

# NFX Series

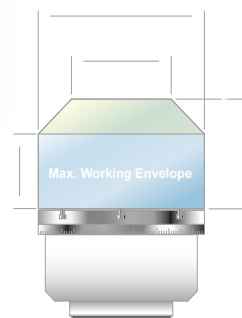
High Performance 5-Axis Vertical Machining Center



# NFX 380A / 500A

## High Performance 5-Axis Vertical Machining Center

The high performance YCM NFX series 5-axis vertical machining center is designed especially for complex high-quality parts mainly for aerospace, automotive, medical, job shop and die & mold applications. From roughing to finishing, the NFX series enables manufacturers to reduce setup time and overall lead-time while increasing machining quality and improving precision of complex machining processes.



C-axis Rotary 360 °

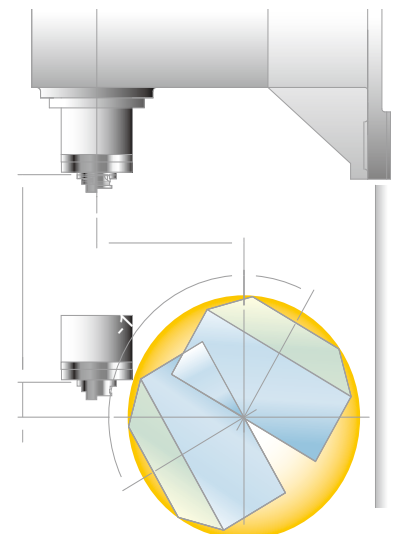


Table	Size: 380 mm Thru Hole: ø80 mm	
Feedrate	A-axis: 33.3 rev/min. C-axis: 33.3 rev/min.	
Accuracy	Positioning (A/C): 28/28 sec. Repeatability (A/C): 16/16 sec.	



## 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.)**

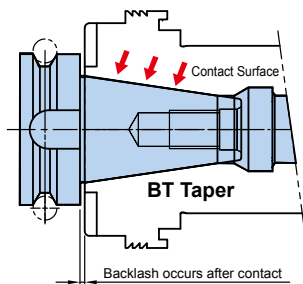


## Spindle Oil Cooling Design

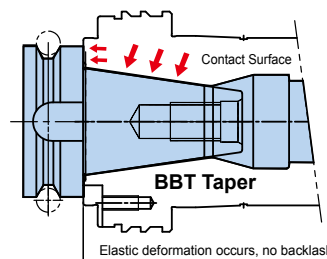
Oil-air lubrication design applied on each bearing, suitable for spindles with the speed of 12,000 rpm and over to ensure prolonged high speed operations.

## BBT40 Spindle Design

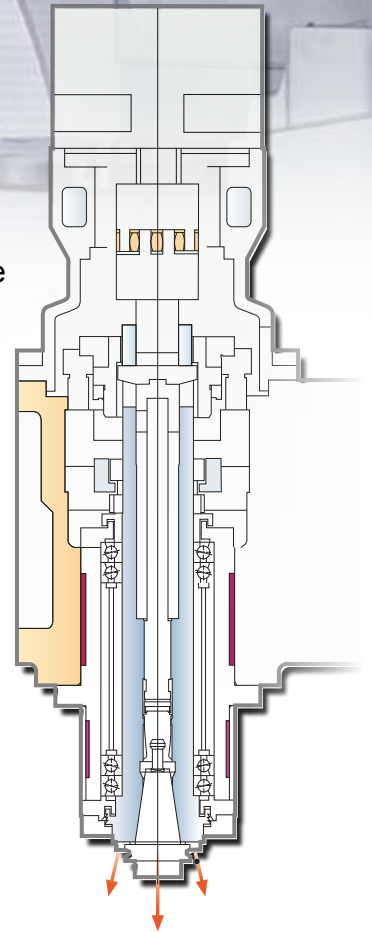
- Spindle and taper dual surface contact.
- Exceptional cutting rigidity with high accuracy.
- Longer tool life.



