

SPEEDIO **H550Xd1**

**Horizontal
Compact Machining Center**



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

***SPEEDIO* H series**

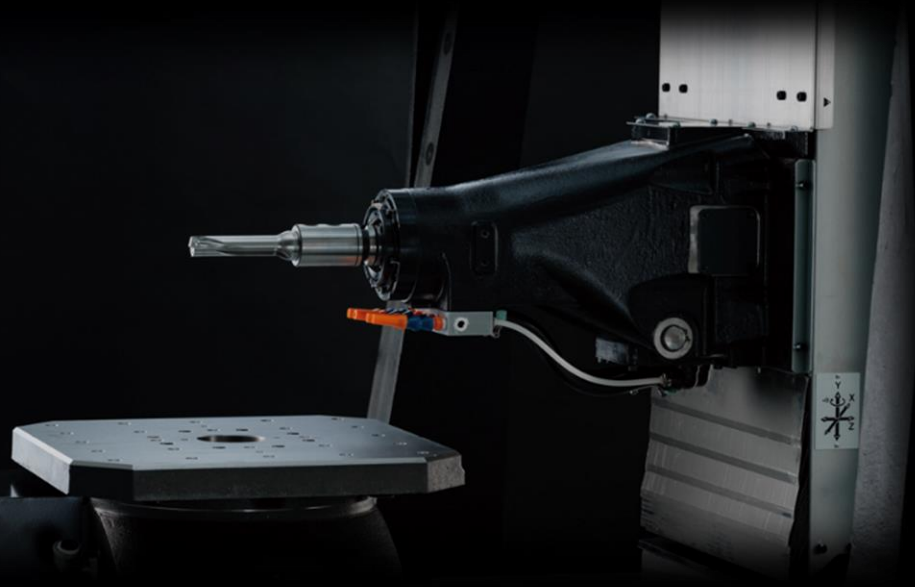
Introduction of **H550Xd1**

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.

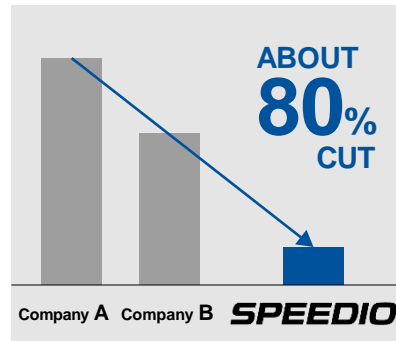




SPEEDIO for the Environment Looking to Achieve Carbon Neutrality

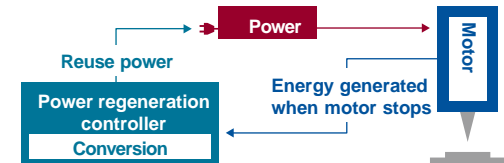
While retaining the #30 spindle, and based on Brother's original technology, the **SPEEDIO** strives for industry-leading environmental performance, in addition to overwhelming high productivity, machining capabilities, and usability.

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.**

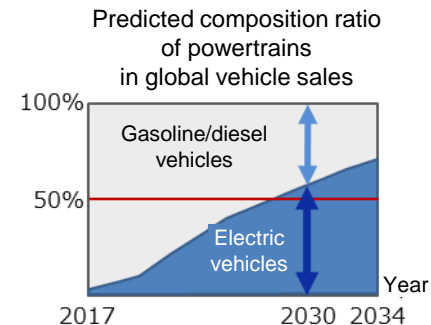
Needs for process integration have increased.

Persistent demand for horizontal machining centers

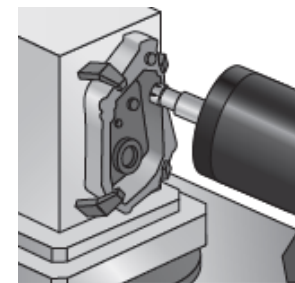
There are cases where horizontal machining centers are used because of the special advantages provided by the horizontal structure.

