



SWISS TYPE AUTOMATIC LATHE equipped with star motion control system  
CNC SWISS TYPE AUTOMATIC LATHE

# SD-26

series



## STAR MICRONICS CO., LTD.

### Machine Tools Division

1500-34 Kitanoya, Misawa, Kikugawa, Shizuoka, 439-0023 Japan  
TEL.+81-537-36-5594 FAX.+81-537-36-5607

<https://star-m.jp/eng/>

**Star CNC Machine Tool Corporation**  
123 Powerhouse Road, Roslyn Heights, NY11577, U.S.A.  
TEL.+1-516-484-0500 FAX.+1-516-484-5820

**Star Micronics GB Limited**  
Unit 1 Riverlands Business Park Raynesway DERBY DE21 7BZ  
TEL.+44-1332-96-44-55 FAX.+44-1332-96-40-05

**Star Micronics GmbH**  
Robert-Grob-Str.1,D-75305 Neuenbürg, Germany  
TEL.+49-7082-7920-0 FAX.+49-7082-7920-20

**Star Micronics AG**  
Lauetstrasse3,CH-8112 Otelfingen,Switzerland  
TEL.+41-43-411-60-60 FAX.+41-43-411-60-66

**Star Machine Tool France**  
90 Allée de Glaisy,ZI,74300 Thyez Haute Savoie,France  
TEL.+33-450-96-05-97 FAX.+33-450-96-91-54

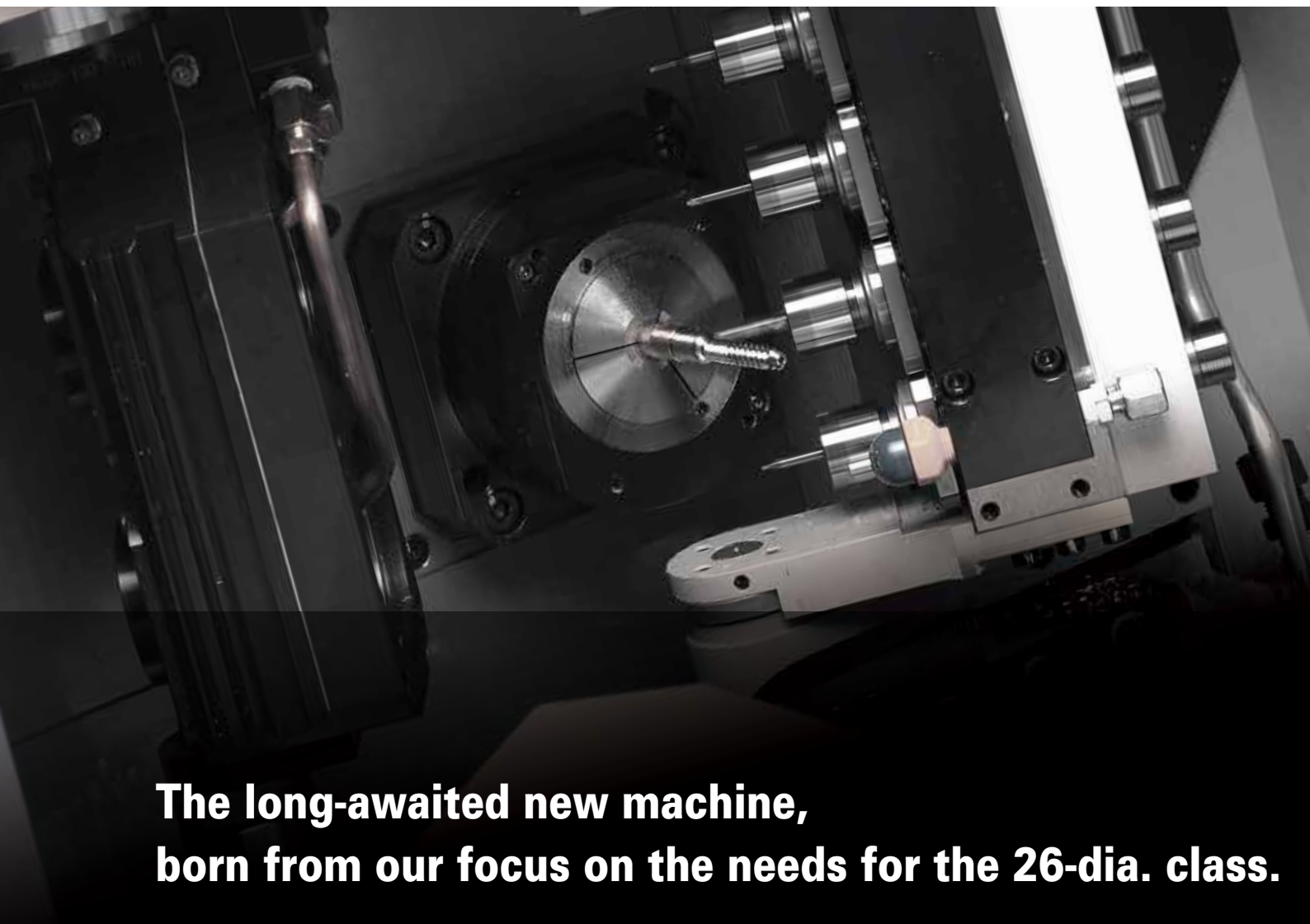
**Shanghai Xingang Machinery Co.,Ltd.**  
2F, 229 Fute Rd.N. The China (Shanghai) Pilot Free Trade Zone  
TEL.+86-21-5868-2100 FAX.+86-21-5868-2101

