DOOSAN

The Reliable Partner

NHP 4000/5000



High productivity Horizontal Machining Center

NHP 4000
NHP 5000

ver. EN 170630 SU

Basic Information

Basic Structure
Cutting
Performance

Detailed Information

Options
Applications
Diagrams
Specifications

Customer Support Service



NHP 4000/5000

The NHP4000 and 5000 horizontal machining centers offer high productivity and ultimate precision due to minimized non-cutting time, stable machine structure and thermal distortion correction function. Grease lubrication is used for all axis ballscrews in order to meet eco-friendly standards. These compact. high speed machining centers provide the best productivity to our customers for small and medium sized parts.



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Improved productivity by reducing non-cutting time

- 15000/20000 r/min high speed bulit-in spindle
- Axes Acceleration/deceleration 1G
- High Speed disc type tool magazine

Reliable and compact machine

- Proven reliability through multi million test cycles
- Grease lubrication prevents coolant contamination
- Three point bed support structure
  (No foundation work, minimum installation time)

Various functions are applied to ensure high precision

- Spindle thermal compensation standard
- Spindle, ballscrew and bearing cooling system standard

Basic structure

3 point support bed structure provides stable stiffness.

Travel distance (X x Y x Z-axis)

NHP 4000

560 x 640 x 660 mm (22.0 x 25.2 x 26.0 inch)

(10% improved over previous model)

NHP 5000

730 x 730 x 880 mm (28.7 x 28.7 x 34.6 inch)

(10% improved over previous model)



Feed Axes

Eco-friendly grease lubrication is applied to all axes as standard and High speed servo motors are installed to improve productivity.

Rapid traverse rate (X/ Y / Z-axis)

NHP 4000

1G / 1G / 1G

NHP 5000

0.9G / 0.8G / 0.8G



Spindle

High-speed built-in spindle is standard, improving noise, vibration, productivity, working environment, and machining accuracy.
In addition, tool change error is minimized by a tool check analog sensor.

Max. spindle speed	Max. spindle motor power	Max. spindle motor torque
15000 r/min	30 kW (40.2 Hp)	230 N·m (169.7 ft-lbs)
15000 r/min	37 kW (49.6 Hp)	303 N·m (223.6 ft-lbs)
20000 r/min	37 kW (49.6 Hp)	221 N·m (1633.1 ft-lbs)



Table

Provides large machining area and three types of table (index, worm/wheel drive, direct drive)

Max. workpiece

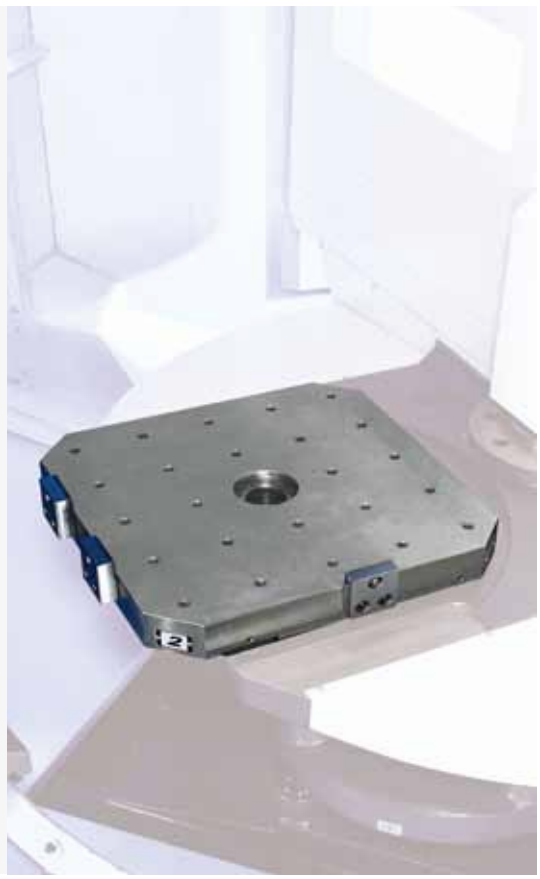
NHP 4000
ø630x900h
(24.8 x 35.4 inch)
(10% improved over previous model)

NHP 5000
ø800x1000h
(31.5 x 39.4 inch)
(8% improved over previous model)

Max. workload

NHP 4000
400 kg (881.8 lb)

NHP 5000
500 kg (1102.3 lb)
700 kg (1543.2 lb) option



90degree indexing time



26% Improved

Magazine

Tool Change time has been optimized to reduce non cutting time.

