The high performance YCM FX 380A 5-axis vertical machining center is designed especially for small, complex high-quality parts mainly for aerospace, automotive, medical, job shop and die & mold applications. From roughing to finishing, the FX380A enables manufacturers to reduce setup time and overall lead-time while increasing machining quality and improving precision of complex machining processes.
High Rigidity Body Structure Design
■ Extra wide column and base design to ensure best support and cutting rigidity.
■ High quality and rugged MEEHANITE® casting maintains optimum accuracy.

High Accuracy Axial Movement
■ Linear guideways adopted for fast and smooth axial movement.
■ Pre-tensioned ball screws with direct drive motors achieve high torque and low backlash.

Working Envelope

<table>
<thead>
<tr>
<th>Table</th>
<th></th>
<th>Feedrate</th>
<th></th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thru Hole:</td>
<td>ø80 mm</td>
<td>C-axis:</td>
<td>33.3 rev/min.</td>
<td>Repeatability (A/C): 16/16 sec.</td>
</tr>
</tbody>
</table>

C-axis Rotary 360 °
Unit: mm (inch)

Max. Working Envelope:
ø380 (ø14.96")
ø210 (ø8.27")
150 (5.91")
220 (8.66")
310 (12.20")
480 (18.90")
70 (2.8")
220°
+30°
YCM In-house A/C-axis Rotary Table

- Rotary table surface leveled at the C-axis center to ensure machining accuracy and easy programming.
- Ø380 mm (Ø14.96") table size with Ø80 mm (Ø3.15") table-through hole design.
- 150°(+30°/ -120°) A-axis tilting angle increases the ability of machining.
- Hydraulic or pneumatic cable preparation.

Tool Magazine

- 30T storage capacity is standard.
- 40T/60T is servo driven.
- ATC tool door design is standard.
YCM In-house IDD Spindle

- YCM self-manufactured IDD spindle.
- Powerful 22 kW, 12,000 rpm spindle for hi-power, hi-speed machining.
- Cooling system design on spindle motor seat, quill, and bearing offers most reliable machining capability.

Max. Speed

12,000 rpm (std.)
15,000 rpm (opt.)

Power Chart

**FANUC**

<table>
<thead>
<tr>
<th>Spindle Speed (rpm)</th>
<th>Power Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,000 rpm (std.)</td>
<td><img src="image" alt="FANUC 12,000 rpm Chart" /></td>
</tr>
<tr>
<td>15,000 rpm (opt.)</td>
<td><img src="image" alt="FANUC 15,000 rpm Chart" /></td>
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</tbody>
</table>

**HEIDENHAIN**

<table>
<thead>
<tr>
<th>Spindle Speed (rpm)</th>
<th>Power Chart</th>
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</thead>
<tbody>
<tr>
<td>12,000 rpm (opt.)</td>
<td><img src="image" alt="HEIDENHAIN 12,000 rpm Chart" /></td>
</tr>
<tr>
<td>15,000 rpm (opt.)</td>
<td><img src="image" alt="HEIDENHAIN 15,000 rpm Chart" /></td>
</tr>
</tbody>
</table>
Spindle Oil Cooling Design

Oil-air lubrication design applied on each bearing, suitable for spindles with the speed of 12,000 rpm and over to ensure prolonged high speed operations.

BBT40 Spindle Design

- Spindle and taper dual surface contact.
- Exceptional cutting rigidity with high accuracy.
- Longer tool life.

Laser Tool Measurement (opt.)
Advantages of 5-axis Machining

- Enhance precision, quality and efficiency of 3D surface machining.
- Reduce tool length and increase rigidity to obtain superior machining quality.
- Cutting with the belly and edge of the tool to increase tool life.
- Reduce fixture error and lessen workpiece loading/uploading time.
- Saves manufacturing cost for fixture and electrode costs.
- Reduces machining process, machining cost while improving productivity.

Differences between 3-axis and 5-axis machining

<table>
<thead>
<tr>
<th></th>
<th>Change fixture</th>
<th>Process 1</th>
<th>Change fixture</th>
<th>Process 2</th>
<th>Change fixture</th>
<th>Process 3</th>
<th>Change fixture</th>
<th>Process 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-axis machine</td>
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<td>FX380A</td>
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</tbody>
</table>

Machining Performance

- Shorten Process
- Reduce Fixture Cost
- Improve precision
Automation Advantages

- Increase productivity through unmanned machining.
- Enhance quality and reliability of products.
- Reduce non-cutting or change waiting time.
The YCM Production Line Monitoring System i-Direct overcomes the limitations of time and distance. This software provides plant operators with instant production status, including production value, output, standby, alarm time, status display and malfunction records of the machine. These data could be browsed online and printed. When incidents occur, i-Direct will automatically warn plant operators through e-mail or MMS message. With i-Direct Production Line Monitoring System the plant operators can easily keep track of production statuses regardless of time and distance.
_walkdown.jpg

### Pre-machining Preparation

**Intelligent Tool Data Management**
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine.

**Tool Length Measurement**
Graphic measuring interface provides automatic tool length measurement function.

**Workpiece Coordinate Calculation**
Conversational operating window provides convenient and fast setup of workpiece coordinates.

### Programming

**I_PATTERN**
- 15 sets of machining cycle program
- Decreases program input and memory time
- Graphic interface & conversational command input

### Machining

**High Performance Machining Mode M300**
With 5 sets of parameter settings, the users choose the most suitable mode for optimum machining.

**High Speed Machining Mode M400**
Increases drilling and tapping speed, reduces machining time for job shop and precision mold machining.