**Star Micronics (Thailand) Co.,Ltd.**  
289/23 M.13 Soi Kingkaew 25/1, Kingkaew Rd.,T.Rachathewa A.Bangplee Samutprakarn 10540,Thailand  
TEL.+66-2-186-8945-47 FAX.+66-2-183-7845



2023.02\_Ver1.0\_1





**The long-awaited new machine,  
born from our focus on the needs for the 26-dia. class.**

*One inch special*

The SD-26 series is a special machine focused on the 26-dia. machining range.

We collected the opinions of users from around the world, and thoroughly pursued the ideal machine from every element, such as machine rigidity, machining capability, and machine dimensions.

The machine could be optimized for the 26-dia. class with a special design.

Furthermore, we have a lineup of 4 types that perfectly fit various machining conditions.

The machine the industry has long awaited is now here.

Star's One-inch Special machine provides a new stage for complex machining.

CONCEPT & DESIGN ❶

**Optimization of the model configuration**

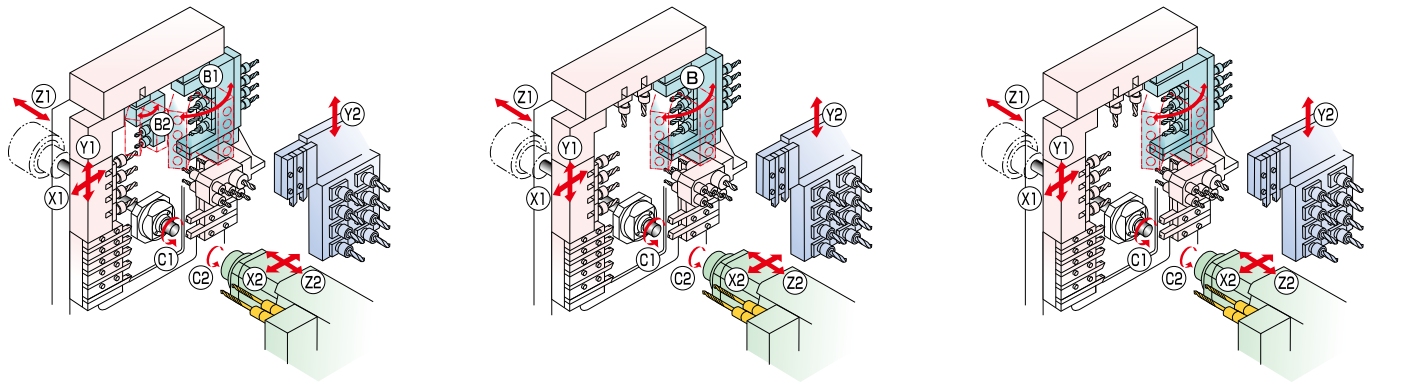
A lineup of 4 models that accurately cover the needs of the 8-dia. to 26-dia. volume zone.

Realizes optimal tooling for a variety of machining conditions.

