



SWISS TYPE AUTOMATIC LATHE equipped with star motion control system 

SV-20R





SV INNOVAT

Outstanding capability and flexibility for the machining of complex mill turn components. The most advanced $\phi 20$ -class model in the SV series has been upgraded from every angle to enable the user to manufacture even the most complicated components

The latest upgrade of the ever popular SV-20 offers even more functionality, capability and productivity for mil



B axis control + Back working Y axis control
Equipped with the Star Motion Control function,
higher speed and larger variety of complex
machining is achieved.

F E A T U R E

- 8-position turret type tool post equipped with a B axis control mechanism enables simultaneous 5-spindle machining of complicated shape parts and angle hole machining.
- 8-spindle back working unit with additional Y-axis function ensures the maximum overlapping of operations to further improve machine output.
- The G.B./N.G.B. function provides the user with the ability to maximize part manufacture per bar.
- Tool post structure suited for flexible overlap machining and Star Motion Control function contributes to the further reduction of non-cutting time.

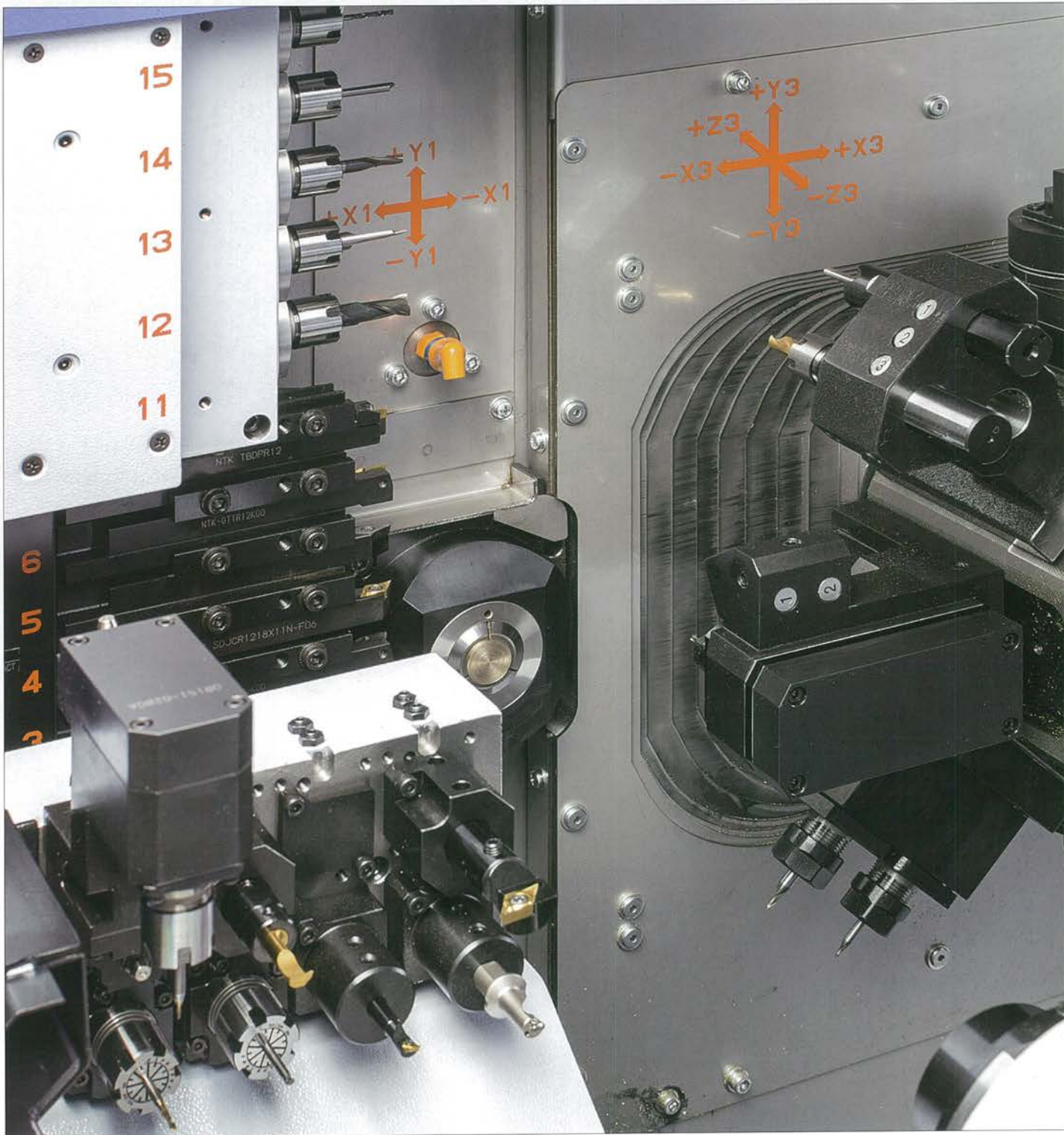
02



SWISS TYPE AUTOMATIC LATHE
 equipped with star motion control system

SV-20R

turn components.



Complex machining capability for the manufacture of components for the Medical, Aerospace and Automotive industries.



Gang type + 8-position turret-type + Back working tool post

