TABLE-TYPE HORIZONTAL BORING MILL

MAF-EII

NIDEC MACHINE TOOL CORPORATION

Maximize Your Productivity

High Precision

Spindle Cooling System
Cooling of bearing housing and gearbox minimizes thermal displacement during spindle rotation.

Thermally Stabilized Column
Thermal Control Material inside the column lowers machine's sensitivity to environmental temperature changes and reduces deformation.

High Rigidity

Sliding Surface with a Wide Box Guide Way Supports High-Load Machining
X, Y, and Z axes utilize quenched and polished wide guide surfaces.

Robust Mechanical Structure
All main structures are cast and optimally designed by FEM analysis. Double wall structure column receives the reaction force of heavy machining.

High Productivity

Best-in-Class Spindle Performance and Rapid Traverse
Spindle output: 30/37 kW
Rapid traverse speed: X, Y, Z axes 15 m/min 590.5 ipm
                                   W axis 10 m/min 393.7 ipm
                                   B axis 500 deg./min

Expanded W-axis Spindle Stroke
Increases machinable range of workpieces
800 mm 31.5 inch

The world of "Monozukuri" (Japanese word for manufacturing with the drive for perfection) has entered a new era of global market competition. A higher level of precision, quality, and productivity are now essential. The goal: A horizontal boring machine that can process as the operator envisions. After much consideration, our answer at NIDEC MACHINE TOOL CORPORATION is to minimize any decline in processing accuracy from thermal displacement. To achieve high-precision manufacturing, the MAF-E is equipped with a spindle cooling system to completely suppress thermal displacement during spindle rotation. The thermally stabilized column suppresses deformation from changes in environmental temperature that would distort the machine's main structure. The focus is not only on improving accuracy, but also on rigidity. All of the main structures are castings with high damping properties against vibration and have a wide sliding surface with a wide box guideway. The MAF-E has inherited the highly rigid design established in the previous generation of conventional large machines, and through further evolution, has an improved rigidity of the table, the main structure, and the spindle. Furthermore, the machine incorporates a spindle motor output of 30/37kW, 30 minute continuous torque of 2,953/3,643 Nm and rapid traverse speed of 15 m/min for X, Y, Z axes. MAF-E has the highest performance and speed in its class to maximize your productivity. Our dedication to "Monozukuri" is realized in MAF-E 's high precision, high rigidity, and high productivity. We are introducing your indispensable partner for world-class manufacturing.
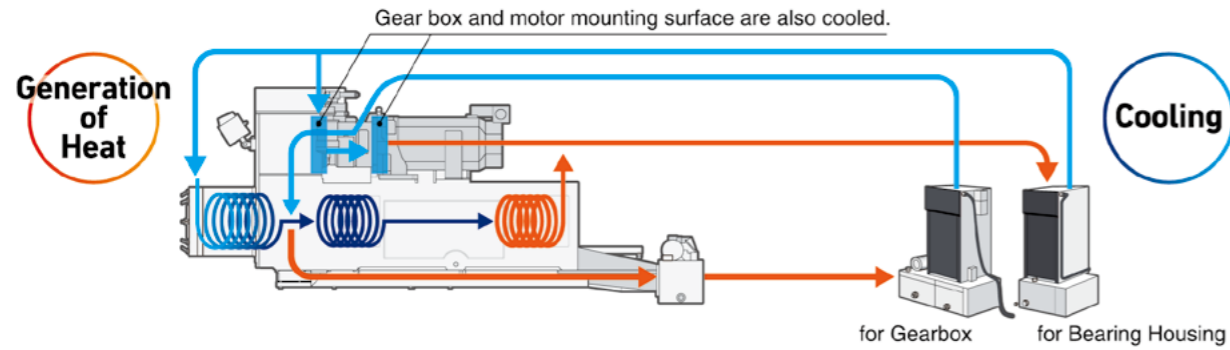
More Power, Precision & Rigidity

MAF-EⅡ
TABLE-TYPE HORIZONTAL BORING MILLS

●The photo includes optional equipment. Actual product may vary based on options and specifications chosen.

High Precision

Spindle Cooling System

● Cooling of bearing housing and gearbox minimizes thermal displacement during spindle rotation.

Gear box and motor mounting surface are also cooled.

Generation of Heat

Cooling

for Gearbox   for Bearing Housing

Verification Test

Boring machining: Displacement is measured at spindle rotation speed of 600 min-1 for 120 minutes.

Spindle tip displacement in X and Y directions

Within ± **3 μm**

600 min-1

By suppressing displacement during spindle rotation, warm-up operation time of spindle is reduced, and machining for an extended period is also highly accurate.

