

# ***SPEEDIO*** **H550Xd1**

**Horizontal  
Compact Machining Center**



**Machine Tools Sales Department,  
Machinery Business Division,  
Brother Industries, Ltd.**

# ***SPEEDIO* H series**

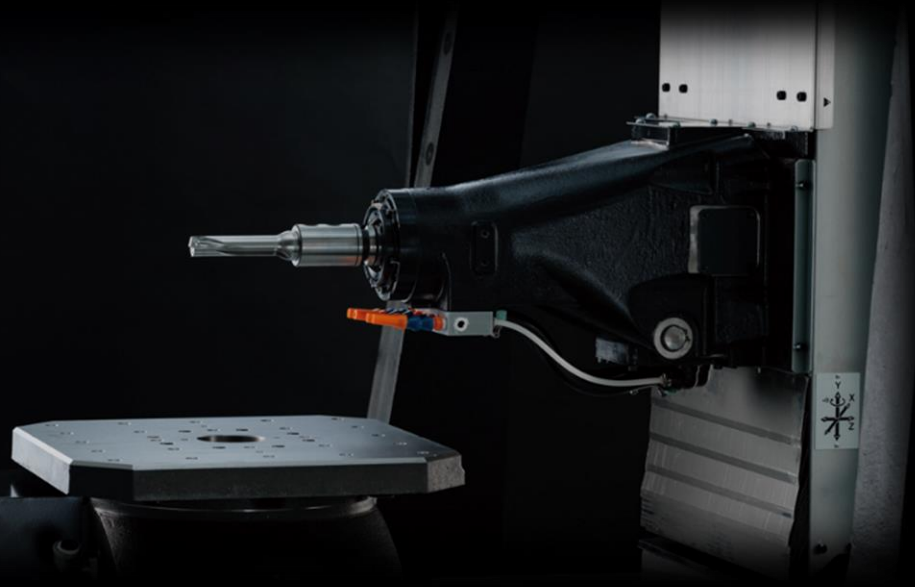
## Introduction of **H550Xd1**

1. Description of ***SPEEDIO***
2. Outline and Concept
3. Performance and Features
4. Machining Demonstration

# Cutting Out the Waste

Times are changing. Are you ready?  
You need a machine that's fast and compact.  
With the ability to make any cut.  
In this world, only the strong survive.  
Make it better with SPEEDIO.

***SPEEDIO***



# *SPEEDIO*

**SPEEDIO is a brand of No. 30 machine for customers who demand high productivity, which has high machining ability while having compactness and speed not found in No. 40, and is eco-friendly.**

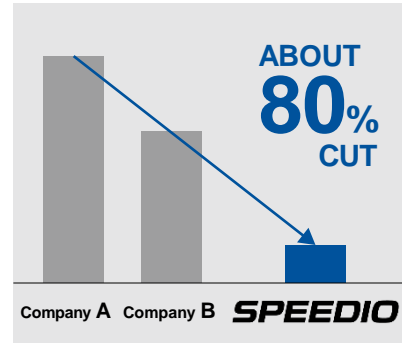




## **SPEEDIO** for the Environment Looking to Achieve Carbon Neutrality

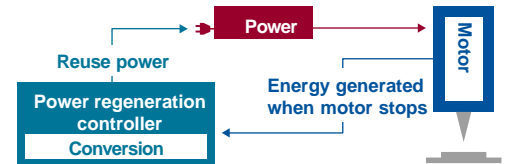
While retaining the #30 spindle, and based on Brother's original technology, the **SPEEDIO** strives for industry-leading environmental performance, in addition to overwhelming high productivity, machining capabilities, and usability.

When machining is performed by replacing a general #40 machining center with the **SPEEDIO**



### Power-Saving Functions

#### Power Regeneration system



#### Power consumption application



- LED work light
- Coolant automatically turns OFF
- Standby mode
- Machine light automatically turns OFF
- Display automatically turns OFF
- High efficiency pump, etc.

# H

## SPEEDIO

### H550Xd1

Horizontal  
Compact Machining Center



**S** Compact Machining Center  
**S300Xd1**  
**S500Xd1**  
**S700Xd1**



**W** Wide Travel Compact Machining Center  
**W1000Xd2**



**M** Compact Multi-Tasking Machine  
**M200Xd1**



**R** Pallet Changing Compact Machining Center  
**R450Xd1**  
**R650Xd1**



**U** Universal Compact Machining Center  
**U500Xd1**



**F** High Rigidity Compact Machining Center  
**F600X1**



Special Options  
**T-200Ad/ BV7-870Ad**  
**T-200A**





## 2. H550Xd1 Outline and Concept

## Market environment changes

In response to a shift to EVs in the automobile industry, reducing weight and consolidating functions has accelerated.

- **Parts have become larger.**
- **Medium- to large-size die-cast workpieces that require multi-face machining have increased.**
- **Product cycle has shortened greatly.**

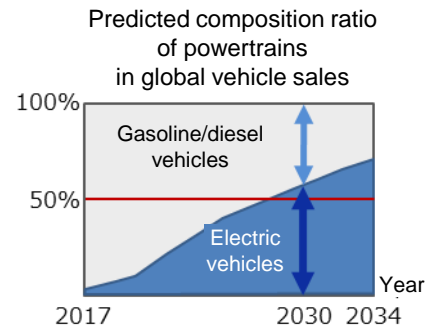
**Needs for process integration have increased.**

## Persistent demand for horizontal machining centers

There are cases where horizontal machining centers are used because of the special advantages provided by the horizontal structure.

