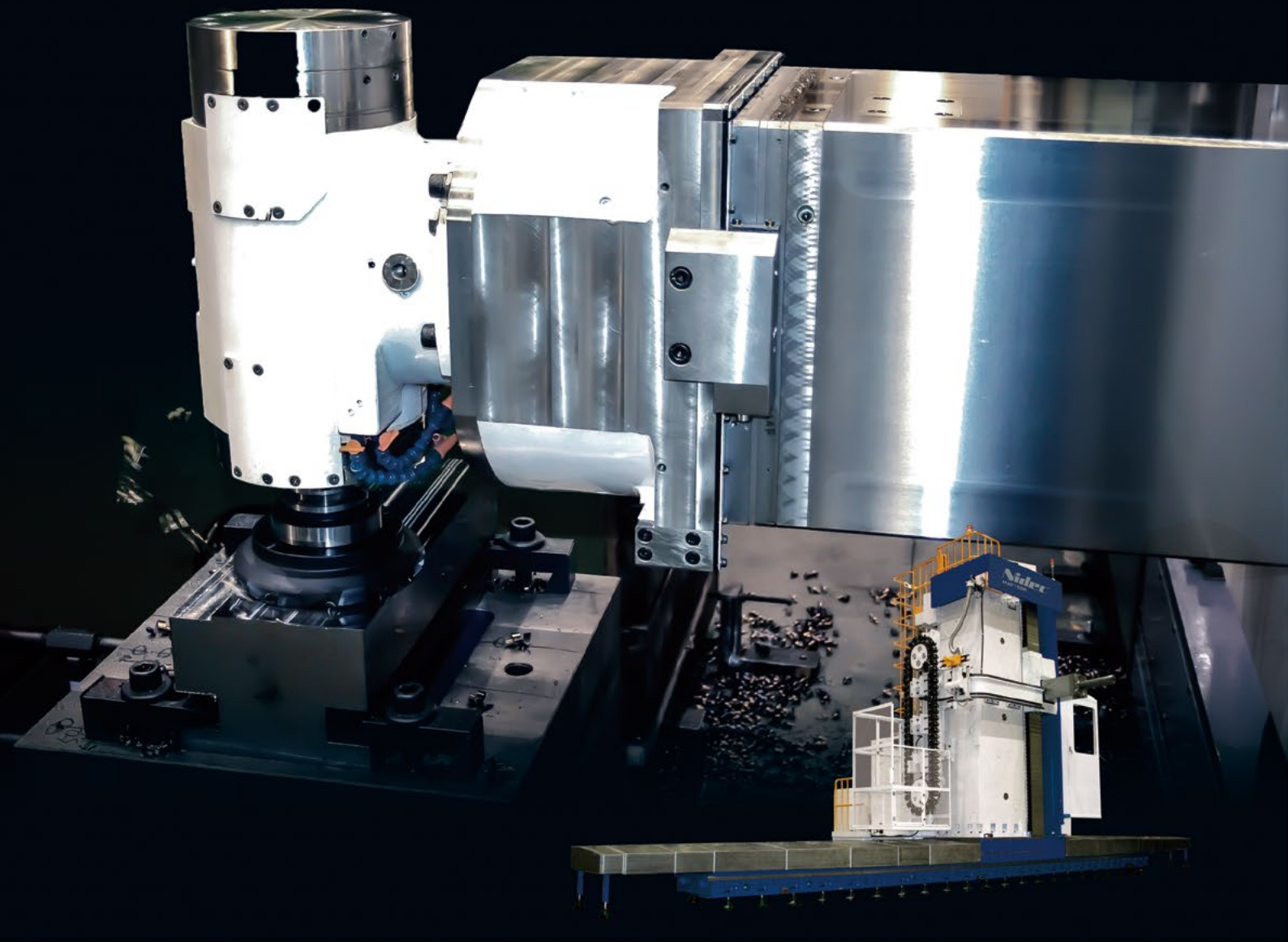


FLOOR TYPE HORIZONTAL BORING MILL

# MAF150R



**NIDEC MACHINE TOOL CORPORATION**

[www.nidec.com/en/nidec-machinetool/](http://www.nidec.com/en/nidec-machinetool/)

# Combining Strength & Speed Our Next Generation MAF is Designed To Be The Industry's Most Productive Horizontal Boring Mill

Capable of Heavy Machining High in the Column and Deep Inside of Large Workpieces

## RIGID CONSTRUCTION FOR HEAVY DUTY MACHINING

- Cast iron construction of all main components
  - Column, Column Base, Bed, Saddle and Ram
- Wide slideways X, Y axis: Hydrostatic Z, W axis: Boxway
- 37 kW 50 HP full power cutting at Y axis 2,500 mm 8.2 ft position

## LONG REACH OF RAM & BORING SPINDLE

- Total 1,400 mm 55.1 in extension allows deep machining inside of large parts.
  - Z axis: 700 mm 27.5 in + W axis: 700 mm 27.5 in

## HIGH-SPEED

- Rapid traverse: X axis: 24 m/min. 945 ipm when X-axis travel=5 & 6 m 16.4 & 19.7 ft
  - Y, Z axis: 20 m/min. 787 ipm
- Spindle speed: 3,000 min<sup>-1</sup>

## HIGH-ACCURACY

- Thermal displacement compensation and substantial attitude compensation function
  - Column distortion or deflection elimination by thermally symmetrical column design
  - Ram sag compensation function
  - Y axis and Z axis thermal displacement compensation (Option)

## USER FRIENDLY

- Programming is easy with the assistance of machining support software.
  - Five face machining software (Option)
  - Easy centering function (Standard)
- Centrally located maintenance related equipment.
  - Lubrication unit, filters etc.

