SV-20R

SWISS TYPE AUTOMATIC LATHE equipped with star motion control system
Outstanding capability and flexibility for the machining of complex mill turn components. The most advanced Ø20-class model in the SV series has been upgraded from every angle to enable the user to manufacture even the most complicated components.

The latest upgrade of the ever popular SV-20 offers even more functionality, capability and productivity for mill
B axis control + Back working Y axis control
Equipped with the Star Motion Control function, higher speed and larger variety of complex machining is achieved.

**FEATURE**

- B-position turret type tool post equipped with a B axis control mechanism enables simultaneous 5-spindle machining of complicated shape parts and angle hole machining.
- B-spindle back working unit with additional Y-axis function ensures the maximum overlapping of operations to further improve machine output.
- The G.B./N.G.B. function provides the user with the ability to maximize part manufacture per bar.
- Tool post structure suited for flexible overlap machining and Star Motion Control function contributes to the further reduction of non-cutting time.

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

SV-20R
Complex machining capability for the manufacture of components for the Medical, Aerospace and Automotive industries.
Gang type + 8-position turret-type + Back working tool post
The layout provides the User with multiple tooling options and unrivaled overlapping functions.

Gang-type tool post + 8-position turret-type tool post with B axis control + Back working 8-spindle unit with Y axis control and the Star Motion Control for high-level complex machining and superb productivity.

The G.B./N.G.B. switching function for flexible response to the varied part shape. The combination of the machine design and expanded support software contributes to improved ease of operation and further increases machine output.

Performance required for parts machining today are thoroughly explored from every angle to achieve the latest and the best model in the SV series. SV-20R, the model for the next generation of complex small part machining.

SV-20R
CNC SWISS TYPE AUTOMATIC LATHE equipped with Star motion control system

Control method: CNC control by Star motion control system
Machine composition:
- Main spindle
- Sub spindle
- Gang type Tool post
- Turret type Tool post
- Backworking 8-spindle unit with Y-axis control

Illustration of tool layout: Guide bush type

<table>
<thead>
<tr>
<th>TOOLING SYSTEM</th>
<th>Turning tool</th>
<th>Power-driven tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gang type Tool post</td>
<td>6 tools (Ø16mm), 7 tools (Ø2mm)</td>
<td>5 tools</td>
</tr>
<tr>
<td>Turret type Tool post</td>
<td>Turning tool</td>
<td>max. 3 tools / station (Ø12mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max. 3 tools / station</td>
</tr>
<tr>
<td>Power-driven tool</td>
<td></td>
<td>max. 2 tools / station</td>
</tr>
<tr>
<td>Back 8-spindle unit</td>
<td>Stationary tool</td>
<td>Total 8 tools (Power-driven tool : max. 8 tools)</td>
</tr>
</tbody>
</table>
Improvement in High Functionality and Machining Capability

8-position turret-type tool post with B axis control mechanism
2-spindle power tool unit for B axis control can be mounted on a maximum of 4 positions on the turret-type tool post. Machining of inclined surfaces including angular holes on both the front and the back side is possible. Simultaneously controlled 5-spindle machining is possible.

G.B./N.G.B. switching function
The type best suited to any size of workpiece is selectable from the G.B. and the N.G.B.

Back working 8-spindle unit with Y axis control function specially for back machining
Back working tool post with Y axis control to mount a power tool unit to accommodate a maximum of 8 tools. A back working 8-spindle unit is mounted as standard. Various power tool units are also available for versatile complex machining on the rear side. By combining with the sub spindle with 2-axis (X, Y) control function, three dimensional machining is possible.

Tool stations maximum of 28 pos.
Compared with SV-20, the number of tools to mount is increased by max. 12 to allow a larger variety of tooling layouts.

Achievement in High Rigidity and High Accuracy

A high rigid spindle sleeve slide guideway structure for N.G.B. type
The N.G.B. type employs a spindle sleeve slide guideway structure to support the cutting force on the guideway, thus suppressing spindle deflection and realizing accurate machining. Rigidity of the headstock is ensured and continuous machining with stable accuracy is achieved.

A built-in spindle for high indexing accuracy
The main and sub spindle employ a built-in structure to enhance spindle indexing accuracy with a built-in sensor.

