

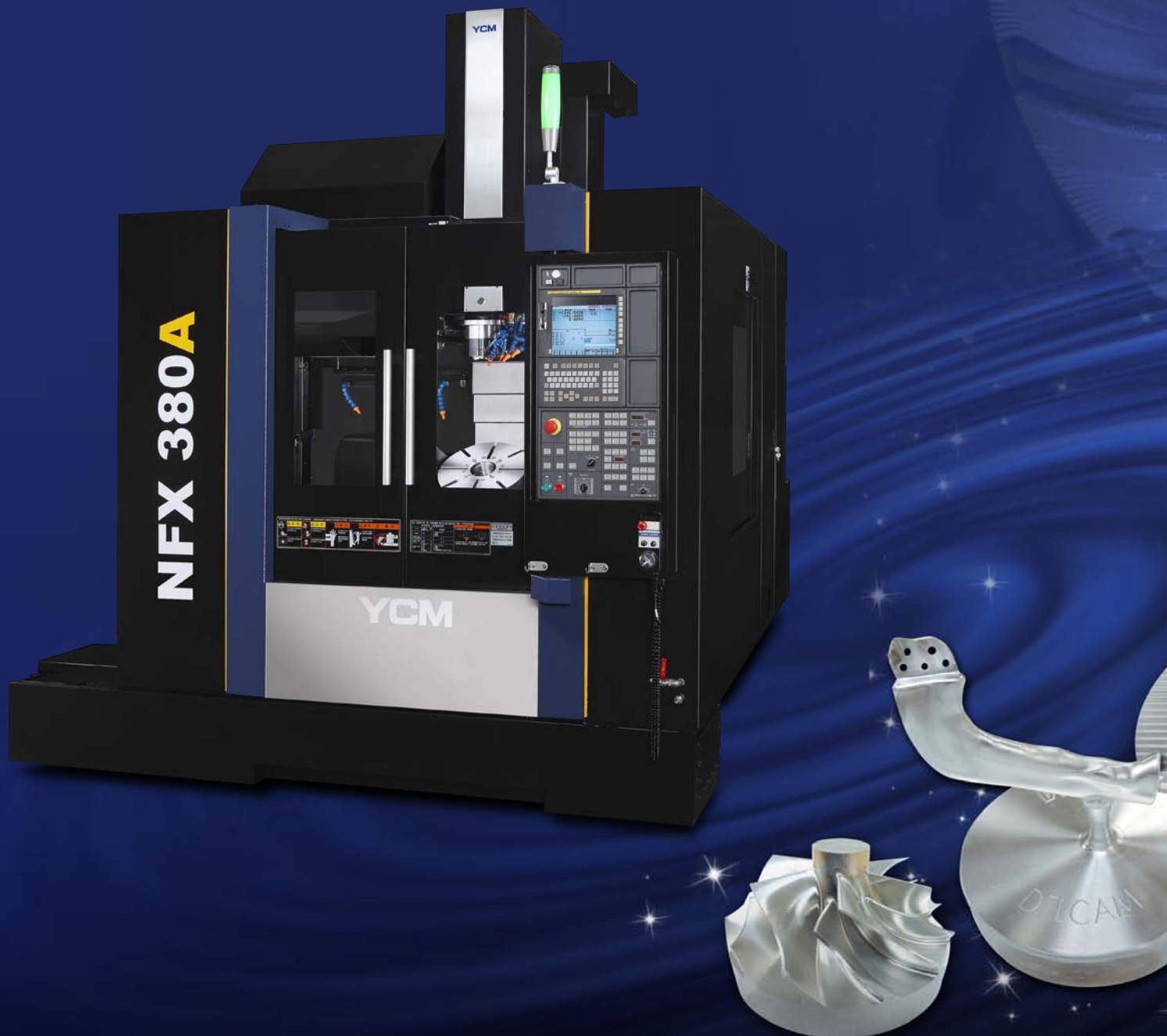
NFX 380A

HIGH PERFORMANCE 5-AXIS VERTICAL MACHINING CENTER



NFX 380A

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

$\varnothing 380$ ($\varnothing 14.96''$)
 $\varnothing 210$ ($\varnothing 8.27''$)
 150 (5.91")
 Max. Working Envelope
 220 (8.66")