Floor type HBM

Table type HBM

MAF-B series

MAF-RS series

**MAF150R**

MAF-S series

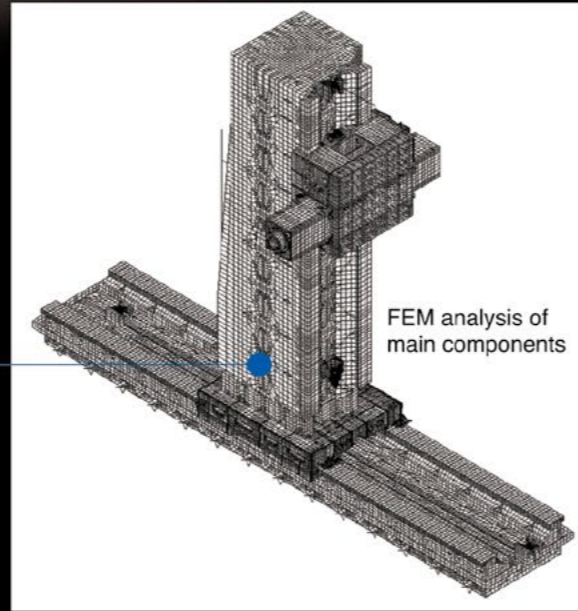
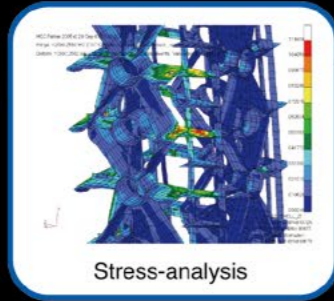
MHT series

**MAF150R**  
FLOOR TYPE HORIZONTAL BORING MILL

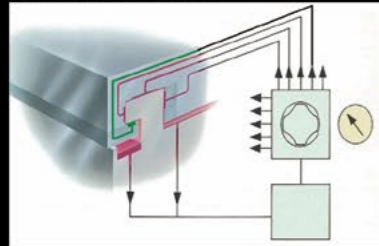
### Rigid Structure for Heavy Cutting

- All main components are cast iron
  - Column, Column Base, Bed, Saddle and Ram
- Guideway system for high rigidity
  - X, Y axis: Hydrostatic bearing guide
  - Z, W axis: Harden box slide way guide
- Full power milling at Y axis 2.5 m 8.2 ft position

#### FEM analysis utilized to create ideal structural rigidity



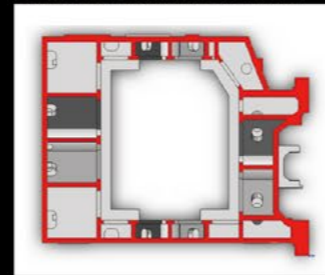
Opposed slideway holding type hydrostatic bearing system



#### All main components are cast iron

X, Y axis square slideways are monobloc casting and opposed holding type hydrostatic bearing system allows smooth slow to high feed with high rigidity.