Thermally Stabilized Column

● Thermal Control Material inside the column lowers machine's sensitivity to environmental temperature changes and reduces deformation.
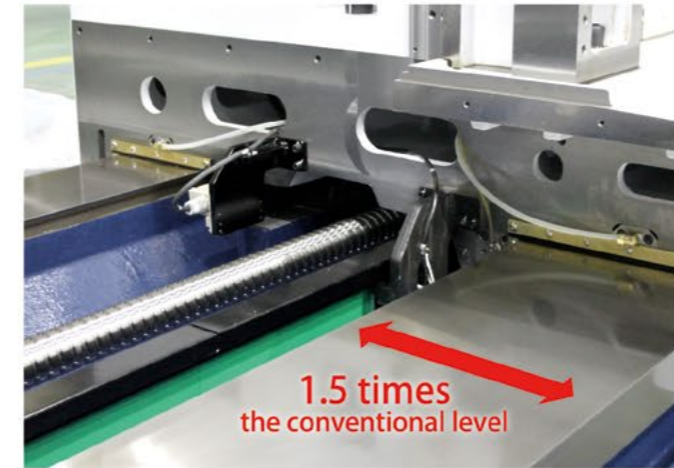
Column

Thermal Control Material

*Thermal Control Material is completely sealed in column and is maintenance-free.
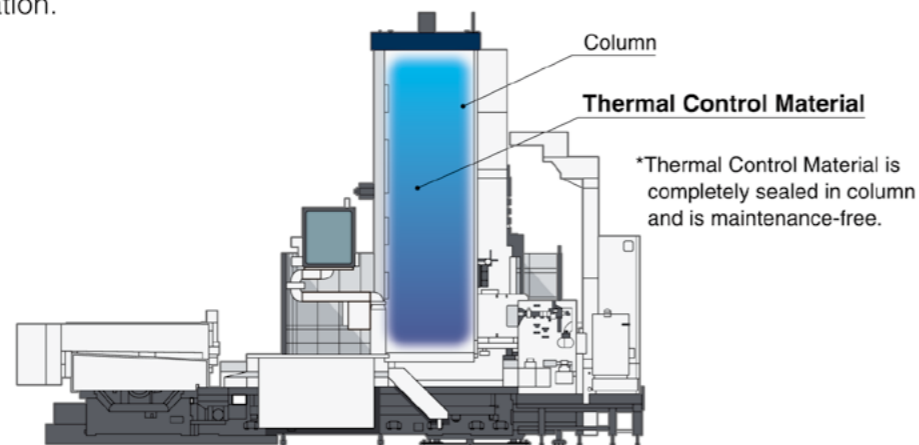
●The data in this catalog is based on actual results at our company plants ; it is not warranted.

High Rigidity

Sliding Surface with a Wide Box Guide Way Supports High-Load Machining

● X, Y, and Z axes utilize wide sliding surfaces.
● The widest X-axis guideway and thickest table in its class accommodate large workpieces weighing up to 20 tons 44,000 lbs.

1.5 times the conventional level

1.5 times the conventional level
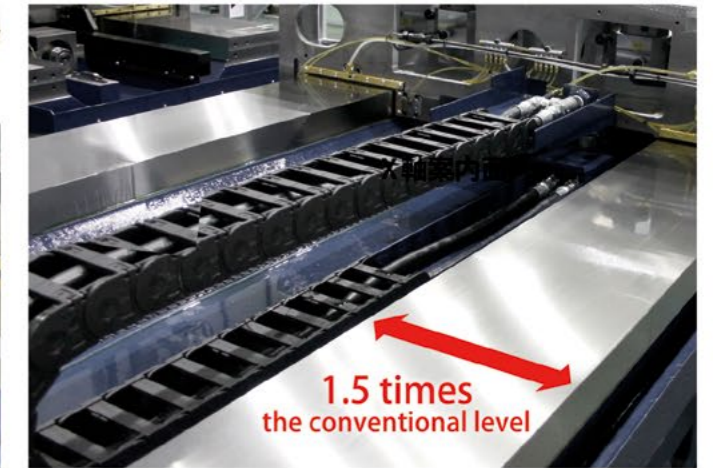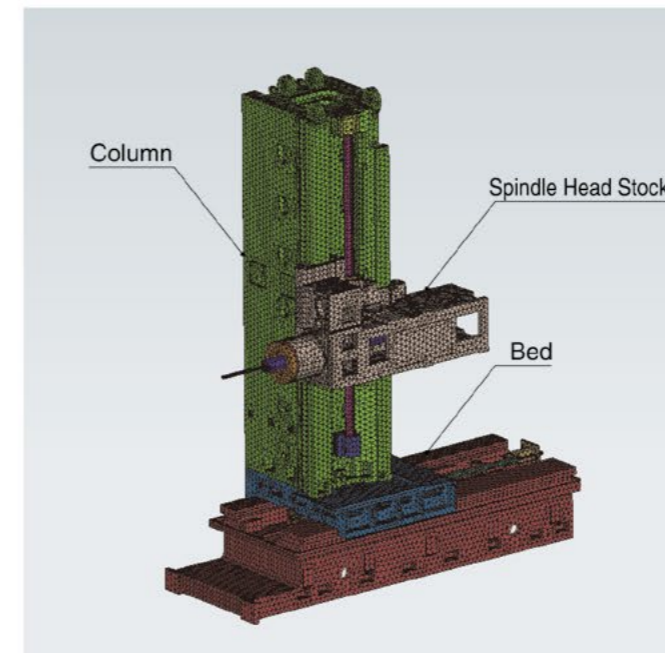
Column Guide Surface (Z axis)

Table Guide Surface (X axis)

Robust Mechanical Structure

● The double-wall structure of the column receives the reaction force of heavy machining.