- **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**

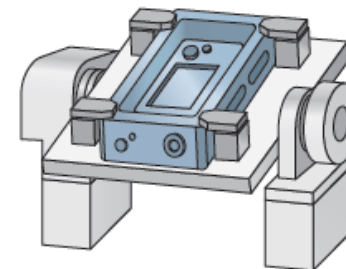
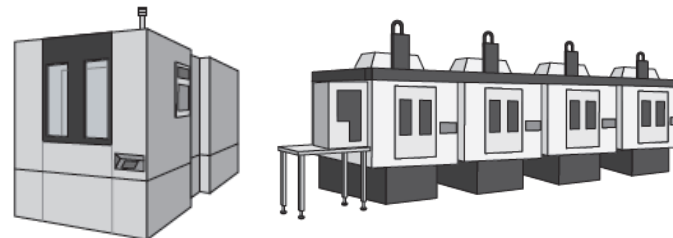
Vertical machining centers

- 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

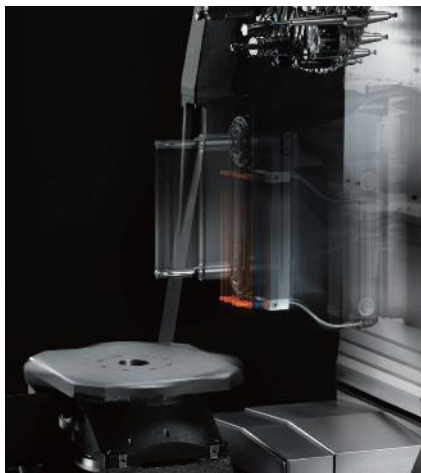
***SPEEDIO* H550Xd1**

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 ²
Max. spindle speed	12,000 min ⁻¹ / 10,000 min ⁻¹ high torque (optional) / 16,000 min ⁻¹ (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^{*1}).
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.

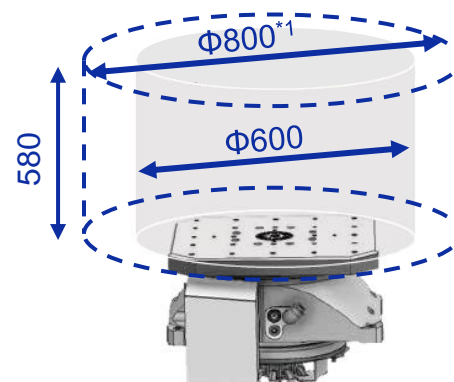
Newly developed 30-tool magazine available

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



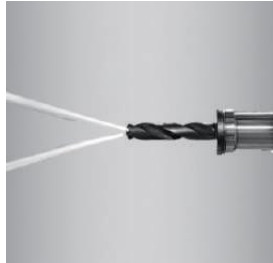
Battery case
Aluminum alloy
500×320×100



Steering rack housing
Aluminum alloy
520×170×130

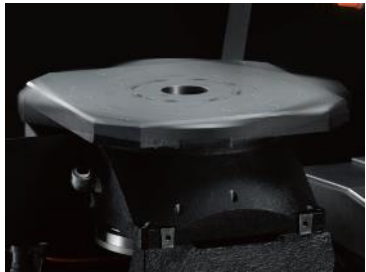
3. H550Xd1 Performance and Features

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

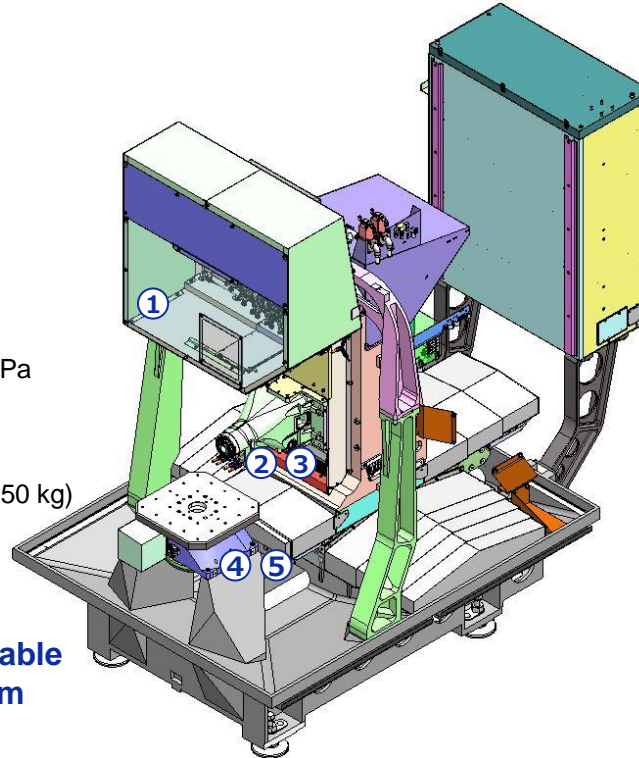
Max. tool weight 4 kg (Total weight 50 kg)