Double walled structure of column

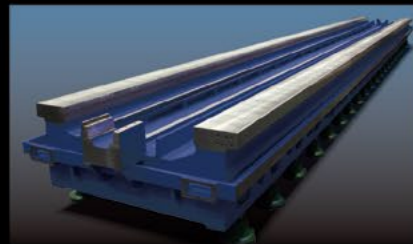


Column: FC300

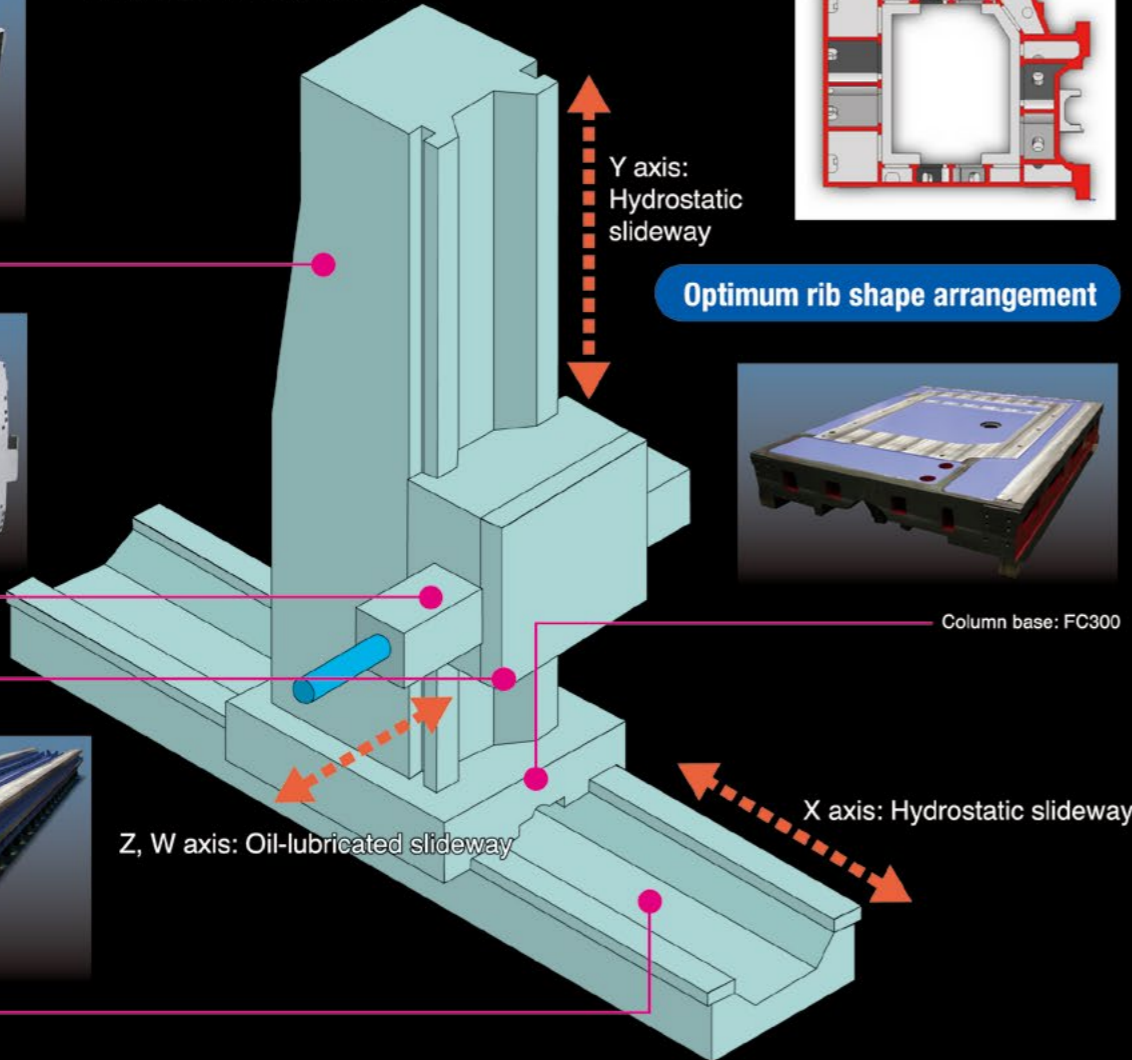


Ram: FCD600 (Ductile cast iron)

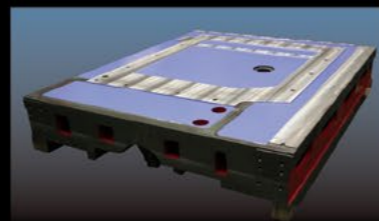
Saddle: FC300



Bed: FC300



#### Optimum rib shape arrangement



### Large Axis Travels for Large Workpieces

Z & W axis total stroke 1,400 mm 55.1 in enable deep machining inside of large parts



#### EASY ACCESSIBILITY TO WORKPIECE

Z axis stroke: 700 mm 27.5 in

W axis stroke: 700 mm 27.5 in

Size of ram: □400 mm □15.7 in

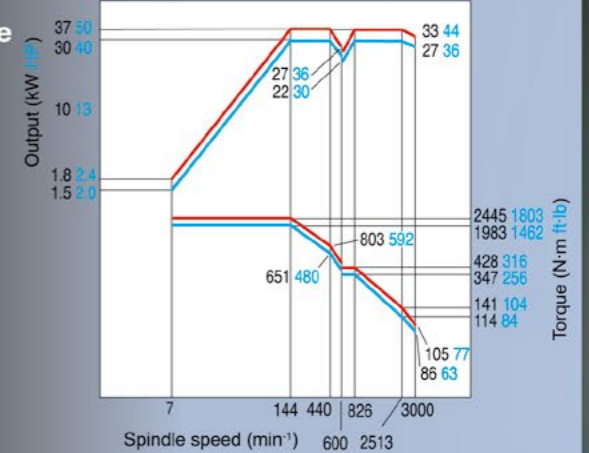
Diameter of boring spindle: φ150 mm φ5.9 in

#### HIGH POWER

Spindle motor: 30/37kW 40/50 HP

Max. torque: 2,445 Nm

#### Spindle output/torque chart



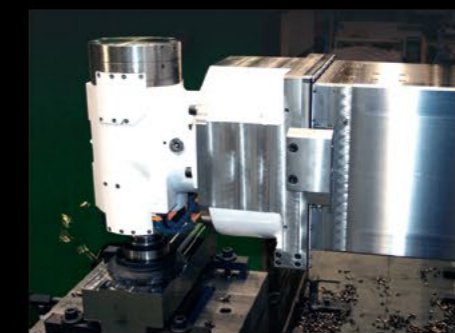
#### Machining Capability



##### Face milling by main spindle

Material: SS400  
 Tool: φ200 mm 8 in 10-Insert  
 Spindle speed: 320 min<sup>-1</sup>  
 Cutting depth: 8 mm 0.24 in  
 Cutting width: 180 mm 7.1 in

Feedrate: 1,300 mm/min 51.2 ipm  
 Chip removal: 1,400 cc/min 85.4 cu.in/min  
 Y axis position: 2,500 mm 98.4 in  
 Ram extension: 700 mm 27.5 in



##### Face milling by R-A-Head

Material: SS400  
 Tool: φ200 mm 8 in 10-Insert  
 Spindle speed: 320 min<sup>-1</sup>  
 Cutting depth: 5 mm 0.2 in  
 Cutting width: 180 mm 7.1 in

Feedrate: 1,000 mm/min 39.4 ipm  
 Chip removal: 900 cc/min 54.9 cu.in/min  
 Ram extension: 500 mm 19.7 in



##### Boring

Material: FC300  
 Tool: φ600 mm 23.6 in  
 Spindle speed: 64 min<sup>-1</sup>

Depth of cut: 10 mm 0.4 in/side  
 Feedrate: 0.26 mm 0.01 in/rev.  
 Chip removal: 300 cc/min 18.3 cu.in/min

