SHARP Model SVX-500
5-Axis Simultaneous Vertical Machining Center
SHARP’s 5-axis Vertical Machining Center allows 5-sided machining and 5-axis simultaneous machining to increase productivity at a reduced cost compared to other similar machines.

Compared to a 3-axis machine that requires a separate setup for cutting different sides of a part, a 5-axis machine can clamp a part one time and rotate into a series of positions to machine each side without re-fixturing.

A 5-axis simultaneously machining has the additional benefit, especially for mold work, of using shorter and stronger tools to speed up the feed rate, taking heavier and deeper cuts without sacrificing accuracy. It also maintains a longer tool life, delivers a smoother and finer finish of the part. For complex multiple helical shape parts, simultaneous 5 axis cutting motion is essential.

The trunnion table design of the Model SVX-500 machine offers maximum undercut capability due to the table rotating -110 to +20 degree along the A axis (front and back) and 360 degree along the C axis. Parts with numerous angled holes and a cross section through it can easily be positioned to create the compound angle, so the machine can do straight hole drilling. Otherwise, it would need multiple setups, or use compound-angle drills heads to do the job, which limits the speeds and feeds and often do not have through-coolant capability.

For CNC controls, the Fanuc 31i or Siemens Sinumerik are available as standard controls and drive systems.

**Complex Machining Makes Easy**
The 5-axis simultaneous model is perfect for precision machining of parts like the impeller and the mold for the golf ball.
Box-in-Box Construction
The machine is constructed using the box-in-box design to assure precision and rigidity under different cutting conditions. The work piece is fixed along the X, Y axis to allow large heavy parts to be machined with high accuracy. The spindle head moves on highly rigid roller guide ways along the X and Y axis on top of the box structure. Such arrangement maintains total machine balance and eliminates overhang due to the moving table.

Rigidity By Design
All major castings are analyzed using Finite Element Method (FEM) to locate areas of stress strain, multiple loading conditions from thermal, gravitational, centrifugal and other enforced displacements. Ribs locations are properly defined to maintain rigidity throughout the entire machine.
**High Precision Spindle**
The standard 25 HP, 15,000 rpm spindle is mounted on high precision, high power ceramic bearings that deliver 87 ft-lb (118Nm) of torque with High-Low windings built in the spindle. The spindle provides dual contact between the spindle face and the angle face of the tooling. It greatly increases tool rigidity, reduce run out on the high speed 15,000 rpm spindle.

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**Large Volume Trunnion Table**
The integrated trunnion table is part of the fixed table that offers ample under cut capability as it can tilt -110 degree to + 20 degree. Its large work envelope delivers more torque at low rpm than a swivel head machine. Its design also facilitates the transition from 3 axis to 5 axis machining practice due to the similarity in approach to parts.

**Working Envelope**

<table>
<thead>
<tr>
<th>Ø800 (Ø31.5&quot;)</th>
<th>100 (3.9&quot;)</th>
<th>350 (13.8&quot;)</th>
<th>450 (17.7&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø600 (Ø23.6&quot;)</td>
<td>19.7&quot; (500 mm) diameter, 770 lbs. (350 Kg.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-slot:</td>
<td>width: 0.7&quot; (18 mm), 45 degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracies:</td>
<td>Indexing: +/- 6 arc sec (A axis), +/- 5 arc sec (C axis)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability:</td>
<td>+/- 3 arc sec (A axis), +/- 3 arc sec (C axis) Based on VDI 3441</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Spindle Power & Torque Chart**

![Spindle Power & Torque Chart]
Efficient Automatic Tool Change System (ATC)
The newly designed ATC is located at the back of the machine and make the tool change from behind the spindle. It eliminates the action of a swing arm. All tools sit vertical on the stand. Its simple mechanism avoids malfunction. Its location allows easy access for maintenance from the back of the machine.

Precision through Craftsmanship and Technology
Structural mating surfaces are precision hand scraped to increase the flatness and to improve geometric accuracy (straightness and squareness) of the whole assembly. This provides near perfect alignment assuring long term accuracy. Linear scales and rotary encoders are installed to ensure such high accuracy.

Fast And Durable Linear Axes Travel
The machine utilizes highly rigid Roller Guide System with low gravity center and low friction to maintain fine finish on workpieces even under heavy cutting conditions. Rapid feed rate on the X and Y axes is 2,362 in/min (60M/min), and on the Z axis is 1,890 in./min (48M/min). Such high rapid traverse speed reduces non-cutting time and improves productivity.
Rigorous Testing and Inspection Procedures
All machines are tested under different cutting conditions. Inspections are done by various instruments to assure conformance to all standards.

Thermal Stability Management
To stabilize thermal expansion that may affect accuracy, the high speed spindle is equipped with oil chiller and the ballscrew brackets have cooling system.

