Various tool selection enables the production of various type or volume of complicated workpiece.
Various tool selection enables the production of various type or volume of complicated workpiece.

- Powered up live tools improve combined machining capability.
- Modular type live tools can be arranged onto the rear tool post and the back tool post. The suitable tool and position can be selected according to the workpiece.
- By increasing gripping force of the spindles, the cutting capability is increased by 30% compared to current models.
- 1-axis oscillation cutting (optional) improves chip disposal.
- Thanks to the thermal displacement compensation function provided as standard, the long-term stable production is realized.
- Automatic programming system is prepared as standard.

*Pictures and figures contain options.
Modular tooling
Various arrangement of live tools, ID holders and turning holders

On S206-II simultaneous machining including milling such as off-center drilling, off-center tapping, endmilling, or cross drilling on back side is possible by adding Y-axis on the back tool post. Flexibly respond to workpieces requiring complex back machining.

Live tools on rear tool post and back tool post are modular type, and optimum tool allocation is possible.
- Cross tool spindle on rear tool post: 3pos
- Cross tool spindle on back tool post: 8pos (S206-II)

Optional direct-drive rotary guide bushing provides high-speed and accurate machining.
- Max. speed: 10,000 min⁻¹
- Max. machining length: 210 mm

The stable geometrical accuracy, the dimensional accuracy and the surface roughness are secured by the quiet operation even on high speed.

Guide-bush type or guide-bushless type is selectable according to the workpiece (option)

- Possible to switch between the guide-bush type and guide-bushless type. Most suitable system for the workpiece can be chosen.
- The guide-bushless type does not require ground bars, enabling high speed and high precision machining from cheap cold-drawn bars.

Minimum tool change time is achieved with the optimized tool path made by the automatic programming system.

The program created by the automatic programming system allows an optimum matching of both paths, and shortens the cycle time. The 3D simulation function enables the user to check the operations of the main/back spindles from any angle.

Since our know-how (on machining process, cutting conditions, and such) has been applied, anyone can create high quality and standardized program for complicated and high precision workpieces.

1-axis oscillation cutting
X1/Z1 (Option)
- Chips breaks into small pieces, and do not entangled on tools or workpieces.
- Small pieces of chips do not take up much space.
- Oscillation cutting by servo learning (option)
  - In case of NC is 31i or 32i, oscillation cutting by servo learning can be selected.
  - With this option, cutting tool follows correctly to the command, and minimize the time for fine tuning.
  - Correspond to circular interpolation.
  - Oscillation cutting by servo learning has some restrictions on NC, consult Tsugami.

Machining using oscillation cutting
Machining with oscillating X1 axis
- Grooving
- Cutting-off
- Tuning
- Boring
- Drilling
- Circular turning

Machining with oscillating Z1 axis
- Taper turning
- End-facing

*Not possible to perform machining as oscillating X1 and Z1 axes simultaneously.
### Standard Specifications of Machine

<table>
<thead>
<tr>
<th>Item</th>
<th>S205-II</th>
<th>S206-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working barstock diameter</td>
<td>φ3 to φ20 mm</td>
<td></td>
</tr>
<tr>
<td>Maximum machining length</td>
<td>210 mm (direct-drive rotary guide bushing), 250 mm (stationary guide bushing), 80 mm (carrier type rotary guide bushing), 45 mm (guide bushing)</td>
<td></td>
</tr>
<tr>
<td>Maximum main spindle drilling diameter</td>
<td>⌀12</td>
<td></td>
</tr>
<tr>
<td>Maximum spindle tapering diameter</td>
<td>M10</td>
<td></td>
</tr>
<tr>
<td>Maximum deep hole drilling diameter</td>
<td>φ8</td>
<td></td>
</tr>
<tr>
<td>Maximum back spindle chucking dia.</td>
<td>⌀8</td>
<td></td>
</tr>
<tr>
<td>Maximum cross drilling diameter</td>
<td>M10</td>
<td></td>
</tr>
<tr>
<td>Maximum tool spindle setting cutter dia.</td>
<td>⌀30 (T04)</td>
<td></td>
</tr>
<tr>
<td>Main spindle speed</td>
<td>200 to 10,000 min⁻¹</td>
<td>200 to 10,000 min⁻¹</td>
</tr>
<tr>
<td>Back spindle speed</td>
<td>200 to 10,000 min⁻¹</td>
<td>200 to 10,000 min⁻¹</td>
</tr>
<tr>
<td>Rotary guide bushing speed</td>
<td>250 to 10,000 min⁻¹ (Direct drive)</td>
<td></td>
</tr>
<tr>
<td>Cross tool spindle on front tool post to Back tool post</td>
<td>200 to 10,000 min⁻¹</td>
<td></td>
</tr>
<tr>
<td>Tool size</td>
<td>8 x 22 x 1,970 mm</td>
<td></td>
</tr>
<tr>
<td>Tool rapid traverse rate</td>
<td>35 m/min (X1,Y1,Y2: 24 m/min)</td>
<td></td>
</tr>
<tr>
<td>Main spindle</td>
<td>2.2/3.7 kW</td>
<td></td>
</tr>
<tr>
<td>Back spindle</td>
<td>2.2/3.7 kW</td>
<td></td>
</tr>
<tr>
<td>Cross drill</td>
<td>1.0 kW (Front tool post), 1.0 kW (Rear tool post), 1.0 kW (Back tool post)</td>
<td></td>
</tr>
<tr>
<td>Rotary guide bushing</td>
<td>0.75/1.1 kW (Direct-drive rotary guide bushing)</td>
<td></td>
</tr>
<tr>
<td>Coolant pump</td>
<td>0.4 kW</td>
<td></td>
</tr>
<tr>
<td>Lubricating oil pump</td>
<td>3 W</td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>3,750 kg</td>
<td></td>
</tr>
<tr>
<td>Power source requirement</td>
<td>12.1 kVA</td>
<td></td>
</tr>
<tr>
<td>Compressed air requirement</td>
<td>0.4 MPa or above</td>
<td></td>
</tr>
<tr>
<td>Air discharge rate</td>
<td>100 NL/min</td>
<td></td>
</tr>
<tr>
<td>M/min to a height of 2,325 x 1,270 x 1,970 mm</td>
<td>100 NL/min</td>
<td></td>
</tr>
</tbody>
</table>

