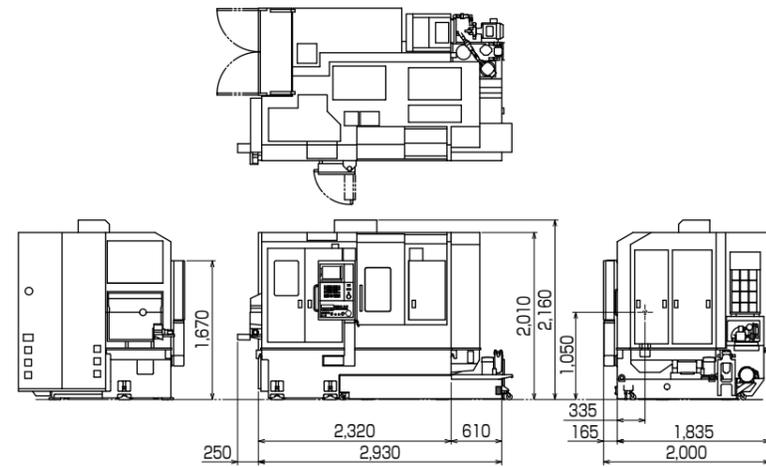


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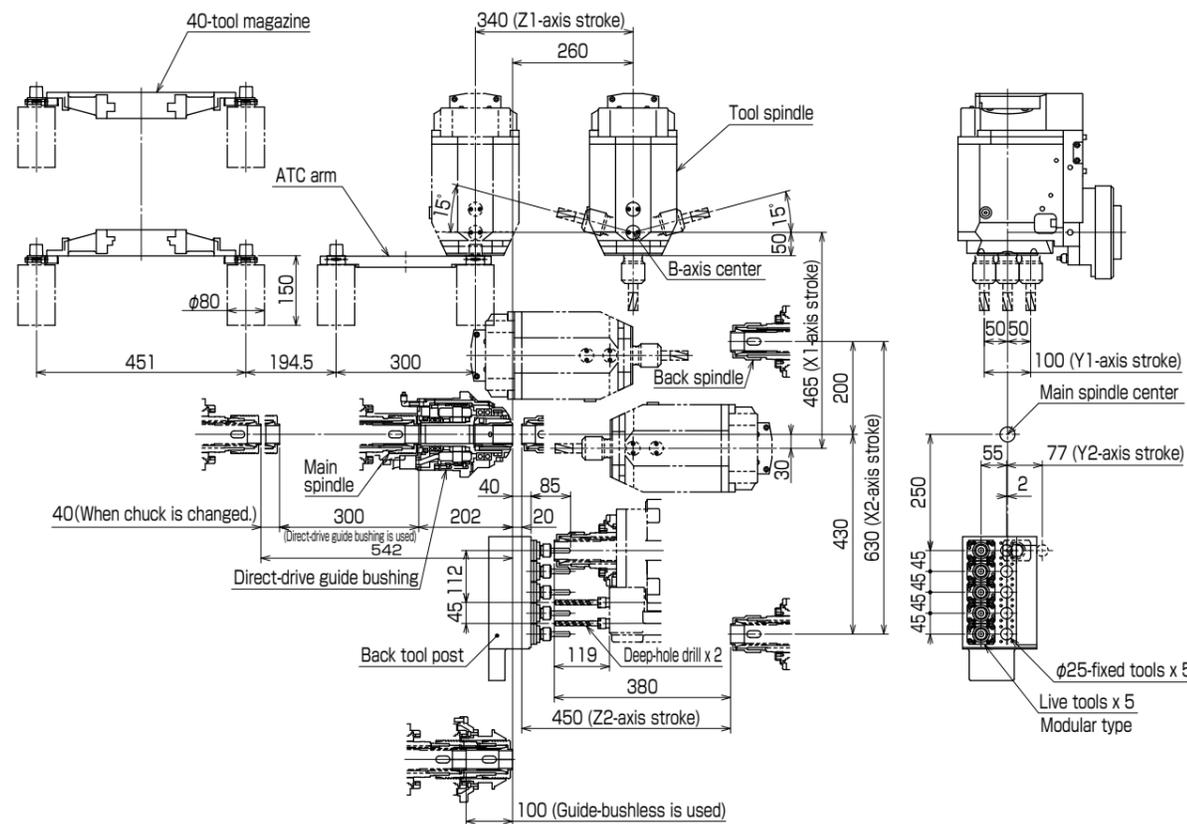
CNC Precision automatic lathe

SS38MH SS38MH-5AX

Layout



Tooling zone



Productive combined machine by the integration of Swiss type automatic lathe (sliding headstock type) and machining center

Optimum for mass production of complex-shaped parts from bar stock

High-speed tool spindle (max. 20,000 min⁻¹) which realizes high-performance machining is provided as standard.