C-axis Rotary 360°

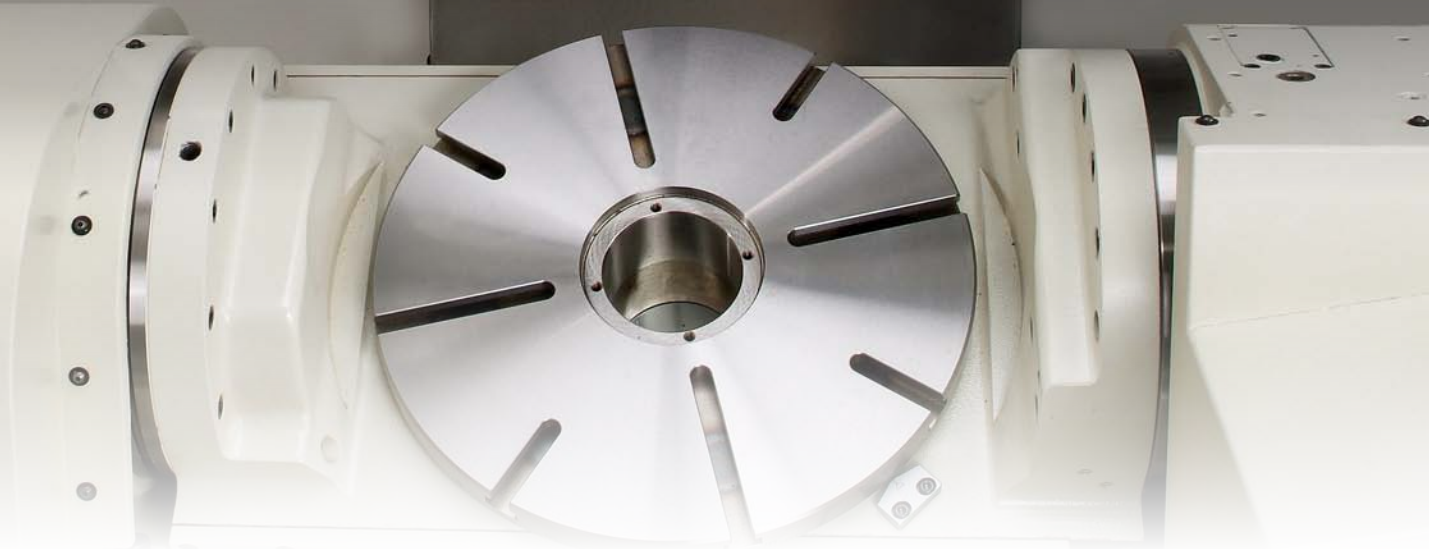
Unit: mm (inch)

Table	Size: 380 mm Thru Hole: $\varnothing 80$ mm
Feedrate	A-axis: 33.3 rev/min. C-axis: 33.3 rev/min.
Accuracy	Positioning (A/C): 10/10 sec. Repeatability (A/C): 6/6 sec.



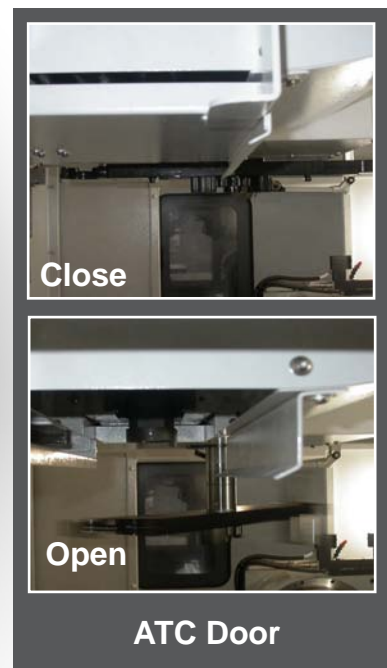
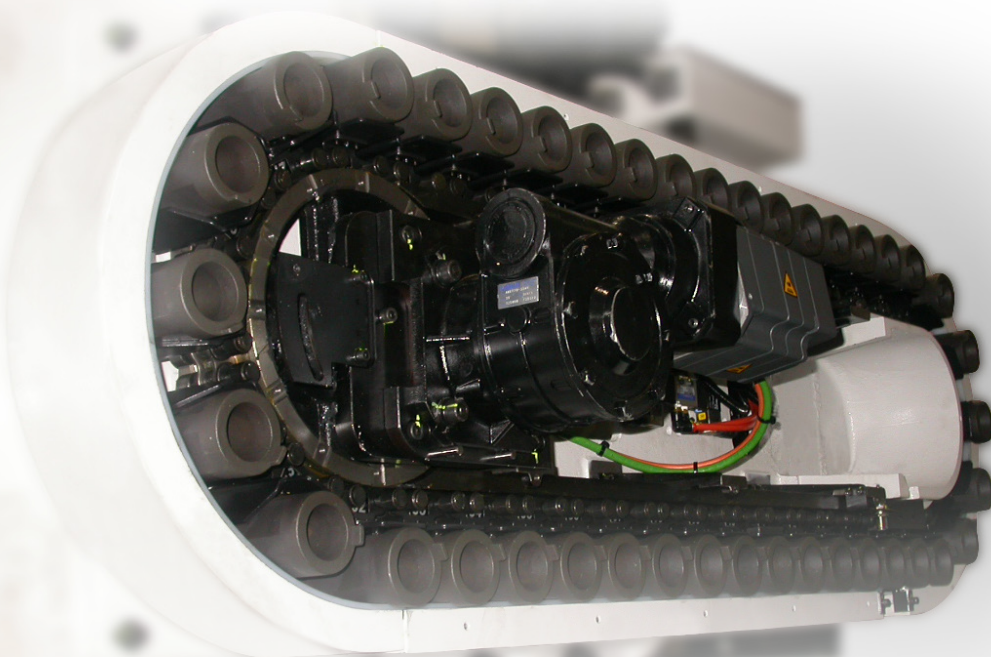
YCM In-house A/C-axis Rotary Table

- Rotary table surface leveled at the C-axis center to ensure machining accuracy and easy programming.
- $\varnothing 380$ mm ($\varnothing 14.96$ ") table size with $\varnothing 80$ mm ($\varnothing 3.15$ ") table-through hole design.
- 150° ($+30^{\circ}$ / -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. (opt.)
- ATC tool door design is standard that prevents coolant and chips from entering tool magazine.