Disk type

40T

60T option

Chain Type

80T option

120T option

Matrix type

171T option

275T option



* 40T/60T Magazine

Tool to Tool

Previous model	1.0 sec
NHP series	0.9 sec

10% Improved

Chip to Chop*

Previous model	3.8 sec
NHP series	2.3 sec

30% Improved

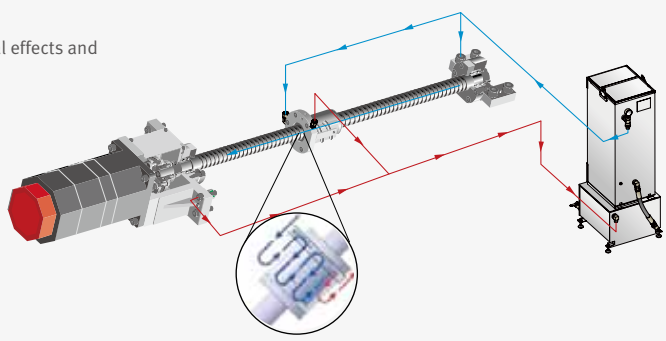
* MAS

High accuracy equipments

High accuracy options are available to provide stable precision.

Cooling system

Reduces axis thermal effects and maintains precision.



Linear scale option

To maintain high precision for long time operation.



Cutting Performance

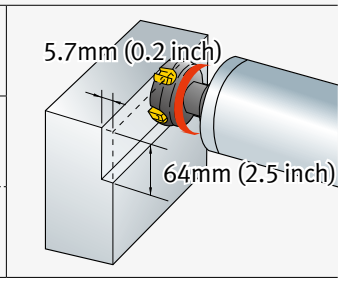
Excellent machining capability due to machine structure and spindle performance.

Higher Cutting Power

NHP series (NHP 5000)

Face mill_Carbon Steel (SM45C) [ø125mm Face mill (8Z)]

	Machining rate	Spindle speed	Feed rate
NHP series	788 cm^3/min (48.1 $inch^3$/min)	1200 r/min	2160 mm/min (85.0 ipm)



* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Productiviry test

Productiviry test

18 % Improved

- Product : Cylinder block
- Material : Aluminum



Cycle time



Productiviry test

22 % Improved

- Product : ABS block
- Material : Aluminum



ABS BLOCK

Cycle time



* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Standard / Optional Specifications

Various optional features are available for customer-specific work environments.

● Standard ○ Optional

No.	Description	Features		NHP 4000	NHP 5000
1	Spindle	15000 r/min	30/18.5 kW (40.2/24.8 Hp), 230 N·m (169.7 ft-lbs)	●	●
2		15000 r/min	37/22 kW (49.6/29.5 Hp), 303 N·m (223.6 ft-lbs)	○	○
3		20000 r/min	37/18.5 kW (49.6/24.8 Hp) 221 N·m (163.1 ft-lbs)	○	○
4	Magazine	Tool storage capacity	40 ea	●	●
5			60 / 80 / 120 / 171 / 275ea	○	○
6	Tool shank type	BIG PLUS BT40		●	●
7		BIG PLUS CAT40/DIN/HSK63A		○	○
8	Coolant	FLOOD	0.7 MPa (1.8 kW (2.4 Hp))	●	●
9		TSC	2 MPa (1.5kW (2.0 Hp))	○	○
10			3 MPa (2.2 kW (3.0 Hp))	○	○
11			7 MPa (3.7 kW (5.0 Hp))	○	○
12	Chip disposal	Chip conveyor	Drum type (Hinged)	●	●
13			Drum type (Scraper)	○	○
14		Chip bucket	Folklift type	○	○
15			Rotation type	○	○
16		Air gun		○	○
17		Coolant gun		○	○
18	Precision machining option	Linear scale	X / Y / Z-axis	○	○
19		AICC II (200Block)		●	●
20		AICC II (600Block)		○	○
21		AICC II (1000Block)		○	○
22	Measurement & Automation	Automatic tool measurement	TS27R_RENISHAW	○	○
23			RMI-Q_ONLY_RENISHAW	○	○
24		Automatic work-piece measurement	RMP60_RENISHAW	○	○
25			OMP60_RENISHAW	○	○
26	Others	LED Work light		●	●
27		Signal tower		●	●
28		Tool load monitoring		●	●
29		EZ Guide i		○	○
30		Automatic power off		○	○