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** _____

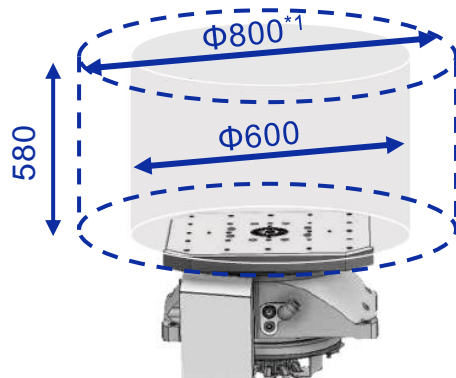
**Pursuit of
High Productivity** _____

**Advanced
D00 Control** _____

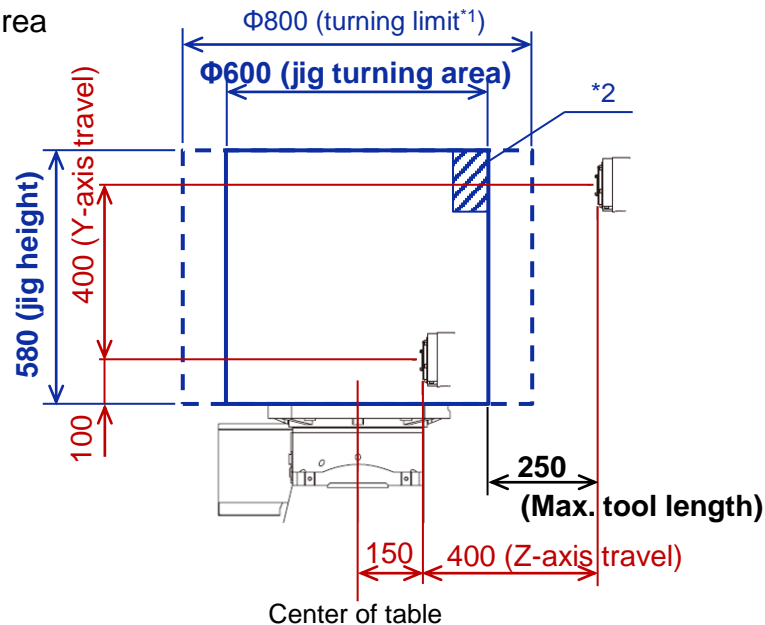
**Achievement of
Reliable Production** _____

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)

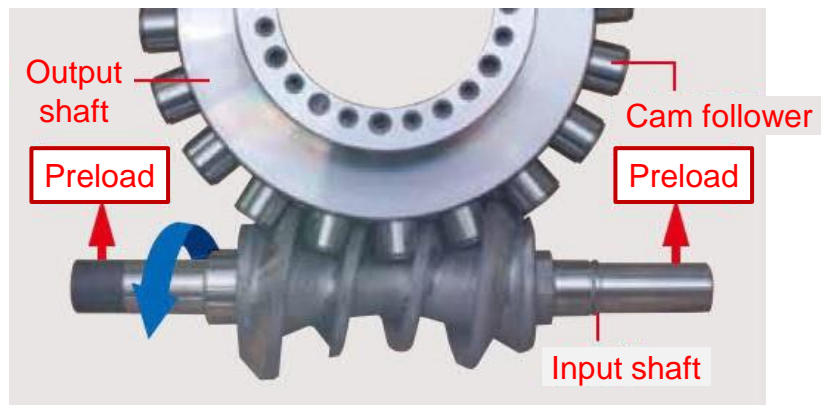
*1. The tool must be moved to a safe position when the B-axis rotates or the tool length is restricted.

*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

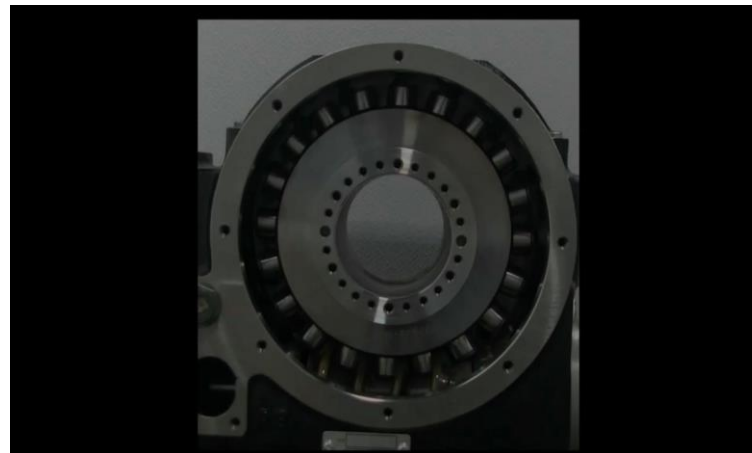
Achieves backlash-free operation, high rigidity, and high-speed indexing. As there is very little abrasion, adjustment is not necessary.