CONCEPT & DESIGN ❷

**Optimization of machining capabilities**

Machining capabilities are further enhanced with a double B-axis (type S only), high-speed & high-output spindle motor, turning tool of the back-working tool post, deep hole machining support, expansion of the cartridge position, etc.



**Functionality, rigidity, workability... With the special design,  
everything has been leveled up to optimize for the needs of the 26-dia. class.**

CONCEPT & DESIGN ❸

**Optimization of machine rigidity**

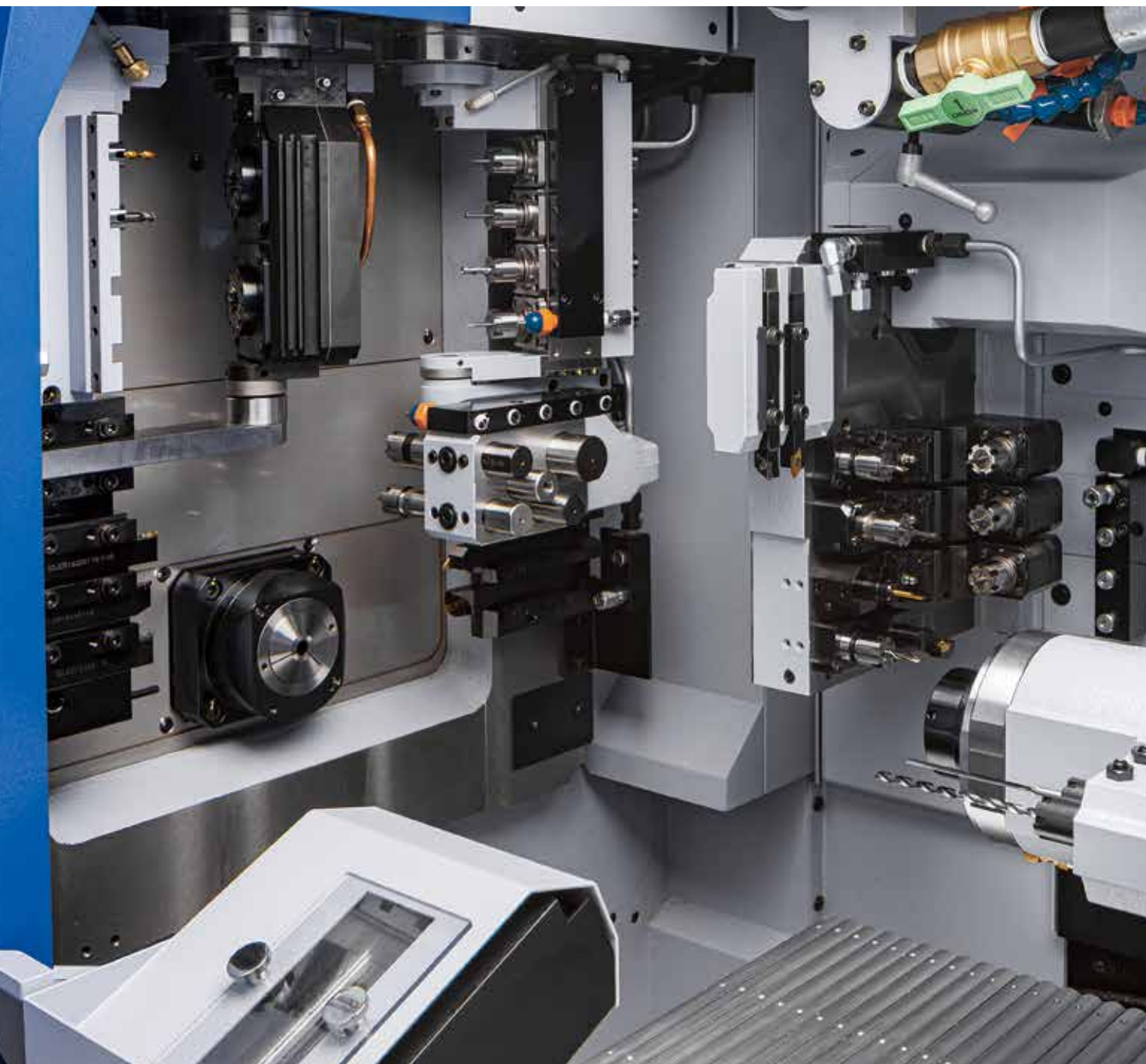
We pursue machine rigidity from every manner of perspectives, such as the platen type tool post employing uniform load cross guide structure, dovetail slide guideway structure of the back-working tool post, strengthening of the drive system of the B-axis, and both ends clamp structure.