- **Excellent chip evacuation at machining points**
- **Multi-face machining of long workpieces possible by installing the B-axis**
- **Enables narrow layouts**

**Stable needs for horizontal machining centers**



\* Electric vehicles include EV, PHV, HV, and FCV.  
[Source] Created based on data provided by LMC Automotive Ltd.

<https://www.marklines.com/ja/forecast/index>





## Selection currently available

### Horizontal machining centers

- **Expensive** large machine, **overengineering** for mass production
- Small machine developed for specialized lines, **lacking general versatility**

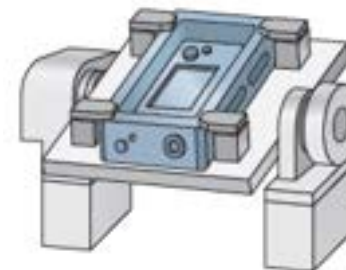
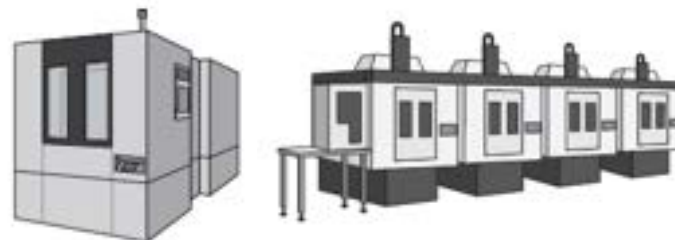
### Vertical machining centers

- For workpieces that occupy a large turning diameter, a **#40 machine** is needed, **which requires large installation space** accordingly.
- **Many manhours** needed to consider mounting an **additional axis** to enable multi-face machining.



## Ideal machine

**Compact horizontal machining center with high general versatility appropriate for multi-face machining of medium- to large-size workpieces**



Manhours to consider mounting additional axis

- Selection of rotary axis
- Spacers for mounting rotary jig
- Reduction in weight

# ***SPEEDIO* H550Xd1**

Highly productive horizontal machining center with consistent SPEEDIO concept

Space-saving  
Machine width 1,560 mm



B-axis provided as standard



Direct ATC type  
high-speed 30-tool magazine



## Overall specifications

Compact Machining Center  
**SPEEDIO**

# H550Xd1



Travels X / Y / Z	550 mm / 400 mm / 400 mm
Jig area (turning diameter x height)	Φ600 x 580
Max. loading capacity / Inertia	300 kg / 5.4 kg·m <sup>2</sup>
Max. spindle speed	12,000 min <sup>-1</sup> / 10,000 min <sup>-1</sup> high torque (optional) / 16,000 min <sup>-1</sup> (optional)
Tool storage capacity (pcs.)	30
Spindle options	BT dual contact spindle Coolant Through Spindle (CTS) Max. 3 MPa / Max. 7 MPa *1

\*1 Only piping is provided when 7 MPa is selected.

### Large jig area that enables handling of long workpieces

As parts are becoming larger, the jig area of #30 vertical machining centers is not sufficient.



The H550Xd1 provides ample jig area of  $\Phi 600$  mm ( $\Phi 800$  mm<sup>\*1</sup>).  
Large workpieces can be mounted.

\*1. The tool must be moved to a safe position when the B-axis rotates or the tool length is restricted.

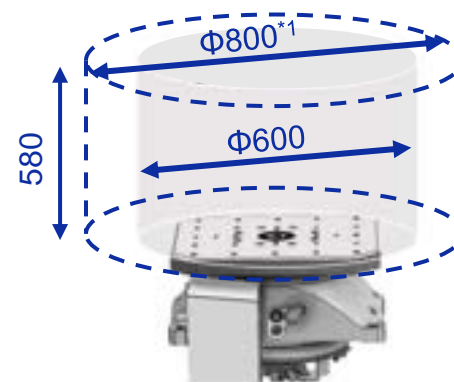
### Newly developed 30-tool magazine available

As parts are becoming complex, the number of tools set is often insufficient.



Space saving while installing a 30-tool magazine.