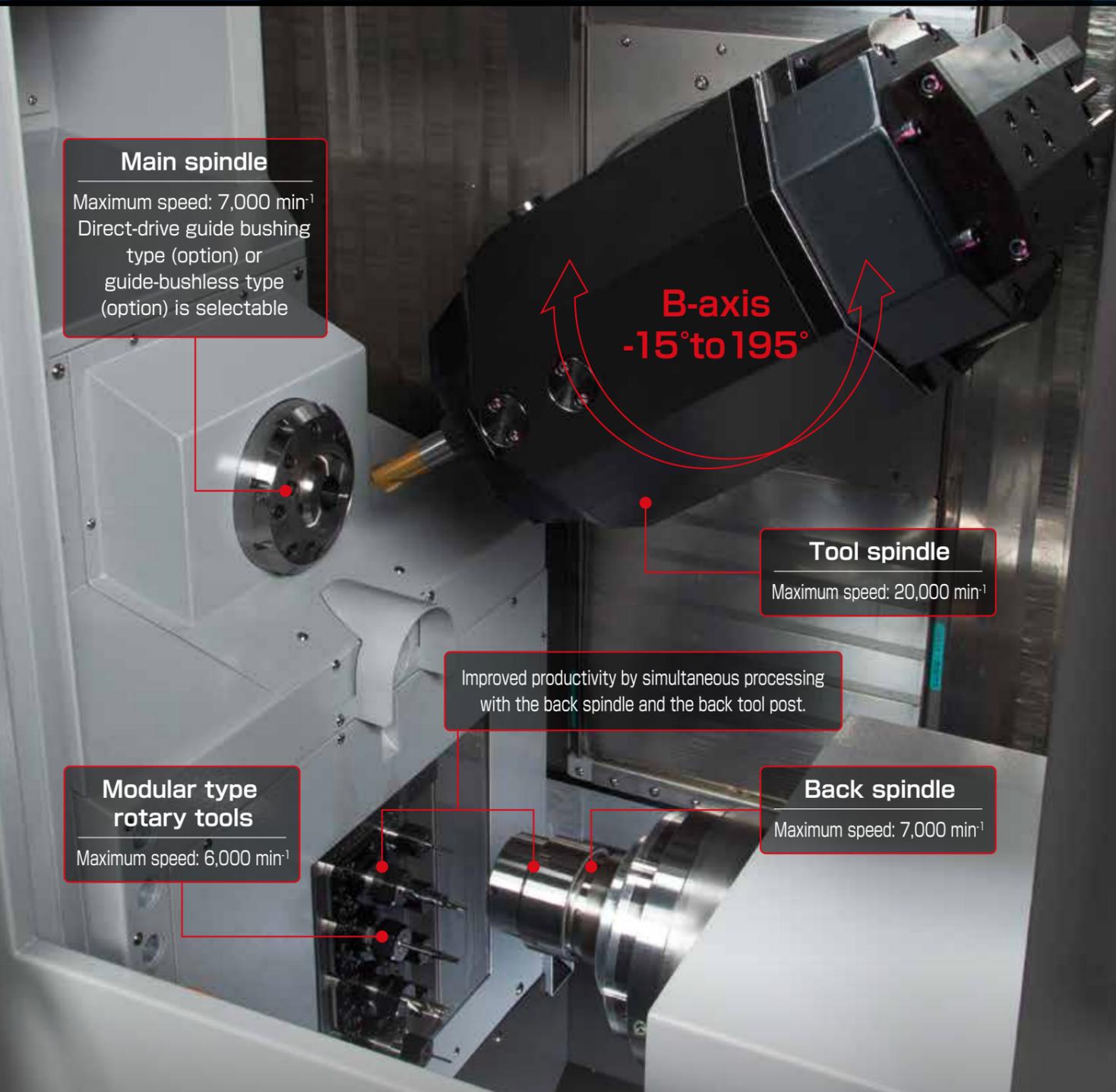
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The specifications of this catalogue are subject to change without prior notice.