The layout provides the User with multiple tooling options and unrivalled overlapping functions.

Gang-type tool post + 8-position turret-type tool post with B axis control + Back working 8-spindle unit with Y axis control and the Star Motion Control for high-level complex machining and superb productivity. The G.B./N.G.B. switching function for flexible response to the varied part shape. The combination of the machine design and expanded support software contributes to improved ease of operation and further increases machine output. Performance required for parts machining today are thoroughly explored from every angle to achieve the latest and the best model in the SV series. SV-20R, the model for the next generation of complex small part machining.

SV-20R

CNC SWISS TYPE AUTOMATIC LATHE
equipped with Star motion control system

Control method : CNC control by Star motion control system

Machine composition :

- Main spindle
- Sub spindle
- Gang type Tool post
- Turret type Tool post
- Backworking 8-spindle unit with Y-axis control



*N.G.B.

*N.G.B.

04

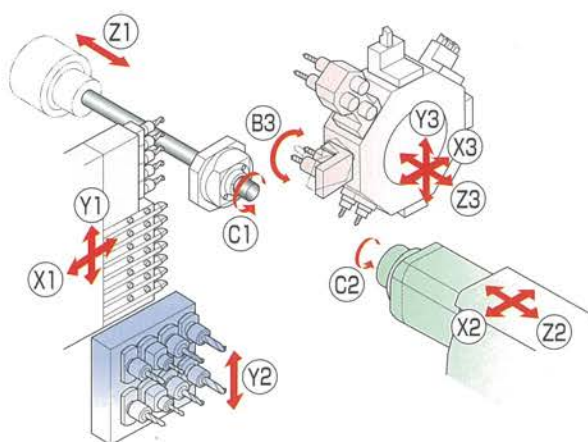


Illustration of tool layout : Guide bush type

TOOLING SYSTEM

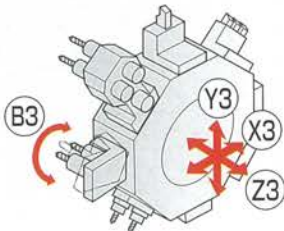
■ Gang type Tool post	Turning tool	6 tools (□16mm), 7 tools (□12mm)
	Power-driven tool	5 tools
■ Turret type Tool post	Turning tool	1 tools / station (□16mm)
		max. 3 tools / station (□12mm)
	Sleeve	max. 3 tools / station
	Power-driven tool	max. 2 tools / station
■ Back 8-spindle unit	Stationary tool	Total 8 tools (Power-driven tool : max. 8 tools)
	Power-driven tool	