Max. B-axis rotary speed	100 min ⁻¹ *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

Max. spindle speed (min⁻¹)	12,000 (standard) 16,000 (optional) 10,000 high torque (optional)
Spindle taper	BT BT dual contact (optional)

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

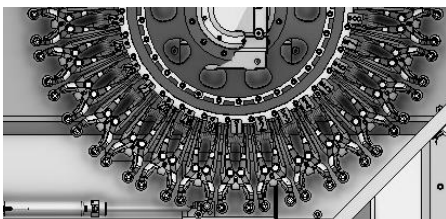


Coolant Through Spindle (CTS) can be selected from 3 MPa or 7 MPa as an option.

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

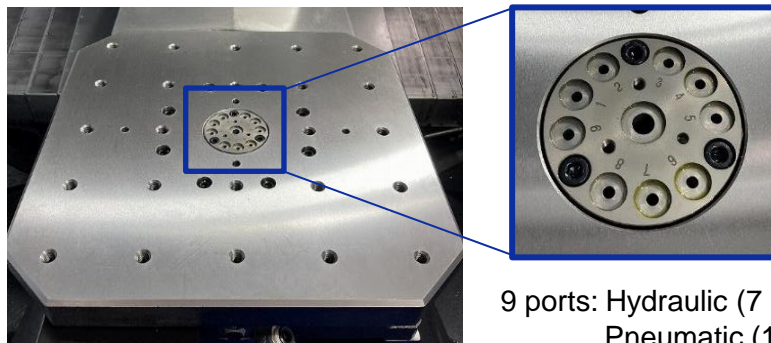
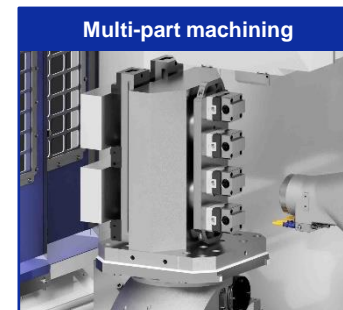
*3. Compared to #40 horizontal MC with equivalent travels

Jig mounting example

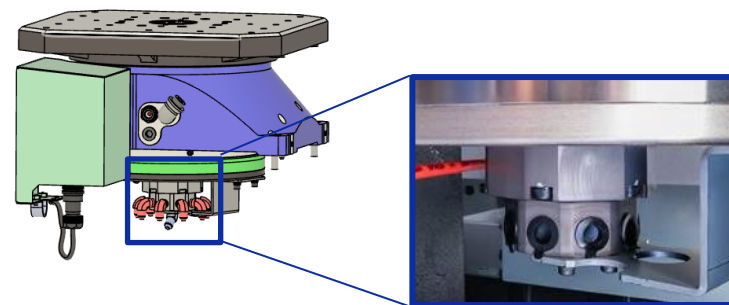
Achieves highly efficient machining of large or long workpieces by fully utilizing features of highly productive #30 horizontal machining centers.

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

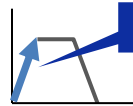
A roller gear cam mechanism is used for the B-axis table to achieve high-speed indexing.

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

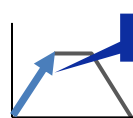
*1. Value in standard inertia mode

Low inertia



Starts with high acceleration

High inertia

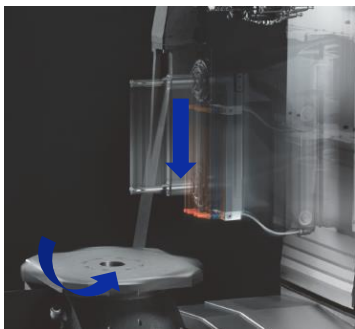


Starts with low acceleration



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.