Single Surface Contact Spindle

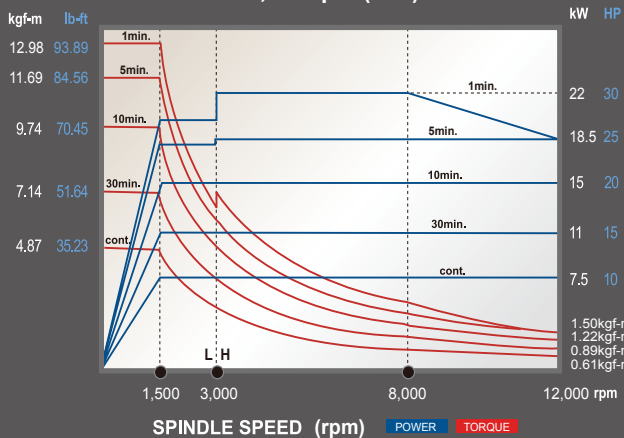


Dual Surface Contact Spindle

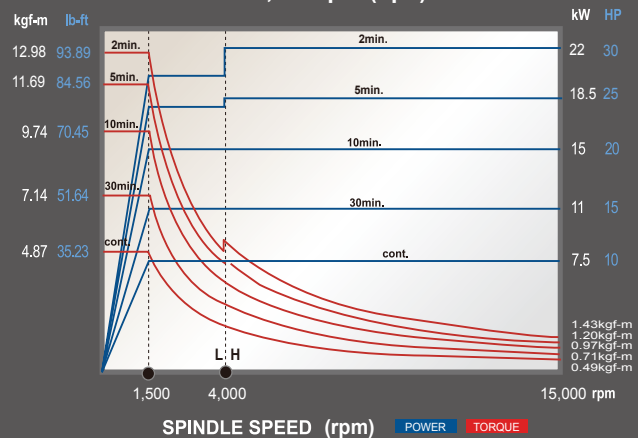


## FANUC

### 12,000 rpm (std.)



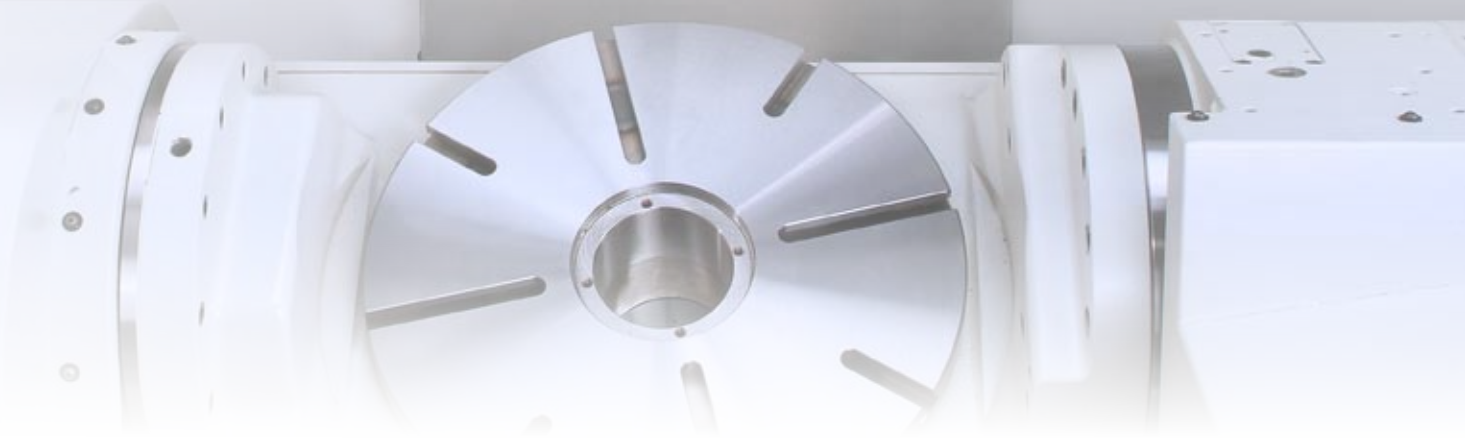
### 15,000 rpm (opt.)





