The compact machining center SPEEDIO has been released, achieving overwhelming productivity and excellent environmental performance based on Brother’s original technologies. Our efforts have been focused on releasing a machine that brings about success to users producing mass-production parts, in response to their deep confidence.
Achievement of high acceleration

Z-axis acceleration

**Former model** 1.1G → **SPEDIO** 2.2G

As the Z-axis moves most frequently, Z-axis acceleration has been improved to realize the former model.

Optimal acceleration according to loading capacity (X/Y-axes)*

<table>
<thead>
<tr>
<th>(Max. load)</th>
<th>1.4G/1.1G</th>
<th>2.0G/1.3G</th>
</tr>
</thead>
<tbody>
<tr>
<td>(150 kg load)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Acceleration for the 5000-operation loading capacity. The loading capacity needs to be set via parameters.

Highly-responsive servo motor

Delay in response has been reduced to almost zero by increasing the responsiveness of the servo motor. For example, high-speed synchronized tapping at the fastest levels in the world is completed within much shorter time.

Comparison of tapping cycle time

Approx. 10% less

Nonstop ATC

Tool change time is minimized by optimizing the magazine operation and improving the Z-axis acceleration, in addition to the shorter start and stop time of the spindle.

**Former model** Chip - Chip: 1.6s → **SPEDIO** 1.4s

**Tool - Tool**: 0.9s → **SPEDIO** 0.8s

Simultaneous operation control

Further reduction of waste time achieved by positioning XXY and additional axes simultaneously with tool change.

Comparison of productivity

Approx. 60% higher

When compared to a general machining center (M/C), the high productivity of the SPEDIO is outstanding. Brother is constantly pursuing overwhelmingly high productivity.

Conditions for productivity comparison

- Nickel steel: 10.0 mm thick, 15.0 mm dia.
- M3 tapping: 12 threads
- Spot facing: X 7
- Workspace change time: 15s
- 100% (120 min) X 85% operating rate

*Data taken by turning machining program created by Brother.
Machining Capabilities

From high-speed, high-efficiency machining to heavy-duty machining

Technologies accumulated over years to enhance machine rigidity, and use of a high-power spindle motor allow the machine to demonstrate its broad machining capabilities from high-speed, high-efficiency machining to heavy-duty machining.

Highly rigid structure

Z-axis rigidity 15% increase

For the Z-axis in particular, the stress path is reduced, leading to improvement of rigidity by approximately 15%.

Based on accumulated analysis technology data, the machine uses a structure that effectively further improves its rigidity.

High-power spindle motor

Medium and high-speed range enabling high-efficiency machining

Low-speed range suitable for heavy-duty machining

Grooving using standard spec material: Carbon steel (for all and rim)

Large hole drilling using high-torque spec material: Carbon steel (for all and rim)

Spindle motor torque

Standard specs
- Max. torque (Innomationary): 40 Nm
- Max. output: 18.9kW
- High-torque specs (Optional)
- Max. torque (Innomationary): 92 Nm
- Max. output: 26.2kW

High-speed three-dimensional machining

High-speed and highly accurate three-dimensional machining has been achieved by high-speed spindle specifications and Speedio's original three-dimensional machining control, such as the 200 block look-ahead function and smooth path offset function.

High-speed spindle spec: 27,000 min⁻¹

Look-ahead function
- High accuracy mode B1 (Standard): 30 blocks
- High accuracy mode B3 (Optional): 200 blocks

Pursuit of high accuracy

High-accuracy machining has been achieved by improving machine rigidity, renewing the control system using a new NC unit, and adding new functions. Stable accuracy for circular machining and three-dimensional machining has also been achieved.

Pursuit of high accuracy

Resolution of the encoder has greatly improved and various offset functions have been added. These improvements achieve high accuracy for circular machining and pin hole machining. The machine structure used is not easily affected by heat expansion due to coolant.

Circular machining
- Roundness 30% better (Compared to previous models)

- Diameter: 60mm
- Material: Aluminum

* This accuracy may not be obtained under some machining conditions/machine/compilation conditions etc.
Equipped with new CNC-C00 control unit.

Operability
- Equipped with "brother" keys to quickly open the display screen and help make program management easier. In addition, the USB memory interface makes programming and tape read/write functions.

Network function
- High-capacity program data can be transmitted via Ethernet at high speed. Ethernet cable or network-equipped function is also available allowing you to monitor the machine's status.