TSUGAMI CORPORATION

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Main spindle

Maximum speed: 7,000 min⁻¹
Direct-drive guide bushing type (option) or guide-bushless type (option) is selectable

B-axis
-15° to 195°

Tool spindle

Maximum speed: 20,000 min⁻¹

Improved productivity by simultaneous processing with the back spindle and the back tool post.

Back spindle

Maximum speed: 7,000 min⁻¹

Modular type rotary tools

Maximum speed: 6,000 min⁻¹

SS38MH

High precision and high performance combined machine with linear scale

SS38MH-5AX

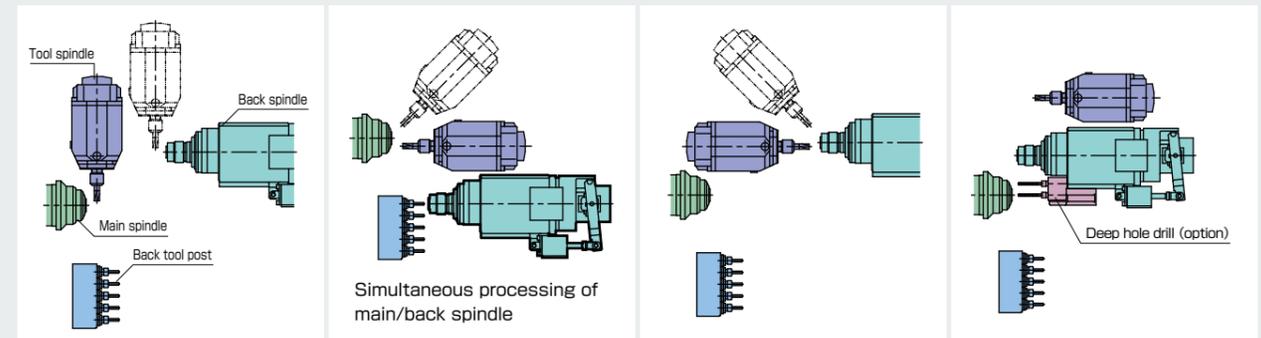
Fully- equipped machine with 5-axis simultaneously controlled machining for the complex-shaped parts



Mass-production type combined machine
High production of complex-shaped parts is realized by various machining patterns.