FEM Analysis of Main Structures

All main structures are cast and optimally designed by FEM analysis.
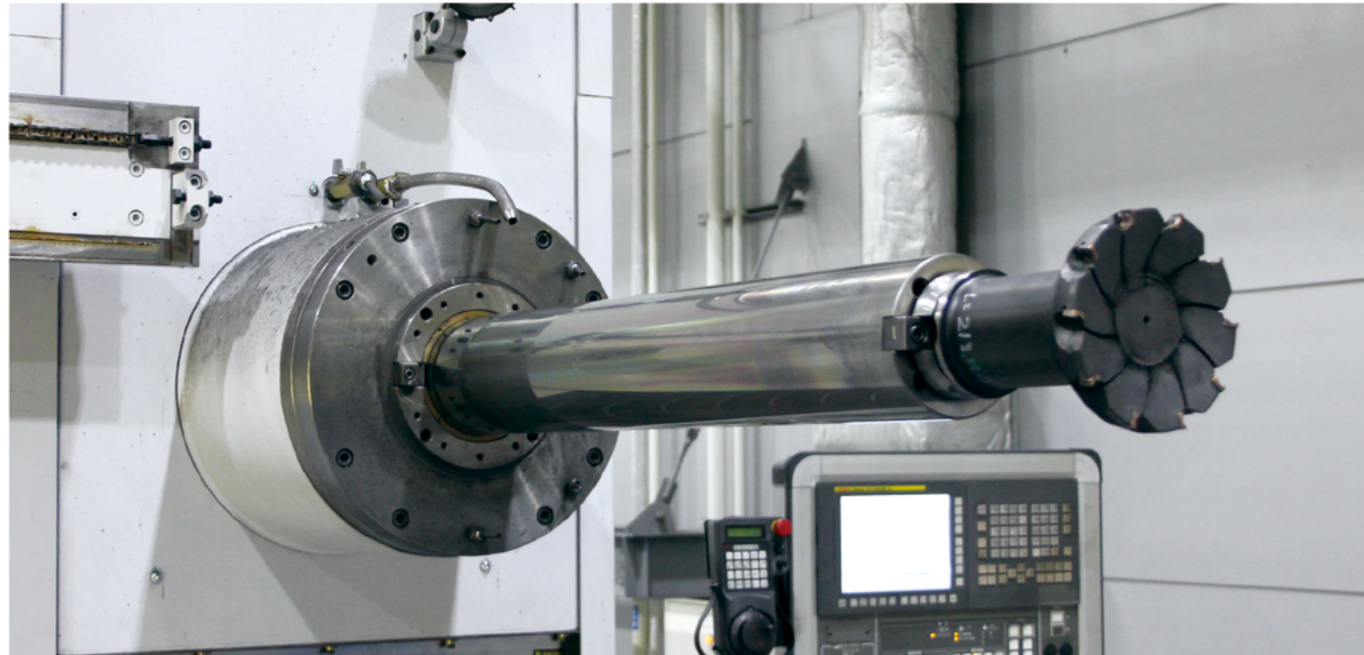*FEM: Fine Element Method