**Tool Load Management**
Instant tool load monitoring with alarm function.

**Multi-display Fuction**
Displays 4 statuses simultaneously with configurable status display.

**Tool Life Management**
Indicates tool status of each group with tool life alert.

### Instant Message Alert

**Pop-up Alarm Display**
Instantly provides troubleshooting procedure.

**Smart control panel (IPANEL)**
Easy to set up and operate important functions.

### Maintenance

**Intelligent Maintenance**
Provide users with periodic maintenance options and descriptions.

**Counter Function**
Allow users to keep count of workpieces with the function of overtime cycle alarm provides easy control over machining cycle time:
- 1. Main Counter
- 2. Periodical Counter
- 3. Daily Counter
- 4. Over Cycle Alarm
FANUC MXP-200 FB/FC Control Standard Function
(5-axis Control)

Tilted Working Plane Command
- Program order automatic exchange X-Y-Z coordinates.

3D Interference Simulation
- 3D Interference Simulation function can help to reduce the danger of collision in 5th axis application.

FANUC 31i-MB5 Control Exclusive Function

STCP (Smooth Tool Center Point)
- Simultaneous 5-axis Machining with tool end / tool side.
- Smooth motion with tool end by compensating tool direction (Angle of rotary axis)
- Smooth machining with tool side by smoothing tool posture

3-Dimensional Cutter Compensation
Tilted Working Plane Command
The PLANE function is a powerful function for defining tilted working planes in various manners.

TCPM (Tool Center Point Management)
The offset of the tilting axes is compensated so that the tool tip remains on the contour.

Dynamic Collision Monitoring (DCM)
Dynamic collision monitoring to protect operators and machine.

Heidenhain iTNC 530 HSCI
- Simultaneous 5-axis control
- TFT color flat-panel display 15-inch
- Storage medium: SSDR solid state disk with 32 GB
- Programming in HEIDENHAIN conversational format, with SmarT.NC or according to DIN/ISO
- Tool Center Point Management (TCPM)
- Dynamic Collision Monitoring (DCM)
- 0.5 ms Short block processing time

Kinematic Compensation
1) Position of the rotary axis in the kinematics model of the control.
2) Actual position of the rotary axis.
3) Resulting position error during tilting.
Table & Dimensions

T-SLOTS

Unit: mm inch
Specifications

**SPINDLE**
- Spindle Speed/Power (std.)
  - FANUC controller
  - Spindle Speed: 12,000rpm
  - Power: 7.5/11/15/18.5/22kW
  - 10/15/20/25/30HP (cont./30min./10min./5min./1min.)
- Spindle Speed/Power (opt.1)
  - FANUC controller
  - Spindle Speed: 15,000rpm
  - Power: 7.5/11/15/18.5/22kW
  - 10/15/20/25/30HP (cont./30min./10min./5min./2min.)
- Spindle Speed/Power (opt.2)
  - HEIDENHAIN controller
  - Spindle Speed: 12,000rpm
  - Power: 7.5/13/16/22.5kW
  - 10/17/22/30HP (cont./S6-40%/S6-25%/S6-10%)
- Spindle Speed/Power (opt.3)
  - HEIDENHAIN controller
  - Spindle Speed: 15,000rpm
  - Power: 7.5/13/16/22.5kW
  - 10/17/22/30HP (cont./S6-40%/S6-25%/S6-10%)
- Spindle Taper
  - BBT40

**TRAVEL**
- X-axis Travel: 700mm
- Y-axis Travel: 520mm
- Z-axis Travel: 480mm

**TABLE**
- Table Size/T-Slots: Ø380mm / 12mm Ø14.96" / 0.47" Radial
- Max. Load on Table (Vertical): 200kg
  - 441lb
- Max. Load on Table (Horizontal): 200kg
  - 441lb
- Available Torque on Table: 30kg-m
  - 217lb-ft

**A/C AXIS**
- A-axis: 150° (+30° / -120°)
- C-axis: 360°
- A/C Axis Feedrate: 33.3 rev/min.

**FEEDRATE**
- X/Y/Z Rapid Feedrate: 36 / 36 / 24m/min
  - 1417.32 / 1417.32 / 944.88ipm
- Cutting Feedrate: 1/10,000/mm/min
  - 0.04~393.7ipm

**ACCURACY**
- ISO 10791-4
- JIS B 6338
  - Positioning: 0.010mm / 0.00039"
  - 0.003mm / 0.00012"
  - Repeatability: 0.007mm / 0.00028" ± 0.002mm / ± 0.00008"

**ATC**
- Tool Magazine Capacity (opt.): 30T (40/60T)
- Max. Tool Weight: 6kg
  - 13.2 lb
- Max. Tool Length: Ø76 x 280mm
  - ø3" x 11.02"

**GENERAL**
- Pneumatic Supplier: 5.5kg/cm²
- Power Consumption (Transformer)
  - FANUC: 34kVA (40kVA)
  - HEIDENHAIN: 47kVA (50kVA)
- Machine Weight: 6,210kg

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms, etc., to improve the performance of the machine without notice. All the specifications shown above are just for reference.

User-friendly Design

- Convenient Swivel Control Panel.
- Chip flush coolant system increase chips removal efficiency.
- Tool magazine with window design is easy for tool changing.
YCM Ultimate 5-axis Technology

TCV3000A-5AF/5AX
High Performance Traveling Column Multi-face Vertical Machining Center

DCV4030B-5AF/5AX
5-axis Advanced Double Column Vertical Machining Center

NBX102A
High Performance Swivel Head 5-axis Vertical Machining Center

FX380A
High Performance 5-axis Vertical Machining Center

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