Machining support functions
- Equipped with machining support functions, such as a large-random and tool-life废弃 compensation system.

Maintenance functions
- Equipped with motor insulation resistance measurement, operation log, and maintenance notice functions.

System capacity
- Standard equipped with PLC, input and output points can be extended to up to 192 points each (Optional).

Earth-friendly machine

Lower power and air consumption ensures high environmental performance.
- A power regeneration system that effectively lowers power consumption is used for all models.

Machining support functions

- Power consumption for one cycle
  - General VMC: 100 %
  - SPEEDIO: Approx. 80 %

LED type work light (Optional)
- Energy-saving pump

Reliable functions that enhance productivity, minimizing defects and preventing failure
- Productivity can also be enhanced from the following viewpoints: prevent dimensional defects and prevent machine failure with minimal maintenance to minimize machine downtime. The SPEEDIO is equipped with functions to achieve these.
Roller Gear Cam Mechanism

Combining the roller gear cam with the proper motor provides high acceleration and high rotation speed. In addition, machining can be performed only by the holding torque with motor without using the clamp mechanism depending on the machining load. Backlash can be eliminated with preloading the cam followers. Even machining with the turning direction in reverse will not adversely affect the machining surface. There is very little wear because the contact area is a rolling surface that rotates. While the worm gear requires regular adjustment, the roller gear cam does not require any adjustment even in long-term use.

Optional Specifications

- Coolant unit
  - Can be selected from 50L, 100L, or 150L depending on the machine
  - [Photo] Tank with 150L chip shower
- Coolant Through Spindle (CTS)
  - 0.5 MPA CTS used for BT spindle
  - [Photo] Circuit diagram for use of 0.5 MPA CTS
  - CTS option is not available for 20000rpm specifications
- Back washing system (for CTS)
  - This prevents the filter from clogging, enabling long continuous operation without filter replacement
- High accuracy main HD ball screw (280mm)
  - The 0D/4D backlash elimination function enables high speed and high-accurate three-dimensional machining.
  - Also equipped with a smooth path offset function to improve machining quality
- Tool breakage detector touch type
  - A touch switch type tool breakage detector is used
- Manual pulse generator
  - Manual pulse generator with a catch makes operation through the machining automatic easier

Cleaning gun

- Chip shower
  - Chip shrapnels are bound at the upper outlet route. The shrapnels move along the flute and fall back to the machine. Chip shrapnels can be directed to the sides of the machine cover or sections where chips tend to accumulate.
- Top cover
  - Shifting the opening on the top prevents coolant or chips splashing outside of the machine, and reduces the effect of flaws on the spindle motor.
- Spindle override
  - Spindle speed can be changed without changing the program.
- High column (150mm, 200mm)
  - High column of 150mm and 200mm can be used in response to customers’ needs. 150mm high column is not available for 50000rpm specifications

Rotary Table T-200

- Feature
  - High Productivity
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  - Feature
    - High Accuracy
      - Spindle can be eliminated with preloading the cam followers. Even machining with the turning direction in reverse will not adversely affect the machining surface.
  - Feature
    - Maintenance free
      - There is very little wear because the contact area is a rolling surface that rotates. While the worm gear requires regular adjustment, the roller gear cam does not require any adjustment even in long-term use.

Optional Specifications

- Coolant unit
  - 50L
    - [Photo] Tank with 150L chip shower
  - 100L
    - [Photo] Tank with 150L chip shower
  - 150L
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- Automatic greased lubricator
  - Regular grease at preloading points on the three axes
  - Manual greasing applies to the standard specifications models
- Manual pulse generator with a catch makes operation through the machining automatic easier

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### Machining capability - Examples of target workpieces

**Automotive and machinery parts**

- CVT intermediate housing
- Clutch case
- Cylinder head cover
- Cylinder block
- EPS housing
- Throttle body
- Alternator
- Starter motor
- Crankcase
- Cylinder head
- Small motor cylinder

**Medical implants**

- Mobile phone
- Personal computer case
- Watch parts
- Medical implants

### Standard RC functions

- Arc cutting
- Path cutting
- Round end compensation
- Nonlinear path compensation
- Coordinate system setting
- Subprogram
- External tool compensation
- Tool selection
- Operation limit
- High speed 2D/3D cutting
- NC program conversion

### Optional RC functions

- Tool life management
- Subroutine
- Operation log
- Alarm history
- Backlash compensation
- Machine lock
- Start/stop log
- Operation level
- External input map

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**Examples of target workpieces**