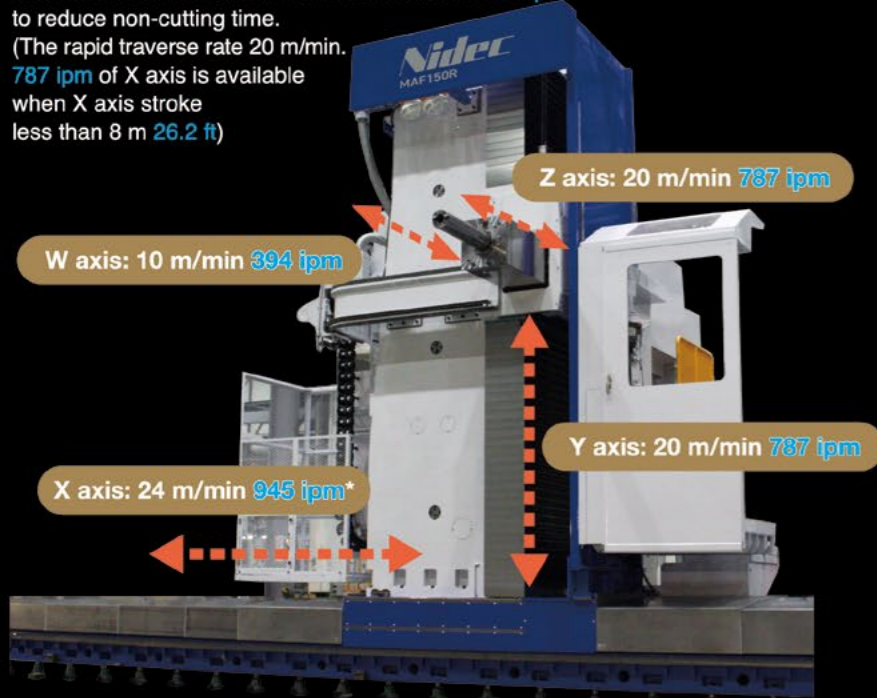
# PRECISION

## High Speed

- Rapid traverse: X axis: 24 m/min **945 ipm**  
Y, Z axis: 20 m/min **787 ipm**
- Spindle speed: 3,000 min<sup>-1</sup>

The rapid traverse rate of each axis are increased to reduce the time required for positioning the axis during feed operation. The rapid traverse rates of X, Y and Z axis which are frequently moved are increased with more than 20 m/min **787 ipm** to reduce non-cutting time.

(The rapid traverse rate 20 m/min. **787 ipm** of X axis is available when X axis stroke less than 8 m **26.2 ft**)



\* 24 m/min. **945 ipm**: when X-axis travel=5 & 6 m **16.4 & 19.7 ft**  
20 m/min. **787 ipm**: when X-axis travel=7 & 8 m **23.0 & 26.2 ft**

## High Productivity

- Rapid traverse speed of each axis are increased.
- Tool changer can change tools on both the main spindle and the right angle head.



ATC for main spindle



ATC for right angle head

## Large Diameter Hirth Coupling

- For attachment indexing accuracy a large diameter  $\phi 420$  mm  $\phi 16.5$  in hirth coupling is employed.
- Attachment clamping force is 4.5 ton **9,900 lb** x 4 clampings
- Attachment indexing time is within 5 seconds for 15 or 90 degrees.
- A dummy plate protects the ram face when attachments are not used.

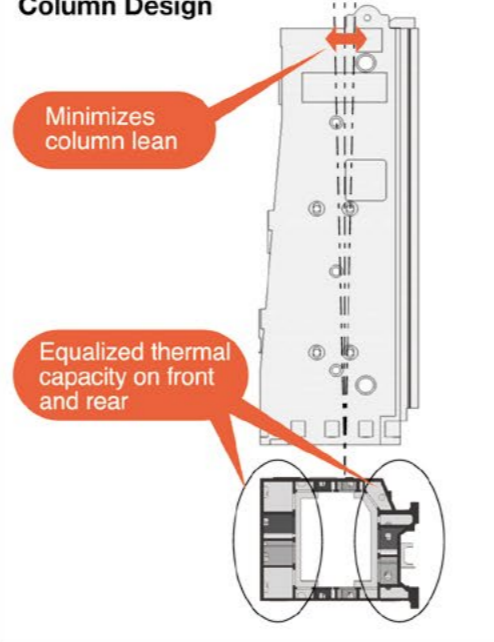


## High Accuracy

Thermal displacement compensation and substantial attitude compensation function

- Column distortion and deflection elimination by thermally symmetrical column design
- Ram sag compensation function
- Y and Z axis thermal displacement compensation (Option)

### Thermally Symmetrical Column Design



# EASY OPERATION

## Maintenance and Operation

### Chip Disposal

- Equipped with standard operator's platform front guard with ceiling.
- Telescopic steel cover is applied for Y axis slideway.
- Oil pan under ATC tool magazine is standard when ATC selected.

### Handy Operation Box

Manual pulse handle is included.

