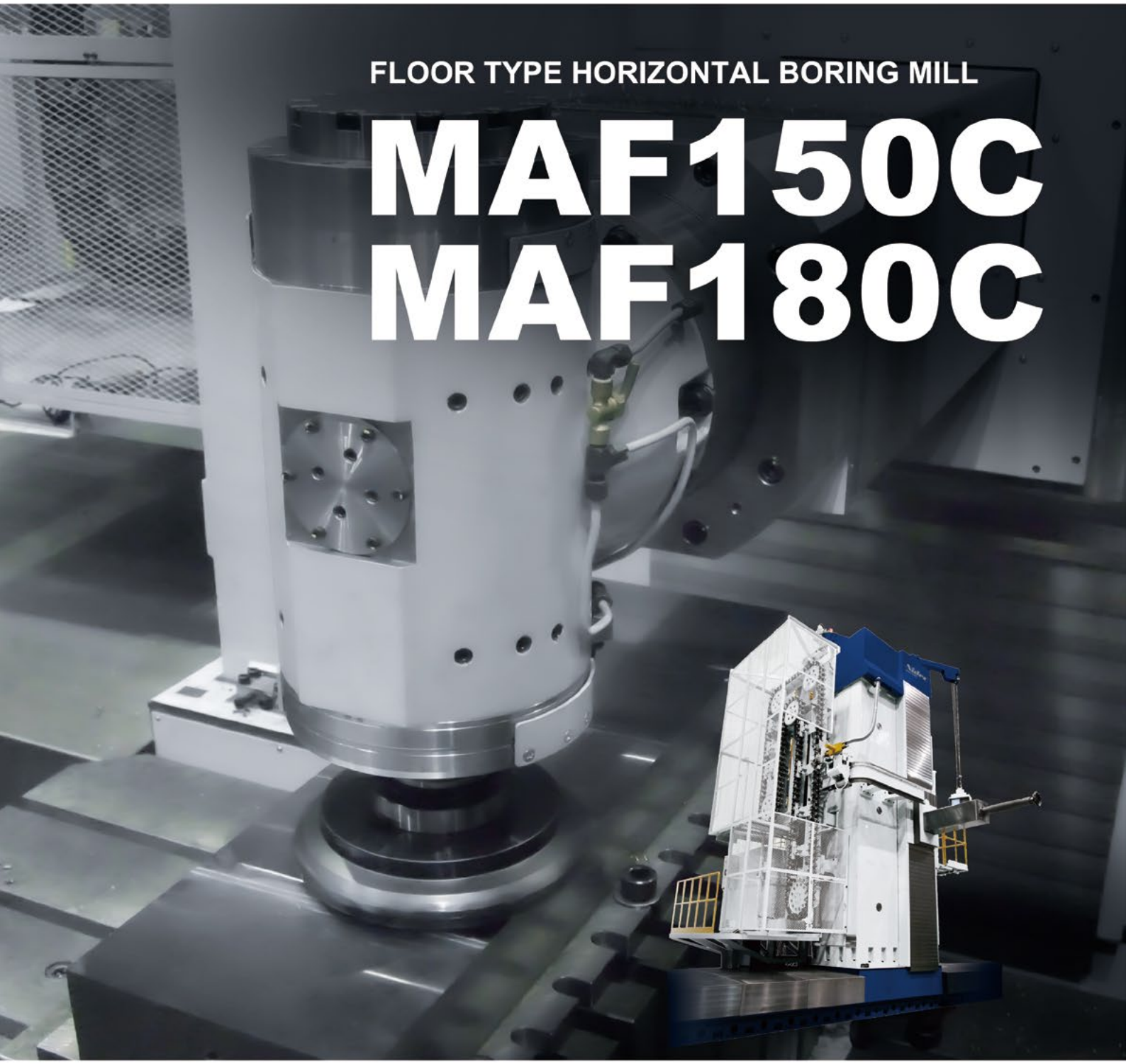
Nidec
All for dreams

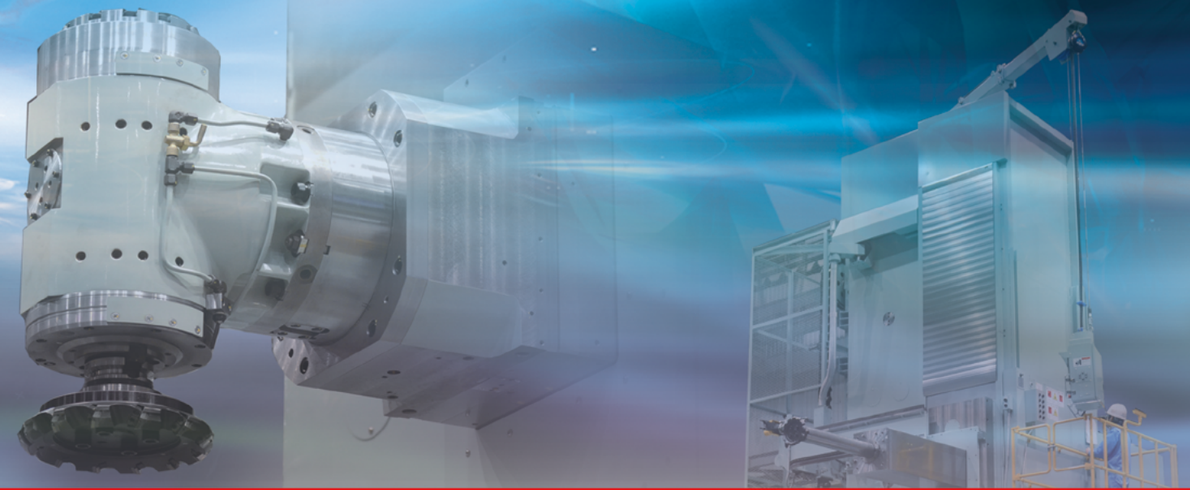


FLOOR TYPE HORIZONTAL BORING MILL

MAF150C
MAF180C

NIDEC MACHINE TOOL CORPORATION
www.nidec.com/en/nidec-machinetool/

Powerful, Precise and User Friendly



State-of-the-Art Floor Type Horizontal Boring Mill with φ150/180 mm 5.9/7.1 in boring spindle.