* Please contact DOOSAN to select detail specifications.

Peripheral equipment

Grease lubrication system

The standard grease lubrication system eliminates the need for an oil skimmer and reduces lubrication costs by about 65% compared to oil lubrication.

Yearly maintenance cost

Max. 65% ↓



Chip Conveyor



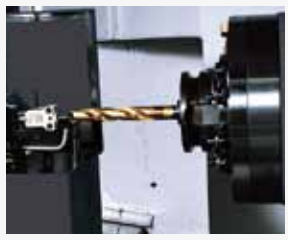
Drum filter type option



Measurement Systems



Auto tool damage detection device I (BK 9) option



Auto tool damage detection device II (OMRON) option



Automatic tool measuring device (TS 27R) option

Chip Disposal System



Flushing coolant



Coolant spray gun on the spindle head



Shower coolant option



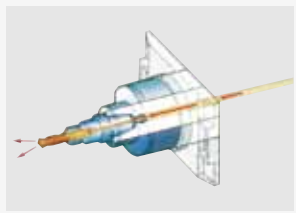
Coolant gun option



Flood coolant



Spindle-through coolant spray device option





MQL system option

Misting device

Environmentally-friendly Devices



Oil skimmer option



Mist collector option

User Convenience

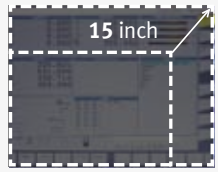
User convenience has been significantly enhanced with a new operation panel.

Simple and Convenient Operation Panel

The operator's panel has been redesigned and integrated for better usability. Additional, customized function switches (option) can be provided to maximize the operator's convenience.



Large 15inch screen display



Clamping fixture lock/unlock button, counter, timer and other special optional buttons can be provided.

The buttons are separated by partitions in order to prevent erroneous operation of the buttons.

Swiveling Operating Panel



The operating panel can swivel by 120°, and displays various alarm messages concerning machine and controller error, enhancing the operator's convenience.

PCMCIA Card

The PCMCIA card enables uploading and downloading of the NC program, NC parameters, tool information, and ladder programs, and also supports DNC operation.

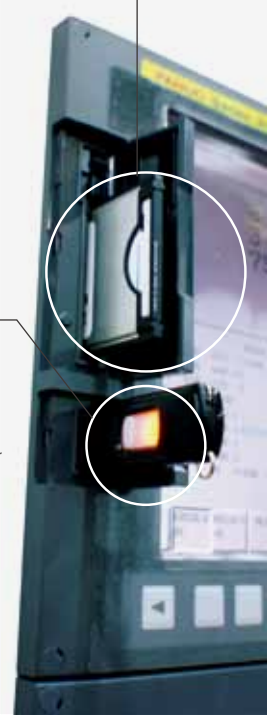
Portable MPG

The portable MPG allows the user to set up workpieces more easily.



USB Port

Upload/download of NC software programs, NC parameters, tool information and ladder program using a USB drive is allowed, but DNC operation is not supported.



EOP Function

Doosan's Easy Operation Package (EOP) supports the user with tool, help desk, operation, and pallet magazine functions among others.

EOP (Easy Operation Package)

Doosan's EOP supports the user with tool, help desk, operation, and pallet magazine functions among others to maximize operational efficiency and user convenience.