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

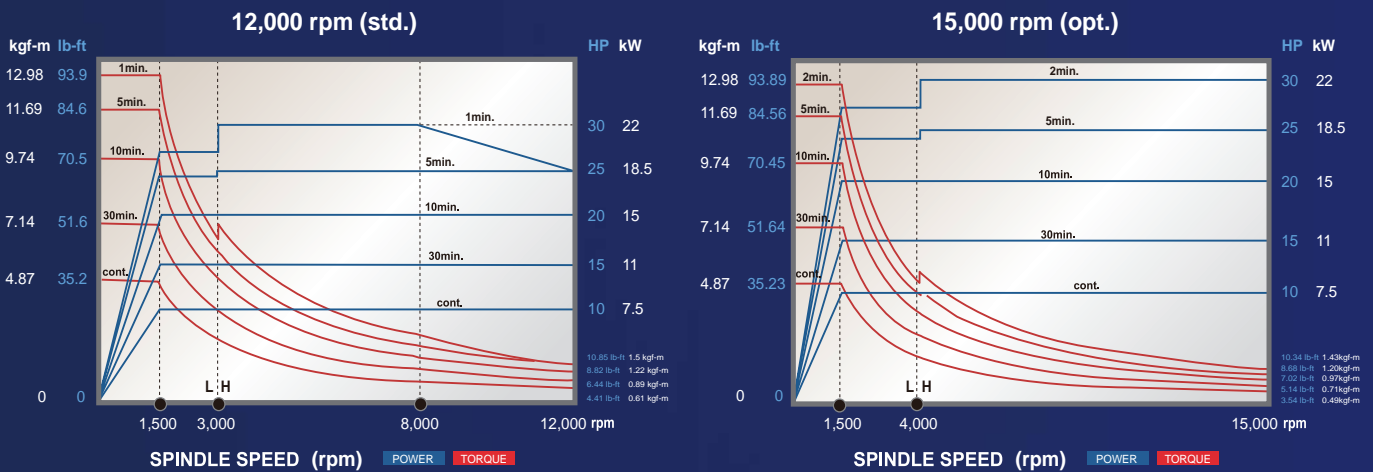
12,000 rpm (std.)

15,000 rpm (opt.)

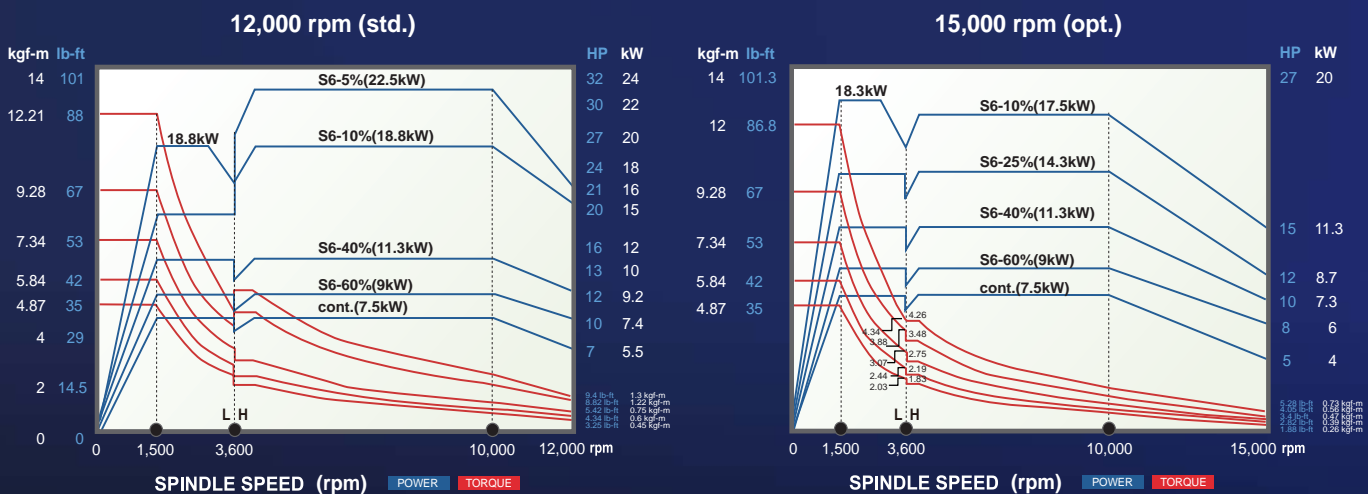


Power Chart

FANUC



HEIDENHAIN

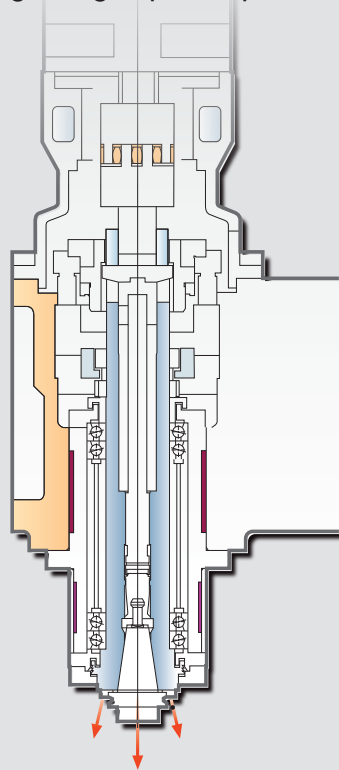


Spindle Oil Cooling Design

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.