Class Leading High Power Machining

- Shorter distance from machining point to the spindle drive motor by integration of spindle drive motor and gear box with ram
- Spindle motor output (cont. /30min/10min): 55/75/85 kW 74/101/114 HP, 80/100/150 kW 107/134/201 HP (opt.)
- High power right angle head: Max. motor output 55kW 74 HP
- All main components are cast iron or Ductile cast iron with excellent vibration dampening and higher rigidity ram.
- Hydrostatic guideways with excellent vibration dampening for X, Y and Z axes allows for heavy load machining.

High Accuracy Machining

- Our original "New Perfect Balancing System" enables higher accuracy machining regardless of Y/Z axes positions, with/without attachments.
- Unique cooling technology minimizes thermal displacement and MP scale feedback system is provided as a standard specification.
  - Positioning accuracy: ±0.008mm/1,000mm ±0.0003 in/39.4 in
  - Repeatabiligy: ±0.005mm ±0.0002 in
- Hydrostatic guideways allow for X, Y and Z axes precise positioning, as well as, stable rigid machining.

Wide Machining Area and Attachments Create Versatility

- □420mm compact ram reduces interference
- Ram in/out stroke (Z axis): 1,250 mm 49.2 in + Boring spindle in/out stroke (W axis): 1,000 mm 39.4 in, extended to 2,250 mm 88.6 in total.
- Saddle vertical stroke (Y axis): Max. 5,000mm (opt.)
- Rapid traverse X, Y axes: 20m/min 66 fpm
  Z, W axes: 15m/min 49 fpm
  Feed thrust X,Y and Z axes: 40 kN 8992 lbf
- Various attachments are available to meet various applications
- Heavy duty, multi-purpose rotary tables are available.

FLOOR TYPE HORIZONTAL BORING MILL

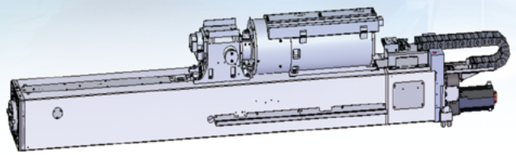
MAF150C
MAF180C

Powerful

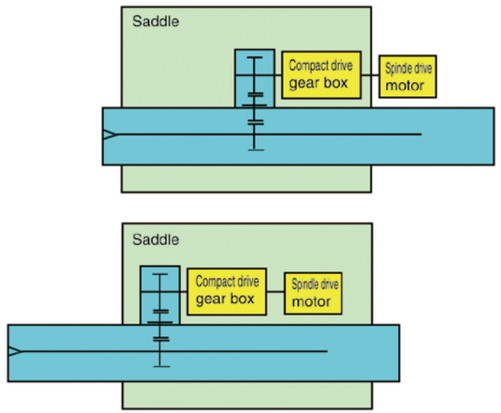
● Class Leading High Powered Spindle

High Rigidity Spindle Construction

The distance from spindle drive motor to the machining point is shorted by locating the spindle drive motor and originally developed compact drive gear box on the ram and the direct connection of rotation drive of spindle drive motor/drive gear box into the spindle drive shaft reduces twist and increases rigidity.

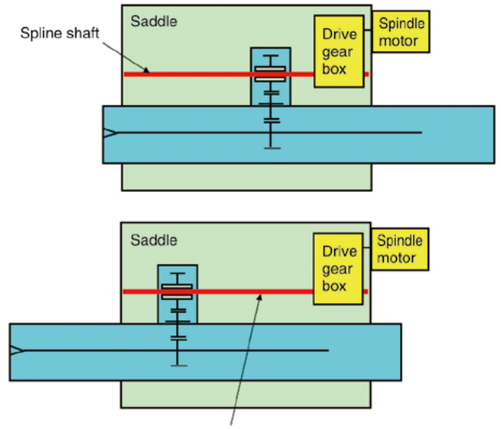


MAF-C Spindle Construction (New Development)



Newly developed compact drive gear box enables integration with ram.
Construction to minimize the degradation of twist rigidity.

Construction with Spline Shaft



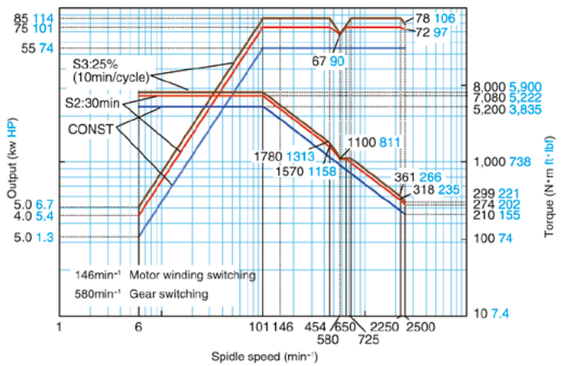
By being separated from the spindle drive motor/drive gear box at the time of the ram extention, the spline shaft becomes easy to twist (twist rigidity is degraded)

High Power Spindle (Cont./30min/10min)

■Max. Spindle Motor Output: 55/75/85 kW 74/101/114 HP
80/100/150 kW 107/134/201 HP (opt.)

■Max. Torque: 5200/7080/8000 N·m 3835/5222/5900 ft·lbf
7200/9000/11300 N·m 5310/6638/8334 ft·lbf(opt.)