CONCEPT & DESIGN ❹

**Optimization of the machine dimensions**

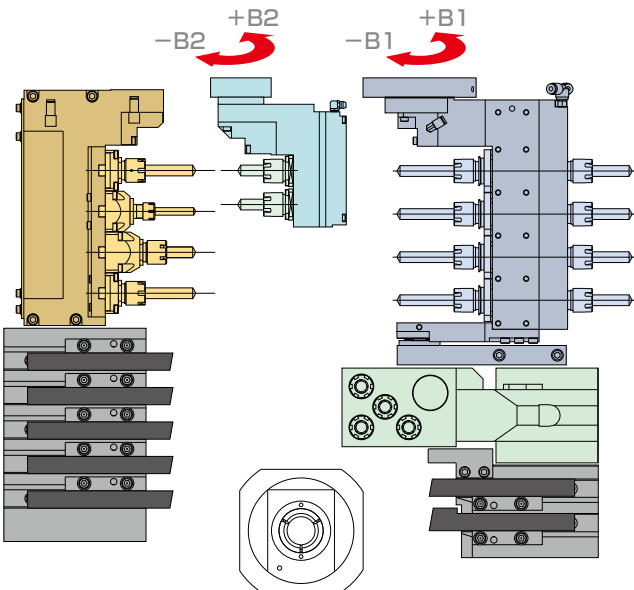
With a special design which has the 26-dia. machining range filtered as the target, the pitch between tools and stroke are optimized, and the machine is designed to the required machine dimensions.

Equipped with star motion control system **Type S**



**Unprecedented high-accuracy complex machining using the double B-axis**

- The 4-spindle counter face unit with B-axis control allows for 135° swivel control
- Drives the various tool units for the 2nd.B-axis, which is controlled simultaneously with the 4-spindle counter face unit, realizing high-accuracy complex machining.



**Tool unit for the 2nd.B-axis**



Twin thread whirling unit



Gear hobbing unit



Thread whirling unit



2-spindle cross drilling unit

**Type S**

**Model equipped with double B-axis (simultaneous 5-axes control)**

|                     |                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------|
| Control method      | Star motion control system (FANUC 31i-B5 Plus)                                                                           |
| Machine composition | ● Main spindle / sub spindle<br>● Gang type tool post (platen type)<br>● 8-spindle back-working unit with Y-axis control |
| Control axis        | ● Main side: X1, Y1, Z1, C1, B1, B2 (synchronized with B1 axis)<br>● Back side: X2, Y2, Z2, C2                           |

❶ 1st.B-axis 4-spindle counter face unit : ER16 (90 to -45°)