Improvement in High Functionality and Machining Capability



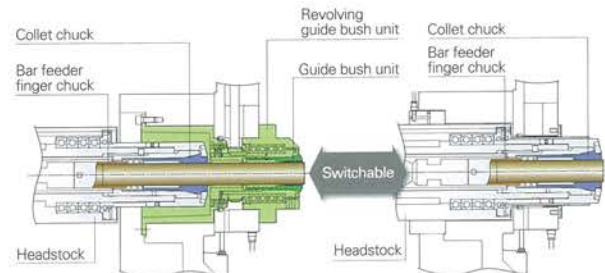
8-position turret-type tool post with B axis control mechanism

2-spindle power tool unit for B axis control can be mounted on a maximum of 4 positions on the turret-type tool post. Machining of inclined surfaces including angular holes on both the front and the back side is possible. Simultaneously controlled 5-spindle machining is possible.



G.B./N.G.B. switching function

The type best suited to any size of workpiece is selectable from the G.B. and the N.G.B.



Guide bush type

Highly accurate machining of motor shafts and other long parts by suppressing material deflection with the G.B. type.

Non-guide bush type

The N.G.B. type for machining nuts and other short parts with less residual materials to reduce material costs and increase output.



Back working 8-spindle unit with Y axis control function specially for back machining

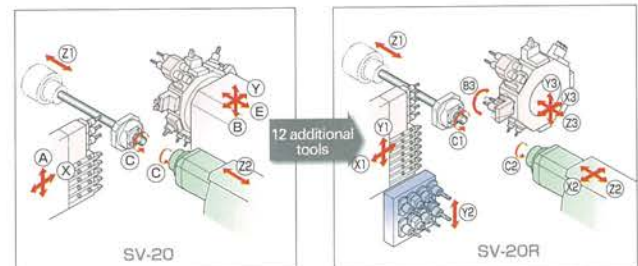
Back working tool post with Y axis control to mount a power tool unit to accommodate a maximum of 8 tools.

A back working 8-spindle unit is mounted as standard. Various power tool units are also available for versatile complex machining on the rear side. By combining with the sub spindle with 2-axis (X, Y) control function, three dimensional machining is possible.



Tool stations maximum of 28 pos.

Compared with SV-20, the number of tools to mount is increased by max. 12 to allow a larger variety of tooling layouts.



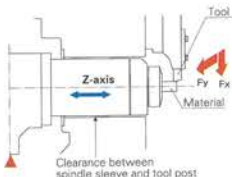
Achievement in High Rigidity and High Accuracy



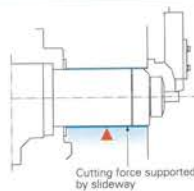
A high rigid spindle sleeve slide guideway structure for N.G.B. type

The N.G.B type employs a spindle sleeve slide guideway structure to support the cutting force on the guideway, thus suppressing spindle deflection and realizing accurate machining. Rigidity of the headstock is ensured and continuous machining with stable accuracy is achieved.

For ordinary non-guide bush type



Spindle sleeve slide guideway structure



A built-in spindle for high indexing accuracy

The main and sub spindle employ a built-in structure to enhance spindle indexing accuracy with a built-in sensor.



Suppression of thermal displacement

The X2, X3 and Y3 axes are equipped with a thermal displacement correction switch each for correcting thermal displacement based on the measurement results.

In search of high functionality,
accuracy and productivity from every angle

Improvement in Operability and Workability



Machine design in consideration of setup & maintenance works

- ① A cutting chamber uses a large-opening (1,154mm), flip-up door.
SV-20 : 463mm ⇒ SV-20R : 1,154mm
- ② The headstock chamber employs a link-type door which opens upward of the machine to realize a larger opening.
SV-20 : 390mm ⇒ SV-20R : 772mm

Fulfilling operation support software

- ① "Center height adjustment function" to enable measurement of the tool center height on the gang edge side by handle operation.
- ② "Spindle synchro phase adjustment function" for simple operation by only following the guidance displayed on the NC screen.
- ③ "Multi-path program control function" for reduction of input/output operation by putting 3-path programs into one file.