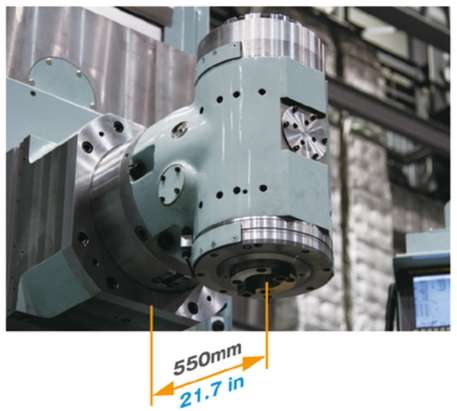
Spindle Output/Torque Chart (Standard spec.)



High Power Right Angle Head RH55-550-AC

■Max. Motor Output 55kW 74 HP

■Max. Torque 2850 N·m 2102 ft·lbf



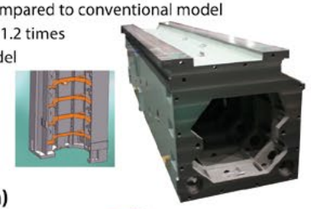
● Main Components Enable Heavyduty Machining

All Main Components are Cast Iron and Hydrostatic Guideways are Adopted for X,Y and Z Axes

Column (Cast Iron)

High rigidity double wall structure.

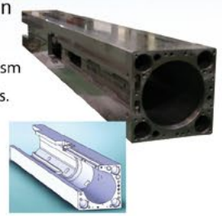
-Cross section area 1.4 times compared to conventional model
-Width of guideway 2 times compared to conventional model
-Distance between guideways 1.2 times compared to convetional model



Ram (Ductile Cast Iron)

Ductile cast iron with excellent vibration damping and higher rigidity.

-Hydrostatic bearing 4-face constraint mechanism can support full stroke 1250 mm 49.2 in of Z axis.



Column base (Cast iron)

-Thickness of components 1.5 times compared to conventional model

Bed (Cast iron)

-Width of guideway 2.2 times compared to conventional model
-Distance between guideways 1.2 times compared to conventional model

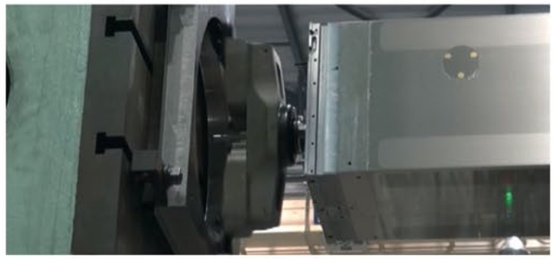
● Higher Machining Capability Allows Higher Productivity
Large Diameter Face Milling at The Height of 3000mm by Main Spindle (SS400)

Large Diameter Boring by Main Spindle (SS400)

Tool: 250 mm 9.8 in
Cutting depth: 7 mm 0.3 in
Cutting width: 210 mm 8.3 in
Feedrate: 1100 mm/min 43.3 ipm, 0.34 mm 0.013 in/insert
Chip removal: 1500 cm³ 91.5 cu.in/min
Machining height (Y axis): 3000 mm 118.1 in
Ram extention (Z axis): 800 mm 31.5 in

Large diameter Boring by Main Spindle (SS400)

Tool: 620 mm 24.4 in
Cutting depth: 8 mm 0.3 in
Spindle speed: 73 min⁻¹
Feedrate: 32 mm/min 1.3 ipm, 0.22 mm 0.009 in/insert
Chip removal: 650 cm³ 39.7 cu.in/min
Torque: 3300 N·m 2434 ft·lbf
Machining height (Y axis): 2300 mm 90.6 in
Ram extention (Z axis): 800 mm 31.5 in

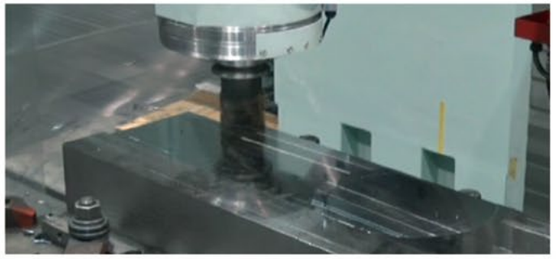


Large Diameter Face Milling by Right Angle Head (S45C)

Tool: 250 mm 9.8 in
Cutting depth: 6 mm 0.2 in
Cutting width: 210 mm 8.3 in
Feedrate: 900 mm/min 35.4 ipm, 0.28 mm 0.011 in/insert
Chip removal: 1134 cm³ 69.2 cu.in/min
Machining height (Y axis): 600 mm 23.6 in
Ram extention (Z axis): 800* mm 31.5* in
*from gage line

End-Mill Cutting by Right Angle Head (S45C)

Tool: 80 mm 3.1 in
Cutting depth: 50 mm 2.0 in
Cutting width: 40 mm 1.6 in
Spindle speed: 600 min⁻¹
Feedrate: 240 mm/min 9.4 ipm, 0.20 mm 0.008 in/insert
Chip removal: 480 cm³ 29.3 cu.in/min
Machining height (Y axis): 600 mm 23.6 in
Ram extention (Z axis): 800 mm 31.5 in



Precise

● New Perfect Balancing System (Patented)

Characteristic Problems of Horizontal Boring Mills

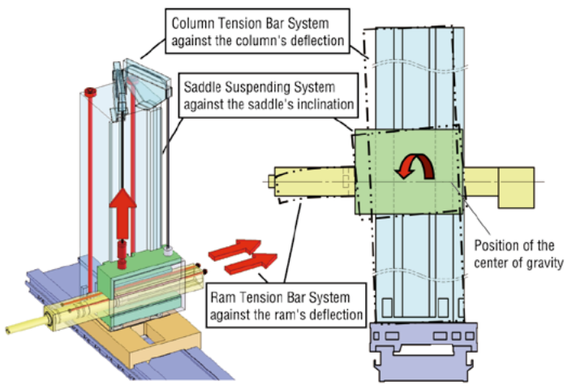
"Cutting surfaces are changed depending on Ram extended position"
"Changing Y/Z perpendicularity when equipped with attachments causes steps in the cutting surface"
"Machining accuracy is degraded at the higher Y axis position"

"New Perfect Balancing System" is the optimum solution against such characteristic problems of horizontal boring mills.