Linear scale & Rotary encoder are installed to maintain high accuracy
Easy Access, Simple maintenance Design
The machine is ergonomically designed for operator comfort and safety. Easy approach for handling work piece, reaching for the spindle, inspecting ATC system, lifting with crane, or performing maintenance works.

Convenience Features
- LED work light
- Front mounted coolant gun and air gum
- Chip Conveyor situated at back of machine for easy disposal of chips
### SHARP SVX-500-F Specifications and Standard Accessories (for USA)

#### Model | unit | SVX-500-F
--- | --- | ---
Control | | 
Fanuc | | 5.1-8.5

### Travel

| axis | unit | SVX-500-F |
--- | --- | ---
X axis travel | inch (mm) | 21.6" (550) |
Y axis travel | inch (mm) | 31.9" (810) |
Z axis travel | inch (mm) | 19.7" (500) |
A axis travel | Degree | -110°~20° |
C axis travel | Degree | 360° |
Spindle nose to table (A=0°) | inch (mm) | 2.7" (69) |

#### Table

| Table area | inch (mm) | SVX-500-F |
--- | --- | ---
Max. work piece weight | lb (kg) | 350 (770) |
Table travel (X or Y) | inch (mm) | 19.2" (488) |

#### Spindle

| Speed | rpm | SVX-500-F |
--- | --- | ---
| | | 45 (Roller) |

#### Feed Rate

| Rapid traverse | ipm (mm/min) | SVX-500-F |
--- | --- | ---
X/Y axis | | 2,362 (60000) |
Z axis | | 0.04 (1 - 48,000) |

#### Motor

| Power requirements | | SVX-500-F |
--- | --- | ---
Spindle motor: | | Direct drive |
Fanuc motor | | 20 / 25 (15/18.5) |

#### Automatic tool changer

| ATC capacity | Method of tool selection | SVX-500-F |
--- | --- | ---
| | | 30 |

#### Accuracy

| Axis | Repeatability (±0.00006") | Accuracy (±0.001") |
--- | --- | ---
X/Y/Z | ±0.0015 | ±0.0015 |
A | ±0.0015 | ±0.0015 |
C | ±0.0015 | ±0.0015 |

#### Spindle

| Spindle speed | CPR | SVX-500-F |
--- | --- | ---
| | | 15,000 |

#### Transmission

| Transmission | | SVX-500-F |
--- | --- | ---
| | | 2,000 (50,000) |

#### Motor

| Motor | | SVX-500-F |
--- | --- | ---
Spindle motor: | | Built in |

#### Spindle Oil Chiller

| Spindle oil chiller | | SVX-500-F |
--- | --- | ---
| | | Ceramic bearing |

#### Spindle Taper

| Taper | | SVX-500-F |
--- | --- | ---
| | | 45° |

#### Motor

| Motor | | SVX-500-F |
--- | --- | ---
Spindle motor: | | Built in |

#### Power Requirements

| Power requirements | | SVX-500-F |
--- | --- | ---
| | | 3 Phase / 45 KVA |

### Standard Accessories:

1. Fanuc 31i-B5 controller 10.4" LCD
2. Fanuc two years warranty
3. AICC (200 block look ahead)
5. USB port
6. Embedded Ethernet
7. RS-232C interface
8. 6K10 M memory
9. 3 Dimensional cutter
10. 3D interference check
11. High speed smooth TCP
12. Rigid tapping
13. 3 axis (X/Y/C) axis scale
14. 2 axis (A/C) rotary encoder
15. Spindle air blast (Auto)
16. Automatic lubrication system
17. 4 additional M code
18. M30 auto power off
19. Removable hand wheel M.F.G
20. Safety door lock
21. Electric cabinet heat exchanger
22. LED work light
23. Alarm light
24. Spindle oil chiller
25. Oil skimmer
26. Cutting coolant around the spindle
27. Hinge type chip conveyor with bucket
28. Fully enclosed splash guard
29. Coolant system 500L tank capacity
30. Coolant gun
31. Oil slinger
32. Spindle air blast
33. Air accumulator
34. Leveling bolts and caps
35. Adjusting tool with tool box
36. Voltage: 3PH 220V 60HZ / 45KVA
37. 785-49364ATS (silver) / RAL7021 (black)
38. Operator’s manual and part list menu in English

### Machine Size

| Machine size | SVX-500-F |
--- | ---
Floor space | 127.1" (3,230mm) x D |
Height | 169" (4295 mm) |
Weight | 28,050 (12,750 kg) |
Door opening | 31.5" (800mm) |

### Coolant System

| Coolant system | SVX-500-F |
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### Siemens, Heidenhain control are also available

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* Proper foundation and environmental controls are required