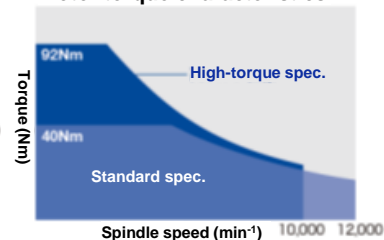
Tool change time
T-T : 1.1 s C-C : 2.4 s

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⁻¹ spec. motor (standard) or 10,000 min⁻¹ 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 ⁻¹ (standard)			
Max. torque	40 N•m	Max. output	18.9 kW
10,000 min ⁻¹ high torque (optional)			
Max. torque	92 N•m	Max. output	26.2 kW

3. H550Xd1 Performance and Features



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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

The Home screen displays the following information:

- Cycle time:** 00:01:45
- Workpiece counter:** Workpiece counter1 111/1000
- Program:** TANAHASHI/D00/1100
- Tool life:**

Tool	D3.0 ENDMILL	D63.0 MILL	D4.2 DRILL	D8.0 CHANF	M5.0X0.8 TAP
Life	774	933	967	970	970
- Support app keys:** Support application list, Modal info 1, Workpiece coordinate zero, Tool list, Macro variable number G20s, Memory operation, Cycle time log.

Program

Shortcut keys

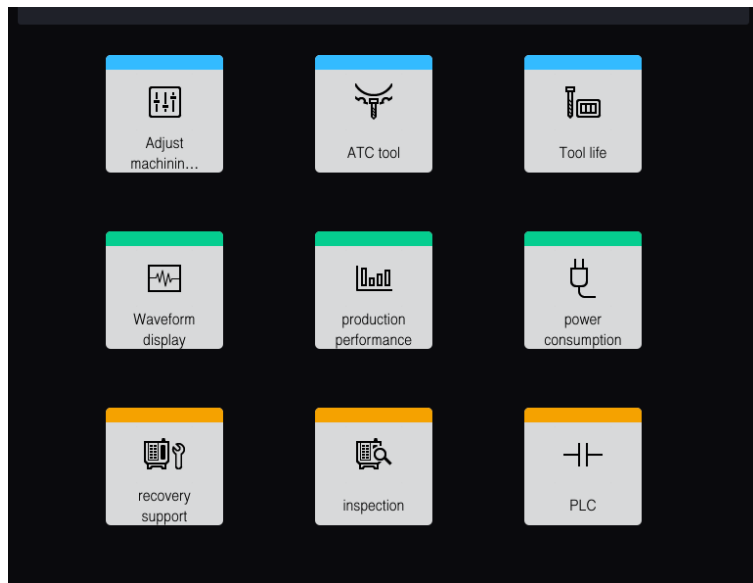
Previous Screen

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



Advanced user interface

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



More visibility

Production performance



Task support

ATC tools

Tool ID	Name	Status
01	ATC-001	OK
02	ATC-002	OK
03	ATC-003	OK
04	ATC-004	OK
05	ATC-005	OK
06	ATC-006	OK
07	ATC-007	OK
08	ATC-008	OK
09	ATC-009	OK
10	ATC-010	OK

Operational performance



Recovery support / Check

Tool ID	Wear	Threshold
001	100	475.750
002	100	4.750
003	100	475.750
004	100	4.750

Power consumption



Shorten cycle time settings

Tool ID	Parameter	Value
14271	...	0.300
14272	...	0.300
14273	...	0.300
14274	...	0.300
14275	...	0.300
14276	...	0.300
14277	...	0.300
14278	...	0.300
14279	...	0.300

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

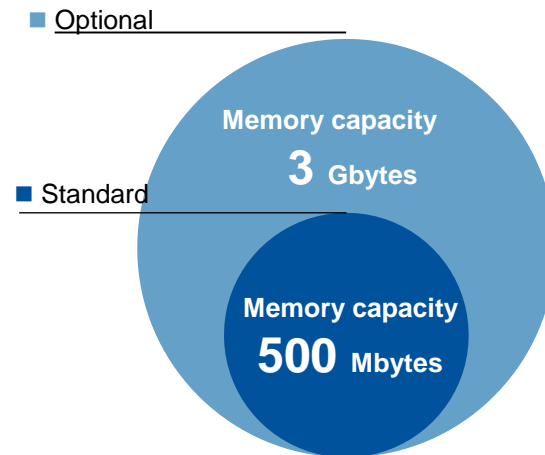
48 → **300**

■ Doubled tool data capacity

99 → **198**

Units of tool life can be set to seconds.