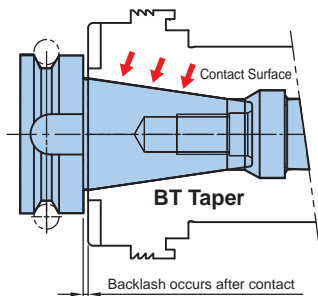
Oil-air Lubrication System



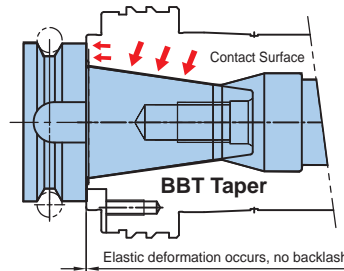
Heat Cooling System

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



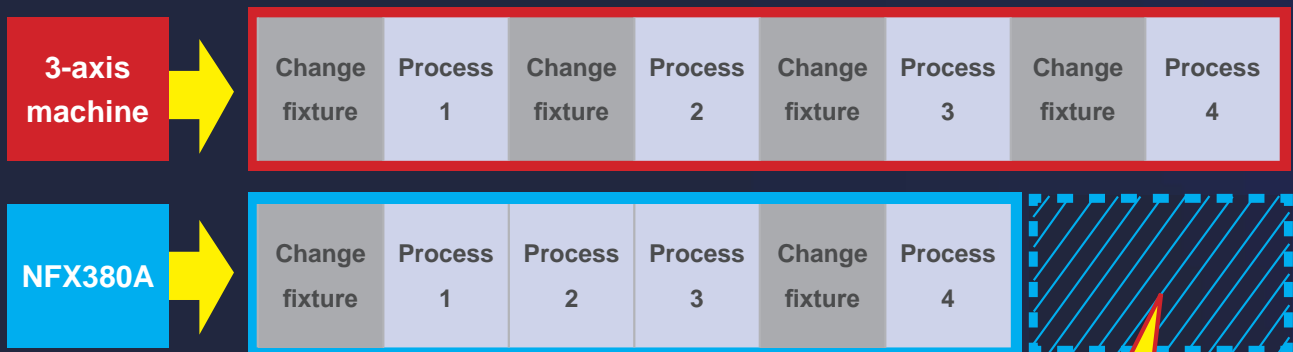
Laser Tool Measurement (opt.)



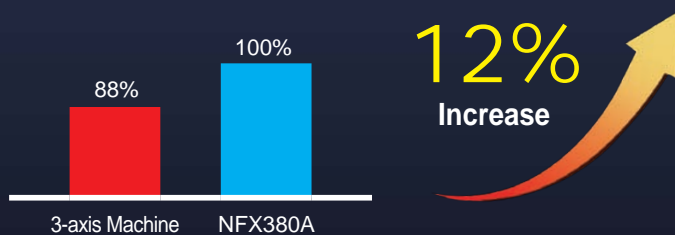
Advantages of 5-axis Machining

- 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



Machining Performance



- Shorten Process
- Reduce Fixture Cost
- Improve Accuracy



Automation Advantages

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



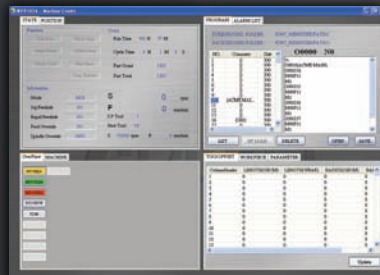
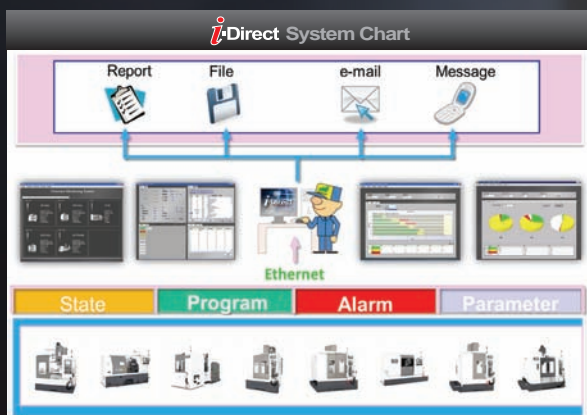
MXP-200 FB/FC

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.