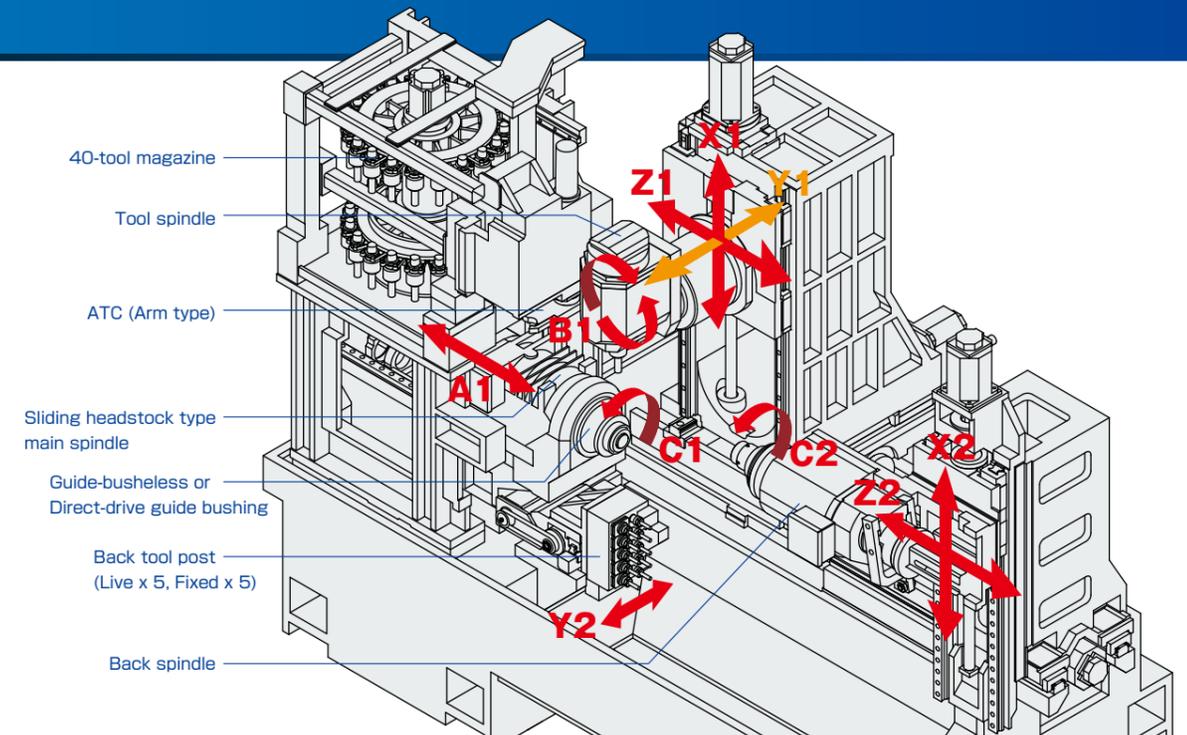
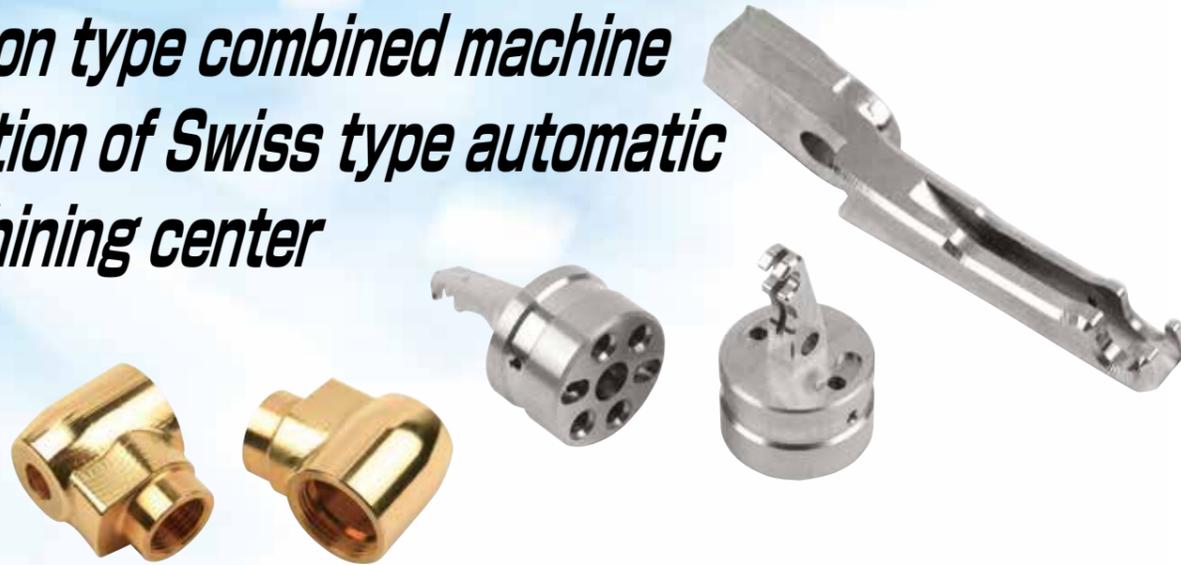
Processing patterns

Thanks to the tool spindle, new processing patterns are realized which was not possible on the conventional automatic lathes. The processing of the complicated part exceeding the automatic lathe is thereby possible.