\*Easy to adjust the cutting tool position apart from the main control panel

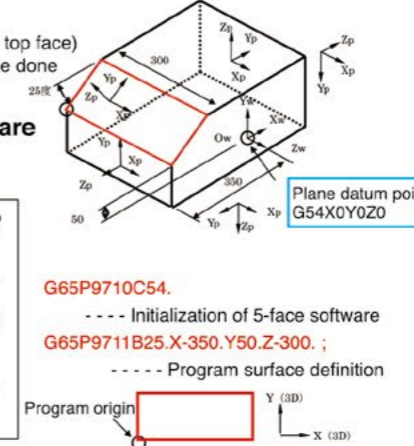
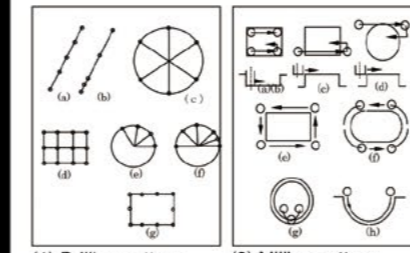


### 5-Face Machining Software (Option)

#### Easy programming on 5-face:

Not only on 90 degree 5-face (4-side face and top face) but also on inclined faces, programming can be done as a plane defined by X and Y coordinates.

#### Pattern programming macros are available.



G65P9710C54.

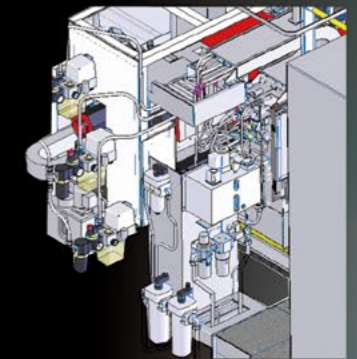
----- Initialization of 5-face software

G65P9711B25.X-350.Y50.Z-300.;

----- Program surface definition

### Concentrated Arrangement of Maintenance Related Equipment

Lubrication systems, filters etc. are arranged near the operation board.



### Various Attachments For Highly Versatile Machining

Automatically changed and clamped attachments



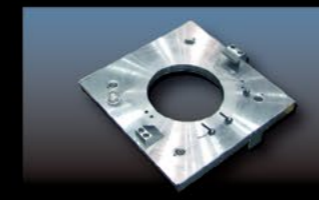
Right angle head RH30-345-R15-AC



Universal head UH10-510-R15-AC



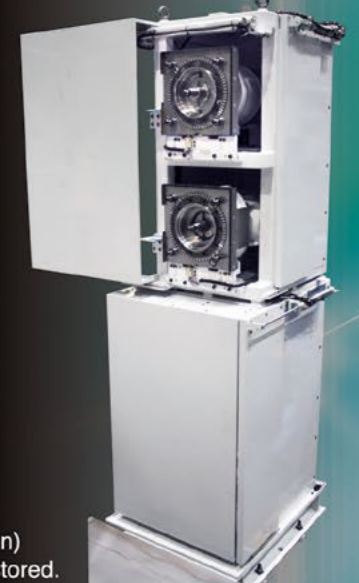
Boring tool head BSH-300x560-R15-AC



Dummy plate DPA-4C-R15-AC

### Attachment Storage Rack

- Door will open/close automatically. (Option)
- Design varies according to attachments stored.



# Specifications

## Machine Specifications

Item	Model	MAF150R		
Diameter of boring spindle	mm in	φ 150 φ5.9		
Spindle taper		Taper 7/24 ISO No. 50		
Size of ram	mm in	400 x 400 15.7 x 15.7		
Spindle speed	min <sup>-1</sup>	7 ~ 3,000		
Spindle torque	N·m lb·ft	2,445 1,803		
Spindle motor output	kW HP	30/37 40/50 (Cont./30 min. rating)		
Axis travel	Column, longitudinal X-axis	mm in	5,000 197 (opt. 6,000 236, 7,000 276, 8,000 315, 9,000 354)	
	Saddle, vertical Y-axis	mm in	2,500 98 (opt. 3,000 118, 3,500 138)	
	Ram, in/out Z-axis	mm in	700 27.5	
	Boring spindle, in/out W-axis	mm in	700 27.5	
Feed rate	NC cutting feed	mm/min ipm	1 ~ 10,000 0.04 ~ 394	
	Rapid Traverse	X-axis	mm/min ipm	24,000 945 (X = 5,000 mm 197 in)
		Y-, Z-axis	mm/min ipm	20,000 787
		W-axis	mm/min ipm	10,000 394
Feed thrust	Z-, W-axis	N lb	29,400 6,600	
	X-, Y-axis	N lb	19,600 4,400	
NC system		FANUC 31i		
Machine weight	kg lb	35,000 77,100		

## Standard Equipment

- Boring spindle nose taper air blow system
- Tool locking system with pull-stud
- Main operation panel
- Handy operation box: Portable type / 1-axis switch system
- Y-axis upper and lower covers (armored bellows cover)
- Bed slideway cover (steel telescopic cover)
- Indication lamp (Red/Yellow/Green)
- Work light
- Spindle bearing housing cooling system
- Hydraulic pump unit
- Intermittent lubrication for Z, W slide and spindle oil-mist lubrication units
- Leveling blocks and anchor bolts
- Wiring materials, electrical equipment, and NC system
- Maintenance tool kit
- Standard paint colors
- Operator friendly functions
- Electric diagram display & diagnosis
- Tool management function
- Earth leakage breaker: Sensitivity current 200 mA

## Optional Equipment

- Automatic Tool Changer (for both vertical and horizontal spindles, 60 tools / 80 tools / 100 tools)
- Automatic Attachment Changing and Indexing (15 degrees each)
- Floor plate.
- Rotary table
- Flood coolant supply system (Tank size: 600 L, Pump discharge pressure / rate: 0.5 MPa, 20 L/min)
- Hinge steel belt type chip conveyor (Elevating type)
- Coolant through spindle (Main spindle only)
- Air blow
- Mist coolant supply system
- Chip box
- 5-face machining software
- Rigid tap
- Customized macro designated by user
- Linear scale (MP scale)
- Thermal displacement compensation for Y and Z axes
- Cooling system of lubricant for hydrostatic bearing
- Independent elevation type operation platform
- Warning light
- Designation of paint colors
- Air compressor (with an air dryer)
- Spare parts
- Yearly check