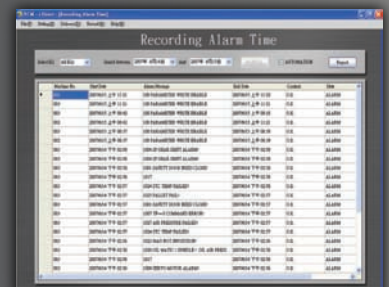
Single Machine Status Browsing
Machine Status Browsing



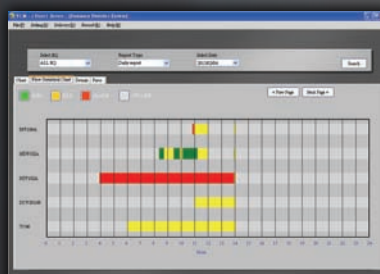
Plant Operation Status Monitoring



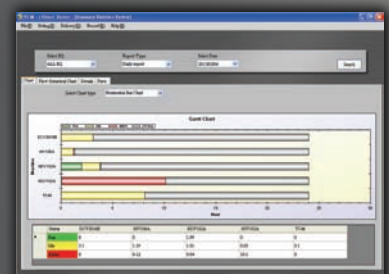
Machine connection, MMS and e-mail settings



Machine Status Time Record



Production Status Process Record



Production Management Statistics

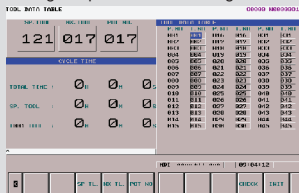
i-OPERATION *Plus II*

Software Enhancement Exclusively from YCM

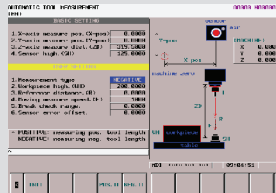


Pre-machining Preparation

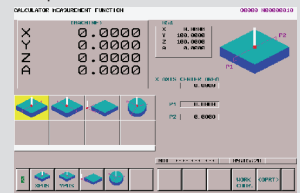
Intelligent Tool Data Management
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



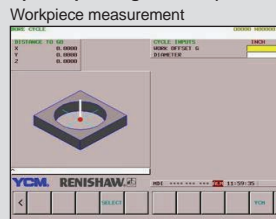
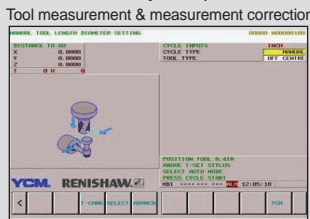
Tool Length Measurement
Graphic measuring interface provides automatic tool length measurement function



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

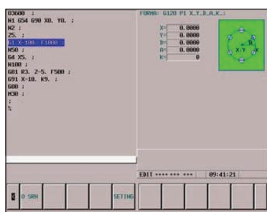


NEW RENISHAW GUI System (Conversational Graphic Operating Interface)

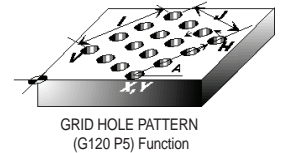
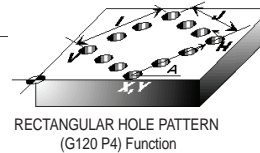
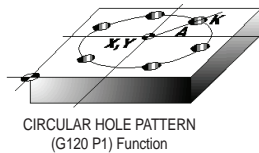


Programming

NEW i_PATTERN



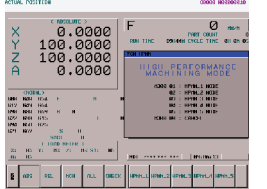
15 sets of machining cycle program
Reduces program input and memory time
Graphic interface & conversational command input



Machining

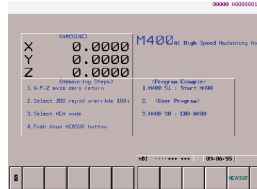
High Performance Machining Mode M300

With 5 sets of parameter settings, the users choose the most suitable mode for optimum machining



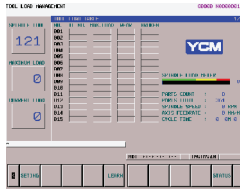
High Speed Machining Mode M400

Increases drilling and tapping speed, reduces machining time for job shop and precision mold machining



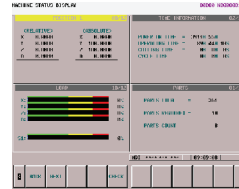
NEW Tool Load Management

Instant tool load monitoring with alarm function



Multi-display Function

Displays 4 statuses simultaneously with configurable status display



NEW Tool Life Management

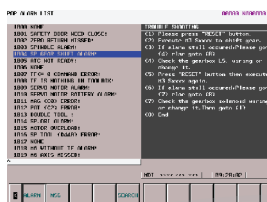
Indicates tool status of each group with tool life alert



Instant Message Alert

Pop-up Alarm Display

Instantly provides troubleshooting procedure
Quick response to alarm



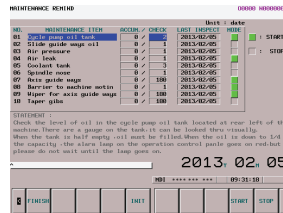
Wireless Message Notification

Machine status sent to a designated cellphone number.