Tool Support Functions



Tool management I

- Tool magazine control
- Tool state display
- Fastems Tool Add/Remove Function option



Tool management II option

- Tool magazine control
- Tool life management
- Tool life prediction
- Tool state control
- Balluff Tool ID function



Tool load monitor option

- Detection of tool damage
- Detection of abnormalities during operation
- Detection of no-load air cutting



ATC/APC panel

- ATC manual
- APC manual

Operation Support Functions



Operation rate

- Measure various machine operating rate
- Support 3 shift operation
- calculate and save 30 days operating rate
- Show data for a specific period



PMC switch

- Operation panel function option
- Substitutes toggle switches
- NC option software

Spindle Power – Torque Diagram

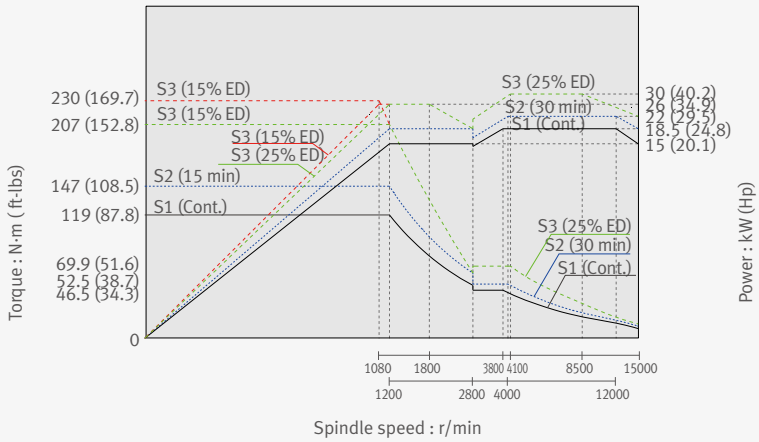
15000 r/min

Max. Spindle motor power

30 kW (40.2 Hp)

Max. spindle motor torque

230 N·m (169.7 ft-lbs)



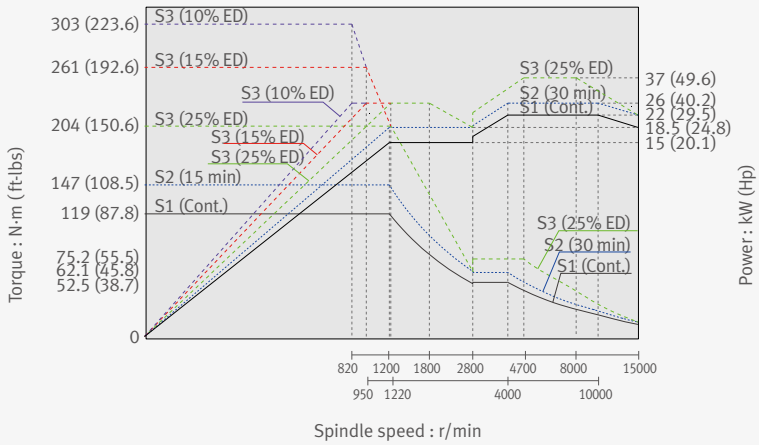
15000 r/min high torque option

Max. Spindle motor power

37 kW (49.6 Hp)

Max. spindle motor torque

303 N·m (223.6 ft-lbs)



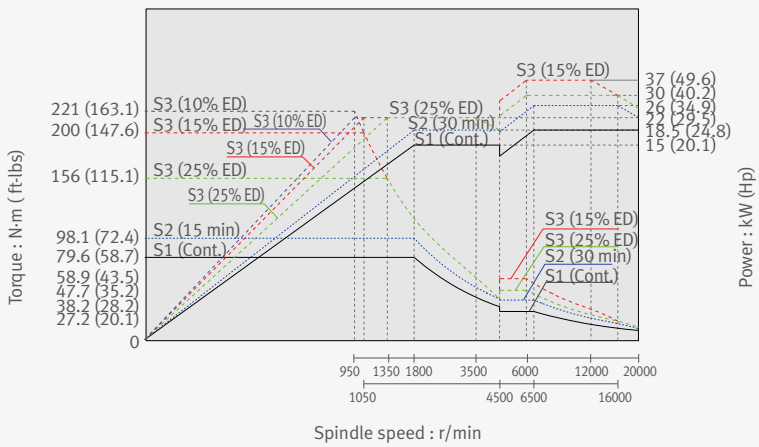
20000 r/min option

Max. Spindle motor power

37 kW (49.6 Hp)

