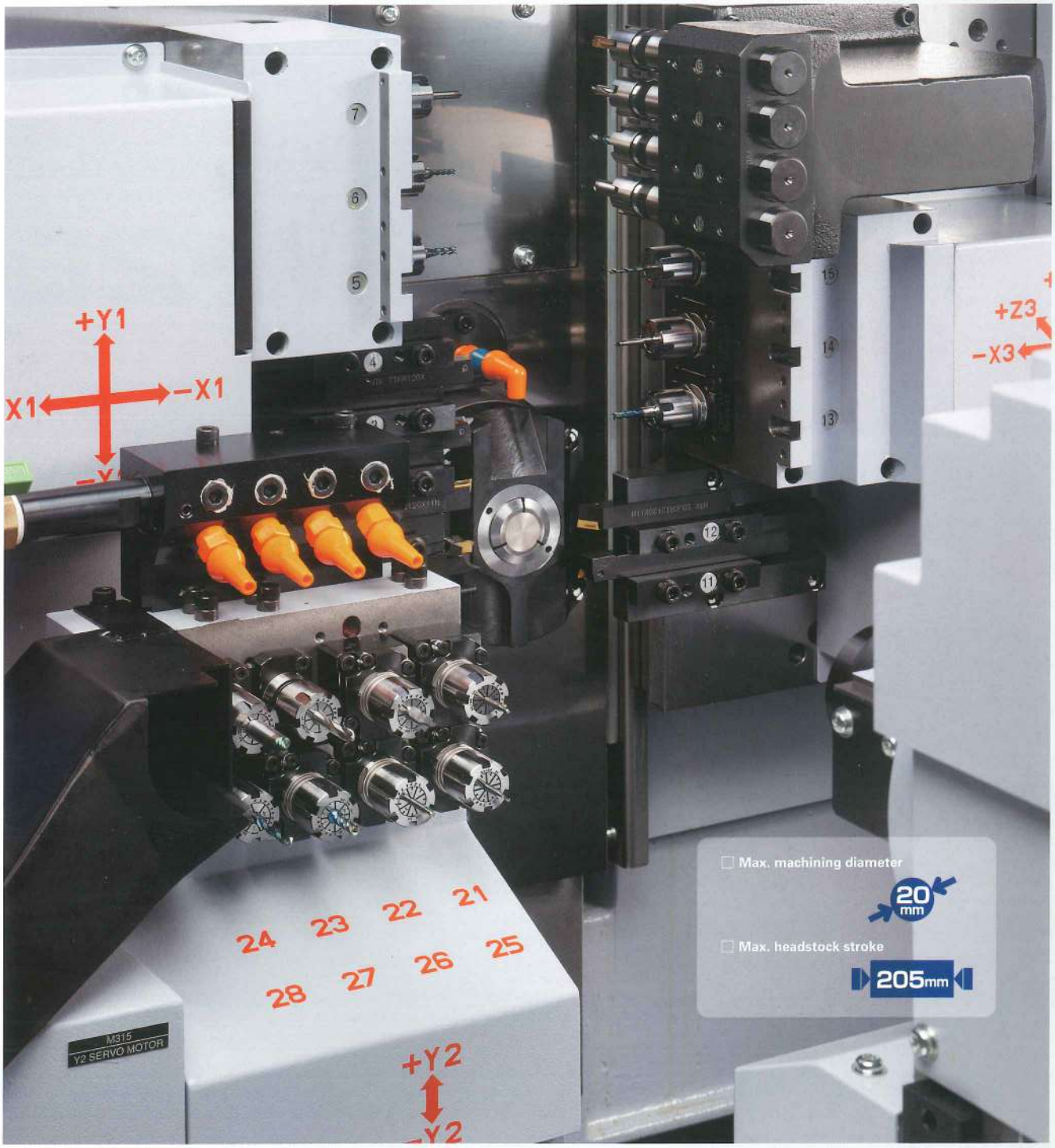
SWISS TYPE AUTOMATIC LATHE equipped with star motion control system