## YCM In-house A/C-axis Rotary Table

- Rotary table surface leveled at the C-axis center to ensure machining accuracy and easy programming.
- Aluminum designed 5-Axis Table, better dynamic accuracy for X/Y axis.
- $\varnothing 380$  mm ( $\varnothing 14.96$ ") /  $\varnothing 500$  mm ( $\varnothing 19.7$ ") table size with  $\varnothing 80$  mm ( $\varnothing 3.15$ ") table-through hole design.
- $150^{\circ}(+30^{\circ} / -120^{\circ})$  A-axis tilting angle increases the ability of machining.
- Hydraulic or pneumatic cable preparation.
- Heidenhain optical scale for A/C-Axis.

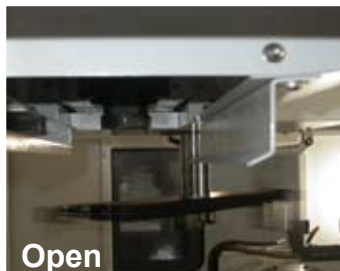


## Tool Magazine

- 30T storage capacity is standard.
- 40T/60T is servo driven.
- ATC tool door design is standard.



Close

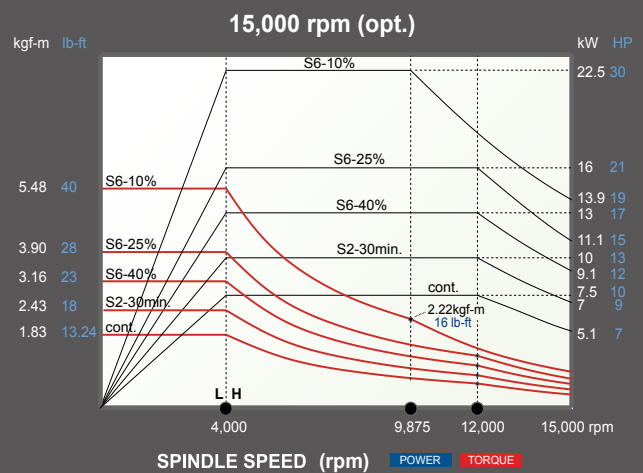
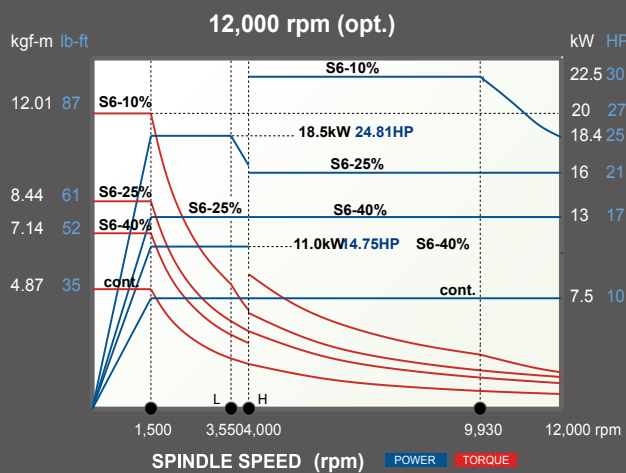


Open



Laser Tool Measurement (opt.)