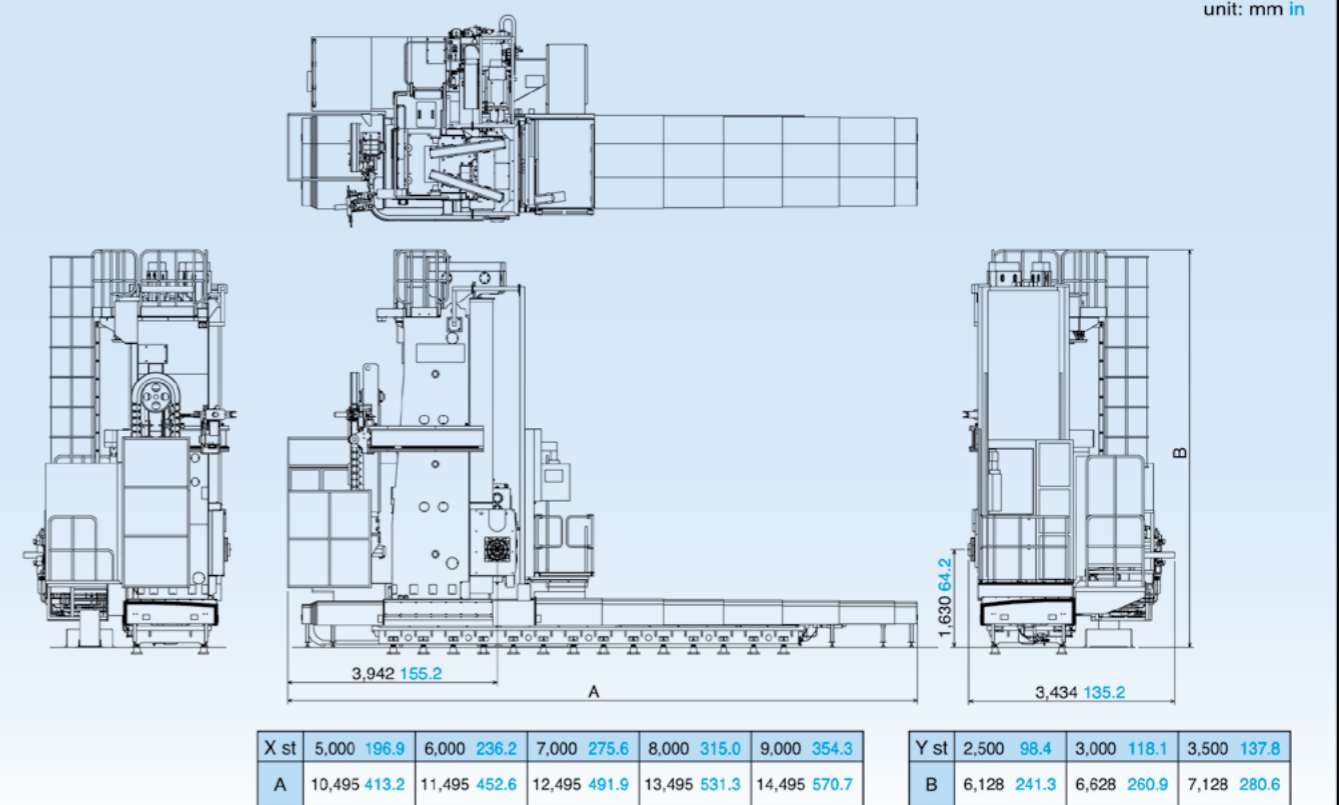
## Attachments

- Ram end protection cover plate (Dummy Plate)
- Spindle support
- Right angled head
- Boring tool head
- Universal head
- Attachment rack

## Monitoring Functions

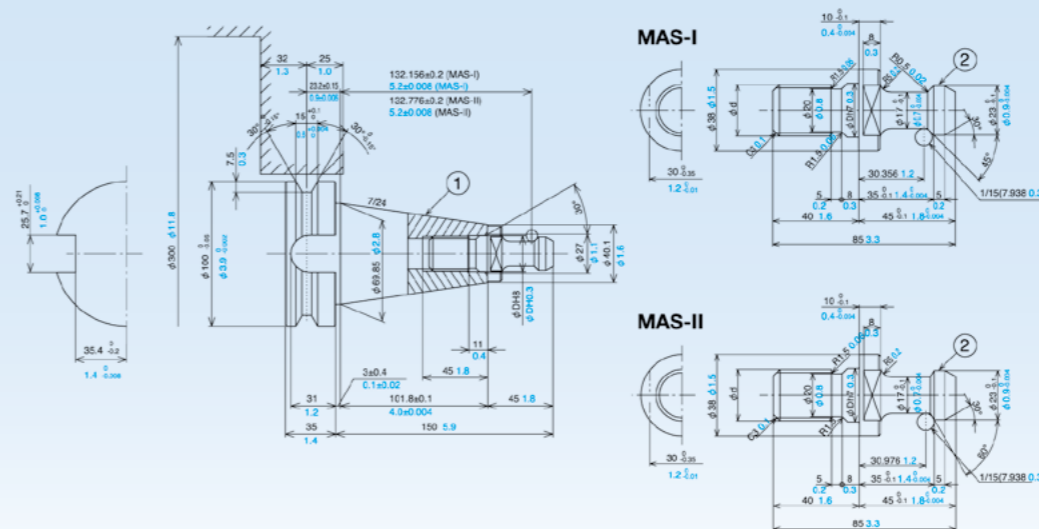
- Overload monitor by the soft meter method
- Tool life monitor
- Automatic tool length measurement and compensation
- Tool breakage monitoring
- Automatic workpiece measuring
- Operation time accumulation
- Production number control
- Spare tool automatic replacement
- Automatic power OFF
- Automatic power ON