SW-20

STAR Environmental Standards Conformity models

Rapid and flexible machining of complex components, achievable by the SW-20

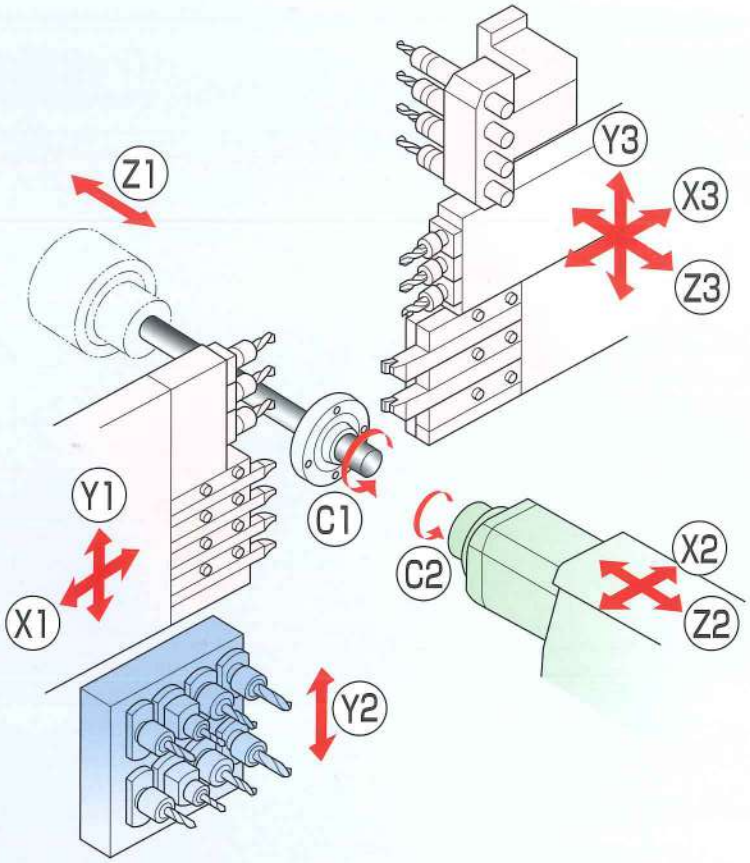
Complicated part machining



SWISS TYPE AUTOMATIC LATHE
equipped with star motion control system

SW-20

The Swiss-type automatic lathe SW-20, equipped with the Star Motion Control System strives for reduced idle time for complex parts from the aspect of both the mechanical and control systems. With the fastest speed ever realized, this machine meets the needs of the manufacturing industry where high added value and high productivity are required.



High productivity

● Opposing gang-type tool post

Thanks to simultaneous machining (turning + drilling) by independently controlled opposing gang-type tool posts, machining time drastically reduced.

● Back working tool post (with Y-axis control) exclusively designed for 8-spindle capability

The machine employs a tool post (with Y-axis control) which is exclusively designed for 8-spindle back working. It enables efficient separation division through enhanced simultaneous machining on both the front and rear sides.

● Star Motion Control System

The unique control technology known as the Star Motion Control System achieves a smooth and uninterrupted tool path and achieves shortened non-cutting time.

● Electric Drives

By eliminating hydraulically driven equipment and introducing electrically-driven equipment, idle time between each axis operation is reduced and energy saving is achieved.

● Chucking unit

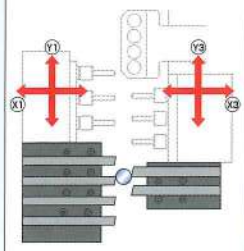
The collet can be opened/closed without decreasing the spindle rotation speed, thus reducing the non-cutting time at the time of spindle acceleration/deceleration.

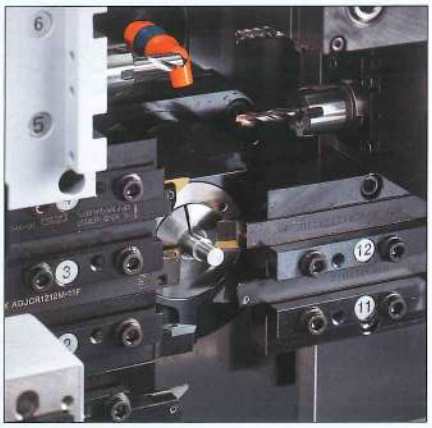
Verification of ultra-high production machine
Machining variations

With an independently controlled, opposing gang-type tool post,
"versatile simultaneous machining" is achieved and machining time is vastly reduced!

Machining variations ❶

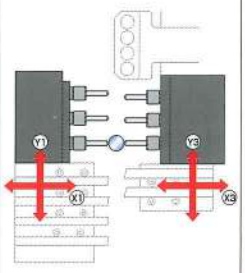
Balance cut

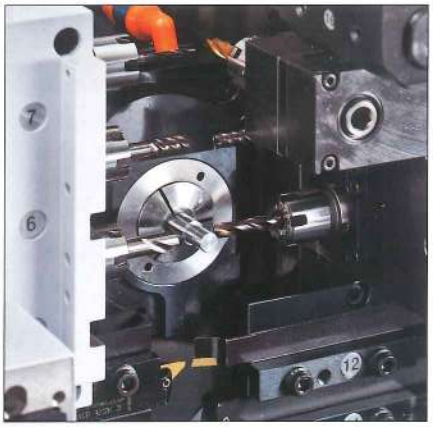




Machining variations ❷

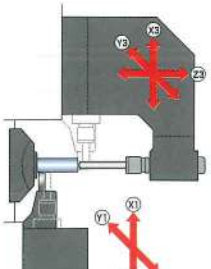
Opposing simultaneous cross milling/drilling