Pursuit of High Productivity

Machining time reduction (mechanical system)

Simultaneous machining on gang type and turret type

Simultaneous machining of turning, milling, etc. by combining the gang type and turret type tool posts to realize reduced cutting time.



Flexible overlap machining

The 8-spindle unit with Y-axis control for back working can accommodate a maximum of eight power tools of various kinds. A wider variety of back working allows efficient front-/rear-end overlap machining. Cutting time is also reduced by optimized process division.



Higher output power of power tool motor

The power tool motor used for the gang-type tool post has high output power.
(SV-20 : 0.5kW ⇒ SV-20R : 2.2kW)

Improvement in rapid feed

Improvement in rapid feed; Z axis feed on the main and sub spindle: 30m/min, X/Y axis on the gang-type tool post: 30m/min, X/Z axis on the turret-type tool post: 30m/min, Y axis: 15m/min.

Machining time reduction (control system)



By the program optimization, the time required for the processes of [Disengagement], [Next tool selection] and [Approach] can be minimized to reduce the non-cutting time.

Star motion control system on board

Reduction of non-cutting time for switching the control system, changing tools, etc.



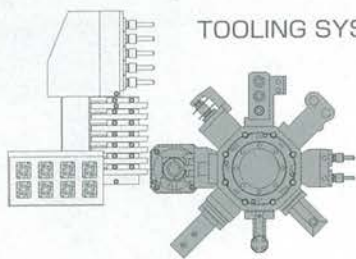
Concept of reduction of non-cutting time

Conventional CNC-controlled machining



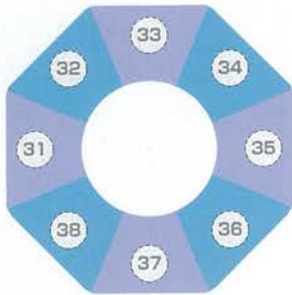
Machining through Star motion control system





TOOLING SYSTEM

Turret type Tool post



Tool unit (turret side)

On-board unit	Mountable positions	
Fixed type tool holder	●	●
Fixed type tool holder (for 3 tools)	●	●
Center adjustable tool holder	●	●
3-spindle sleeve holder	●	●
1-spindle sleeve holder	●	●
1-spindle sleeve holder (for deep hole)	●	●
2-spindle programmable drilling unit	●	● *
1-spindle face drilling unit	●	●
2-spindle face drilling unit	●	●
Opposing type face drilling unit	●	●
2-spindle opposing type face drilling unit	●	●
Cross drilling unit	●	●
2-spindle cross drilling unit	●	●
2-spindle rapid feed cross drilling unit	●	●
Slotting unit	●	●
Angular adjustable drilling unit	●	● *
2-spindle angular adjustable drilling unit	●	● *
Polygon machining unit	●	●
Thread milling unit	●	●
Thread whirling unit	●	●



Fixed type tool holder (for 3 tools)



3-spindle sleeve holder



1-spindle sleeve holder (for deep hole)



2-spindle programmable drilling unit



2-spindle angular adjustable drilling unit



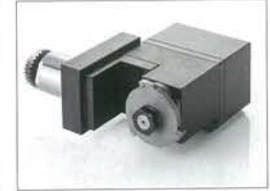
Thread milling unit



2-spindle cross drilling unit



2-spindle face drilling unit



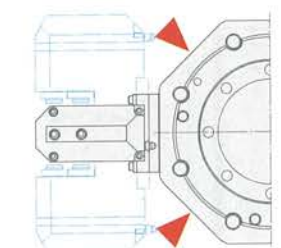
Polygon machining unit



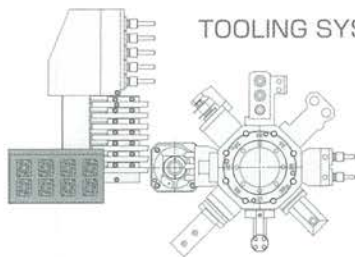
Slotting unit



Thread whirling unit



* When mounting a unit on both neighboring positions, the swivel angle is limited.