Column

Spindle Head Stock

Bed

Double-walled Column

Double-walled structure adopted in upper grade "MAF-C" and "MAF-R" machines yields the highest rigidity in its class.
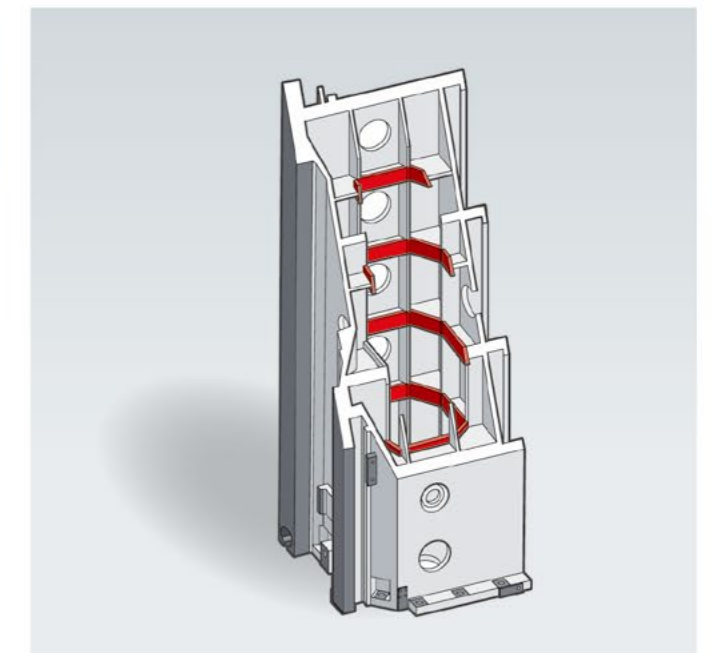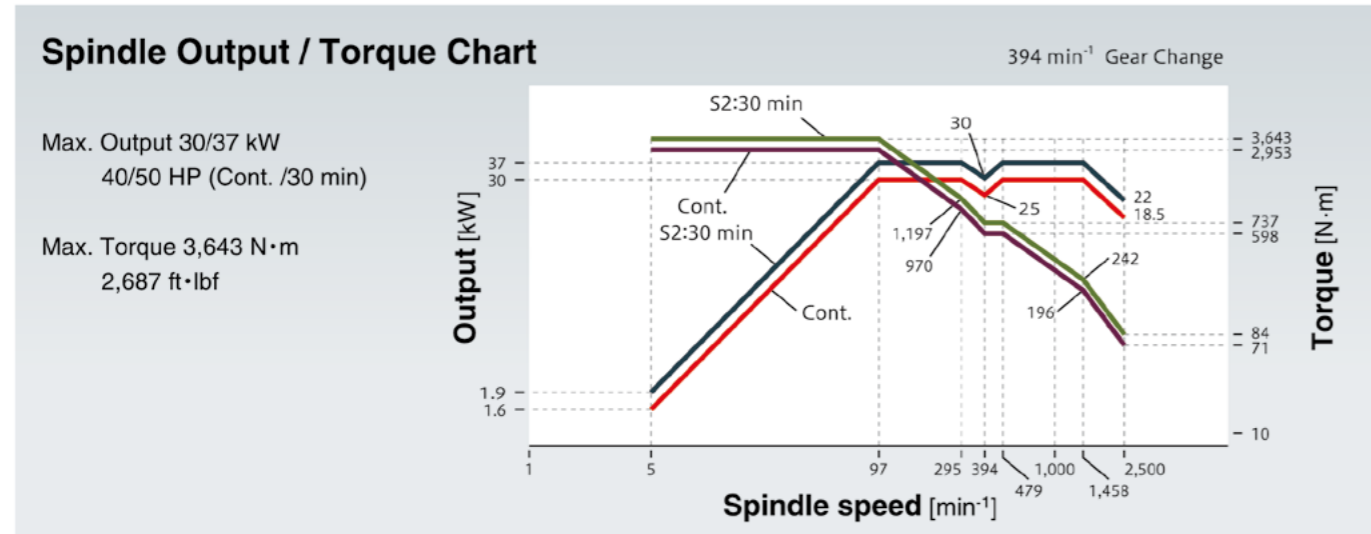
●The photo includes optional equipment. Actual product may vary based on options and specifications chosen.

High Productivity

High Performance Rigid Spindle

● Various machining processes such as high-speed drilling, heavy-duty milling or high-torque boring are possible.

Spindle Output / Torque Chart

Max. Output 30/37 kW
40/50 HP (Cont. /30 min)

Max. Torque 3,643 N·m
2,687 ft·lbf

Best in Class Spindle Feed of 800 mm 31.5 in.

● Excellent access to the workpieces makes MAF-EII suitable for boring deep holes.

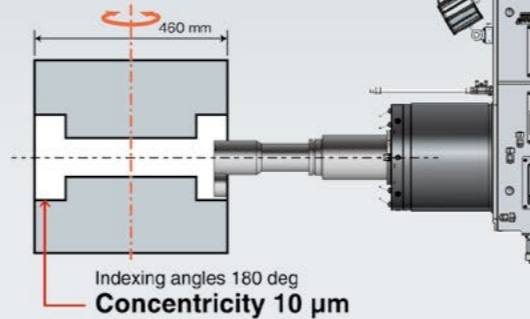## Quick Axis Movement Shortens Non-Cutting Time

● Rapid traverse speed: X, Y, Z axes 15 m/min 590.5 ipm, W axis 10 m/min 393.7 ipm, B axis 500 deg./min
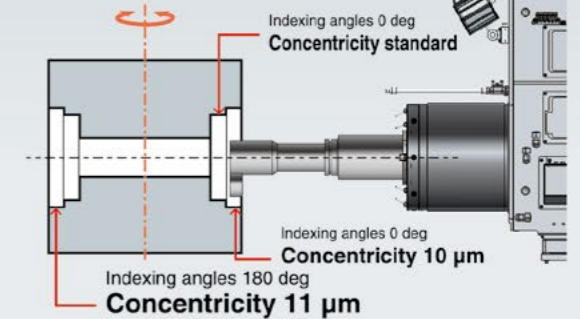
High-Precision Reverse Boring

Reverse boring of 120 mm 4.7 in is performed three times with the W axis extended 500 mm 19.7 in.