The "New Perfect Balancing System" which takes the place of the conventional system (counter balancing system placed on the top of column) realizes higher precision and excellent machining quality by simultaneously adjusting spindle run-out and poisition accuracy at wherever Y and Z axes stroke.

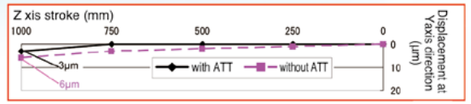
The mechanical adjustment system combination of "Ram Tension Bar System" against the ram's deflection and "Saddle Suspending System" against the saddle's inclination enable high precision straightness of ram extension (Z axis) regardless of with/without attachments.

However, the saddle suspending force on the front side increses when the ram is extended. This changes of saddle suspending force causes a deflection of the clumn, and column deflection increases at higher ram positions.
Therefore, the mechanical adjustment system combination of "Ram Tension Bar System" and "Saddle Suspending System" can only keep high precision of straightness of ram extention (Z axis) against the column itself, but the accuracy against the cutting workpieces would be degraded due to deflection of column iteself.
Our original "New Perfect Balancing System" mechanically adjusts such a deflection of column by "Column Tension Bar System", allowing high precision machining by keeping precision straightness of Y axis at wherever ram positions (Y and Z axes).



Effect of New Perfect Balancing System

Effect-1: Straightness of Z axis (With/without Attachment)

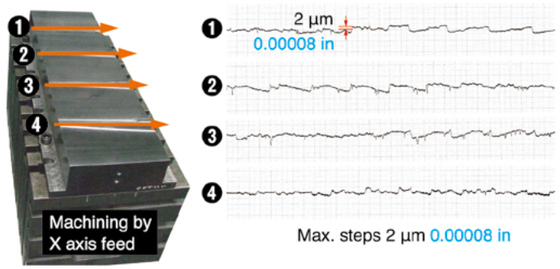


Ram Extended Machining Example with Right Angle Head

Stepless machining surface regardless of Z axis position

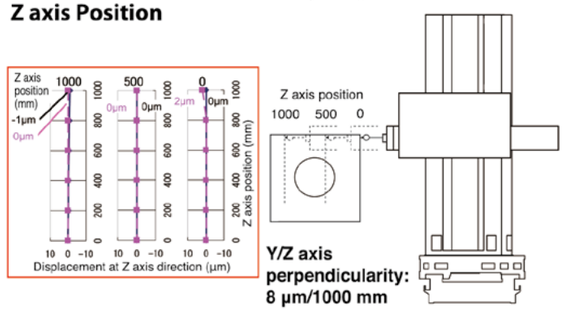
〈Cutting conditions〉
-Material: SS400
-Cutting width: 210 mm 8.3 in
-Tool: ϕ250 mm ϕ9.8 in
-Feedrate: 0.13 mm 0.005in /insert
-Spindle speed: 250 min^{-1}
-Cutting depth: 0.3 mm 0.012 in
-Ram extention: 1000 mm→160mm
39.4 in→6.3 in
(210mm 8.3 in pitch)

Measured steps between each face milling



Max. steps 2 μm 0.00008 in

Effect-2: Y/Z Perpendicularity Regardless of Z axis Position

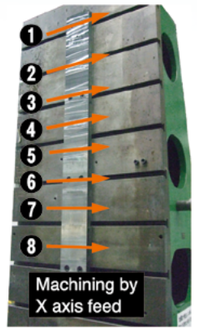


Y/Z axis perpendicularity: 8 μm/1000 mm 0.0003 in/39.4 in

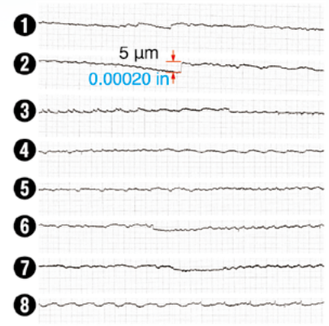
Machining Example Without Column Deflection

Stepless machining surface regardless to Y axis positions

〈Cutting conditions〉
-Material: SS400
-Cutting width: 230mm 9.1 in
-Tool: ϕ250mm ϕ9.8 in
-Feedrate: 0.13 mm 0.005 in/insert
-Spindle speed: 250 min^{-1}
-Cutting depth: 0.3mm 0.012 in
-Y axis position: 3180mm→1340mm
125.2 in→52.8 in
(230mm 9.1 in pitch)



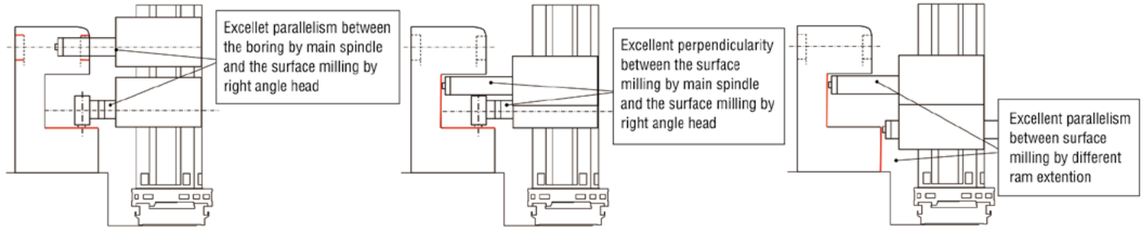
Measured steps between each face milling



Ra Max 0.221 μm 0.000009 in,
Max. steps 5 μm 0.00020 in

High Precision Machining by New Perfect Balancing System

The stable higher precision machining regardless of with/without attachment, ram extention and Y axis position is applicable to below workpieces.