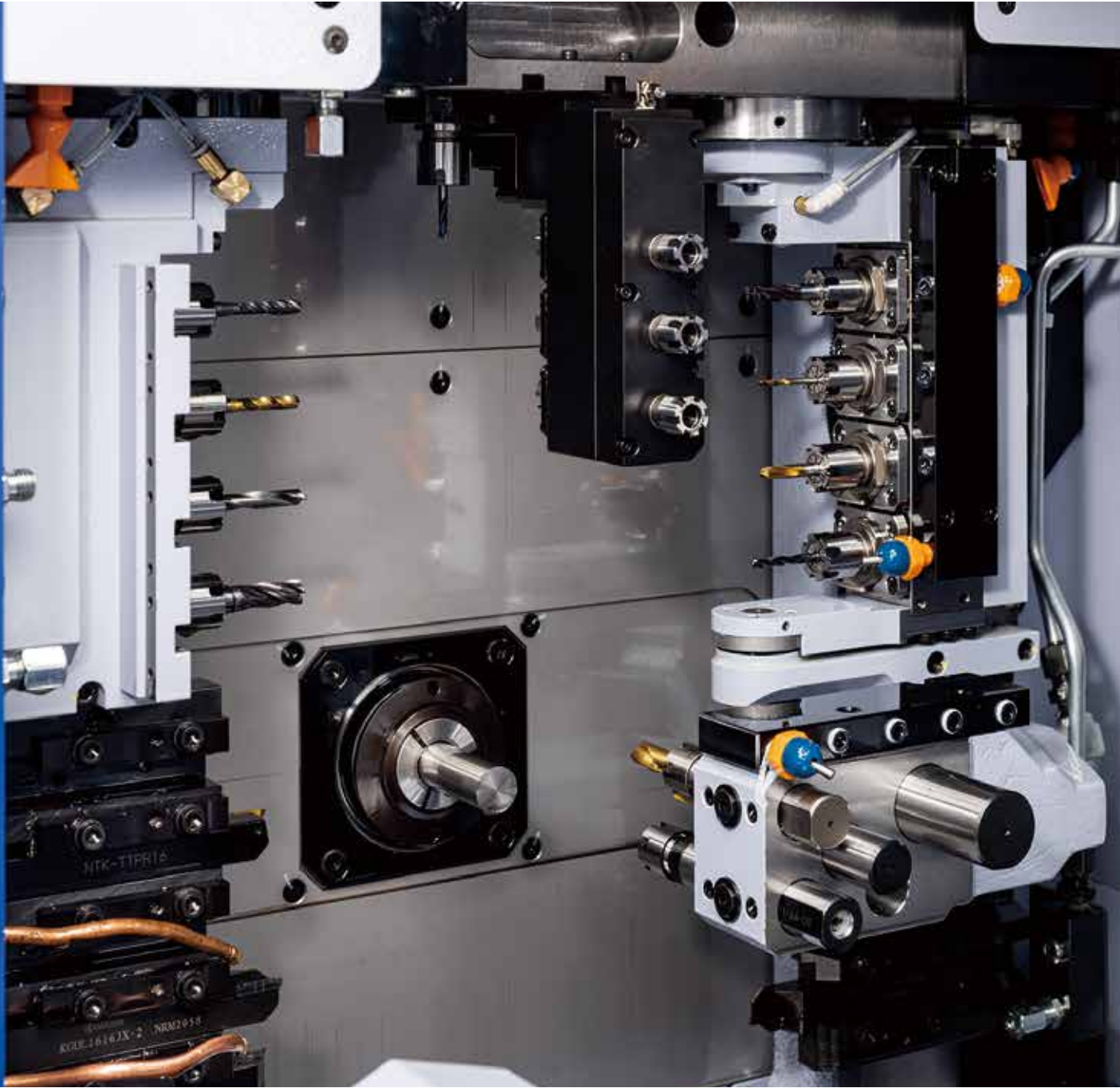
❷ 2nd.B-axis cartridge : 1 pos. (90 to -45°)

❸ Cartridge-type : 4 pos.

❹ Tool holder : 5-tools type (□16 mm)

❺ Sleeve holder : 22-dia. 4 tools / 32-dia. 1 tool

❻ Tool holder : 2-tools type (□16 mm)