## Machine Dimensions



## Tool Dimensions

MAS-I: MAS-BT50 · MAS-P50T-1  
MAS-II: MAS-BT50 · MAS-P50T-2



Item	Material	Heat treatment	Hardness
①	SNCM439 (SNCM8)	Hardening	Hrc : 52-57
②	SNCM420 (SNCM22)	Carburizing	Hrc : 58-62

(Note)  
1. The cutting conditions should be arranged within the permissible transfer torque 2,450 N·m 1,804 ft·lb because of strength of the shank flange and the spindle nose key.  
2. The tool shank and pull-stud should be prepared by customer.

φd	φD
M24 P3	25.0 1.0
1-8UNC	25.4 1.0
1-8W	25.4 1.0

# Specifications

## NC Specifications FANUC Series 31i

### Standard Specifications

Name	Note
<b>Control axis / feedback system</b>	
X axis	Column longitudinal, Pulse coder
Y axis	Saddle vertical, Pulse coder
Z axis	Ram in/out, Pulse coder
W axis	Boring spindle in/out, Pulse coder
<b>Simultaneously controlled axes</b>	
Positioning and linear interpolation	Simultaneous 4 axes, X-Y-Z-W
Multiple quadrant circular interpolation	Simultaneous 2 axes, X-Y, X-Z, Y-Z, X-W, Y-W
Manual	Simultaneous 1 axis
Manual handle	Simultaneous 1 axis, Portable type with position display
<b>Input increment</b>	
0.001 mm/pulse	
<b>Data input/output, DNC input</b>	
Memory Card input/output	
Embedded Ethernet interface	I/F: 100 base-T (1ch.), (Program in/out) *1 (Only hardware), DNC operation is impossible.
Reader/puncher interface (Number of max ch. is total 2ch.)	RS-232C, D-sub (25 pin) connector is installed on the door of main control panel.
Compact flash card (CF)	For NC data back-up (1 piece), Capacity: 256 Mbyte
Adapter for CF card A	For user. (1 piece), For slot of character display
Adapter for CF card B	For user. (1 piece), For general (For PC)
<b>Controlled axis</b>	
Controlled axes / feedback system (Absolute position detection)	X, Y, Z, W axis: Pulse coder X axis: Column longitudinal Y axis: Saddle vertical Z axis: Ram in/out
Controlled axes	4 axis (X, Y, Z, W) W axis: Boring spindle in/out
Simultaneously controlled	4 axis (X, Y, Z, W)
Least input increment	0.001 mm, 0.001deg, 0.0001 inch
Machine lock	All axes / Z 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 ~ ±9999 pulse
Stored pitch error compensation	
Interpolation type pitch error compensation	
<b>Operation</b>	
Automatic operation (memory)	
DNC operation	RS-232C of reader/puncher interface, 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 ~ 4000 mm/min. 0 ~ 157.5 ipm (22 step)
Manual reference position return	
Manual handle feed	1 unit, portable type manual handle
Manual handle feed rate	x1, x10, x100
Manual handle interrupt	One direction
Cycle start / Feed hold	
Program stop / End	M00, M01, M02, M30
Reset / Rewind	M30
<b>Interpolation functions</b>	
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 position return	G28
Reference position return check	G27
2nd reference position return	G30 (P2)
3rd/4th reference position return	G30 (P3, P4)
Tapping mode	G63
Cutting mode	G64

Name	Note
<b>Feed function</b>	
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
<b>Program input</b>	
Tape code	EIA, RS244, ISO840, automatic recognition
Label skip	
Parity check	Horizontal and vertical parity
Control in/out	
Optional block skip	3 (total)
Max. programmable dimension	±99999.999mm, ±8-digit
Program number	32 characters, File name or Program number
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 inch
Plane selection	G17, G18, G19
Coordination system setting	
Automatic coordination system setting	
Workpiece coordinate system	G54 ~ G59, 6pairs
Workpiece coordinate 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), #100 ~ #199, #500 ~ #999
Canned cycles	G73, G74, G76, G80 ~ G89
Circular interpolation by R programming	12-digit
Automatic corner override	G62
Coordinate system rotation	G68, G69
<b>Auxiliary / Spindle speed function</b>	
Auxiliary function	M3-digit
2nd Auxiliary function	C3-digit
Spindle speed function	S4-digit
Spindle override	50 ~ 150%
<b>Tool function / Tool compensation</b>	
Tool function	T8-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	Included tool life management
Tool length measurement	
<b>Editing operation</b>	
Part program storage capacity	256 kbyte, Storage length: 640 m
Number of registerable program	Expansion 1 *5
Program editing	
Background editing	
Extended program editing	
Memory card program operation / editing	Number of program: 63, Maximum size: 2 Gbyte By selecting a memory card including a program storage file as a device, memory operation can be performed with the program storage file selected as the main program.
Memory card program tool	A program storage file can be created using a memory card program tool on a commercially available personal computer.
Program protect	
<b>Setting and display</b>	
Status display	
Clock display	
Cutting position display	
Program display	Program name 31 characters
Self diagnosis function	Self diagnosis in NC system
Alarm display	
Alarm history display	
Graphic function	*3
Multi-language display	English version Japanese version
Data protection function	1 type
Erase CRT screen display	
<b>Others</b>	
CRT character display	10.4" color LCD