Suppression of thermal displacement
The X2, X3 and Y3 axes are equipped with a thermal displacement correction switch each for correcting thermal displacement based on the measurement results.

In search of high functionality, accuracy and productivity from every angle
Improvement in Operability and Workability

**Machine design in consideration of setup & maintenance works**
1. A cutting chamber uses a large opening (1,154mm), flip-up door.
   SV-20 : 463mm ⇒ SV-20R : 1,154mm
2. The headstock chamber employs a link-type door which opens upward of the machine to realize a larger opening.
   SV-20 : 390mm ⇒ SV-20R : 772mm

**Fulfilling operation support software**
1. "Center height adjustment function" to enable measurement of the tool center height on the gang edge side by handle operation.
2. "Spindle synchro phase adjustment function" for simple operation by only following the guidance displayed on the NC screen.
3. "Multi-path program control function" for reduction of input/output operation by putting 3-path programs into one file.

Pursuit of High Productivity

**Machining time reduction (mechanical system)**

**Simultaneous machining on gang type and turret type**
Simultaneous machining of turning, milling, etc. by combining the gang type and turret type tool posts to realize reduced cutting time.

**Flexible overlap machining**
The 8-spindle unit with Y-axis control for back working can accommodate a maximum of eight power tools of various kinds. A wider variety of back working allows efficient front/rear-end overlap machining. Cutting time is also reduced by optimized process division.

**Higher output power of power tool motor**
The power tool motor used for the gang-type tool post has high output power.
(SV-20 : 0.8kW ⇒ SV-20R : 2.2kW)

**Improvement in rapid feed**
Improvement in rapid feed; Z axis feed on the main and sub spindle: 30m/min, XY axis on the gang-type tool post: 30m/min, X/Z axis on the turret-type tool post: 30m/min, Y axis: 18m/min.

**Machining time reduction (control system)**

**Star motion control system on board**
Reduction of non-cutting time for switching the control system, changing tools, etc.
Turret type Tool post

Best tooling system to cover a wide range of machining needs

Tool unit (turret side)

- On-board unit
- Mountable positions

- Fixed type tool holder
- Fixed type tool holder (for 3 tools)
- Center adjustable tool holder
- 3-spindle sleeve holder
- 1-spindle sleeve holder
- 1-spindle sleeve holder (for deep hole)
- 2-spindle programmable drilling unit
- 1-spindle face drilling unit
- 2-spindle face drilling unit
- Opposing type face drilling unit
- 2-spindle opposing type face drilling unit
- Cross drilling unit
- 2-spindle cross drilling unit
- 2-spindle rapid feed cross drilling unit
- Slotting unit
- Angular adjustable drilling unit
- 2-spindle angular adjustable drilling unit
- Polygon machining unit
- Thread milling unit
- Thread whirling unit

- Fixed type tool holder (for 3 tools)
- 3-spindle sleeve holder
- 1-spindle sleeve holder (for deep hole)
- 2-spindle programmable drilling unit
- 2-spindle angular adjustable drilling unit
- Thread milling unit
- 2-spindle cross drilling unit
- 2-spindle face drilling unit
- Polygon machining unit
- Slotting unit
- Thread whirling unit

*When mounting a unit on both neighboring positions, the swivel angle is limited.*
8-spindle unit for back working

- Two cross drilling units and two slotting units can be mounted (on positions not adjoining).
- By mounting a quad-speed unit, the maximum rotation speed of other power tool units is clamped at 5000/min.

Power driven tools (on the back side) / Stationary tools (on the back side)

**Power driven tools (on the back side)**

**On board unit**  **Mountable positions**

- Drill sleeve ER16
- Oil hole drilling type back working unit
- Cross drilling unit
- Slotting unit

**Stationary tools (on the back side)**

**On board unit**  **Mountable positions**

- Drill sleeve ER20
- Bowling sleeve
- Quad-speed milling unit

An abundant line-up of tooling units for milling, cross drilling and slotting as 8-spindle back working units is available. This expands the availability of machining variations by allowing selection of the most appropriate tooling layout suited to user needs.
Machining Capabilities to Meet Diversified Needs for Parts Machining.