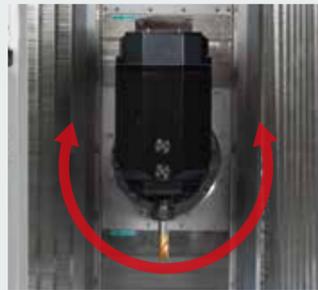
- Complete machining of complex-shaped parts from bar stock
- 5-axis simultaneously controlled processing (SS38MH-5AX)
 - 5-axis simultaneous control is adopted for machining complex shapes.
- Guide-bush type or guide-bushless type is selectable according to workpieces.
- Long workpiece machining is possible by sliding headstock. (Max. machining length: 300 mm)
- Complex machining by high-speed tool spindle with the maximum spindle speed of 20,000 min⁻¹
 - Thanks to the tool spindle and 40-tool magazine, corresponds to complex processing with milling which requires many tools.
- The linear scale on the X1-axis, Y1-axis, Z1-axis and X2-axis slide is provided as standard and high accuracy machining is possible.
- Machines complex parts simultaneously on main and back spindles by adding standard, Y-axis on back tool post.
- Total 52 tools including 40 tools in the tool magazine, 10 tools on back tool post and 2 tools on deep hole drill holder (option)
 - 5 modular type live tools on back tool post for optimum allocation of machining capability.
- Corresponds to heavy-duty cutting by dual contact holder (CAPTO C4).
- Abundant software (Standard)
 - Shortening cycle time
 - Periodic maintenance screen
 - Interference check function
 - Thermal displacement compensation

Mass-production type combined machine by the integration of Swiss type automatic lathe and machining center



■ Tool spindle with B-axis swiveling mechanism

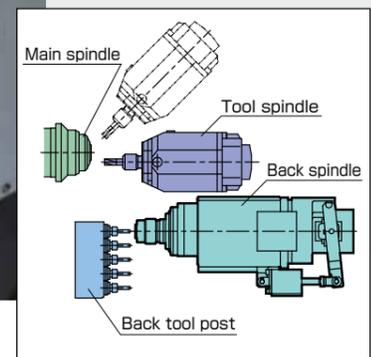
Single tool spindle structure that allows turning tools and milling tools to fit in the same tool spindle bore is adopted. B-axis swiveling mechanism with direct drive realizes high precision angular machining. The dual contact tool holder held by bore taper and end face of the tool spindle can perform powerful and high-accuracy machining. Employment of 11 kW powerful built-in motor performs milling as efficient as a machining center from low speed to the maximum speed of 20,000 min⁻¹.



Maximum speed: 20,000 min⁻¹
B-axis index angle: 0.001°
(Continuous control: SS38MH-5AX)
Swiveling angle: -15° to 195°

■ Back tool post

With the dedicated back tool post, back side processes can be overlapped with the main spindle processes. Even during the tool change of tool spindle, the back spindle side can processes with back tool post, and high productivity is secured. Tool capacity: Live x 5, Fixed x 5. Live tools on back tool post (5 tools) are modular type, and optimum tool allocation is possible.



■ Main spindle

Maximum speed: 7,000 min⁻¹
C-axis control (0.001° control)



■ Back spindle

Maximum speed: 7,000 min⁻¹
Turning and milling on the workpiece rear side is possible.
C-axis control (0.001° control)



■ Equips high-speed tool change unit as standard

The cam driven tool change unit performs the tool-to-tool change at 0.8 sec.



■ Corresponds to high accuracy machining by equipping linear scale (Standard)

Linear scales are equipped on X1, Y1, Z1 and X2 axes as standard.

■ Abundant software (Standard)

● Shortening cycle time

M code output during movement (Operations such as coolant discharge during axis movement can be executed.) Axis start command during movement (Axis movement command can be executed during other axis movement, and overlapped operation is possible without interference.)

● Periodic maintenance screen

Tools and maintenance parts can be checked on the screen, and the messages of times for replacement or maintenance are displayed.

● Thanks to the thermal displacement compensation function, the long-term stable production is realized.

● Interference check function

Prevents the interference between each component and the spindle during program debugging.

■ Options

● Direct-drive rotary guide bushing, Guide-bushless

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



● Work conveyor

The workpiece ejected from the back spindle is carried out with the conveyor to outside of the machine.



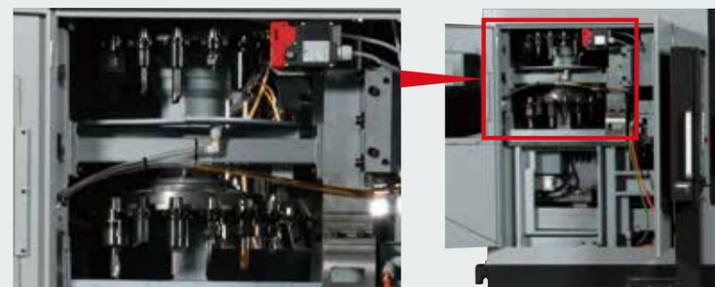
● Chip conveyor

Hinge type chip conveyor and scraper type chip conveyor are prepared.