### Optional Specifications

Name	Note
<b>Control axis / feedback system</b>	
X axis	Column longitudinal, MP scale
Y axis	Saddle vertical, MP scale
Z axis	Ram in/out, MP scale
<b>Data input/output, DNC input</b>	
Reader/puncher interface (Number of max ch. is total 2ch.)	RS-232C addition of 1ch. *2 (Program in/out, DNC operation) D-sub (25 pin) connector is installed in the main control panel. RS-232C addition of 1ch. *2 (auto. measuring Data print-out) D-sub (25 pin) connector is installed in the main control panel.
Reader/puncher interface expansion of receiving buffer	Remote Buffer Interface
Data server	Memory device: ATA FLASH CARD I/F: 100base-T(1ch.) (Program in/out, DNC operation) *1 (Only hardware in NC) Capacity: 1 Gbyte (Program length ≈ 2500 km)
Program Transfer Tool	Application software for PC For CNC Part program storage memory
Program Transfer Tool	Application software for PC, Ethernet function For CNC Part program storage memory For Data server Memory
Compact flash card (CF)	For user. ___ piece, Capacity: 256 Mbyte
Adapter for CF card A	For user. ___ piece
Adapter for CF card B	For user. ___ piece
<b>Controlled axis</b>	
Controlled axes / feedback system (Absolute position detection)	X, Y, Z axis: Linear MP scale (X axis: Table longitudinal travel, Y axis: Saddle cross travel, Z axis: Ramstock axis travel, W axis: Crossrail vertical travel)
Controlled axes expansion	Addition of 2 axis, Select for the DIT table
Controlled axes expansion	Addition of 4 axis, Select for the second DIT table
Inch/metric conversion	G20, G21
Stored stroke check 2, 3	
<b>Operation</b>	
Tool retract and recover	
3D handle feed	Tool direction + normal direction
<b>Interpolation functions</b>	
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 ~ P4), This function is required for Tool breakage monitor / Automatic tool length measurement
<b>Feed function</b>	
One-digit F code feed	
Feed stop	
<b>Program input</b>	
Polar coordinate command	G15, G16
Addition of workpiece coordinate system pair (48 pairs)	G54.1 Pn n=1 ~ 48
Addition of workpiece coordinate system pair (300 pairs)	G54.1 Pn n=1 ~ 300
Interruption type custom macro	
Scaling	G50, G51
3-dimensional coordinate conversion	G68, G69 for 5-face machining software
Programmable mirror image	G50.1, G51.1
Figure copy	G72.1, G72.2
Retrace	
Program format for FS15	
<b>Auxiliary / Spindle speed function</b>	
<b>Rigid tapping</b>	
<b>Tool function / Tool compensation</b>	
Tool offset pairs	±7-digit, 400 ±7-digit, 499 ±7-digit, 999 ±7-digit, 2000
3-dimensional cutter compensation	G40, G41

Name	Note
<b>Editing operation</b>	
Part program storage capacity	512 kbyte, Storage length: 1280 m 1 Mbyte, Storage length: 2560 m 2 Mbyte, Storage length: 5120 m 4 Mbyte, Storage length: 10240 m 8 Mbyte, Storage length: 20480 m
Number of registerable program	Expansion 2 *6
Extending the number of memory card program registrations	Number of program: 500 or 1000
Playback	
Machining time stamp	
<b>Setting and display</b>	
Run hour and parts count display	This function is required for operation time accumulation.
Dynamic graphic display	*4
Multi-language display	Chinese version Korean version

#### (Notes)

- For data transfer and DNC operation, application software for FTP (File Transfer Protocol) file transfer function is necessary to be prepared in the PC. This FTP application software should be prepared by customer. Usually in case of Windows XP Professional, FTP file transfer application software IIS (Internet Information Service) is attached. Network setting of NC side can be done by customer based upon NC manual. All necessary PC, cable, HUB etc. should be prepared by customer.
- This optional item is alternative.
- Not specify this function when Dynamic graphic display is specified.
- This function include "Background display". Not specify this function when Graphic function is specified.
- Expansion 1 (Standard)

Storage capacity	Storage length	Number
256 kbyte	640 m	2098.4 ft
512 kbyte	1280 m	4196.7 ft
1 Mbyte	2560 m	8393.4 ft
2 Mbyte	5120 m	16786.9 ft
4 Mbyte	10240 m	33573.8 ft
8 Mbyte	20480 m	67147.5 ft

#### 6: Expansion 2 (Optional)

Storage capacity	Storage length	Number
256 kbyte	640 m	2098.4 ft
512 kbyte	1280 m	4196.7 ft
1 Mbyte	2560 m	8393.4 ft
2 Mbyte	5120 m	16786.9 ft
4 Mbyte	10240 m	33573.8 ft
8 Mbyte	20480 m	67147.5 ft



Inquiry

## NIDEC MACHINE TOOL CORPORATION

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Machine specifications such as dimensions etc., are fixed using SI units including the metric system.  
In case data are shown in other units in blue, such as inches, pounds and gallons etc. they are for reference only and the formal data  
in black supersedes any equivalent data given in blue when fractions caused by conversion become an issue.  
Specifications are subject to change without prior notice.  
The export of this product is subject to Japanese Governmental approval.