*Measured values in this brochure are provided as an example.
The result indicated in this brochure might not be achieved due to differences in cutting conditions as well as enviromental conditions during measurement.

● Cooling System to Suppress Thermal Displacement

Three independent cooling systems suppress heat on each part of the machine minimizing thermal displacement.

Cooling system of spindle bearing and inside drive gear box

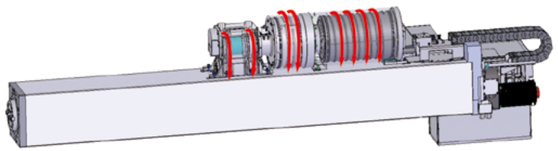
Oil air lubrication adopted for spindle bearing and drive gear box, and circulate cooling oil in the spindle bearings suppress heat during spindle rotation.

Lubrication oil cooling system for hydrostatic guideways

Lubrication oil cooling system for hydrostatic guideways is adopted as standard specification.

Cooling system of circumference of spindle drive motor and drive gear box

Cooling oil is circulated on circumference of spindle drive motor and drive gear box placed on the ram to suppress thermal effects into the ram as well as suppress heat from those units.



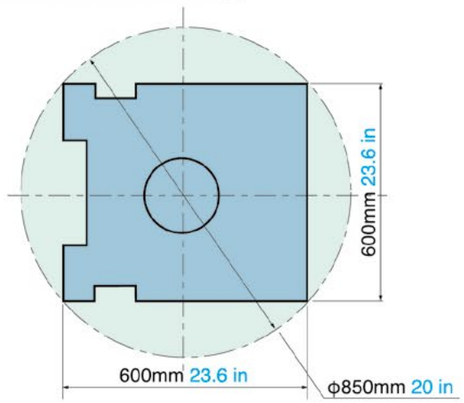
User Friendly

● Expanded Machining Area

420mm 16.5 in Compact Ram

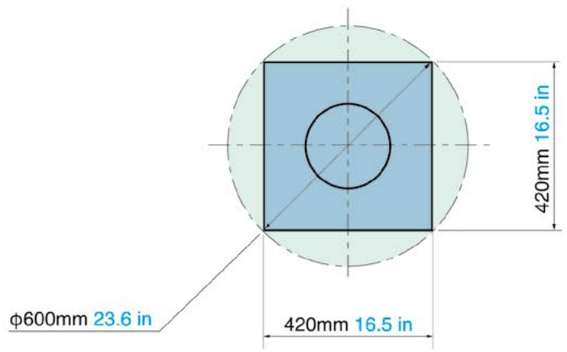
□420mm 16.5 in compact ram reduces interference and reaches areas that cannot be reached normally without long tools or special attachments.

Ramstock Type



MAF-RSC(convention model)

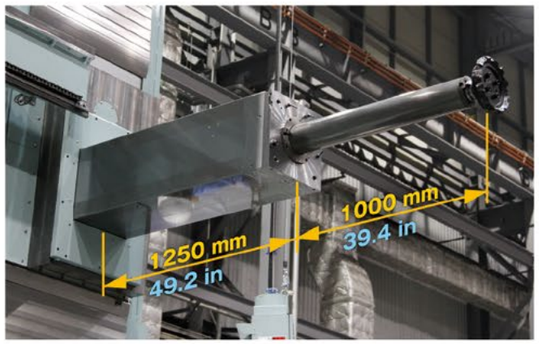
Ram Type

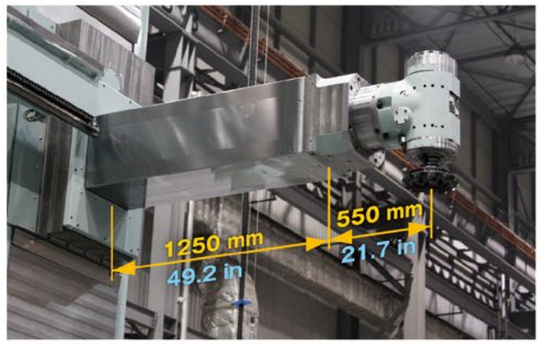


MAF-C

Z axis + W axis = 2250 mm 88.6 in Total Stroke

Ram extention (Z axis) 1250 mm 49.2 in and boring spindle extention (W axis) 1000 mm 39.4in, long-stroke 2250 mm 88.6 in total enable the improvement of the machining efficiency by deep cutting depth with shorter cutting tools as well as approaching deep inside of workpiece.





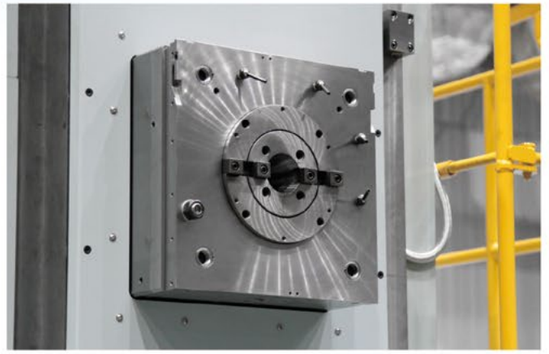
Ram Up/Down Stroke (Y axis) Available up to Max. 5000 mm 196.9 in.

Ram up/down stroke (Y axis) can be extended up to 5000mm 196.9 in for large workpieces.