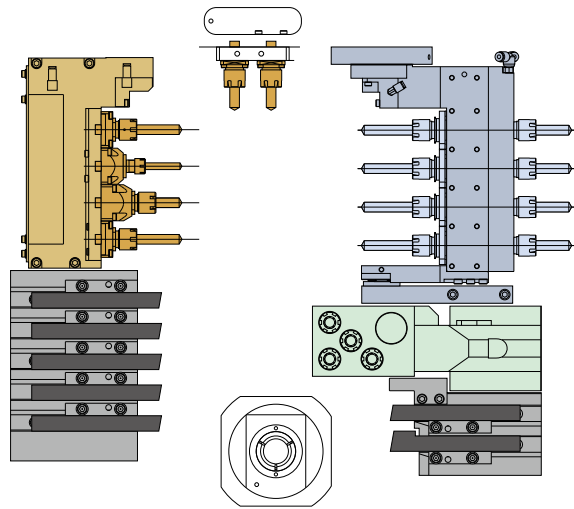


# Design that takes machining capabilities to the limit

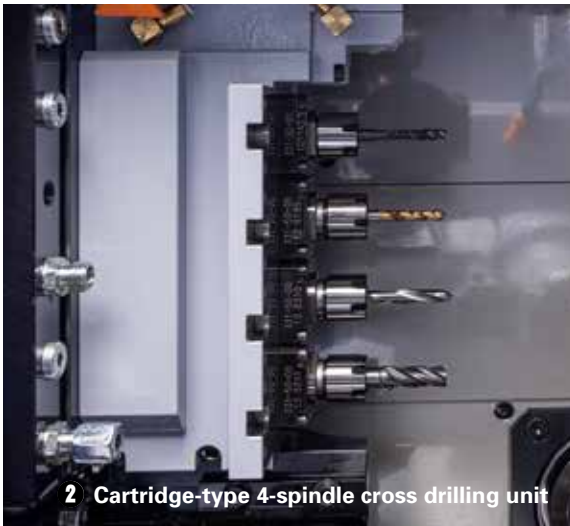
## Diverse cross machining using a wealth of tool units

### Diverse cross machining ① ②

- Equipped with 4-spindle cross-drilling unit in front side of the gang-type tool post
  - Type S** : Cartridge-type 4-spindle cross drilling unit
  - Type G/E/C** : 4-spindle cross milling unit or, Cartridge-type 4-spindle cross drilling unit
- Can mount a cartridge-type unit on the gang-type tool post
  - Type S** : 2nd.B-axis unit 1 pos.
  - Type G/E/C** : Cartridge-type unit 2 pos.



1 4-spindle cross milling unit



2 Cartridge-type 4-spindle cross drilling unit

## Tool unit for cartridge-type position



Milling unit



Quad-speed milling unit



2-spindle face drilling unit / 2-spindle counterface drilling unit



3-spindle face drilling unit / 3-spindle counterface drilling unit



2-spindle front drilling adaptor



Slotting unit



Polygon machining unit



Thread whirling unit

**Type G** Model equipped with B-axis (simultaneous 5-axes control)  
**Type E** Model equipped with B-axis (simultaneous 4-axes control)  
**Type C** Model with angle-adjustable unit

|                     |                                                                                                                       |                                                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Control method      | Type G                                                                                                                | Star motion control system (FANUC 31i-B5 Plus) |
|                     | Type E                                                                                                                | CNC control (FANUC 32i-B Plus)                 |
|                     | Type C                                                                                                                | CNC control (FANUC 0i-TF Plus)                 |
| Machine composition | ●Main spindle / sub spindle<br>●Gang type tool post (platen type)<br>●8-spindle back-working unit with Y-axis control |                                                |
| Control axis        | ●Main side: X1, Y1, Z1, C1, B1<br>●Back side: X2, Y2, Z2, C2                                                          |                                                |

① B-axis 4-spindle counter face unit : ER16 (90° to 45°)  
Manually adjustable 4-spindle counter face unit : ER16 (90° to 45°)

② Cartridge-type : 2 pos.

③ Cross milling 4 tools / Cartridge-type : 4 pos. (selectable\*)

④ Tool holder : 5-tools type (□16 mm)

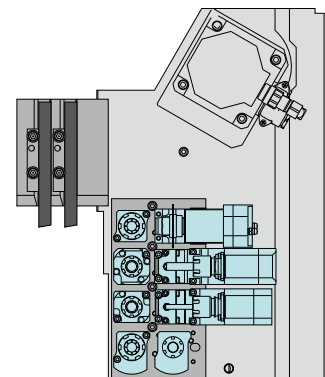
⑤ Sleeve holder : 22-dia. 4 tools / 32-dia. 1 tool

⑥ Tool holder : 2-tools type (□16 mm)

\* 4-spindle cross milling unit (ER16) / Cartridge-type 4-spindle cross drilling unit



## Design that takes machining capabilities to the limit



### Versatile back-working tool post

#### Supports outer diameter turning on the back side ①

2-station type tool holder available as an option for the back-working tool post. Supports needs for outer diameter turning on the back side in large diameter part machining scenarios.

#### Diverse complex machining on the back side

The power-driven tool unit can be mounted on all positions of the Y2-axis controlled back-working tool post (8-spindle type). Various power-driven tools such as cross drilling and slotting are available for expanded machining capability.