TOOLING SYSTEM

8-spindle unit for back working



* Two cross drilling units and two slotting units can be mounted. (on positions not adjoining).

* By mounting a quad-speed unit, the maximum rotation speed of other power tool units is clamped at 5000min⁻¹.

 Power driven tools (on the back side) / Stationary tools (on the back side)

Power driven tools (on the back side)



Stationary tools (on the back side)



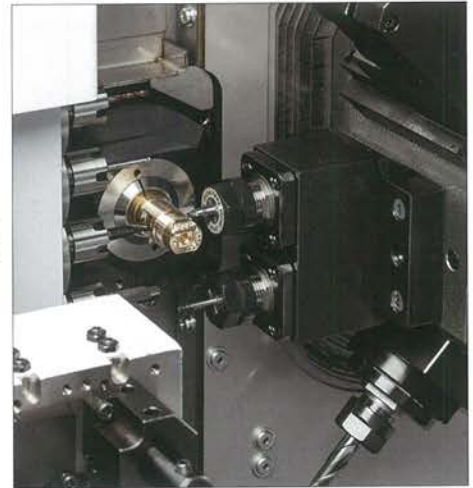
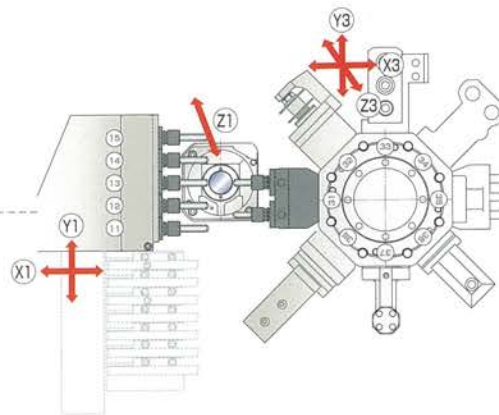
An abundant line-up of tooling units for milling, cross drilling and slotting as 8-spindle back working units is available. This expands the availability of machining variations by allowing selection of the most appropriate tooling layout suited to user needs.

Machining Capabilities to Meet Diversified Needs for Parts Machining.

VARIATION 01

Front-end working

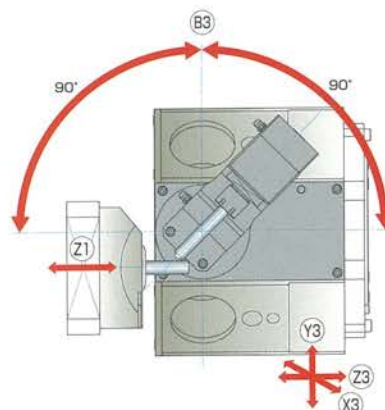
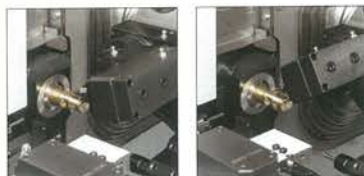
Opposing cross machining



VARIATION 02

Front-end working

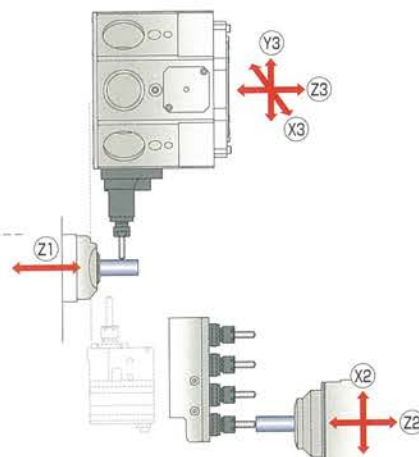
Back slanting machining with B-axis power tools