Max. spindle motor torque

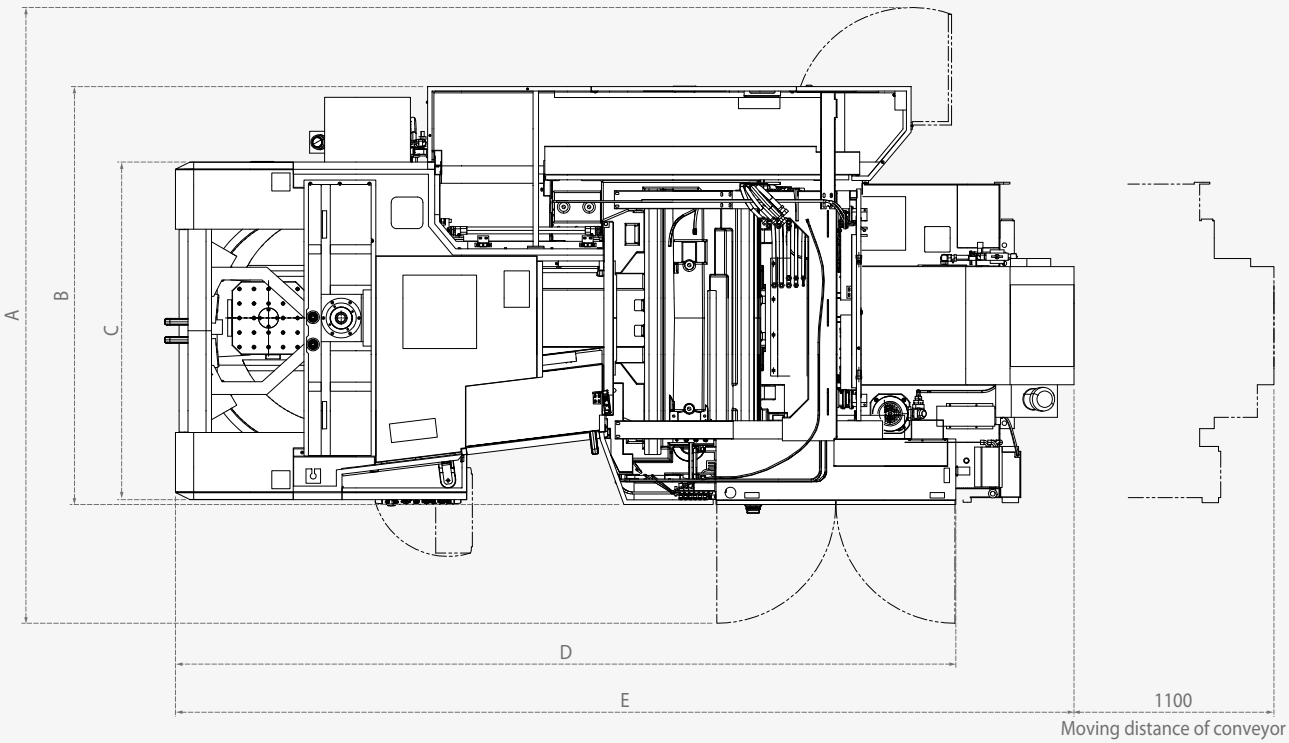
221 N·m (163.1 ft-lbs)