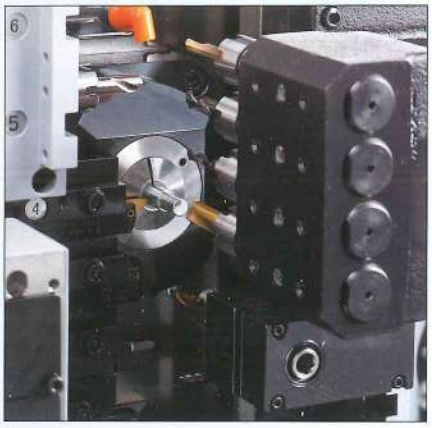




Machining variations ❸

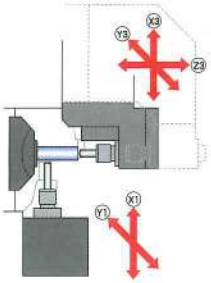
Turning + Face drilling/milling

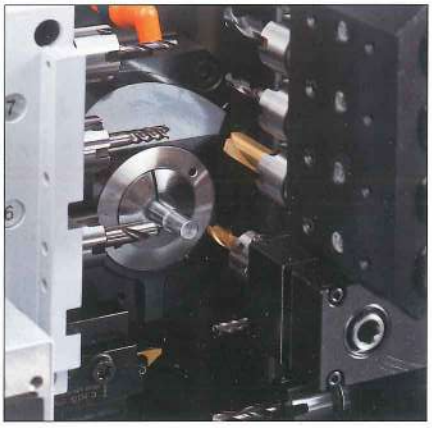




Machining variations ❹

Cross milling + Face drilling/milling





Strengthened machining capability

● A tool post (with Y-axis control) exclusively designed for 8-spindle back working

The tool post designed for back working can accommodate a maximum of 6 power-driven tools to allow versatile complex machining (cross milling, slotting, etc.) on the rear side.

● High-power sub spindle

The sub spindle employs a spindle motor with the same power as the main spindle. This improves the machining capability on the back side and accommodates the machining of a range of difficult materials.

● Machining of demanding materials

In combination with a high-pressure coolant unit (optional), this model is suited to the machining of a range of exotic materials.

Improved operability and workability

Thanks to the latest NC unit, a range of new functions are available to improve both operability and workability.

[Major new functions]

Alarm help function
- Contents of alarms can be checked on the NC screen.

Program check function
- Contents of created programs can be checked in advance.

Code help function
- Contents of codes can be checked on the NC screen.

Manual handle retrace function
- A program can be checked, using the actual machine, through operation with manual pulse generator (in forward/reverse directions).

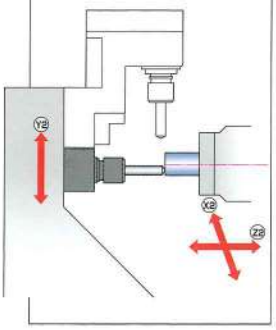
Key operation protective function
- By using a timer to set a time to depress each key, the machine can be prevented from malfunctioning.

Product counter screen display function
- Estimated time to count-up is displayed.

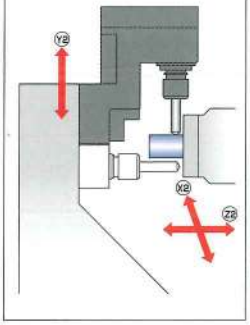
Verification of ultra-high production machine
Machining variations

With a tool post (with Y-axis control) exclusively designed for 8-spindle back working, "versatile back working" is achieved for optimal machining process.

Machining variations ⑤
Back eccentric drilling



Machining variations ⑥
Back cross milling



Examples of SW-20 machining unit

☐ **Front drilling unit**

Refer to the machining variation 4.

☐ **Back cross milling unit**

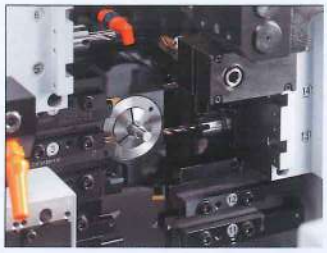
Refer to the machining variation 6.