Maintenance

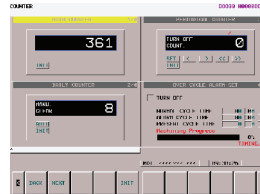
Intelligent Maintenance



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

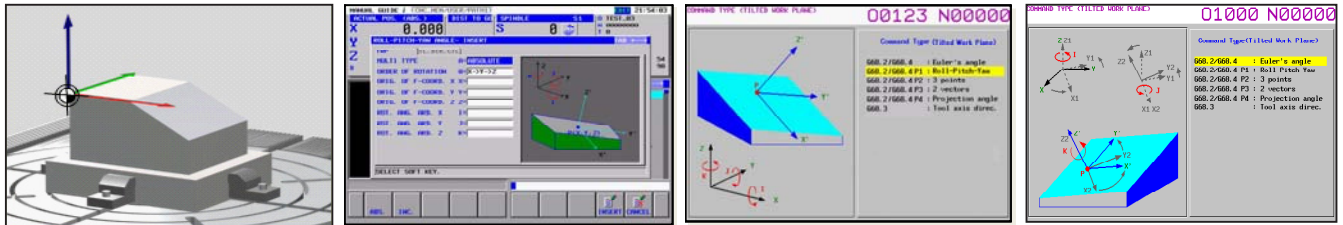
1. Main Counter
2. Periodical Counter
3. Daily Counter
4. Over Cycle Alarm



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

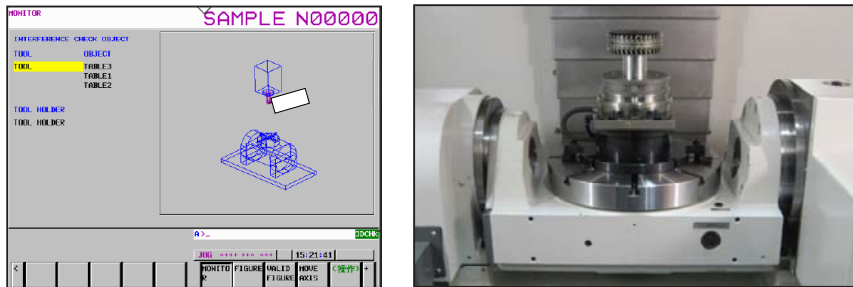
Tilted Working Plane Command

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



3D Interference Simulation

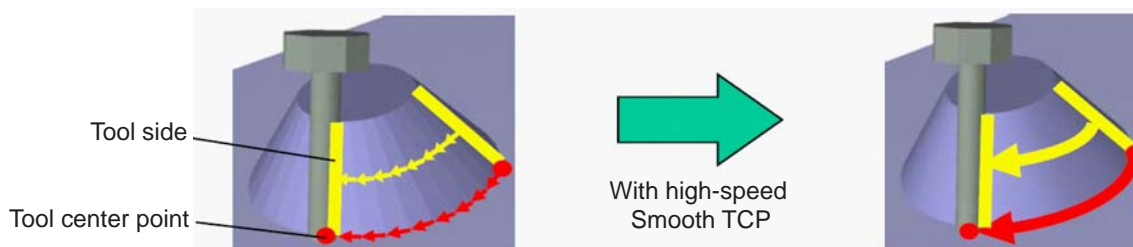
- 3D Interference Simulation function can help to reduce the danger of collision in 5th axis application.



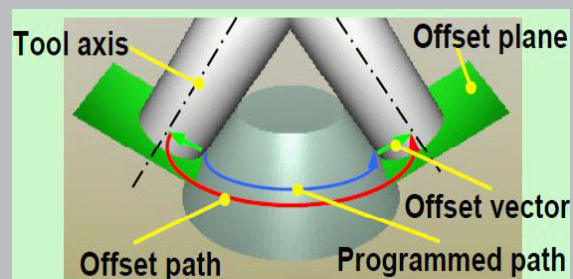
FANUC 31i-MB5 Control Exclusive Function

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



HEIDENHAIN TNC 640 HSCI Exclusive Function

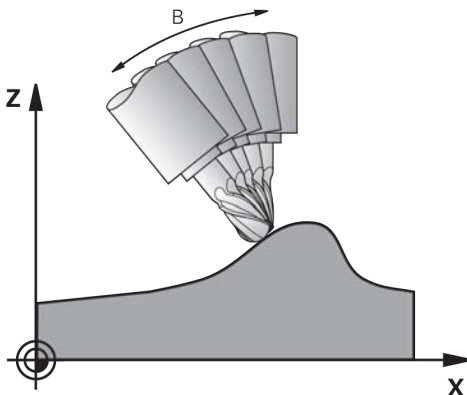


Heidenhain TNC 640 HSCI

- 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

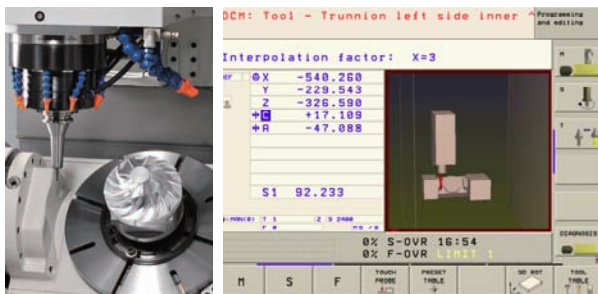
TCPM (Tool Center Point Management)

The offset of the tilting axes is compensated so that the tool tip remains on the contour.