Jig area  $\Phi 600$  ( $\Phi 800$ ) x 580



Machine width: 1,560 mm

## Multi-face machining of mainly die cast parts, using large jig turning diameter



EV Gear box housing  
Aluminum alloy  
450×310×125



EV Gear case  
Aluminum alloy  
470×420×200



Aluminum wheel  
Aluminum alloy  
φ550 x 230



ABS valve housing  
Aluminum alloy  
90 x 70 x 30



Inverter case  
Aluminum alloy  
400×245×100



Battery case  
Aluminum alloy  
500×320×100



Steering rack housing  
Aluminum alloy  
520×170×130

# 3. H550Xd1 Performance and Features

### 3. H550Xd1 Performance and Features



#### ① Tool magazine

Direct ATC type 30-tool magazine  
Magazine chamber separation structure



#### ② Spindle

12k, 10k high-rigidity spindle  
Coolant Through Spindle Max. 7 MPa (optional)

#### ③ Machining capability

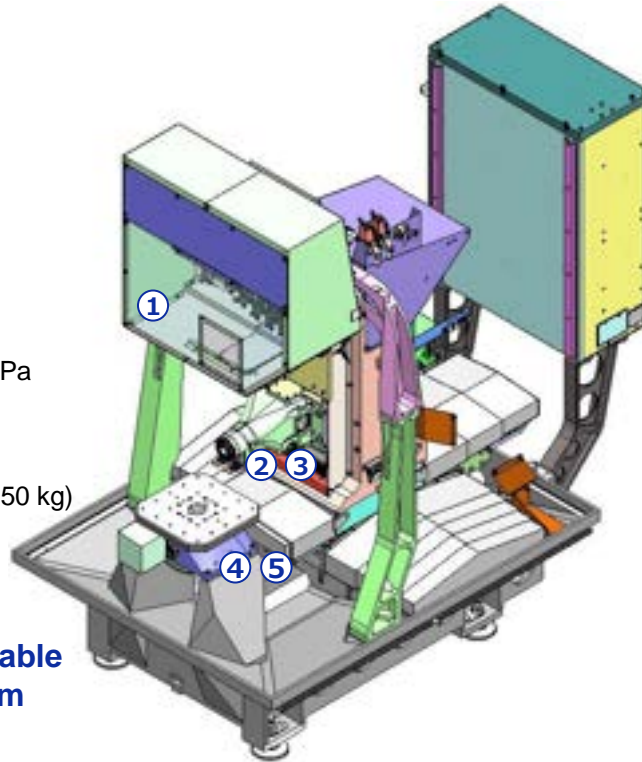
Max. tool weight 4 kg (Total weight 50 kg)

#### ④ Table

Table loading capacity 300 kg

#### ⑤ Equipped with a B-axis table that uses a roller gear cam

Achieves high-speed indexing



#### Controller CNC-D00



### 3. H550Xd1 Performance and Features



**Extensive  
Machine Performance** \_\_\_\_\_

**Pursuit of  
High Productivity** \_\_\_\_\_

**Advanced  
D00 Control** \_\_\_\_\_

**Achievement of  
Reliable Production** \_\_\_\_\_



### 3. H550Xd1 Performance and Features



**Extensive  
Machine Performance**

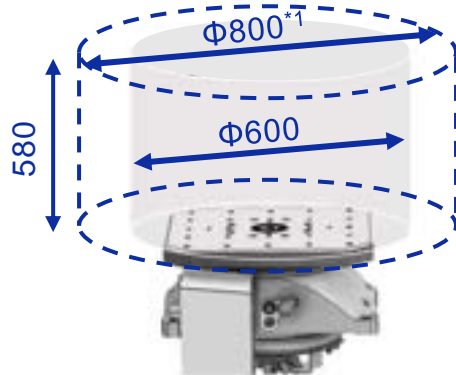
**Pursuit of  
High Productivity**

**Advanced  
D00 Control**

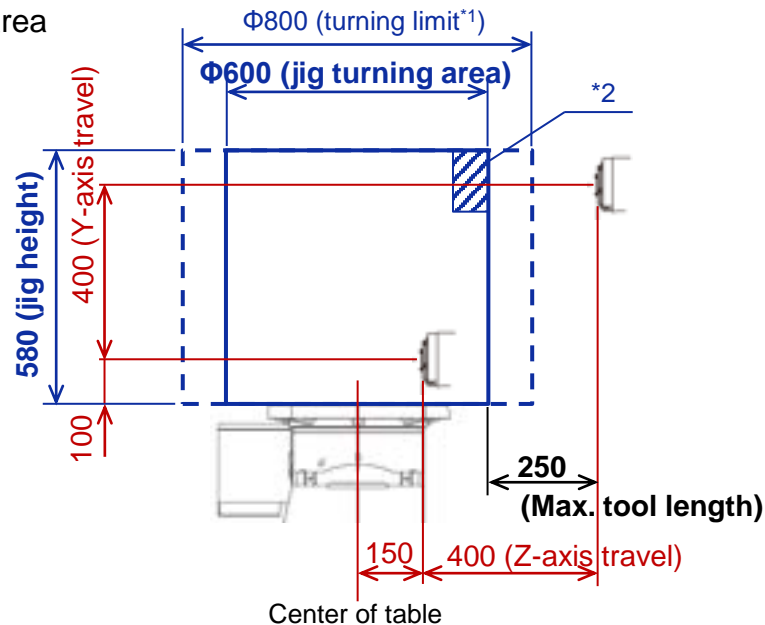
**Achievement of  
Reliable Production**

## Standard B-axis table and horizontal spindle structure secure ample jig area

Jig mounting area



Travel area



Jig mounting area	$\Phi 600 \text{ mm } (\Phi 800 \text{ mm }^{*1}) \times 580 \text{ mm}$
Travels	X 550 mm $\times$ Y 400 mm $\times$ Z 400 mm
Max. loading capacity	300 kg
Max. inertia	$3.4 \text{ kg} \cdot \text{m}^2$ ( $5.4 \text{ kg} \cdot \text{m}^2$ /high inertia mode)