Drill sleeve



Bowling sleeve



Quad-speed milling unit



Oil-through type back working drill unit



Milling unit



Cross drilling unit



Slotting unit

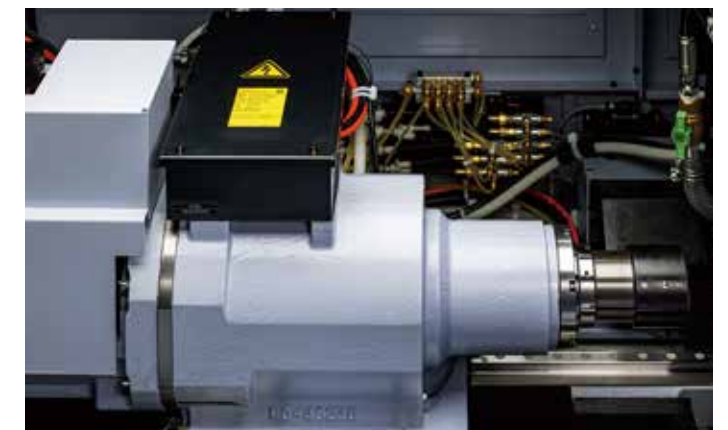
### High-spec spindle

#### High-output spindle motor

Equipped with high-output spindle on both the main and back sides, obtaining power equivalent to 30-dia. class. This realizes drilling capability of 13-dia. and tapping capability of M12.

#### High-speed rotation of 10,000 min<sup>-1</sup>

Realizes main spindle speed of up to 10,000 min<sup>-1</sup>. Achieves high-speed, high-precision large-diameter machining with a well-balanced design that does not cause rotational runout even for large-diameter workpieces with a large moment of inertia.



### Supports needs for high-pressure coolant and deep-hole machining

#### Coolant through tool holder

The coolant through type tool holder is optionally available. Support for chip removal using high-pressure coolant.

#### High-capacity coolant tank

Even when using a high-pressure coolant unit where a large amount of cutting oil is discharged, secure sufficient coolant capacity that can supply sufficient circulation.

#### High-pressure coolant piping

Various optional piping for the coolant for high pressure is available as a measure for high-pressure, and ultra-high pressure coolant.

#### Product lengths of up to 160 mm are possible.

Optional product separator available for long product support. Can discharge products up to 160 mm (\*) inside the machine. \*Standard specification : Max. 80 mm

#### G.B./N.G.B. switching mechanism

Use the guide bush specification (G.B.) to process long workpieces with high accuracy while preventing deflection. Use the non-guide bush specification (N.G.B.) to process short workpieces while significantly reducing the stock waste. By switching the guide bush/non-guide bush, you can select the optimal specification for full-length dimensions of machining parts on a single unit.

#### Deep-hole machining-compatible sleeve holder

Equipped with 2-spindle sleeve holder for deep hole processing alongside the sub spindle. Realizes deep-hole drilling of up to 10-dia. and depth of 100 mm.



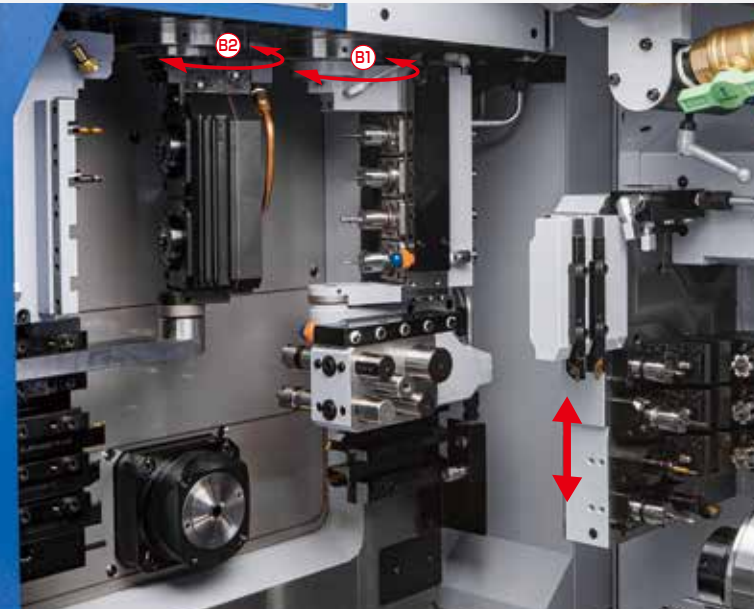
# Highly rigid and precision design

## Tool post structure with high rigidity

### Platen type tool post employing uniform load cross guide structure

The platen type tool post incorporates a tool post with 8 linear bearings arranged uniformly around the point (= guide bush) where a cutting load is applied. By distributing the cutting load to 8 guide bearings at all times, the moment load applied to each guide bearing is minimized and rigidity of the tool post is improved.