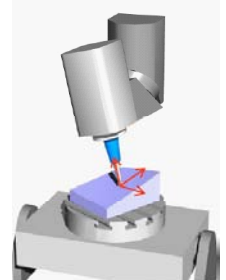
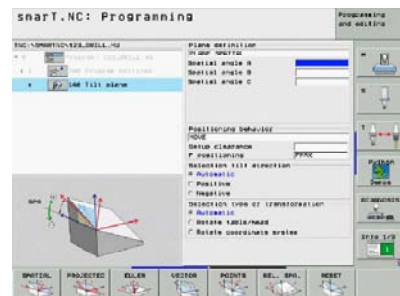
Dynamic Collision Monitoring (DCM)

Dynamic collision monitoring to protect operators and machine.



Tilted Working Plane Command

The PLANE function is a powerful function for defining tilted working planes in various manners.



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.

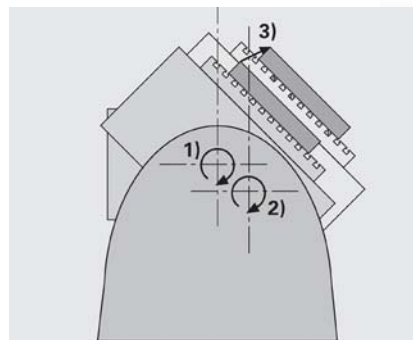
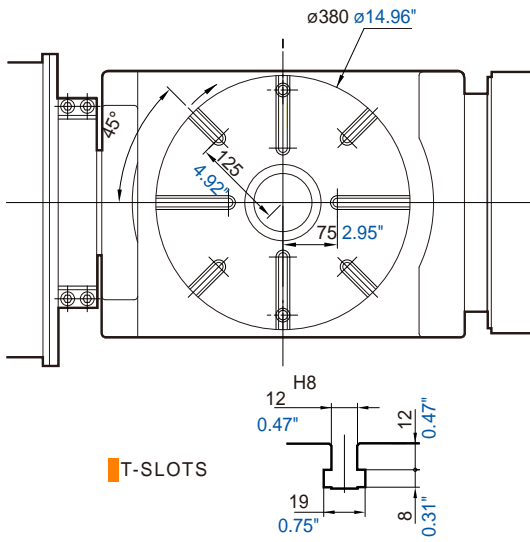
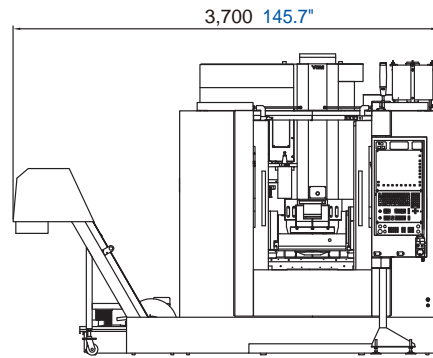
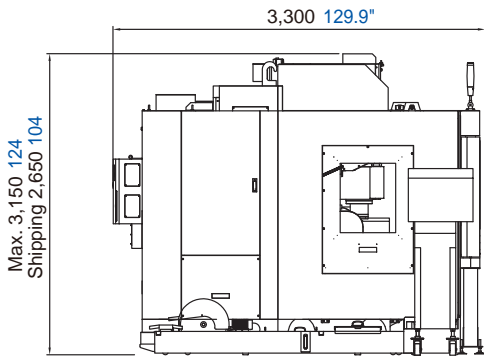
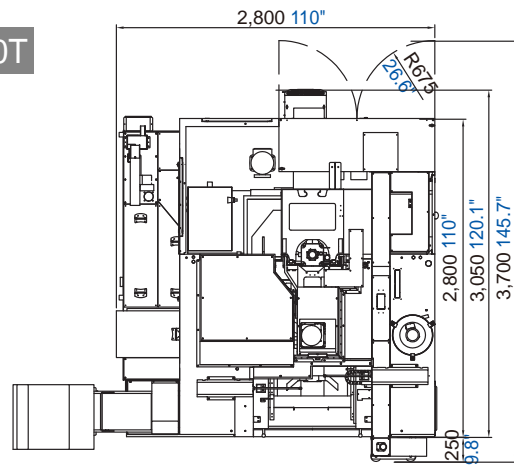