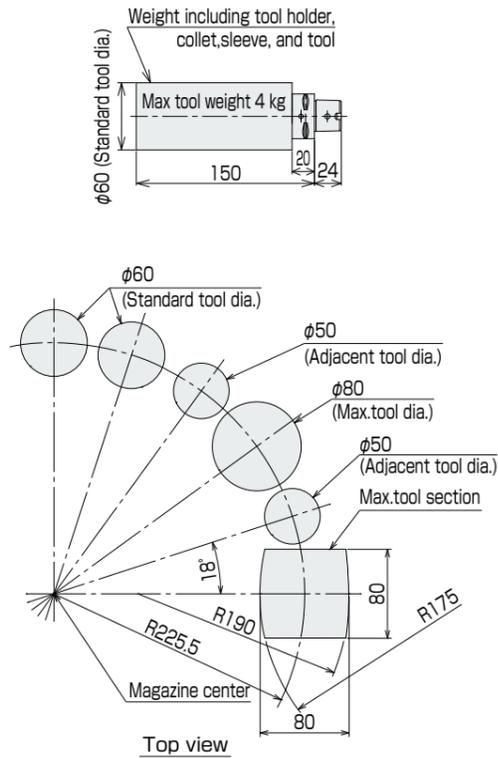
■ Tool magazine accessible from the machine front 40-tool ATC magazine is equipped as standard (Tool shank: CAPTO C4)

Direct magazine indexing in nearest direction with the AC servo motor. Easy changing and maintenance of tool holder by locating the magazine on the machine front side.

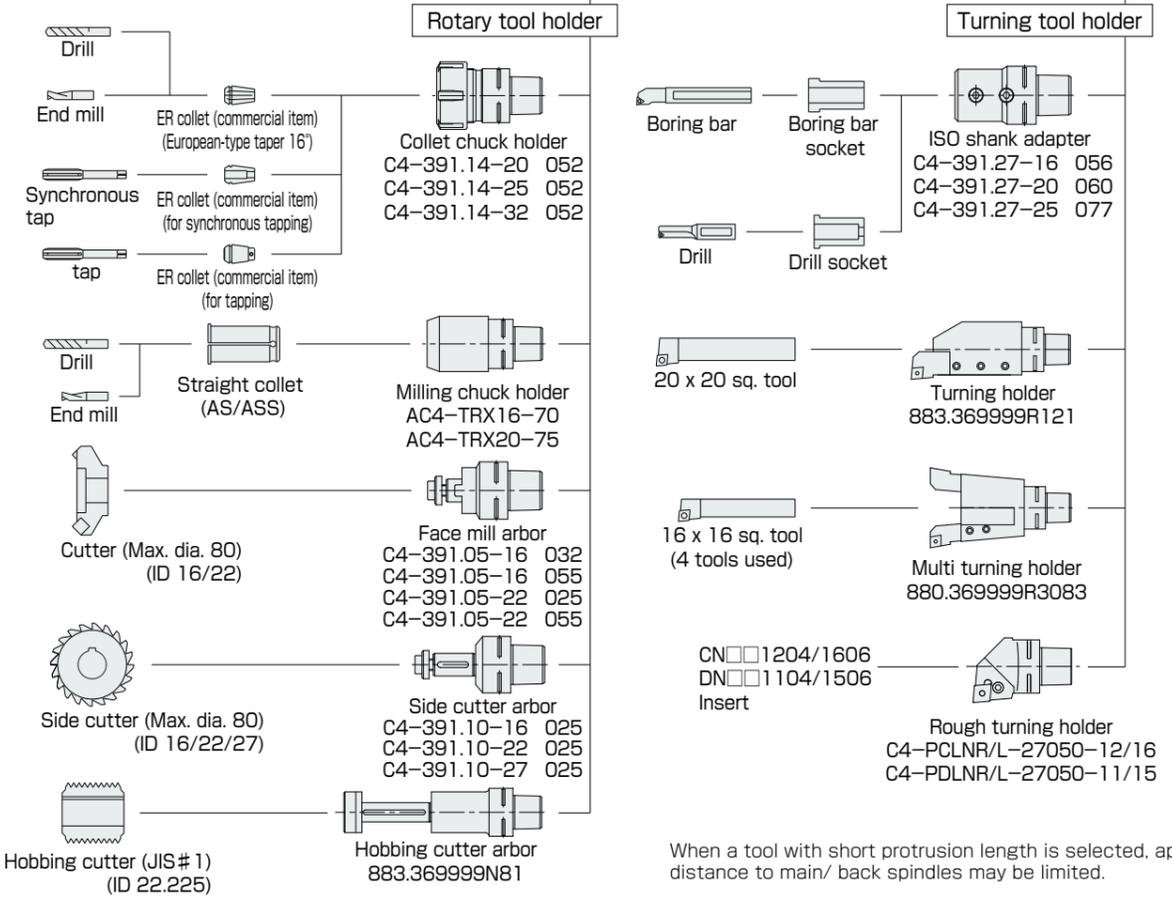
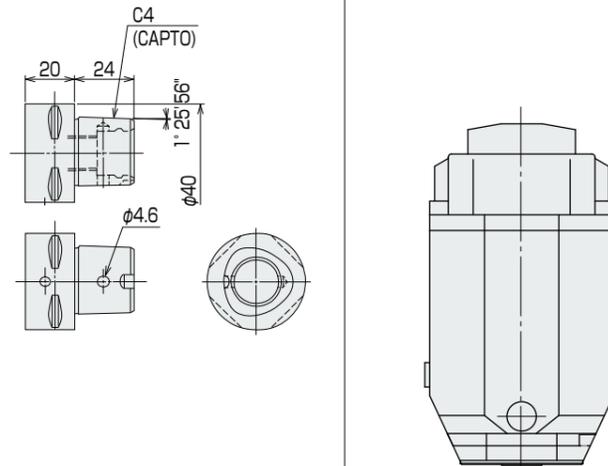