● Various Attachments

Special attachments for specific applications are also available

■Dummy Plate: DPA-4C-AC

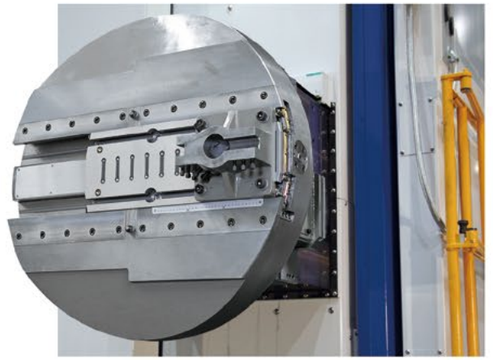


■Right Angle Head: RH55-550-AC

■Spindle Support: SS860-AC

■Special Right Angle Head: RH8x460/S-360-AC

■Surfacing Head: SHD-950X-AC

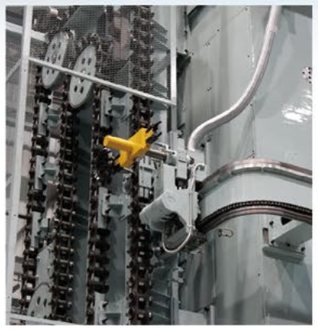


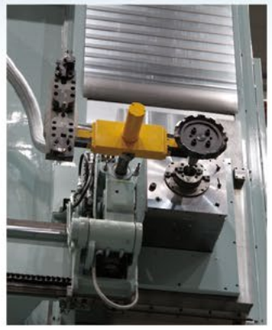
■A axis NC Tilt Universal Head: UH15-1NC-670-AC

User Friendly

● Quick ATC

ATC
Quick ATC can change tools on both the main spindle and the right angle head.


ATC unit


ATC for main spindle


ATC for right angle head


Large capacity
ATC magazine

Attachment Rack


With totally enclosed cover (opt.)

Centralized Maintenace Equipments

Operator Platform


Independent up/down operator platform
(opt.)

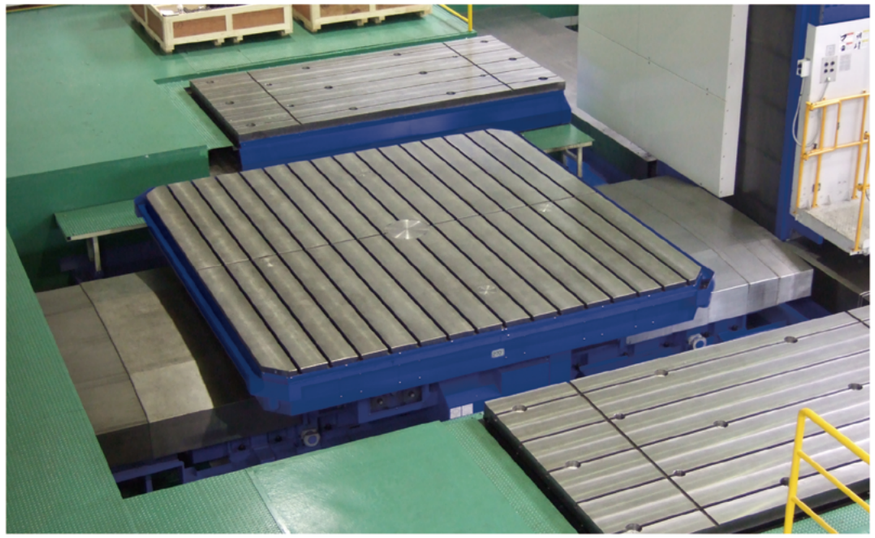

Special operator platform
(opt. with operator door and ceiling)

● Heavy Duty, Multi-Purpose Rotary Tables

Sturcture to Achieve High Rigidity and High Accuracy

The rotary table is configured from table, table base and bed units, and all main components are cast iron with unique high rigid rib structure.
Hydrostatic guideways are adopted for rotary axis (B axis) and linear axis (V axis) enabling stable machining accuracy by automatic control. The numbers of guideway at linear axis (V axis) are three lines for DIT-AH series and four lines for DIT-BH series.

The combined system with ring gear and double pinion gear is adopted for the table rotary drive. The thick and rigid helical gear, and the structure of double arrangement of pinion gear eliminate backlash. This structure is controlled hydraulically enabling stable and precise positioning accuracy by controlling backlash automatically at optional index angle.




Independent Control Box
for DIT Table (opt.)

■ **Specifications of Rotary Table**

Item \ Model		DIT-AH series	DIT-BH series
Table size	mm in	2000×2500 78.7×98.4	3000×3500 118.1×137.8
		2500×3000 98.4×118.1	3500×4000 137.8×157.5
		3000×3500 118.1×137.8	4000×4500 157.5×177.2
Max. loading capacity	t lb	30 66100 (std.) 45 99200 (opt.)	65 143300 (std.) 100 220400 (opt.)
Table NC rotary feed	deg/min	0.1~200	
Table rotary rapid traverse	deg/min	720	540
Linear axis stroke (V axis)	mm in	1500~3000 59.1~98.4 (extended at every 500 mm 19.7 in)	2000~ 78.7~ (extended at every 1000 mm 39.4 in)
Linear axis cutting feed	mm/min ipm	1~4000 0.04~157.5	
Linear axis rapid traverse	mm/min ipm	10000 393.7	

Standard Equipment
- Rotary MP scale
- Hydraulic clamping system: table rotary
- Lubrication pump unit
- Steel telescopic slideway covers
- Preventive measure for coolant infiltration
- Leveling block
- Wiring materials

Optional Equipment
- Independent control box
- Oil pan for table pit
- MP scale feed back system for table linear axis (V axis)
- NC rotary cutting feed
- Coolant/hydaulic piping from center of table
- Chip conveyor on both side of table (coil type/hinged steel belt type)