① Boring is performed at table indexing angles of 0° and 180° to evaluate concentricity.

② After 6 hours, when the temperature has changed 6°C, the machining is resumed to evaluate concentricity.

460 mm

Indexing angles 180 deg
Concentricity 10 μm

Indexing angles 0 deg
Concentricity standard

Indexing angles 0 deg
Concentricity 10 μm

Indexing angles 180 deg
Concentricity 11 μm

Cutting Examples

Milling Spindle stroke 300 mm

Tool diameter	φ160 mm 6.3 in
Depth of cut	6 mm 0.24in
Width of cut	130 mm 5.1 in
Feed rate	1,195 mm/min 47.0 ipm
Cutting quantity	932 cm³/min 6.8 cu.in/min
Material	SS400
Machining Position from Table Surface	970 mm 38.2 in

Large Diameter Tapping

Outside diameter	φ80 mm 3.1 in
Pitch	6.0 mm 0.24 in
Spindle speed	20 min⁻¹
Cutting speed	5 m/min 0.24 in
Feed rate	120 HP/min 4.72 ipm
Material	SS400
Machining Position from Table Surface	1,480 mm 58.3 in

Large Diameter Boring

Tool diameter	φ580 mm 22.8 in
Depth of cut	6 mm
Spindle speed	80 min⁻¹
Feed rate	32 mm/min 1.3 ipm
Cutting quantity	347 cm³/min 21.2 cu.in/min
Material	SS400
Machining Position from Table Surface	870 mm 34.3 in

Boring Spindle stroke 500 mm

Tool diameter	φ170 mm 6.7 in
Depth of cut	5 mm 0.20 in
Spindle speed	320 min⁻¹
Feed rate	160 mm/min 6.3 ipm
Cutting quantity	415 cm³/min 25.3 cu.in/min
Material	SS400
Machining Position from Table Surface	1,860 mm 73.2 in

●Results above are not guaranteed. They are examples of actual machined values. Your results depend on specifications and tooling and cutting conditions.

User Friendly

Operation Panel Is Light and Easy to Use

- The thickness of the control panel has been reduced to 90 mm to reduce weight.
- This is an operation screen that pursues ease of use such as multi-screen display and 3D maintenance screen.

Energy Saving

- Machine uses LED lighting and energy–saving valves.
- A thorough energy-saving design reduces power consumption.
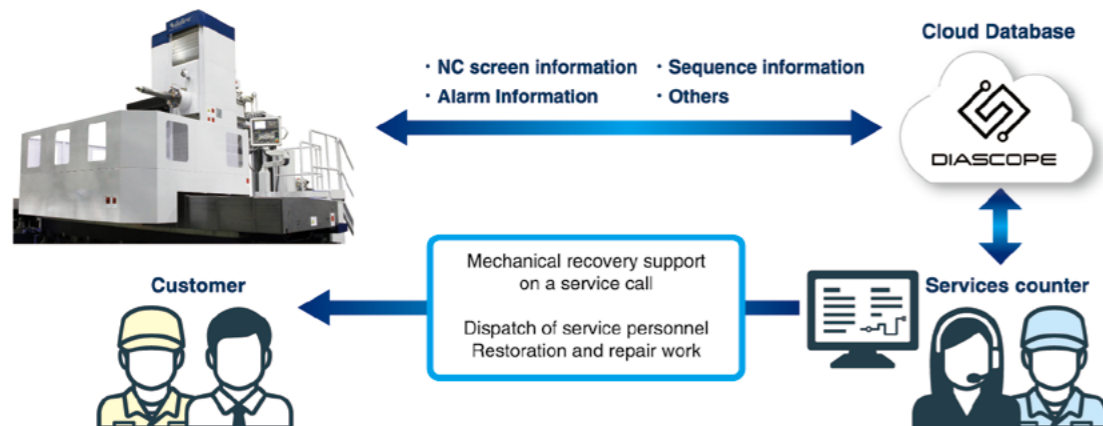
Easy Maintenance

- Equipment such as lubricant units and air valves are concentrated near the control panel for easy maintenance.

Maintenance equipment

Remote Monitoring Maintenance Service

- Leverage IoT Platform "DIASCOPE"
- In response to reports of trouble, the support center provides remote access to the machine to instantly grasp the machine status. Based on monitor information, we will guide you to the correct solution to minimize machine downtime.

Cloud Database

- NC screen information   · Sequence information
- Alarm Information   · Others

DIASCOPE

Customer

Services counter

Mechanical recovery support on a service call

Dispatch of service personnel Restoration and repair work

● To use Remote Monitoring Maintenance Service, you must agree to the terms and conditions of the data communication service.