Thanks to high dynamic stability, continuous operation is possible for a long time with stable accuracy and longer service life of the linear guide bearing is ensured.



## B-axis holding rigidity

### Rigidity of the 4-spindle counter face unit (Type S/G/E)

The 4-spindle counter face unit employs a structure for holding the upper and lower ends, together with a motor and decelerator for B-axis control on one grade.

### Holding rigidity of the 2nd.B-axis unit (Type S)

A brake mechanism is employed on the 2nd.B-axis side unit of Type S to secure sufficient holding rigidity when swivel machining.

### Dovetail guide surface of Y2-axis sliding

A dovetail guide surface is employed for the sliding section of the Y2-axis of the back tool post. This greatly improves tool post rigidity and suppresses deflection and vibration due to the cutting load.

## Measure for thermal displacement

### Thermal displacement correction feature

In the thorough pursuit of structural machine accuracy, equipped with the thermal displacement feature, which provides for even higher precision machining at a higher dimension. Flexible automatic thermal displacement correction is realized based on real time thermal expansion data fed back from the thermal sensors arranged on each part of the machine, including the pedestal frame.

### Back tool post arranged at the rear

By arranging the back tool post at the rear of the machine, machining is possible with a short X2-axis ball screw.

This improves the rigidity when machining at the back side, and minimizes the impact of thermal displacement.

## Indexing accuracy

### Built-in spindle

A built-in spindle is employed on both the main and sub spindles. The main axis indexing accuracy is greatly improved by using a built-in sensor.



## Arrangement for improved workability of the cutting chamber

The machine has been reconfigured for improved accessibility to the guide bush and tool post. Furthermore, the workability of setup has been greatly improved, such as by vertically laying out the spindle arrangement on the back tool post at the rear of the cutting chamber.

## Front-side arrangement of the maintenance device

Realizes more simplified day-to-day tasks by arranging maintenance equipment such as the main breaker, lubrication device, and pneumatic device at the front of the machine.

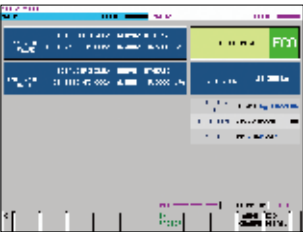


Design with excellent workability

# Control system design that changes productivity

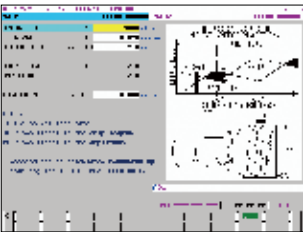
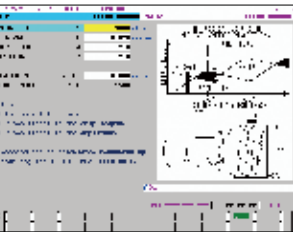
## Eco mode feature

Use eco mode to reduce power consumption by interrupting the Fanuc Amp power, etc., which is not needed during standby. In addition to the display of power consumption and cumulative power consumption for the machine as a whole, including peripherals, you can also check CO2 emissions, on the power consumption screen.power consumption screen.



## Chip cutting system Stepcycle Pro. (option)

A new generation chip cutting system that can be operated with ease with simple NC operations. The use of vibration cutting to finely cut and dispose of chips during machining prevents chips from becoming tangled up with the workpiece.



## Star Motion Control System

Type S/G

This control system converts the NC program through “optimization” and finishes processing related to switching of the control system in order to enable “tool selection for the next process and approach during cutting” and “tool disengagement and next cutting at the same time”.

By this control method, the non-cutting time, which is considered to be a disadvantage for NC-controlled machines, is largely reduced and contributes to improved productivity. - Furthermore, this control system moves each axis while taking the shortest way, utilizing the previous cutting process time to minimize excessive vibration caused by axis feed and contributes to the maintenance of stable machining accuracy.

## Concept of reduction of non-cutting time