Tooling system

Tool size



Shank size



When a tool with short protrusion length is selected, approaching distance to main/ back spindles may be limited.

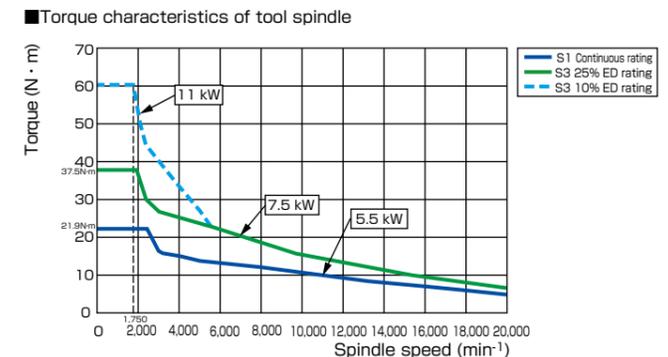
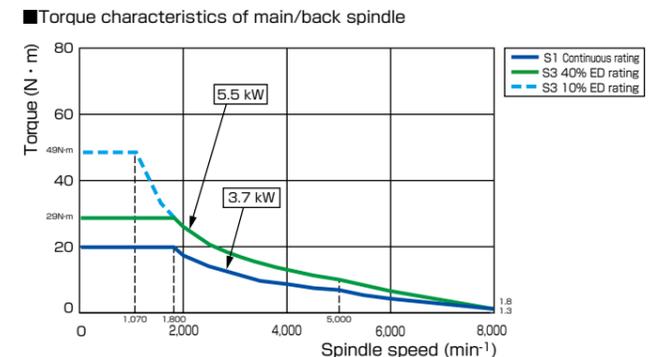
Machine specifications