### NC Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>S205-II</th>
<th>S206-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled axis</td>
<td>X1, Y1, Z1, X2, Z2, C1, C2</td>
<td>X1, Y1, Z1, X2, Z2, Y2, C1, C2</td>
</tr>
<tr>
<td>Least input increment</td>
<td>0.001 mm (X1,X2 in diameter)</td>
<td>0.0005 mm, other axes: 0.001 mm</td>
</tr>
<tr>
<td>Least command increment</td>
<td>X1, X2: 0.0005 mm, other axes: 0.001 mm</td>
<td></td>
</tr>
<tr>
<td>Maximum programmable value</td>
<td>±5 digits</td>
<td>±16 digits</td>
</tr>
<tr>
<td>Interpolation method</td>
<td>Linear, circular</td>
<td>Linear, circular</td>
</tr>
<tr>
<td>Feedrate</td>
<td>1 to 6,000 mm/min</td>
<td>1 to 6,000 mm/min</td>
</tr>
<tr>
<td>Feedrate override</td>
<td>0 to 150 % in 10 % increments</td>
<td>0 to 150 % in 10 % increments</td>
</tr>
<tr>
<td>Dewell</td>
<td>004, 0 to 9999.999</td>
<td>004, 0 to 9999.999</td>
</tr>
<tr>
<td>Tool offset pairs</td>
<td>09</td>
<td>99</td>
</tr>
<tr>
<td>LCD/MDI</td>
<td>10.4&quot; color LCD</td>
<td>10.4&quot; color LCD</td>
</tr>
<tr>
<td>Display language</td>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>Part program storage size</td>
<td>512 kbyte (equivalent to 1,280 m tape length)</td>
<td>512 kbyte (equivalent to 1,280 m tape length)</td>
</tr>
<tr>
<td>Registerable programs</td>
<td>1,000 (sum of main and back spindle NCs)</td>
<td>1,000 (sum of main and back spindle NCs)</td>
</tr>
<tr>
<td>Miscellaneous functions</td>
<td>Main: 16 digits, Back: 5 digits</td>
<td>Main: 16 digits, Back: 5 digits</td>
</tr>
<tr>
<td>Spindle function</td>
<td>56 digits</td>
<td>55 digits</td>
</tr>
<tr>
<td>Tool function</td>
<td>T4-digits</td>
<td>T4-digits</td>
</tr>
</tbody>
</table>

### Standard Accessories

- Cross tool spindle on front tool post
- Rear drive
- Deep hole drill holder (φ25 x 2)
- Main spindle: C axis / Back spindle: C axis
- Automatic programming software
- Tool height compensation
- Tool life counter
- Periodic maintenance screen
- Main spindle adapter
- Back spindle adapter
- Internal work light (Tooling zone)
- Thermal displacement compensation

### NC standard accessories

- Chaining function
- Continuous thread cutting
- Manual pulse generator
- Memory card input/output interface
- HRR control
- Back ground editing
- Multiple repetitive cycle
- Run time & parts number display
- Extended program editing
- Custom macro
- canned drilling cycle
- Constant surface speed control
- Spindle synchronous control (rotation/phase)
- Z1-Z2 synchronous control
- Spindle speed fluctuation detection
- Tool geometry/laser offset
- Stored stroke check 2.3

### Options

- Programmable data input
- Chamfering & corner R
- Tool nose radius compensation
- Multiple repetitive cycle
- Multiple repetitive cycle
- Cut-off detection (Speed Differential type)
- Spindle speed fluctuation detection
- Stored stroke check 2.3

### NC standard accessories

- Guide bushing
- Back spindle brake
- Work tray
- Work table
- Work table
- Work conveyor
- Mist collector
- Coolant level detector
- Door interlock
- Coolant level detector
- Spindle cooling unit
- Standard tools
- Automatic power shut off
- Automatic power shut off
- Spindle cooling unit
- Thermal displacement compensation

### Angular spindle

- Used for inclined drilling

### Back cross tool spindle

- Used for machining bone screws and long screws

### Thread whirling head

- Used for machining bone screws and long screws