Specifications

Machine Specifications

Item			MAF150C	MAF180C
Diameter of boring spindle/Spindle taper		mm in	ϕ150 5.9/Taper 7/24 ISO No.50	ϕ180 7.1/Taper 7/24 ISO No.50
Ram size		mm in	420x420 16.5x16.5	
Spindle speed		min^{-1}	6～2500	
Spindle motor output (cont./30min/10min)		kW HP	55/75/85 74/101/114 (std.) 80/100/150 107/134/201 (opt.)	
Spindle max. torque (cont./30min/10min)		N·m ft·lbf	5200/7080/8000 3835/5222/5900 (std.) 7200/9000/11300 5310/6638/8334 (opt.)	
Axis travel	Ram, in/out Z axis	mm in	1250 49.2	
	Boring spindle, in/out W axis	mm in	1000 39.3	
	Z axis+W axis	mm in	2250 88.6	
	Saddle, vertical Y axis	mm in	3000 118.1 (std.) 4000 157.5, 5000 196.9 (opt.)	
	Column, longitudinal X axis	mm in	5000 196.9 (std.) extended at every 2000 78.7 (opt.)	
Feed rate	NC cutting feed	mm/min ipm	1～10000 0.04～393.7	
	Rapid Z, W axis	mm/min ipm	15000 590.6	
	Traverse X, Y axis	mm/min ipm	20000 787.4	
Feed thrust	Z, W axis	N lbf	40000 8992	
	X, Y axis	N lbf	40000 8992	
Machine weight		kg lb	70000 154400*	

*This figure is the one of machine proper with X=5 m 16.4 ft, Y=3 m 9.8 ft specification and does not include optional equipments etc.

Standard Equipment

-Main spindle orientation
-Boring spindle nose taper air blow system
-Tool locking system with pull-stud
-Y-axis upper and lower covers (armored bellows cover)
-Lubrication, hydraulic pump units
-Bed slideway cover (steel telescopic cover)
-Leveling blocks and anchor bolts
-MP scale feedback system for X, Y and Z axis
-Main operation panel: at operator step or up/down platform(opt.)
-Work light
-Lubrication oil cooling system for hydrostatic guideways
-NC system: FANUC 31i
-Wiring materials
-Maintenance tool kit
-Electric diagram display & diagnosis
-Warning light
-Earth leakage breaker: Sensitivity current 200mA
-Operator friendly function
Recovery function
Diagnosis function
Periodical maintenance function
Centering function
Maintenance service function
Alarm display function

Optional Equipment

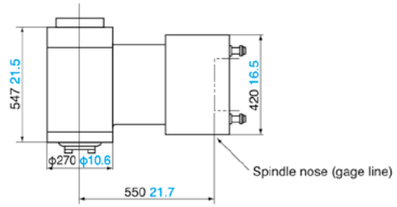
-Coolant through spindle
-NC threading function
-Rigid tap
-Automatic attachment changing
-Automatic attachment indexing at every 5 deg.
-Air blow system
-Thermal balancing wall behind column
-Thermal displacement compensation (Z axis direction) during spindle rotation
-Flood coolant supply system
-Oil skimmer
-Coolant temperature control system
-Mist coolant supply system
-Automatic tool changer (ATC): for both horizontal and vertical spindles, 60/80/100/120/160 tools
-Independent up/down operator platform
-Up/down and left/right moval pendant type operation panel
-Status light
-Floor plate
-Rotary table (DIT-AH/DIT-BH)
-Chip conveyor/Chip box
-Attachment rack
-Spare parts
-5-face machining software
-Air compressor
-Machine special painting color
-Attachments
Dummy plate
Spindle support
Right angle head
Universal head
Tilt universal head
Boring tool head
Surfacing head
Extention milling head

Monitoring Functions

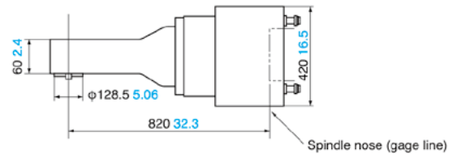
-Overload monitor by soft meter method
-Tool life monitor
-Automatic tool length measurement and compensation
-Tool breakage monitoring
-Automatic workpiece measuring
-Operation time accumulation
-Production number control
-Automatic spare tool replacement
-Automatic power OFF
-Automatic power ON

Attachments

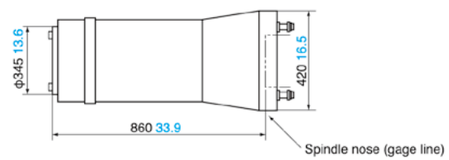
● Right Angle Head RH55-550-AC
- Spindle speed: 2500 min^{-1}
- Spindle motor output: 55 kW 74 HP/270 min^{-1}
- Max. torque: 1945 N·m 1435 ft·lbf
- Weight: 580 kg 1279 lb



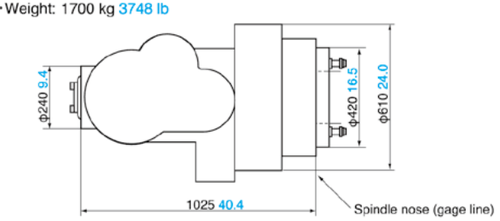
● Right Angle Head RH8x460/S360-AC
- Spindle speed: 500 min^{-1}
- Spindle motor output: 8 kW 11 HP/174 min^{-1}
- Max. torque: 441 N·m 325 ft·lbf
- Weight: 580 kg 1279 lb



● Spindle Support SS-860-AC
- Spindle speed: 1500 min^{-1}
- Spindle motor output: 15 kW 20 HP/65 min^{-1}
- Max. torque: 2200 N·m 1623 ft·lbf
- Weight: 420 kg 926 lb