Item	SS38MH	SS38MH-5AX
Chucking barstock dia.	φ8 to φ38 mm	
Max. machining length	100 mm (Guide-busheless), 300 mm (Direct-drive guide bushing)	
Max. back spindle chucking dia.	φ38 mm	
Max. main spindle drilling diameter	φ16 mm	
Max. main spindle tapping diameter	M12	
Max. back spindle drilling diameter	φ12 mm	
Max. back spindle tapping diameter	M12	
Max. tool spindle drilling diameter	φ12 mm	
Max. tool spindle tapping diameter	M12	
Max. back tool post drilling diameter	φ10 mm	
Max. back tool post tapping diameter	M8	
Max. back tool spindle drilling diameter	φ8 mm	
Max. back tool spindle tapping diameter	M6	
Main spindle speed	200 to 7,000 min ⁻¹	
Back spindle speed	200 to 7,000 min ⁻¹	
Tool spindle speed	200 to 20,000 min ⁻¹	
Least increment of B-axis index angle	0.001°	0.001° (continuous)
B-axis index angle	-15° to 195°	
Main spindle/ back spindle index angle	0.001° (continuous)	
Back tool post (Modular type live tool)	Maximum speed: 6,000 min ⁻¹ /5 tools	
Back tool post (Fixed tool)	φ25 mm/5 tools	
Rapid traverse rate	32 m/min	
Tool selection	Specified address, random indexing	
Tool storage capacity (Tool magazine)	40 tools	
Tool interface	CAPTO C4	
Main spindle	5.5/3.7 kW	
Back spindle	5.5/3.7 kW	
Tool spindle	1.1/5.5 kW	
X1	2.7 kW	
Y1,X2,Z2	2.5 kW	
Z1	3.0 kW	
Back rotary tool	1.0 kW	
Y2 axis, Tool magazine, ATC, Transfer	0.5 kW	
A1	0.75 kW	
Weight	7,100 kg	
Compressed air requirement	0.4 MPa or above	
Air discharge rate	280 NL/min	
Coolant tank capacity	180 L	
Width x Depth x Height	2,930 x 2,000 x 2,160 mm	

Options

Guide bushing	Guide-bushing-less	Work discharge system	Work conveyor	NC functions	RS232C interface
	Direct-drive guide bushing		Front discharge		Part program storage size 2Mbyte
Live tools & holders	Tool spindle	Machine maintenance and monitoring functions	Rear discharge	Safety and other	Number of registrable programs expansion (1000 programs)
	Back tool adapter		Signal indicator		Automatic fire extinguisher
	Drill holder		Tool checker		
Advanced function system	Deep hole drill holder	Coolant system	Chip conveyor		
	0.1 μm specification		Oil-mist separator		
	Bar feeder interface		Spindle-through coolant		

Torque characteristics



NC standard specifications

Item	SS38MH	SS38MH-5AX
NC unit	FANUC Oi-TF	FANUC 31i-B5
Axis name	X1, Y1, Z1, A1, X2, Y2, Z2, B1*, C1, C2	
Least input increment	0.001 mm (X1/X2 axis in diameter)	
Least command increment	X1 axis, X2 axis: 0.0005 mm B1*, C1, C2 axes: 0.001* Other axes: 0.001 mm	
Maximum commandable value	±8 digits	
Interpolation method	Linear/Circular	
Rapid traverse rate function	32 m/min	
Cutting feedrate	1 to 6,000 mm/min	
Feedrate override	0 to 150 %, 10 % step	
Dwell	G04 0 to 99999.99	
Absolute/incremental command	X, Z, Y, A, C, B: Absolute	U, W, V, H: Incremental
No. of tool offsets	Main: 160 Back: 40	
LCD/MDI	10.4" color LCD	
Display language	English	
Part program storage size	1 Mbyte (Total of all paths)	
Auxiliary function	M5 digits	
Tool function	T5 digits	
Spindle function	S5 digits	

*Note: In case of SS38MH, B1 is the indexing axis. Interpolation with the other axes is impossible.

Machine standard accessories

Main spindle adapter	Transit clamps
Back spindle adapter	Main/back spindle C axis
Door interlock (Tooling zone side door/Main spindle side door)	Main spindle air purge/Back spindle air purge/Tool spindle air purge
Coolant flow switch	Periodic maintenance screen
Spindle cooling unit	Automatic power shut off
Standard tools	

NC standard accessory

Chasing function	Programmable data input
Continuous threading	Chamfering corner R
Manual pulse generator	Tool nose radius compensation
Memory card interface	Multiple repetitive cycle
Back ground editing	Expanded program editing
Run time and parts number display	Canned cycle for drilling
Custom macro	Rigid tap (Main spindle, Back spindle, Tool spindle)
Constant surface speed control	Cut-off detection (differential)
Synchronization control (rotation, phase)	Spindle speed fluctuation detection
Tool geometry / wear offset	Three-dimensional coordinate conversion