Mechanical and control design to minimize machining time and maximize efficiency

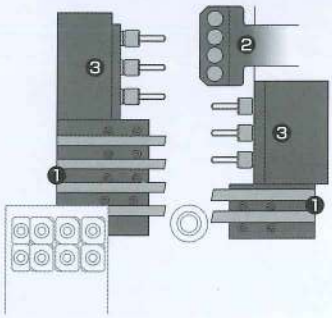
Ultra-high production machine background ❶

The combination of the opposing gang-type tool post and back-working tool post with Y-axis control function ensures optimal process operations.

Simultaneous machining by independent control dramatically reduces cutting time. · · ·
Opposing gang-type tool post



Front side Rear side



An opposing gang-type tool post with rapid tool selection function is arranged for front working. (2-axis control on the front and 3-axis control on the rear side) Each tool post is independently controlled for simultaneous machining (turning, drilling, milling, etc.) in order to reduce machining time.

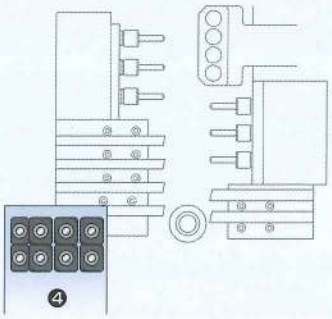
TOOLING system

- ❶ Turning tool 6 pcs.
- ❷ Front-end stationary tool 4 pcs.
  Rear-end stationary tool 2 pcs.
  (max. 4 pcs.)
- ❸ Power-drive tool 6 pcs.

CONTROL axis

- Front side : X1, Y1
- Rear side : X3, Y3, Z3

Enhanced front/rear simultaneous machining capabilities. · · ·
Back 8-Spindle unit



The tool post exclusively designed for back working is equipped with Y-axis controlled 8-spindle unit. A variety of tooling including a maximum of 8 stationary tools and 6 power-driven tools, can perform extended complex machining on the rear side. These features effectively divide the process into the front-end and rear-end.

TOOLING system

- ❹ Stationary tool Max. 8 tools
  Power-driven tool Max. 6 tools

CONTROL axis

- Y2 axis

Ultra-high production machine background ❷

The unique Star Motion Control System dramatically reduces idle time.

Control system changeovers, tool changes and arithmetic processing time are shortened by the original Star Motion Control System. This also facilitates optimized timing for M codes and S codes and minimizes non-cutting time.
Under the CNC control, the machining process advances from "tool selection" to "approach", "cutting", "retracting", "next tool selection", "approach" and "next cutting" and non-cutting time greatly influence the cycle time. The Star Motion Control System has been developed to reduce this non-cutting time.

① Optimized queuing

Queuing in multi-spindle/multi-system machining is optimized so that the idle time for spindle change, weight change, cycle change, etc. is dramatically reduced.

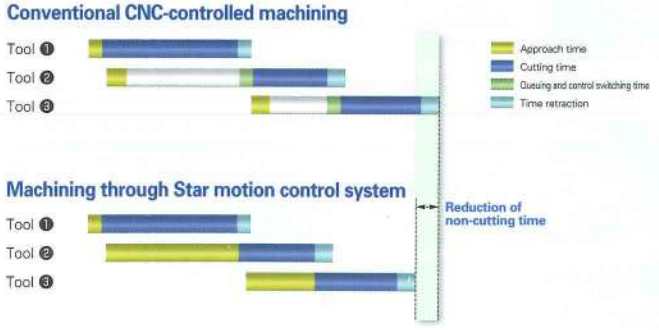
② Pre-analysis of NC codes

Through optimization, NC codes (buffering, nose R calculation, coordinate system setting, etc.) can be previously analyzed, which contributes to the reduction of arithmetic processing time.

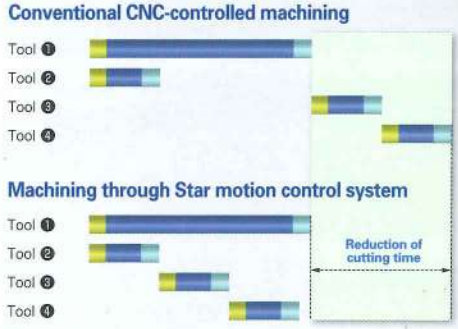
③ Automatic creation of command data during multiple operations

Data for commanding multiple operations can be automatically created by optimized operation. The next operation can be started without waiting for signal processing or checking for operation completion.

