, the work conveyor carries the workpiece to the outside of machine right side.



**Work catcher**  
The workpiece is discharged from back spindle into the chute of the catcher, and carried out to the work conveyor.



**Direct-drive guide bushing**  
Used for long workpiece machining. Stable geometrical accuracy, dimensional accuracy, and surface roughness are ensured by the quiet operation even at high speeds.



**Chip conveyor**  
Carries the chips to the outside of machine right side. Handles curled and long chips with the hinge type conveyor.



**Wavy nozzle**  
The discharge angle can be adjusted to any position. Chips are guided in one direction and it contributes to preventing the jam of chips. Swivel angle and moving speed can be adjusted.

## Machine specifications

Item		Si205A-II	Si206A-II	
Machining range, Machining capacity	Bar stock chucking dia.	φ3 mm to φ20 mm		
	Max. back spindle chucking dia.	φ20 mm		
	Max. machining length	210 mm (Direct-drive rotary guide bushing <sup>*1</sup> )		
		250 mm (Stationary guide bushing <sup>*1</sup> )		
		80 mm (Carrier type rotary guide bushing <sup>*1</sup> )		
			45 mm (Guide-bushless <sup>*1</sup> )	
	Max. main spindle drilling dia.	φ12 mm		
	Max. main spindle tapping dia.	M10		
	Max. back spindle drilling dia.	φ12 mm		
	Max. back spindle tapping dia.	M10		
Max. deep hole drilling dia. <sup>*1</sup>	φ8 mm			
Max. live tool drilling dia.	φ8 mm (Front tool post / Rear tool post <sup>*1</sup> / Back tool post <sup>*2</sup> )			
Max. live tool tapping dia.	M6 (Front tool post / Rear tool post <sup>*1</sup> / Back tool post <sup>*2</sup> )			
Max. live tool slotting cutter dia.	φ30 mm (Front tool post: T04)			
Machine	Main spindle speed	Max. 10,000 min <sup>-1</sup> (Rated speed: 8,000min <sup>-1</sup> ) <sup>*3</sup>		
	Back spindle speed	Max. 10,000 min <sup>-1</sup> (Rated speed: 8,000min <sup>-1</sup> ) <sup>*3*</sup>		
	Rotary guide bushing speed	Direct-drive <sup>*1</sup> : Max. 10,000 min <sup>-1</sup> (Rated speed: 8,000 min <sup>-1</sup> ) <sup>*3</sup> Carrier type <sup>*1</sup> : Max. 8,000 min <sup>-1</sup> (Rated speed: 6,000 min <sup>-1</sup> ) <sup>*3</sup>		
	Live tool speed <sup>*5</sup>	Max. 10,000 min <sup>-1</sup> (Rated speed: 6,800 min <sup>-1</sup> ) <sup>*3</sup> (Front tool post) Max. 8,000 min <sup>-1</sup> (Rated speed: 5,300 min <sup>-1</sup> ) <sup>*3</sup> (Rear tool post <sup>*1</sup> / Back tool post <sup>*2</sup> )		
	Tool storage capacity	27	31	
Tool size	□12 mm			
Rapid traverse rate	35 m/min (Z1, X2, Z2) 24 m/min (X1, Y1, Y2) (Y2 axis is only for Si206A-II.)			
Motors	Main spindle	2.2/3.7 kW		
	Back spindle	2.2/3.7 kW		
	Linear axes	0.5 kW(X1, Y2) 0.75 kW(Y1, Z1, X2, Z2) (Y2 axis is only for Si206A-II.)		
	Live tool	1.0 kW (Front tool post / Rear tool post <sup>*1</sup> / Back tool post <sup>*2</sup> )		
	Coolant pump	0.4 kW		
	Lubricating oil pump	3 W		
Power supply and others <sup>*6</sup>	Weight	3,750 kg		
	Power source requirement	12.1 kVA		
	Compressed air requirement	0.4 MPa or more		
	Air discharge rate	250 NL/min		
	Coolant tank capacity	180 L		
	Width x Depth x Height	2,325 mm x 1,270 mm x 1,970 mm		

\*1 Option  
\*2 Option only for Si205A-II.  
\*3 When the rotation of the spindle exceeds the rated speed, keep the exceeding speed range within 30% of one cycle of the machining process.  
\*4 When the live tool beside the back spindle (option) is used, the maximum back spindle speed is restricted to 8,000 min<sup>-1</sup>.  
\*5 The rotation speed may be limited depending on mounting options.  
\*6 Listed specifications may change depending on the mounted options.

## NC specifications

Item	Si205A-II	Si206A-II
Controlled axes	X1, Z1, Y1, X2, Z2, C1, C2	X1, Z1, Y1, X2, Z2, Y2, C1, C2
Least input increment	0.001 mm (X1/X2-axis in diameter) / 0.001 deg	
Max. programmable value	±8 digits	
Interpolation method	Linear, Circular	
Feedrate	1 to 6,000 mm/min	
Feedrate override	0 to 150% in 10% increments	
Dwell	G04 0 to 99999.999	
Absolute/incremental command	X, Z, Y, C: Absolute U, W, V, H: Incremental	
Number of tool offset	Main: 64 Back: 64	
LCD/MDI	10.4" color LCD	
Display language	English	
Part program storage size	2 Mbyte (sum of main and back)	
Number of registerable programs	1,000 (sum of main and back)	
Miscellaneous functions	Main: M5-digit Back: M3-digit	
Spindle functions	S5-digit	
Tool functions	T4-digit	