## HEIDENHAIN

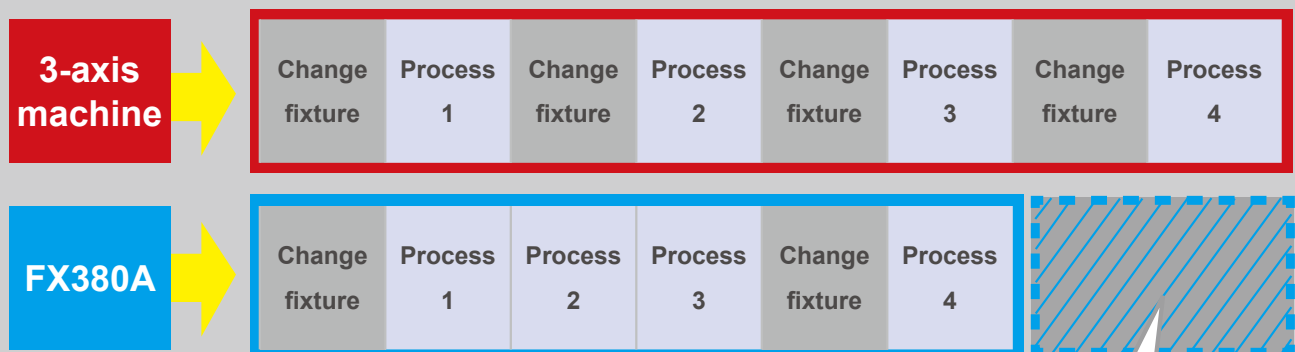




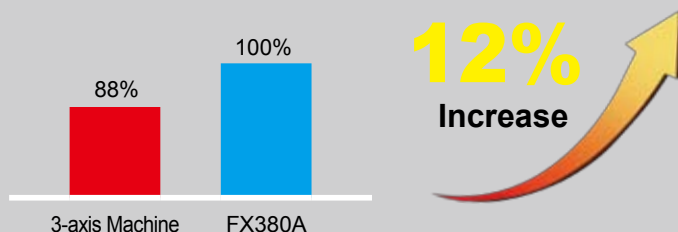
## Advantages of 5-axis Machining

- 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



## Machining Performance

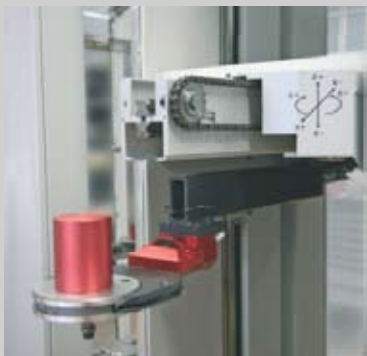


- Shorten Process
- Reduce Fixture Cost
- Improve precision



## Automation Advantages

- Increase productivity through unmanned machining.
- Enhance quality and reliability of products.
- Reduce non-cutting or change waiting time.