Example of three-dimensional machining workpiece

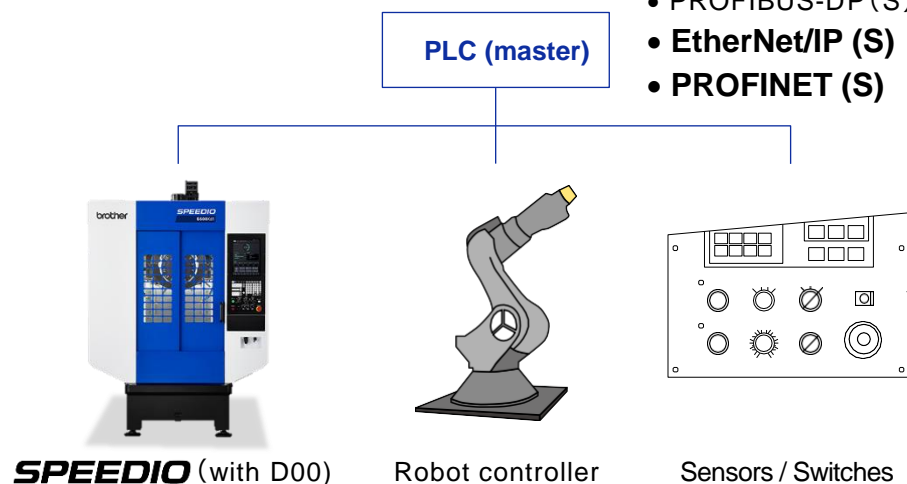


* Data compared to CNC-C00

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

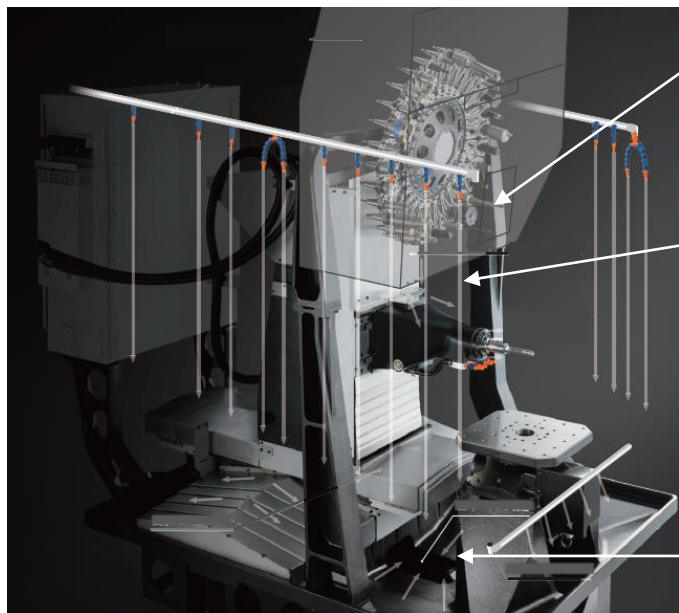
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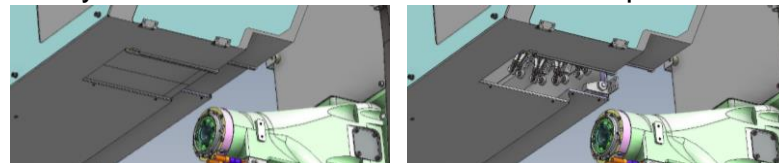
Chip evacuation performance

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



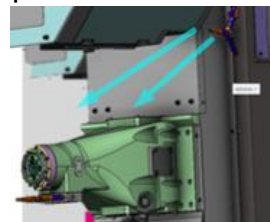
Magazine chamber separation structure

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.

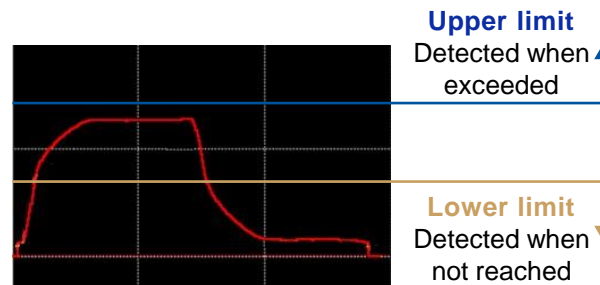
ATC monitoring function

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.

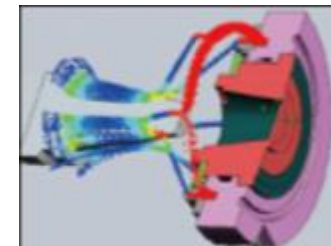


Low air consumption

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

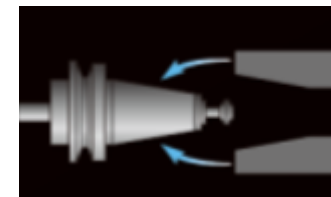
Air purge

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 ⁻¹ 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 ⁻¹ 50 / 56 / 56
	B axis	min ⁻¹ 100 (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