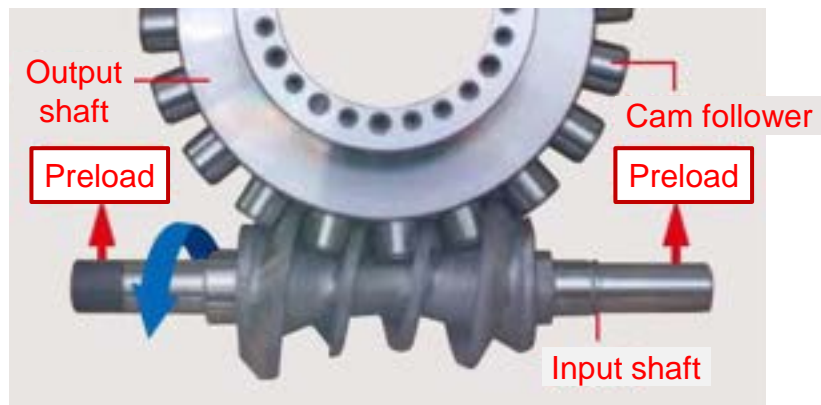
\*1. The tool must be moved to a safe position when the B-axis rotates or the tool length is restricted.

\*2. Interference area when changing the largest tool

(When tool diameter is 125 mm and tool length is 250 mm)

## Roller gear cam used for B-axis

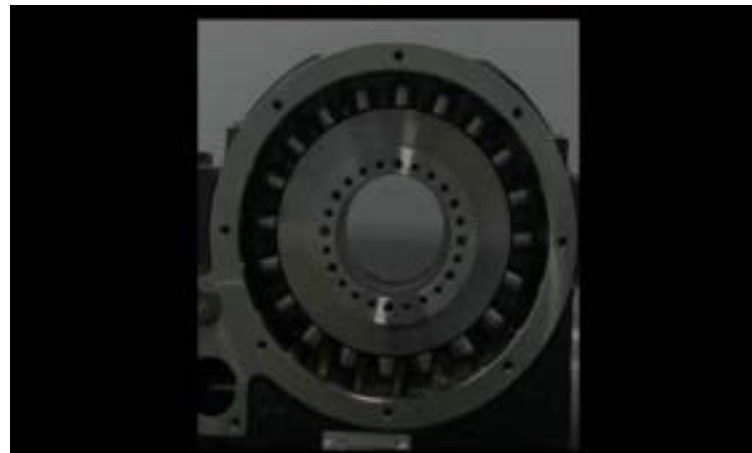
**Achieves backlash-free operation, high rigidity, and high-speed indexing. As there is very little abrasion, adjustment is not necessary.**



Max. B-axis rotary speed	100 min <sup>-1</sup> *1
B-axis clamp torque	670 N·m *2

\*1. Value in standard inertia mode

\*2. Value of mechanical clamp (at pneumatic 0.5 MPa) plus servo clamp



## Spindle lineup

Ample lineup of spindles that can be selected according to machining purpose

<b>Max. spindle speed (min<sup>-1</sup>)</b>	<b>12,000 (standard)</b> <b>16,000 (optional)</b> <b>10,000 high torque (optional)</b>
<b>Spindle taper</b>	<b>BT</b> <b>BT dual contact (optional)</b>

The bearing diameter of the high-torque spindle is the largest among SPEEDIO models.

This enables the machine to demonstrate high machining capabilities from highly efficient machining to heavy-duty machining.

CTS Max. 7 MPa



Coolant Through Spindle (CTS) can be selected from 3 MPa or 7 MPa as an option.

This helps provide excellent performance in high-speed drilling or deep-hole drilling.

## Newly developed direct ATC type 30-tool magazine

Supports maximum tool length of 250 mm, maximum tool diameter of 125 mm, and maximum tool weight of 4 kg, enabling a variety of machining, including long workpieces.



30-tool magazine specifications	
Max. tool length	250 mm
Max. tool diameter	125 mm*1
Max. tool weight	4 kg

\*1. When attaching an adjacent tool, the total diameter of the adjacent tool must be within 130mm.

## Space saving

Machine dimensions are 1,557 mm in width and 2,990 mm in depth, achieving reduction in space while maintaining ample jig and machining areas.