VARIATION 03

Front-end working
+
Rear-end working

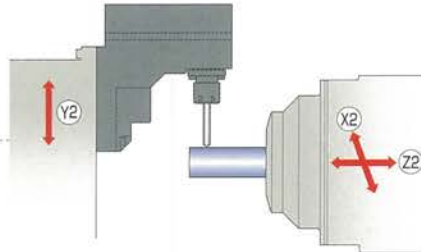
Main / back
simultaneous machining



VARIATION 04

Rear-end working

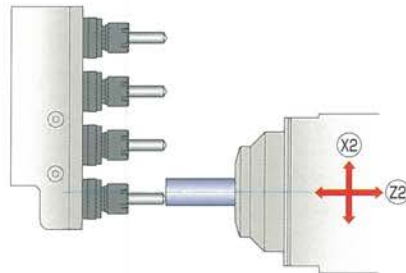
Back cross machining



VARIATION 05

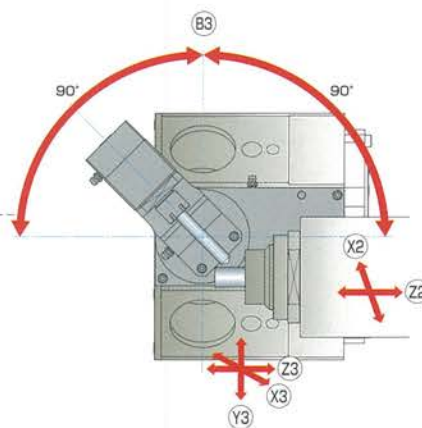
Rear-end working

Back eccentric drilling



VARIATION 06

Rear-end working

Back slanting machining
with B-axis power tools


□ Standard Machine Specifications

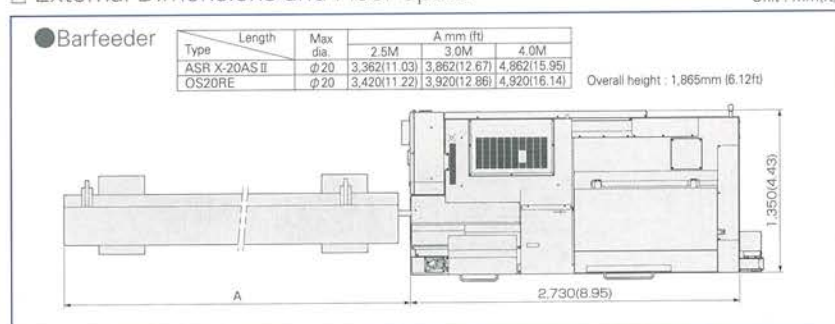
Item		Specifications
Max. machining diameter		φ 20mm(25/32in) OP: φ 23mm(29/32in)
Max. headstock stroke	Standard	205mm(8in)
	R.M.G.B. type	160mm(6-19/64in) : OP
	N.G.B. type	Bar diameter×2.5(Max.50mm)(Max.1-31/32in)
Tool post configuration	Gang type	Turning tool + Power-driven tool
	Turret type	8 stations
Tool	Gang type	6 tools(□16mm), 7 tools(□12mm)
	Turret type	1tool / station(□16mm), Max.3tools / station(□12mm)
Sleeve	Number of tools	Max.3tools / station
	Max. drilling capability	φ 14mm(35/64in)
	Max. tapping capability	M12×P1.75
Power driven attachment	Number of tools	5 tools
		Max.2tools / station(mountable at each 8 positions)
	Gang type	φ 10mm(25/64in)
	Turret type	φ 10mm(25/64in)
	Max. drilling capability	φ 10mm(25/64in)
	Gang type	M8×P1.25
	Turret type	M8×P1.25
	Max. tapping capability	M8×P1.25
	Gang type	Max.8,000min ⁻¹
	Turret type	Max.5,750min ⁻¹
	Spindle speed	2.2kW
	Drive motor	2.7kW(continuous) / 4.0kW(5min. / 30%ED)
Rapid feed rate		30m/min(X1,X2,X3,Y1,Z1,Z2,Z3)
		20m/min(Y2),15m/min(Y3)
Main spindle indexing angle		C-axis control
Main spindle speed		Max.10,000min ⁻¹
Main spindle motor		3.7kW(continuous) / 5.5kW(10min. / 60%ED)
Coolant tank capability		220 ℓ
Dimensions (W×D×H)		2,730×1,350×1,865mm
Center height		1,125mm
Weight		4,150kg
Power consumption		6.3kVA