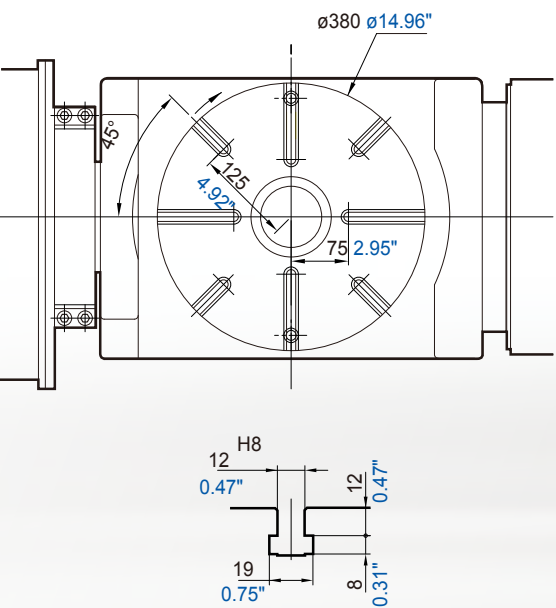


# Table & Dimensions

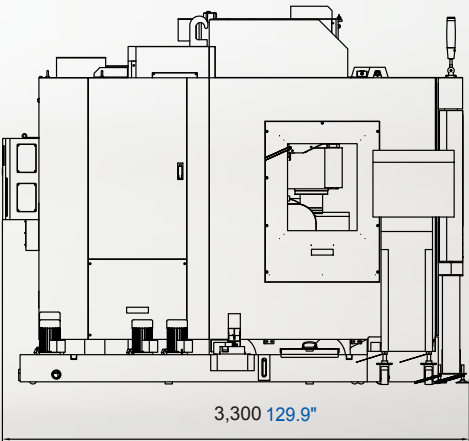
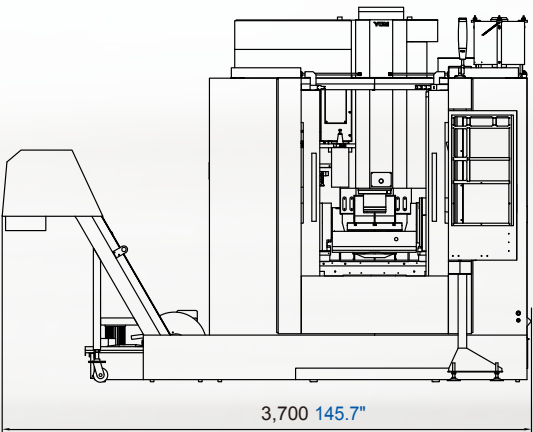
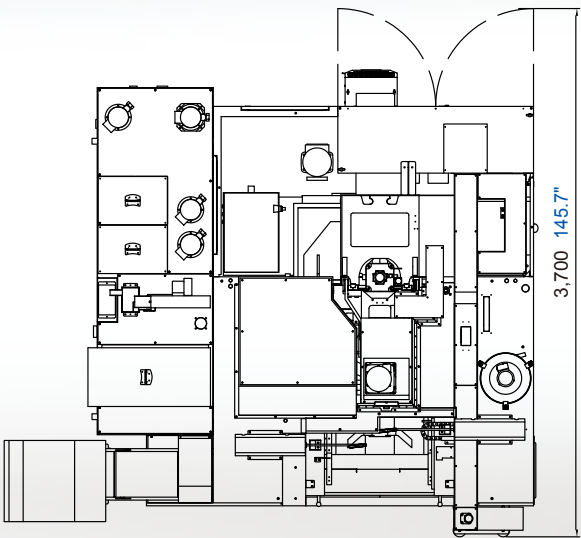
Unit: mm inch



## NFX380A



### T-SLOTS



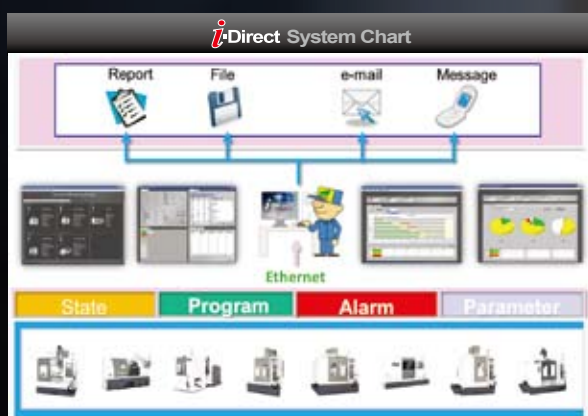
# MXP-200 FB/FC

**YCM CONTROL**  
by **FANUC**

- High Response AC Digital Servo & Spindle Drives with High Definition Absolute Positioning Encoders
- AICC II High Speed High Accuracy with Auto Switching On/Off Machining Function
- JERK Control Function (opt.)
- High Rigidity Tapping, Helical Interpolation
- Custom Marco B and Tool Path Graphics
- Manual Guide i with large Screen Display. (MXP-200FC, opt.)
- Program File Management for Easy Program Classifying
- USB Interface for Easy Parameters & CNC Programs Transfer
- 512KB Memory
- High Speed Positioning Function (MXP-200FC, opt.)
- Memory Card Program Edit & Operation (opt.)
- 3D Interference Check (5-axis Control as Standard)
- NANO Smoothing Function (opt.)
- 400 Pairs Tool Offset, 1,000 Total Registered Programs
- 48 Pairs of Workpiece Coordinate System
- Extended Parts Program Editing (Cut, Copy, and Paste. Max. 4,000 characters)

**i-Direct** A remote monitoring system

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.



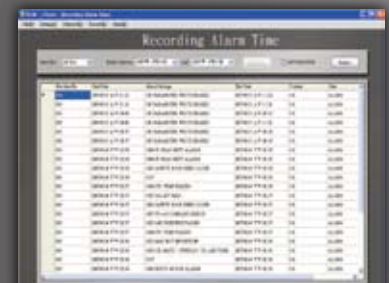
Single Machine Status Browsing Single Machine Status Browsing



Plant Operation Status Monitoring



Machine connection, MMS and e-mail settings



Machine Status Time Record



Production Status Process Record



Production Management Statistics



# i-OPERATION *Plus II*

Software Enhancement Exclusively from YCM



## Pre-machining Preparation

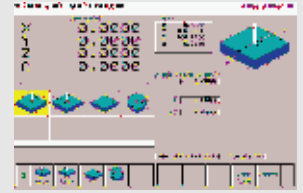
**Intelligent Tool Data Management**  
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