\*2. Dimension including coolant tank

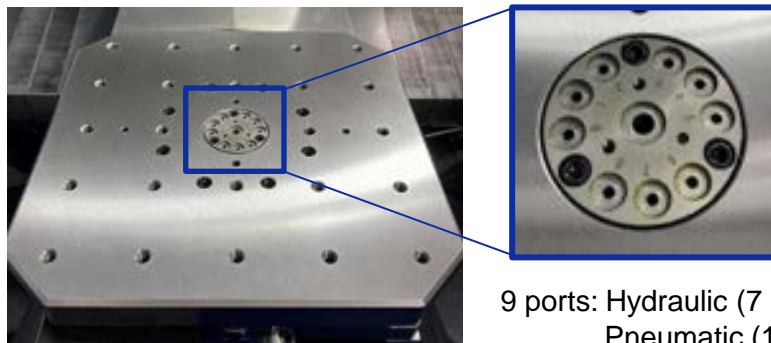
\*3. Compared to #40 horizontal MC with equivalent travels

## Jig mounting example

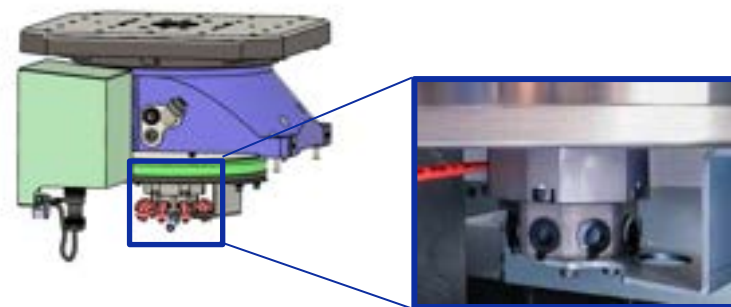
Achieves highly efficient machining of large or long workpieces by fully utilizing features of highly productive #30 horizontal machining centers.

## Rotary joint

The rotary joint with 9+1 ports is built into the B-axis, making jig mounting easier.



9 ports: Hydraulic (7 MPa) /  
Pneumatic (1 MPa)  
1 port (center): Coolant



### 3. H550Xd1 Performance and Features



Extensive  
Machine Performance

Pursuit of  
High Productivity

Advanced  
D00 Control

Achievement of  
Reliable Production

## High-speed B-axis indexing and inertia estimation function

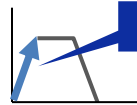
A roller gear cam mechanism is used for the B-axis table to achieve high-speed indexing.

In addition, an inertia estimation function controls acceleration optimally according to the level of inertia. This improves productivity.

B-axis table indexing time*1	
0→90°	1.0 s
0→180°	1.1 s

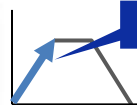
\*1. Value in standard inertia mode

Low inertia



Starts with high acceleration

High inertia



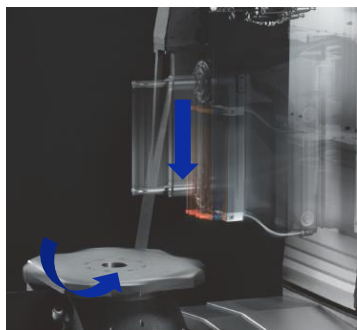
Starts with low acceleration





## Simultaneous operation

Wasted time has been reduced by simultaneously performing tool change and B-axis indexing.



## High-speed tool change

Fast acceleration/deceleration and optimized operation achieve high-speed tool change.

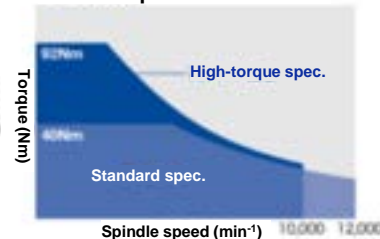
Tool change time
T-T : 1.1 s C-C : 2.4 s

## Highly efficient and fast acceleration/ deceleration spindle motor

The machine is equipped with a highly efficient spindle motor, such as the newly developed 12,000 min<sup>-1</sup> spec. motor (standard) or 10,000 min<sup>-1</sup> high-torque (max. 92 N•m) spec. motor (optional).

As the spindle can provide high torque in the medium- and high-speed range, the machine fully demonstrates its capabilities in high-speed and highly efficient machining of aluminum or steel.

Motor torque characteristics



Spindle start/stop time

0.15 s or less \*1

\*1. Value of high-torque spec.

12,000 min <sup>-1</sup> (standard)			
Max. torque	40 N•m	Max. output	18.9 kW
10,000 min <sup>-1</sup> high torque (optional)			
Max. torque	92 N•m	Max. output	26.2 kW

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## Consolidated access on new “home screen”

**Cycle time**  
Remaining time can also be displayed

**Workpiece counter**  
Workpiece counters enabled in program are displayed

**Tool life**  
5 tools are displayed in order of shortest life.

**Support apps keys**

### Home screen

**Program**

**Shortcut keys**

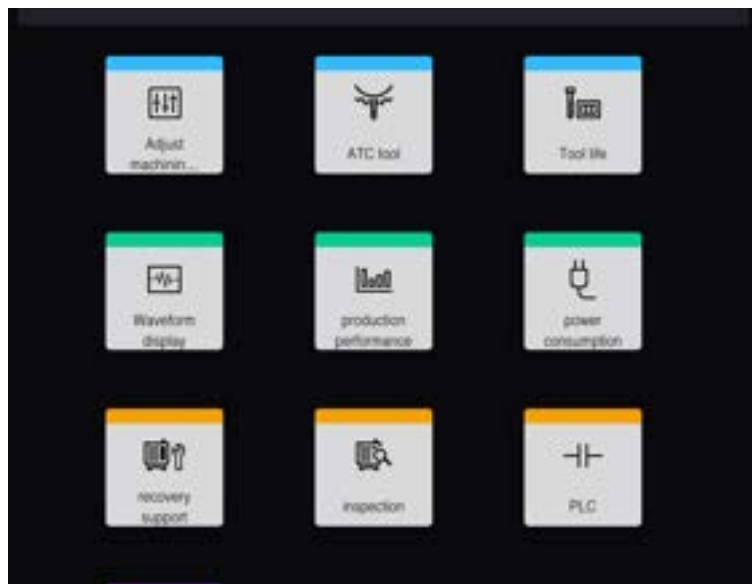
## Previous Screen

Can be changed to the previous screen that users may be more familiar with.