Machine Specifications

Item		MAF130EⅡ		
		1820	2022	2025
Boring spindle diameter	mm in	130 5.1		
Spindle nose taper		ISO No.50 (Taper 7/24)		
Spindle speed	min⁻¹	5-2,500		
Motor output (Cont./30min)	kW HP	VAC30/37 40/50		
Spindle max. torque	N·m ft·lbf	3,643 2,687		
Table size	mm in	1,800 x 2,000 70.8 x 78.7	2,000x2,200 78.7 x 86.6	2,000 x 2,500 78.7 x 98.4
Table rotation		Indexing at every 0.0001° . opt. Cutting feed B axis		
Table load capacity	kg lb	20,000 44,000		
Table X axis	mm in	3,000 118.1		
Spindle head Y axis	mm in	2,300 90.5		
Column Z axis	mm in	1,600 63.0		
Boring spindle W axis	mm in	800 31.4		
Distance from table upper surface to spindle center line	mm in	100 ~ 2,400 3.9 ~ 94.5		
Distance from table center line to spindle surface	mm in	850 ~ 2,450 33.5 ~ 96.5		
Rapid traverse X, Y, Z axes	mm/min ipm	15,000 591		
Rapid traverse W axis	mm/min ipm	10,000 394		
Rapid traverse B axis	deg./min	500		
Cutting feed rate	mm/min ipm	1-10,000 0.04-393.7		
ATC tool number		50 opt. 80, 100		
Total power consumption	kVA	80		
NC Controller		FANUC 31i MB		
Air source pressure	MPa psi	0.4 ~ 0.7 58 ~ 100		
Air source capacity	NL/min	1,400		
Machine height	mm in	5,458.5 214.9		
Required floor area	mm in	8,295 x 8,090 326.6 x 318.5		
Machine mass	kg lb	45,000 99,210	45,500 100,310	46,000 101,415

Standard Equipment

Spindle bearing housing cooling system	Armored bellows covers on spindle head slideway	Maintenance tool kit
Spindle gearbox cooling system	Telescopic steel way covers for X and Z axes	Self-diagnosis function
Thermally stabilized column	Operator's platform	Operator friendly function
Spindle nose taper air blow system	Spindle orientation	Spindle load meter (display on LCD)
Air blow system	Work light	Earth leakage breaker (Sensitivity current 200 mA)
Tool locking system with pull-stud MAS opt.MAS	Coil type chip conveyor parallel to X axis	IoT Platform DIASCOPE
MP scale feedback system for X, Y, Z and B axes	Lubrication and hydraulic pump units	Remote monitoring service system
Pendant control box	Leveling jacks and anchor bolts	

Optional Equipment

Flood coolant supply system (Tank capacity 350 L)	Coil type chip conveyor both side of Z axis
Coolant supply system through the spindle	Easy mount type coolant splash guard
Hinged steel belt conveyor orthogonal to table X axis	Automatic Power off
Mist Coolant supply system	Overload monitor by soft meter method
Chip box	Automatic workpiece measurement and compensation
Indication lamp	

● The photo includes optional equipment. Actual product may vary based on options and specifications chosen.

NC Specifications   FANUC31i-Model B

Standard Functions

Item	Description
Control axis / feedback system	
X axis	Table longitudinal travel, MP scale
Y axis	Spindle head travel, MP scale
Z axis	Column travel, MP scale
W axis	Spindle travel, Pulse coder
B axis	Table rotation, Rotary MP scale
Simultaneously controlled axes	
Positioning and linear interpolation	Simultaneous 4 axes, X-Y-Z-W
Multiple quadrant circular interpolation	Simultaneous 2 axes, X-Y, X-Z, Y-Z
Manual	Simultaneous 1 axis
Manual handle	Simultaneous 1 axis, Portable type with position display
Input increment	
0.001 mm/pulse	X, Y, Z, W axes positioning use
0.0001 deg/pulse	Only B axis positioning use
Data input/output, DNC input	
Memory Card input/output	
USB Memory input/output	NC data input/output
Embedded Ethernet interface	I/F:100 base-T (1 ch.) (Program in/out) DNC operation is impossible Used in Remote Monitoring Support Service (Only hardwear)
Compact flash card (CF)	For NC data back-up (1 piece) Capacity: 256Mbyte
Adapter for CF card A	For user (1 piece) For slot of character display
Controlled axis	
Least input increment	0.001 mm, 0.0001 in, 0.0001 deg. (B axis Only)
Machine lock	All axes/each axis
Emergency stop	
Overtravel	
Stored stroke check 1	
Stroke limit check before move	
Mirror image	X, Y axes
Follow-up	Emergency stop
Backlash compensation	0−±9,999 pules
Stored pitch error compensation	
Interpolation type pitch error compensation	
Operation	
Automatic operation(memory)	
DNC operation	RS-232C of reader/puncher interface (opt.), Memory card interface
MDI operation	
Program number search	
Sequence number search	
Sequence number comparison stop	
Program restart	
Buffer register	1 block
Dry run	
Single block	
Jog feed	0−4,000 mm/min. (22 step)
Manual reference position return	
Manual handle feed	1unit, potable type manual handel
Manual handle feed rate	×1, ×10, ×100
Cycle start / Feed hold	
Program stop / End	M00, M01, M02, M30
Reset / Rewind	M30