**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



## RENISHAW GUI System (Conversational Graphic Operating Interface)

Tool measurement & measurement correction



Workpiece measurement

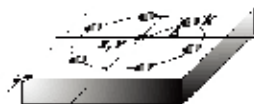


## Programming

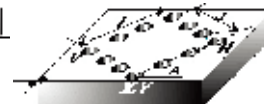
### **NEW** I\_PATTERN



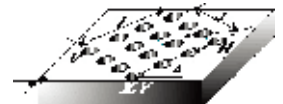
15 sets of machining cycle program  
Reduces program input and memory time  
Graphic interface & conversational command input



CIRCULAR HOLE PATTERN  
(G120 P1) Function



RECTANGULAR HOLE PATTERN  
(G120 P4) Function

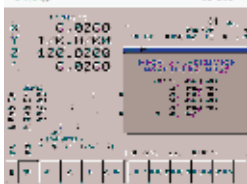


GRID HOLE PATTERN  
(G120 P5) Function

## 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 Function

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  
Quick response to alarm



### Wireless Message Notification

Machine status sent to a designated cellphone number.



## Maintenance

### Intelligent Maintenance



Provide users with periodic maintenance options and descriptions

Instantly provide users with maintenance notifications

### Counter Function



Allow users to keep count of workpieces with the function of overtime cycle alarm provides easy control over machining cycle time

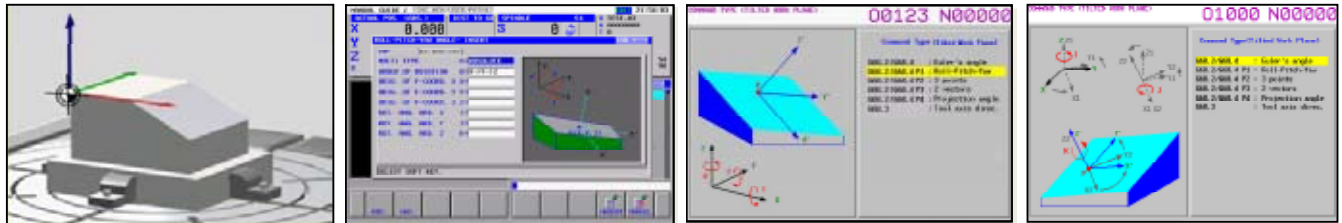
1. Main Counter
2. Periodical Counter
3. Daily Counter
4. Over Cycle Alarm



# FANUC MXP-200 FB/FC Control Standard Function (5-axis Control)

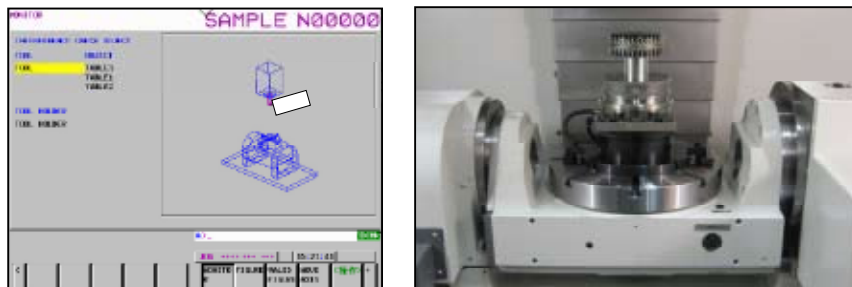
## Tilted Working Plane Command

- Program order automatic exchange X-Y-Z coordinates.
- Easy program edition, easy machining for Tilted Working Plane.