相対座標位置		絶対座標位置		ロードモニタ	
X	-300.000	X	-400.000	主軸	100
Y	-300.000	Y	-400.000	X	100
Z	-50.000	Z	430.000	Y	100
QT	0.000	QT	0.000	Z	100
A	0.000	A	0.000	A	100
B	0.000	B	0.000	主軸回転数	7000 min <sup>-1</sup>
C	0.000	C	0.000	送り速度	1000
A	0.000	A	0.000	安全	安全
B	0.000	B	0.000	プログラムの実行	実行
C	0.000	C	0.000	プログラムの停止	停止
A	0.000	A	0.000	プログラムの再開	再開

## Advanced user interface

Equipped with new “support apps” to help users with everyday tasks



### More visibility

Production performance



Operational performance



Power consumption

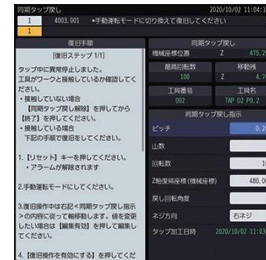


### Task support

ATC tools



Recovery support / Check



Shorten cycle time settings



## Many new convenient functions added

### ■ Tap override

Spindle or cutting **override enabled** during tapping

\* **Also enabled during tap return, a recovery operation**

\* Cannot be used for end mill tapping (G177/178)

### ■ Cycle time log

Keeps the most recent **20 records** for cycle time

### ■ Tool log

After selecting a record from the cycle time log, the **cutting time of each tool** in that program **can be displayed.**

### ■ Additional functions

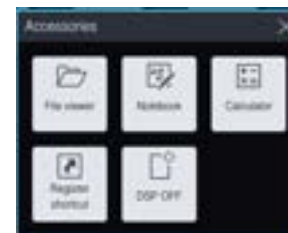
- Accessories
- Multiple skip
- Program restart from automatically saved position
- Time measurement for specified section
- Load monitoring to predict and display overload
- Multiple block support in MDI operation
- External sub program call
- Added new ST/FBD languages to built-in PLC

No.	Tool No.	Cutting time
1.0	1.0	00:00:00.0
1.1	1.0	00:00:00.0
1.2	1.0	00:00:00.0
1.3	1.0	00:00:00.0
1.4	1.0	00:00:00.0
1.5	1.0	00:00:00.0
1.6	1.0	00:00:00.0
1.7	1.0	00:00:00.0
1.8	1.0	00:00:00.0
1.9	1.0	00:00:00.0
1.0	1.0	00:00:00.0
1.1	1.0	00:00:00.0
1.2	1.0	00:00:00.0
1.3	1.0	00:00:00.0
1.4	1.0	00:00:00.0
1.5	1.0	00:00:00.0
1.6	1.0	00:00:00.0
1.7	1.0	00:00:00.0
1.8	1.0	00:00:00.0
1.9	1.0	00:00:00.0
1.0	1.0	00:00:00.0

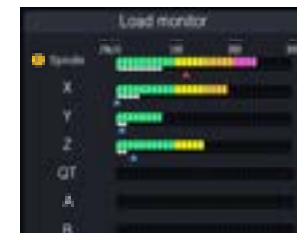
Cycle time log

No.	Tool No.	Cutting time
1	1	00:00:00.0
2	2	00:00:00.0
3	3	00:00:00.0
4	4	00:00:00.0
5	5	00:00:00.0
6	6	00:00:00.0
7	7	00:00:00.0
8	8	00:00:00.0
9	9	00:00:00.0
10	10	00:00:00.0

Tool log



Accessories



Load monitor

## Hardware specifications upgrade

### ■ Faster block processing speed

Block processing speed increased fourfold

### ■ Increased look-ahead blocks in high accuracy mode B

Standard 40 → **160**

Optional 200 → **1,000**

### ■ Increased memory capacity and workpiece coordinate zero point settings

◎ Memory capacity

Standard 100MB → **500 Mbytes**

Optional 500MB → **3 Gbytes**

(Number of files that can be registered: 4000 for either)

◎ Extended workpiece coordinate zero point settings

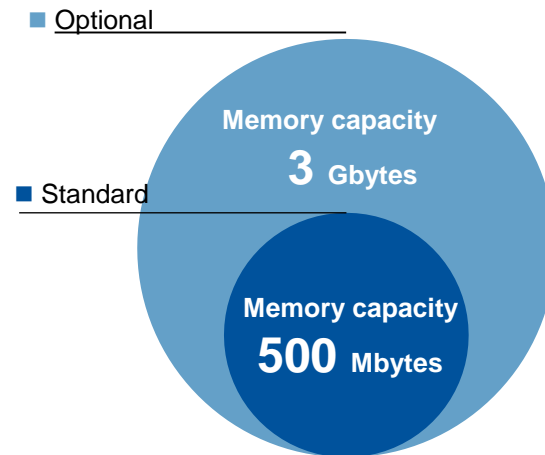
48 → **300**

### ■ Doubled tool data capacity

99 → **198**

Units of tool life can be set to seconds.