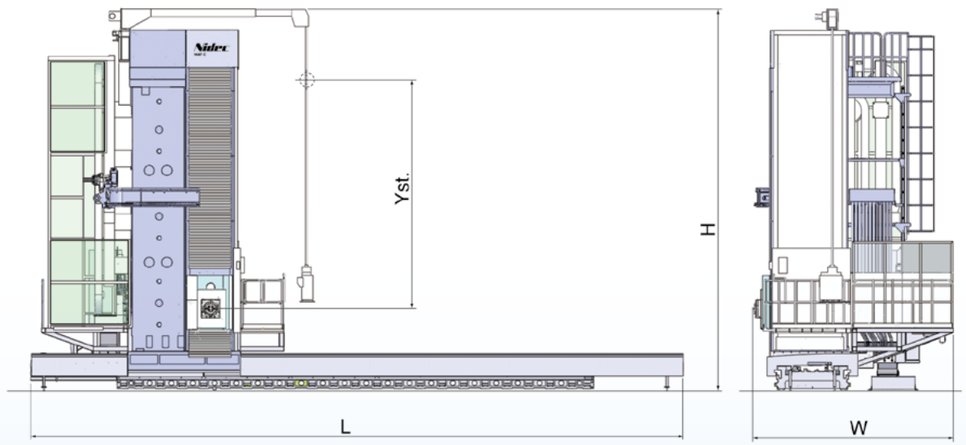


● A Axis NC Universal Head UH-15-1NC-670-AC
- Spindle speed: 2500 min^{-1}
- Spindle motor output: 15 kW 20 HP/306 min^{-1}
- Max. torque: 468 N·m 1058 ft·lbf
- Weight: 1700 kg 3748 lb



Machine Dimensions

Unit: mm in



L		H		Yst.		W
16790/11000	661.0/433.1	7372 (7916)	290.2 (311.7)	3000	118.1	4972 195.7
18940/13000	745.7/511.8	8372 (8916)	329.6 (351.0)	4000	157.5	
21090/15000	830.3/590.6	9372 (9916)	369.0 (390.4)	5000	196.9	

For the other detail dimensions, please contact us.

Specifications

NC Specifications FANUC Series 31i

Please refer to instruction manual of NC for details.

Standard Specifications

Name	Note	
Control axis/feedback system		
X axis	Column longitudinal, MP scale	
Y axis	Saddle vertical, MP scale	
Z axis	Ram in/out, MP scale	
W axis	Boring spindle in/out, Pulse coder	
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, X-W, Y-W	
Manual	Simultaneous 1 axis	
Manual handle	Simultaneous 1 axis, Portable type with position display	
Input increment		
0.001 mm/pulse		
Data input/output, DNC input		
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)	
Controlled axis		
Controlled axes	4 axis (X, Y, Z, W)	X axis: Column longitudinal Y axis: Saddle vertical
Simultaneously controlled	4 axis (X, Y, Z, W)	Z axis: Ram in/out W axis: Boring spindle in/out
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		
Operation		
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	
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 position return	G28	
Reference position return check	G27	
2nd reference position return	G30 (P2)	
3nd/4th reference position return	G30 (P3, P4)	
Tapping mode	G63	
Cutting mode	G64	

Name	Note
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: 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. 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
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	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 position offset	G45, G46, G47, G48
Cutter dia. compensation C	
Tool management function	Included tool life management
Tool length measurement	
Editing operation	
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	
Setting and display	
Status display	
Clock display	
Current 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	Soft key
Erase CRT screen display	
Others	
CRT character display	10.4" color LCD

Optional Specifications

Name	Note
Control axis/feedback system	
V axis	Table in/out, Pulse coder/MP scale
B axis	Table rotation, Pulse coder/MP scale
Data input/output, DNC input	
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 1553 mi)
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
Controlled axis	
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	
Stored stroke check 2, 3	
Operation	
Tool retract and recover	
3D handle feed	Tool direction+nomal direction
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–P4), 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 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	
Auxiliary / Spindle speed function	
Rigid tapping	
Tool function / Tool compensation	
Tool offset pairs	±7-digit, 400
	±7-digit, 499
	±7-digit, 999
	±7-digit, 2000
3-dimensional cutter compensation	G40, G41

Name	Note
Editing operation	
Part program storage capacity	512 kbyte, Storage length: 1280 m 4196.7 ft
	1 Mbyte, Storage length: 2560 m 8393.4 ft
	2 Mbyte, Storage length: 5120 m 16786.9 ft
	4 Mbyte, Storage length: 10240 m 33573.8 ft
	8 Mbyte, Storage length: 20480 m 67147.5 ft
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	
Setting and display	
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)
1: 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.
2: This optional item is alternative.
3: This function is alternative with "Dynamic graphic display".
4: This function include "Background display". Not specify this function when Graphic function is specified.
5: Expansion 1 (Standard)

Storage capacity	Storage length	Number
256 kbyte	640 m 2098.4 ft	500
512 kbyte	1280 m 4196.7 ft	1000
1 Mbyte	2560 m 8393.4 ft	1000
2 Mbyte	5120 m 16786.9 ft	1000
4 Mbyte	10240 m 33573.8 ft	1000
8 Mbyte	20480 m 67147.5 ft	1000

6: Expansion 2 (Optional)

Storage capacity	Storage length	Number
256 kbyte	640 m 2098.4 ft	500
512 kbyte	1280 m 4196.7 ft	1000
1 Mbyte	2560 m 8393.4 ft	2000
2 Mbyte	5120 m 16786.9 ft	4000
4 Mbyte	10240 m 33573.8 ft	4000
8 Mbyte	20480 m 67147.5 ft	4000

Nidec

All for dreams

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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.
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