Concept of reduction of non-cutting time



Concept of cutting time reduction



Standard Machine Specifications

Item			Specifications
Max. machining diameter			φ20mm(25/32in)
Max. headstock stroke	Standard		205mm(8in)
	With R.M.G.B.		175mm(6-57/64in)
Tool post configuration	Front		Turning tool + Power-driven tool
	Rear		Turning tool+4-spindle sleeve holder+Power-driven tool
Number of tools	Front		4 tools
	Rear		2 tools
Tool shank			□12mm / □16mm
4-spindle sleeve holder	Number of tools		Front 4 tools
			Rear 4 tools
	Max. drilling capability		φ10mm(25/64in)
	Max. tapping capability		M8×P1.25
Power driven att.	Number of toolsn	Front	3 tools
		Rear	3 tools
	Max. drilling capability		φ8mm(5/16in)
	Max. tapping capability		M6×P1.0
	Spindle speed		Max.8,000min^{-1}
	Drive motor		1.0kW(continuous)/1.2kW(5min./30%ED)
Rapid feed rate			35m/min(X2,Z1,Z2,Y1,Y3)、20m/min(X1,Y2,X3,Z3)
Main spindle indexing angle			C-axis control
Main spindle speed			Max.10,000min^{-1}
Main spindle motor			2.2kW(continuous)/3.7kW(10min./25%ED)
Coolant tank capacity			150ℓ
Dimensions (W×D×H)			2,588×1,300×1,765mm
Center height			1,040mm(3.41ft)
Weight			3,400kg
Power consumption			4.8kVA
A-weighted sound pressure : note-1			Max.70dB (A)

Backworking Attachment Specifications

Item			Specifications
Max. chucking diameter			φ20mm(25/32in)
Max. length for front ejection			80mm(3-5/32in)
Max. parts projection length			30mm(1-3/16in)
Back 8-Spindle unit	Number of tools	Stationary tool	Max.8 tools
		Power driven tool	Max.6 tools
	Max. drilling capability	Stationary tool	φ10mm(25/64in)
		Power driven tool	φ8mm(5/16in)
	Max. tapping capability	Stationary tool	M8×P1.25
		Power driven tool	M6×P1.0
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./25%ED)

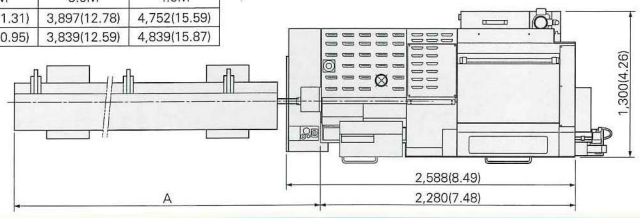
External Dimensions

Unit : mm(ft)

●Bar Feede

Type \ Length	A(mm)		
	2.5M	3.0M	4.0M
OS203E	3,447(11.31)	3,897(12.78)	4,752(15.59)
S204	3,339(10.95)	3,839(12.59)	4,839(15.87)

Overall height : 1,765mm(5.79ft)



Standard Accessories and Functions

1. CNC unit FANUC 31i-B5
2. Operation panel 10.4-inch color LCD display
3. Pneumatic unit
4. Automatic centralized lubrication unit
5. Coolant level detector (lower limit)
6. Door interlock system
7. Broken cutoff tool detector
8. Drive unit for revolving guide bush
9. C-axis control unit (Main/Sub)
10. Spindle clamp unit (Main/Sub)
11. Drive system for power-driven tool (for the tool posts 1 and 2)
12. 4-Spindle sleeve holder
13. Back 8-Spindle unit
14. Drive unit for power-driven attachment B
15. Parts ejector (Spring type)
16. Air purge for revolving guide bush
17. Sub spindle air purge unit
18. Sub spindle air blow unit
19. Parts separator
20. Automatic bar feeder interface
21. Work light
22. Leakage breaker

Optional Accessories and Functions

1. Revolving guide bush
2. Rotary magic guide bush unit
3. Collet (Main/Sub)
4. 2-station tool holder (□12mm/□16mm)
5. 4-station tool holder (□12mm/□16mm)
6. Parts conveyor
7. Parts ejector
8. Parts ejector (Spring type rotary ver.)
9. Parts separator unit A
10. Barstock gripping unit
11. Parts ejector with guide tube
12. Parts stopper unit
13. Main spindle inner tube
14. Coolant unit 2.5MPa
15. Coolant unit 6.9MPa
16. Coolant unit 0.7MPa
17. Coolant pipings
18. Coolant flow detector
19. Parts ejection detector
20. Warning light
21. Water separator
22. Compliant with the RS-232C interface
23. Transformer
24. Transformer CE marking version
25. Transformer CE marking specifications

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.

note-1 : ● Measures conforming to ISO standard.
● A-weighted sound pressure is a general assessment standard characteristic that corrected the sound level to human acoustic sense.

※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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