Table & Dimensions

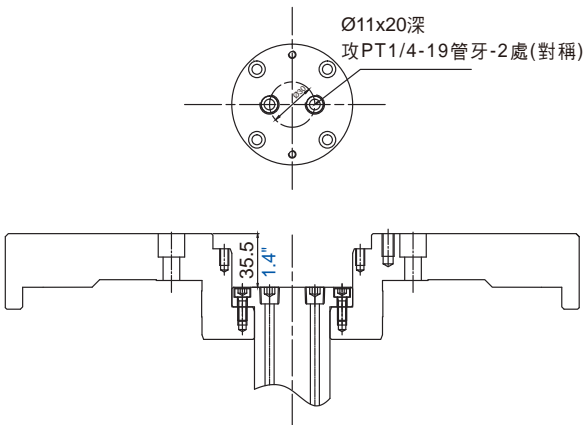
Unit: mm inch



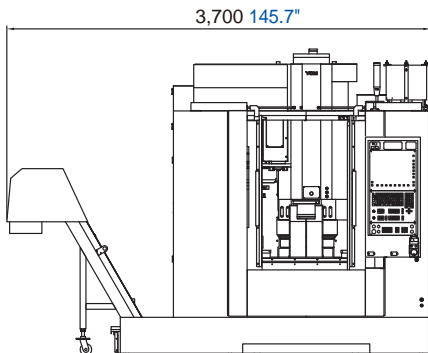
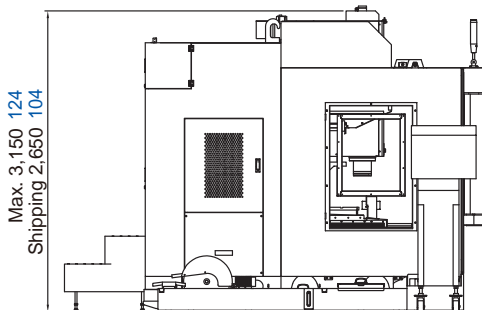
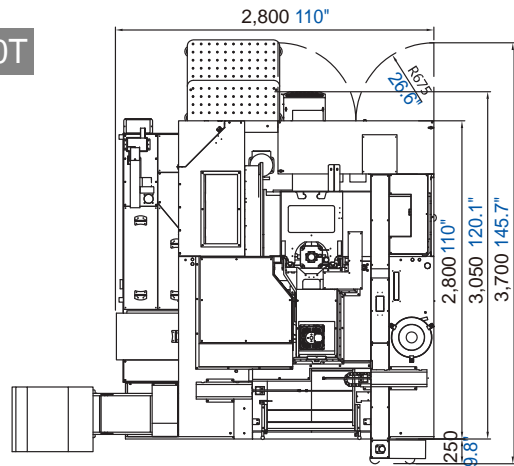
30T



治具孔位置詳圖



40T



Specifications

NFX380A

SPINDLE

Spindle Speed/Power (std.) FANUC controller	12,000 rpm 7.5/11/15/18.5/22 kW 10/15/20/25/30 HP (cont./30min./10min./5min./1min.)
Spindle Speed/Power (opt.1) FANUC controller	15,000 rpm 7.5/11/15/18.5/22 kW 10/15/20/25/30 HP (cont./30min./10min./5min./2min.)
Spindle Speed/Power (opt.2) HEIDENHAIN controller	12,000 rpm 7.5/9/11.3/18.8/22.5 kW 10/12/15/25/30 HP (cont./S6-60%/S6-40%/S6-10%/S6-5%)
Spindle Speed/Power (opt.3) HEIDENHAIN controller	15,000 rpm 7.5/9/11.3/14.3/17.5 kW 10/12/15/19/23 HP (cont./S6-60%/S6-40%/S6-25%/S6-10%)
Spindle Taper	BBT40

TRAVEL

X-axis Travel	700 mm 27.56"
Y-axis Travel	520 mm 20.47"
Z-axis Travel	480 mm 18.90"

TABLE

Table Size/T-Slots	ø380 mm / 12 mm ø14.96" / 0.47" Radial
Max. Load on Table (Vertical)	200 kg 441 lb
Max. Load on Table (Horizontal)	200 kg 441 lb
Available Torque on Table	30 kg-m 217 lb-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 / 24 m/min 1,417 / 1,417 / 944 ipm
Cutting Feedrate	1~10,000 mm/min 0.04~393.7 ipm

ACCURACY

	ISO 10791-4	YCM*
Axial Travel	Full Length	
Positioning (X/Y/Z) A	0.025/0.025/0.022 mm 0.00098"/0.00098"/0.00086"	0.010/0.010/0.010 mm 0.00039"/0.00039"/0.00039"
Repeatability (X/Y/Z) R	0.015/0.015/0.012 mm 0.00059"/0.00059"/0.0005"	0.007/0.007/0.007 mm 0.00028"/0.00028"/0.00028"

*All values shown above are measured for the machine in good air-conditioned environment.

ATC

Tool Magazine Capacity(opt.)	30T (40 / 60T)
Max. Tool Weight	6 kg 13.2 lb
Max. Tool Length	ø76 x 280 mm ø3" x 11.02"

GENERAL

Pneumatic Supplier	5.5 kg/cm ²
Power Consumption (Transformer)	FANUC: 34 kVA (40 kVA) HEIDENHAIN: 54 kVA (65 kVA)
Machine Weight	6,200 kg 13,669 lb

Note: Above specifications may vary depending on the machine and the surrounding environment.
The manufacturer reserves the right to modify the design, specifications, mechanisms, etc., to improve the performance of the machine without notice.
The test data provided in this catalog is performed under specific test procedures and environmental conditions.

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 TNC640

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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