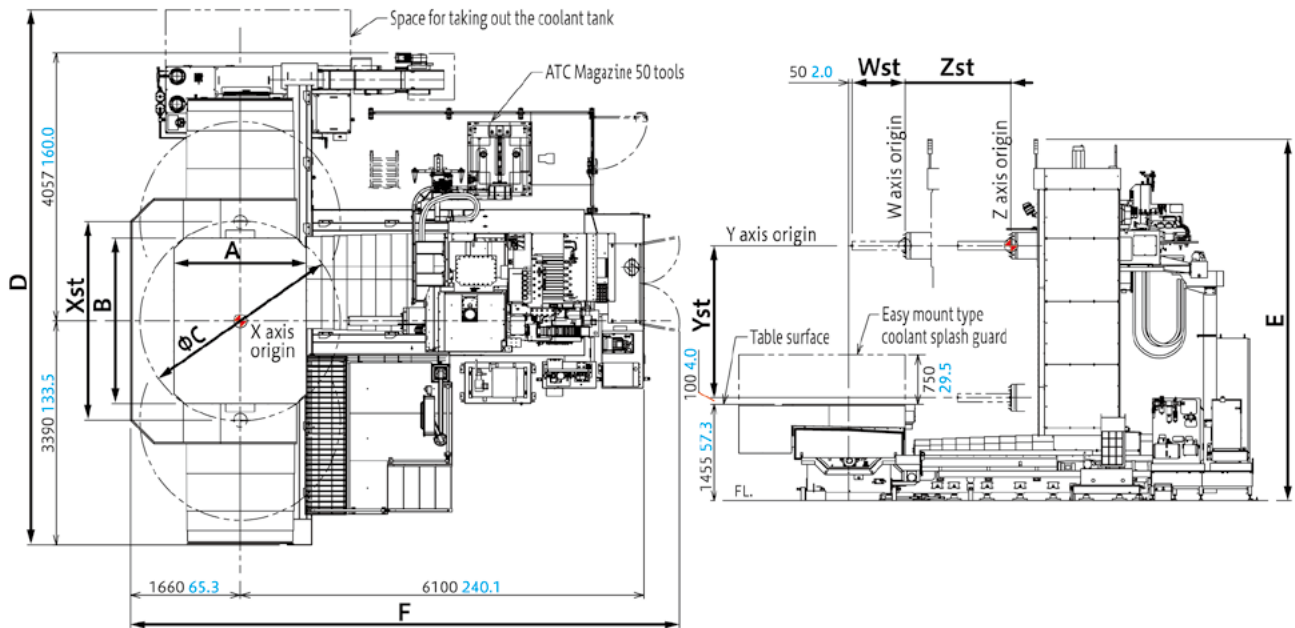| Item	Description
Interpolation functions	
Positioning	G00
Single direction positioning	G60
Exact stop mode	G61
Exact stop	G09
Linear interpolation	G01
Circular interpolation	G02, G03, Multi-quadrant is possible
Dwell	G04, Dwell in seconds
Helical interpolation	G02, G03, Circular interpolation plus max. 2 axes linear interpolation.
Skip	G31
Reference positiion return	G28
Reference positiion return check	G27
2nd reference position return	G30 (P2)
3rd/4th reference position return	G30 (P3, P4)
Tapping mode	G63
Cutting mode	G64
Feed function	
Rapid traverse rate	0, 1, 10, 25, 50, 100 %
Feed per minute	G94, mm/min.
Tangential speed constant control	
Cutting feedrate clamp	
Automatic acceleration/deceleration	Rapid traverse: linear Cutting feed: linear + exponential
Override cancel	M48: Enable / M49: Disable
Program input	
Tape code	EIA, RS244, ISO840 Automatic recognition
Label skip	
Parity check	Horizontal and vertical parity
Control in/out	
Optional block skip	3 (total)
Max. programable dimension	±99999.999 mm (±8-digit)
Program number	32 characters
Sequence number	N8-digit
Absolute/incremental programming	
Decimal point programming / pocket calculator type decimal point programming	
Input unit 10 time multiply	0.01 mm, 0.01 deg., 0.001 in
Plane selection	G17, G18, G19
Coordination system setting	
Automatic coordination system setting	
Workpiese coodinate system	G54−G59, 6 pairs
Workpiese coodinate system preset	G92.1
Manual absolute on and off	
Optional chamfering / corner R	
Programmable data input	G10
Sub program call	M98, 10 folds nested
Custom macro	G65, G66, G66.1, 5 folds nested
Custom macro common variables	82, #100−#149, #500−#531
Addition of custom macro common variables	600 (total)
Canned cycles	G73, G74, G76, G80−G89
Circular interpolation by R programing	12-digit
Automatic corner override	G62
Coordinate system rotation	G68, G69
3-dimensinal coordinate conversion	G68, G69