Example of three-dimensional machining workpiece

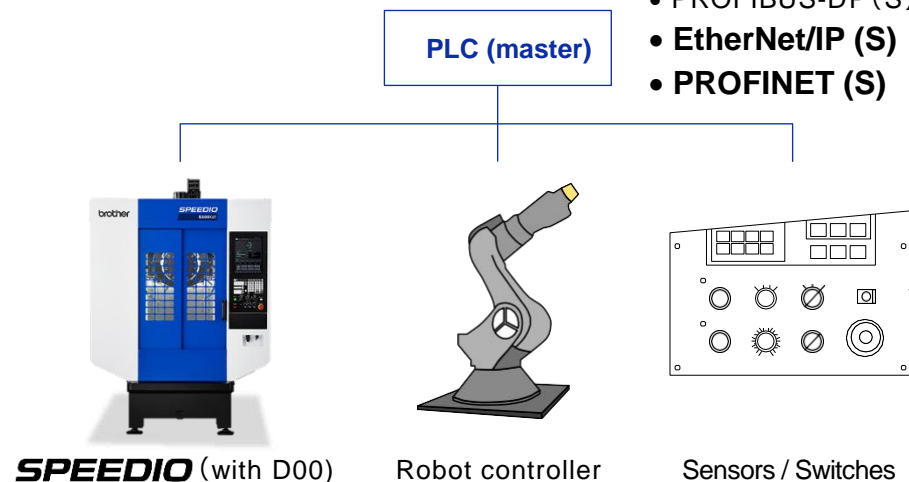


\* Data compared to CNC-C00

## Added compatible standards

Added 2 types of industrial Ethernet to fieldbus networks:  
Ethernet/IP and PROFINET,  
making the connection easier for users.

- CC-Link (M/S) \*1
- Device Net (S)
- PROFIBUS-DP (S)
- **EtherNet/IP (S)**
- **PROFINET (S)**



## Also compatible with OPC UA

Users can connect the machine directly to other companies' monitor software that is compatible with OPC UA.



\*1. PLC (Master) is not necessary for CC-Link (Master).

\*2. All fieldbus networks are optional. Only one type can be selected.

### 3. H550Xd1 Performance and Features



Extensive  
Machine Performance

Pursuit of  
High Productivity

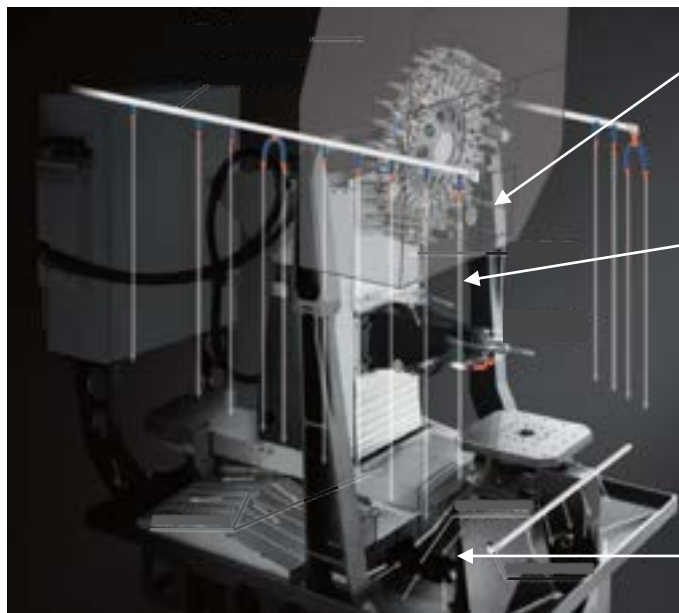
Advanced  
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Achievement of  
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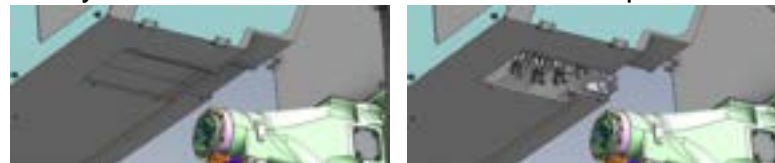
## Chip evacuation performance

Designed to enhance chip evacuation performance to prevent problems caused by chips.



### Magazine chamber separation structure

The magazine chamber is separated from the machining area by a shutter to minimize the effect of chips on tools.



### Head shower (optional\*1)

A head shower is available to remove chips from the spindle head.



\*1. Provided with head coolant nozzle

### Center trough

The inclined base and the center trough structure effectively evacuate chips that fall on the base to the outside of the machine.