## 3D Interference Simulation

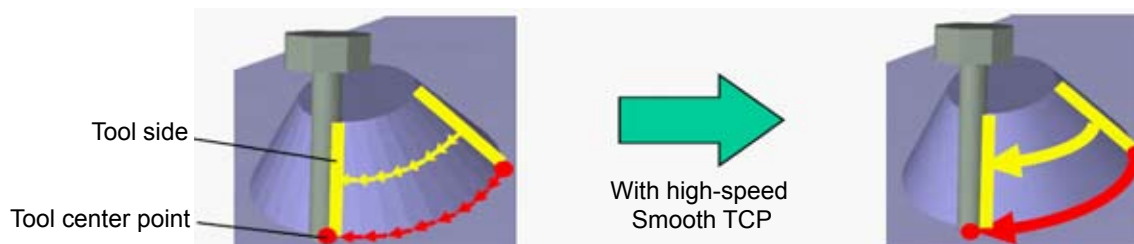
- 3D Interference Simulation function can help to reduce the danger of collision in 5th axis application.



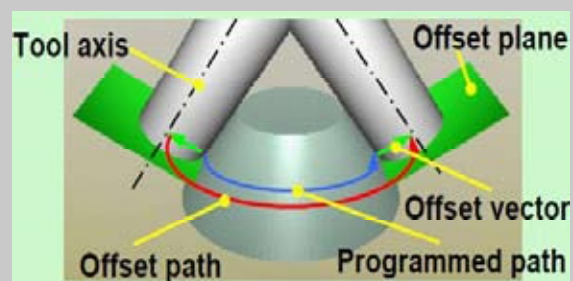
# FANUC 31i-MB5 Control Exclusive Function

## 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



# Specifications

NFX380A

SPINDLE		
Spindle Speed/Power (std.) FANUC controller	12,000rpm	7.5/11/15/18.5/22kW 10/15/20/25/30HP (cont./30min./10min./5min./1min.)
Spindle Speed/Power (opt.1) FANUC controller	15,000rpm	7.5/11/15/18.5/22kW 10/15/20/25/30HP (cont./30min./10min./5min./2min.)
Spindle Speed/Power (opt.2) HEIDENHAIN controller	12,000rpm	7.5/13/16/22.5kW 10/17/22/30HP (cont./S6-40%/S6-25%/S6-10%)
Spindle Speed/Power (opt.3) HEIDENHAIN controller	15,000rpm	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 27.56"	
Y-axis Travel	520mm 20.47"	
Z-axis Travel	480mm 18.90"	
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.	
A/C Axis Positioning Accuracy	10 sec.	
A/C Axis Repeatability Accuracy (A-axis Optical Scales is standard)	6 sec.	
FEEDRATE		
X/Y/Z Rapid Feedrate	36 / 36 / 24m/min 1417.32 / 1417.32 / 944.88ipm	
Cutting Feedrate	1~10,000mm/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/cm <sup>2</sup>	
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.

● : Standard ○ : Optional — : None

## STANDARD ACCESSORIES

- Tool Kit
- Work Lamp
- Pilot Lamp
- Spindle Air Blast
- Spindle Air Seal
- Cutting Air Blast
- Spindle Cooling System
- Guideway Cover (X, Y, Z)
- Oil Skimmer
- Coolant Gun
- Coolant System
- Central Lubrication System
- Hydraulic Unit (for 4th and 5th Axes)
- Complete Chip Enclosure (With Top Cover)
- Leveling Bolts and Pads
- Heat Exchanger for Electrical Cabinet
- Mechanical, Maintenance, Electrical and Operating Manuals
- Safety Door
- CNC Control: FANUC MXP-200FB

## OPTIONAL ACCESSORIES

- CE
- Foundation Bolts
- Chip Conveyor
- Coolant Through Spindle System (CTS)
- Heavy Duty Coolant Pump
- Auto Tool Measurement System (Blum Laser Mini NT)
- CNC Control: FANUC MXP-200FC
- CNC Control: FANUC 31i-MB5
- CNC Control: HEIDENHAIN iTNC640



# YCM®

## YCM Ultimate 5-axis Technology



### **NFP 500A - 5AX**

High Speed High Precision Double Column  
5-axis Machining Center



### **NFX380A**

High Performance 5-axis  
Vertical Machining Center



### **TCV3000A - 5AF/5AX**

High Performance Traveling Column Multi-face  
Vertical Machining Center



### **DCV4030B - 5AF/5AX**

5-axis Advanced Double Column Vertical Machining Center

# YCM®

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