□ Backworking Attachment Specifications

Item		Specifications
Max. chucking diameter		φ 20mm(25/32in) OP: φ 23mm(29/32in)
Max. length for front ejection		105mm(4-9/64in)
Max. parts projection length		75mm(2-61/64in)
Back 8-spindle unit	Number of tools	8 tools
	Stationary tool	Max.8 tools
	Power driven tool	Max.8 tools
	Max. drilling capability	φ 12mm(1/2in)
	Stationary tool	φ 6mm(15/64in)
	Power driven tool	φ 6mm(15/64in)
Max. tapping capability	Stationary tool	M10×P1.5
	Power driven tool	M5×P0.8
Power-driven att. spindle speed		Max.8,000min ⁻¹
Power-driven att. drive motor		1.0kW(continuous) / 1.2kW(5min. / 30%ED)
Sub spindle indexing angle		C-axis control
Sub spindle speed		Max.10,000min ⁻¹
Sub spindle motor		2.2kW(continuous) / 3.7kW(10min. / 40%ED)

□ External Dimensions and Floor Space

Unit : mm(ft)



□ Standard Accessories and Functions

1. CNC unit FANUC 31i-B5
2. Power electric & Operation panel & 10.4-inch color LCD
3. Pneumatic unit
4. Hydraulic unit
5. Spindle cooling unit
6. Automatic centralized lubrication system (with level detecting function)
7. Cutting oil level (lower limit) detecting unit
8. Door interlock system
9. Broken cutoff tool detector
10. C-axis control (Main / Sub)
11. Spindle clamp unit (Main / Sub)
12. Drive unit for revolving guide bush
13. Revolving guide bush unit
14. Main/Sub collet
15. Air purge for revolving guide bush
16. Sub spindle air purge unit
17. Tool holder (Gang-type tool post)
18. 5-spindle milling unit (Gang-type tool post)
19. Drive system for power-driven attachment (Turret-type tool post)
20. Back 8-spindle unit
21. Drive system for power-driven attachment B (Back 8-spindle unit)
22. Parts conveyor
23. Automatic bar feeder interface
24. RS232C interface
25. Work light (for cutting chamber and headstock chamber)
26. Leakage breaker

□ Optional Accessories and Functions

1. Coolant flow detector
2. Parts ejection detector
3. Water removal unit
4. Oil mist filter
5. Beacon
6. Non-guide bush type
7. Rotary magic guide bush unit
8. For pneumatic unit rotary magic guide bush
9. Main spindle inner tube
10. Parts ejector (Air cylinder type)
11. Parts ejector (Spring type)
12. Parts ejector with guide tube
13. Parts stopper unit
14. Coolant unit(6.9MPa / 2.5MPa / 0.7MPa)
15. Coolant unit signal cable
16. Coolant unit power cable
17. Coolant valve
18. Coolant pipings
19. Manual pulse generator
20. Transformer CE marking version
21. CE marking version
22. Tool Presetter

Note)

The machining capacities apply to SUS303 material. The machining capacities may differ from listed values depending on the machining conditions, such as the material to be machined or the tools to be used.

※Design features, specifications and technical execution are subject to change without prior notice.

※This product is an export control item subject to the foreign exchange and foreign trade laws. Thus, before exporting this product, or taking it overseas, contact your STAR MICRONICS dealer.

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