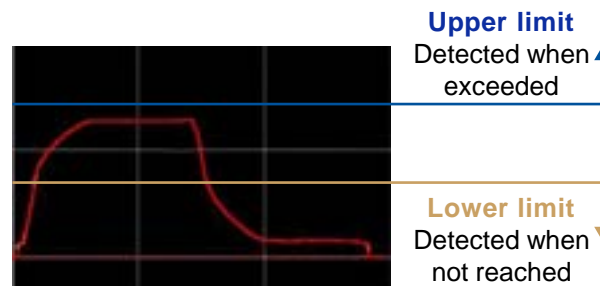
## ATC monitoring function

Checks problems due to omission of tool attachment or incorrect attachment before and after tool change without using a sensor.



## Machining load monitoring function

Detects increase in machining load  
Prevents outflow of defective workpieces, such as re-machining of the same workpiece.



## Environmental performance

**Provides excellent environmental performance, including low power and air consumption, to achieve carbon neutrality**

### Low power consumption

In addition to the low inertia spindle and highly efficient spindle motor, the machine is equipped with various energy saving functions to lower power consumption.

### Power regeneration system

Reuses the energy generated when the servomotor decelerates.

### Highly efficient spindle motor

### Energy-saving pump

### LED work light

### Energy-saving NC functions

- Automatic coolant off
- Automatic work light off
- Standby mode
- Automatic power off

### Power consumption app

Current and past power consumption can be checked.

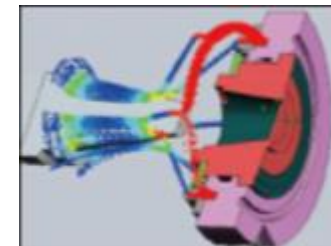


### Low air consumption

Air related functions have been reviewed and optimized to eliminate any waste, leading to reduction in air consumption.

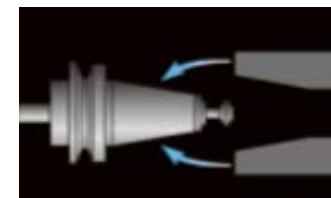
### Air purge

A highly airtight structure achieved through repeated flow rate analysis reduces the amount of air used.



### Spindle air blow

Amount of air used is reduced by discharging three times the conventional volume of air only when required.



## Basic Specifications



Item		Specifications
Spindle	Tapered hole	BT30 / BBT30 (Optional)
	Spindle speed	min <sup>-1</sup> 12,000 / 16,000 (Optional) / 10,000 High torque
	CTS piping	Max.3 MPa / Max. 7 MPa (Piping only) *1
ATC unit	Tool storage capacity	pcs. 30
	Max. tool length	mm 250
	Max. tool diameter	mm 125 *2
	Max. tool weight	Kg/pc. 4
Travels	X / Y / Z axis	mm 550 / 400 / 400
	Jig area (Dia. x height)	mm Φ600 x 580
Rapid traverse rate	X / Y / Z axis	m/min <sup>-1</sup> 50 / 56 / 56
	B axis	min <sup>-1</sup> 100 (85) *3
Table	Work area size	mm □400
	Max. loading capacity	kg 300
Machine dimensions	Width x depth (Does not include the coolant tank.)	mm 1,557 x 2,743
CNC Unit	-	CNC-D00

\*1. Max. 7 MPa spec is only for BT dual spindle spec.

\*2. Total diameter of the adjacent tool must be within 130mm.

\*3. High inertia mode

## 1. Aluminum cutting demonstration

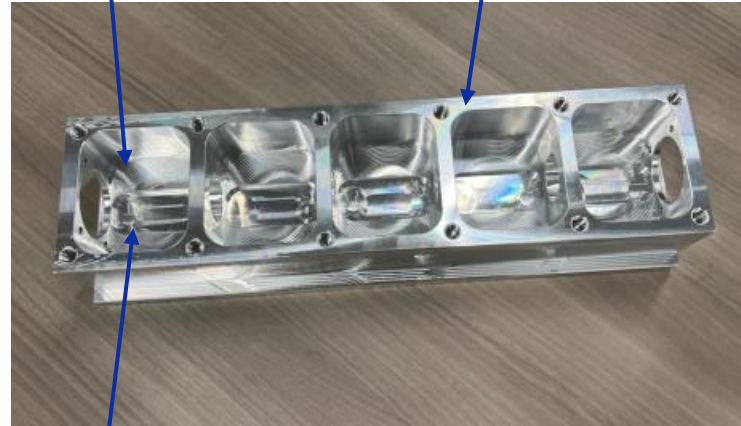
- Cutting aluminum block of 400 x 120 x 70 mm
- Three-face machining by B-axis indexing
- Excellent chip discharge, an advantage of horizontal MCs
- High-speed performance, not possible by #40 horizontal MCs
- Deep-hole drilling of depth 200 x 2 directions = 400 mm



**Φ50 Indexable drill  
Pocket pilot hole**

**Φ100 Face mill  
High speed finishing**

**Φ10xd160 Drill  
Deep hole drilling**



**Φ12 Endmill  
Pocketing**

**L250 Combination reamer  
Stepped deep hole finishing**

Material : A5052

brother  
at your side