Item	Description
Auxiliary / Spindle speed function	
Auxiliary function	M3-digit
2nd Auxiliary function	C3-digit
Spindle speed function	S4-digit
Spindle override	50-150 %
Tool function / Tool compensation	
Tool function	T4-digit
Tool offset pairs	±7-digit 200
Tool offset memory C	Distinction between geometry and wear, or between cutter and tool length compensation
Tool length compensation	G43, G44, 49
Tool offset	G45, G46, G47, G48
Cutter compensation C	
Tool management function	Oversize tools support
Automatic tool length measurement	
Editing operation	
Part program storage capacity	640 m
Number of registerable programs	500
Program editing	
Background editing	
Extended program editing	
Memory card program operation / editing	Number of programs: 63 Maximum size: 2 Gbyte
Memory card program tool	
Program protect	
Setting and display	
Status display	
Clock display	
Cutting potition display	
Program display	Program name 31 characters
Self-diagnosis function	Self diagnosis in NC system
Alarm display	
Alarm history display	
Graphic function	
Multi-language display	English version, Japanese version
Data protection function	1 type
Erase CRT screen display	
Others	
CRT character display	10.4" color LCD

Optional Functions

Item	Description
Data input/output, DNC input	
Reader/puncher interface (Number of max ch. is total 2ch. D-sub(25pin) connector is installed on the door of main control panel.)	RS-232C
	RS-232C addition of 1 ch. (Program in/out, DNC operation)
	RS-232C addition of 1 ch. (Auto. measuring data print-out)
Reader/puncher interface expansion of receiving buffer	Remote Buffer Interface
Data server	Memory device: ATA FLASH CARD I/F: 100base-T (1 ch.) (Program in/out, DNC operation)
	DataServer Explorer connection function
Program Transfer Tool (For CNC Part program strage memory)	For CNC Part program storage memory
	For Data server Memory
Adapter for CF card A	
Adapter for CF card B	
Compact flash card (CF)	Capacity: 256 Mbyte

Item	Description
Controlled axis	
Controlled axes / feedback system (Absolute position detection)	B axis: Rotary MP scale
inch/metric conversion	G20, G21
Stored stroke check 2,3	
Operation	
Tool retract and recover	
Manual handle interruption	One dimension
Interpolation functions	
Conical / spiral interpolation	G02, G03
Polar coordinate interpolation	G12.1, G13.1
Threading, synchronous cutting	G33, Including "Dwell in seconds" and "Feed per revolution (G95)"
High speed skip	This function is required for automatic workpiece measuring / Tool breakage monitor/ Automatic tool length measurement
Multi step skip	G31(P1-4), This function is required for Tool breakage monitor / Automatic tool length measurement
Feed function	
One-digit F code feed	
Feed stop	
Program input	
Polar coordinate command	G15, G16
Addition of workpiese coodinate system pair	G54.1Pn, 48 pairs or 300 pairs
Interruption type custom macro	
Scaling	G50, G51
Programmable mirror image	G50.1, G51.1
Figure copy	G72.1, G72.2
Retrace	
Program format for FS15	
Auxiliary / Spindle speed function	
Rigid tapping	
Tool function / Tool compensation	
Tool offset pairs	±7-digit 400, ±7-digit 499, ±7-digit 999, ±7-digit 2,000
3-dimensional cutter compensation	G40, G41
Editing operation	
Part program storage capacity	1,280 m, 2,560 m, 5,120 m, 10,240 m, 20,480 m
Number of registerable programs	1,000, 2,000, 4,000
Extending the number of memory card program registrations	Number of programs: 500 or 100,000
Playback	
Machining time stamp	
Setting and display	
Run hour and parts count display	This function is required for operation time accumelation.
Dynamic graphic display	
Multi-language display	Chinese version, Korean version

For detailed specifications, refer to the NC operation manual.

Machine Layout

Space for taking out the coolant tank

ATC Magazine 50 tools

4057 160.0

3390 133.5

D

Xst

A

B

ØC

X axis origin

1660 65.3

6100 240.1

F

50 2.0

Wst

Zst

W axis origin

Z axis origin

Y axis origin

Yst

Table surface

Easy mount type coolant splash guard

100 4.0

1455 57.3

750 29.5

FL.

E

Unit: mm in

Model	A	B	C	Xst	D	Yst	E	Zst	Wst	F
MAF-E II /1820	1,800 70.9	2,000 78.7	2,500 98.4	3,000 118.1	8,090 318.5	2,300 90.6	5,458.5 214.9	1,600 63.0	800 31.5	8,295 326.6
MAF-E II /2022	2,000 78.7	2,200 86.6	2,780 109.4							
MAF-E II /2025	2,000 78.7	2,500 98.4	3,023 119.0							

*1 When an 80-tool magazine is equipped, the height of the magazine may be higher than machine dimesion "E". Please contact us for additional details.

*2 This machine layout includes optional equipment.

Inquiry

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