**Variation 01**

Front-end working
Opposing cross machining

**Variation 02**

Front-end working
Back slanting machining with B-axis power tools

**Variation 03**

Front-end working
Rear-end working
Main / back simultaneous machining
VARIATION 04

Rear-end working
Back cross machining

VARIATION 05

Rear-end working
Back eccentric drilling

VARIATION 06

Rear-end working
Back slanting machining with B-axis power tools
## Standard Machine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. machining diameter</td>
<td>Ø230mm (Ø265/320) OP: Ø220mm (Ø265/320)</td>
</tr>
<tr>
<td>Max. headstock stroke</td>
<td>250mm</td>
</tr>
<tr>
<td>Tool post configuration</td>
<td>Gang type (Turret type: 8 stations)</td>
</tr>
<tr>
<td>Tool</td>
<td>Number of tools</td>
</tr>
<tr>
<td>Sleeve</td>
<td>Number of tools</td>
</tr>
<tr>
<td>Power driven attachment</td>
<td>Number of tools</td>
</tr>
<tr>
<td>Rapid feed rate</td>
<td>Gang type (Turret type: 2.7kw/continuous (4.0kw/6min., 30%ED) 3000min. (X2, Y2, Z1, 22.73))</td>
</tr>
<tr>
<td>Main spindle indexing angle</td>
<td>C-axe control</td>
</tr>
<tr>
<td>Main spindle speed</td>
<td>Max. 10000rpm</td>
</tr>
<tr>
<td>Coolant tank capacity</td>
<td>3.7kw (continuous), 5.5kw (10min., 80%ED)</td>
</tr>
<tr>
<td>Center height</td>
<td>1125mm</td>
</tr>
<tr>
<td>Weight</td>
<td>4750kg</td>
</tr>
<tr>
<td>Power consumption</td>
<td>6.3kVA</td>
</tr>
</tbody>
</table>

## Backworking Attachment Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. chucking diameter</td>
<td>Ø320mm (Ø365/420) OP: Ø270mm (Ø365/420)</td>
</tr>
<tr>
<td>Max. length for front projection</td>
<td>1250mm (44–904mm)</td>
</tr>
<tr>
<td>Max. parts projection length</td>
<td>785mm (19–674mm)</td>
</tr>
<tr>
<td>Back spindle unit</td>
<td>Number of tools</td>
</tr>
<tr>
<td>Max. drilling capability</td>
<td>Ø12mm (Ø25mm)</td>
</tr>
<tr>
<td>Max. tapping capability</td>
<td>Ø12mm (Ø25mm)</td>
</tr>
<tr>
<td>Power-driven att. spindle speed</td>
<td>Max. 8000rpm</td>
</tr>
<tr>
<td>Power-driven att. drive motor</td>
<td>1.0kw (continuous), 1.22kw (30%ED)</td>
</tr>
<tr>
<td>Sub spindle indexing angle</td>
<td>C-axe control</td>
</tr>
<tr>
<td>Sub spindle speed</td>
<td>Max. 10000rpm</td>
</tr>
</tbody>
</table>

## External Dimensions and Floor Space

![Diagram](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Width: 1,210mm Length: 2,750mm Height: 1,080mm</td>
</tr>
</tbody>
</table>

### Optional Accessories and Functions

- Coolant flow detector
- Parts ejection detector
- Water removal unit
- Oil mist filter
- Beacon
- Nonguide bush type
- Rotary magic guide bush unit
- For pneumatic unit rotary magic guide bush
- Main spindle inner tube
- Parts ejector (A/B cylinder type)
- Parts ejector (Spring type)
- Parts ejector with guide tube
- Parts stopper unit
- Coolant unit (10MPa / 2.5MPa / 0.7MPa)
- Coolant unit signal cable
- Coolant unit power cable
- Coolant valve
- Coolant spray
- Manual pulse generator
- Transformer CE marking version
- CE marking version
- Tool Presetter

### Notes

The machining capacities apply to SUS303 material. The machining capacities may differ from listed values depending on the machining conditions, such as the material to be machined or the tools to be used.

*Design features, specifications, and technical execution are subject to change without prior notice.

This product is an export control item subject to the foreign exchange and foreign trade laws. Thus, before exporting this product, or taking it overseas, contact your STAR MICRONICS dealer.

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