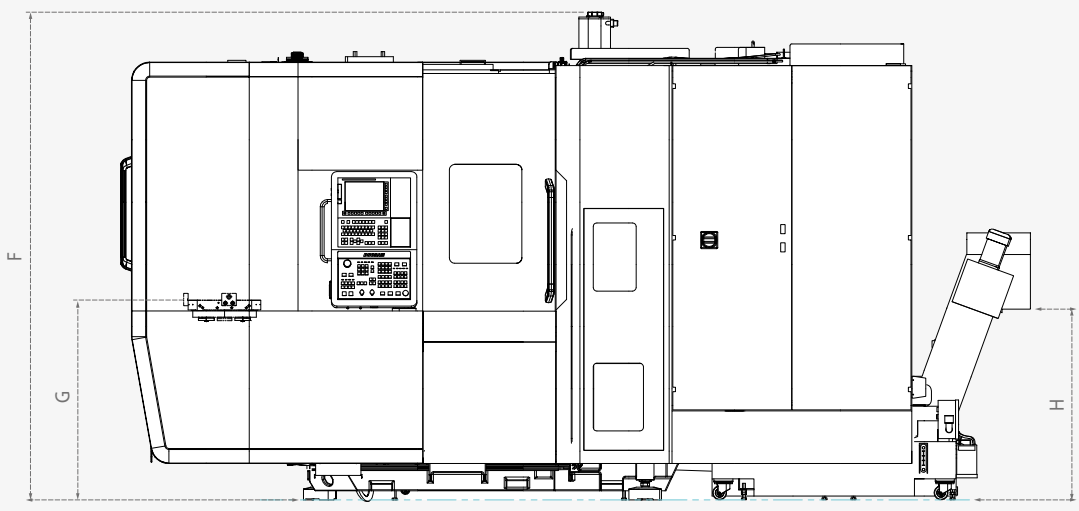
External Dimensions

NHP 4000/5000

Top View



Front View



Unit: mm (inch)

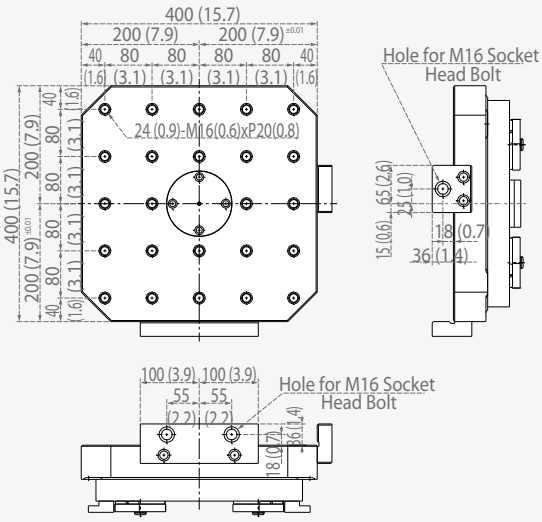
Model	A	B	C	D	E	F	G	H
NHP 4000	3389 (133.4)	2300 (90.6)	1859 (73.2)	4294 (169.1)	4950 (194.9)	2690 (105.9)	1100 (43.3)	1050 (41.3)
NHP 5000	3647 (143.6)	2680 (105.5)	2184 (86.0)	4792 (188.7)	5450 (214.6)	2880 (113.4)	1200 (47.2)	1050 (41.3)

Pallet

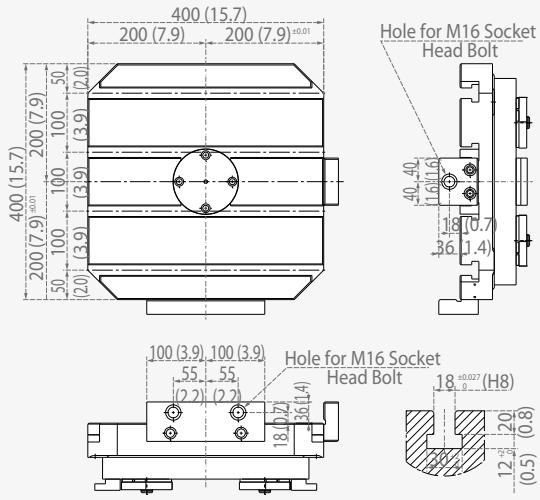
NHP 4000

Unit: mm (inch)

TAP PALLET



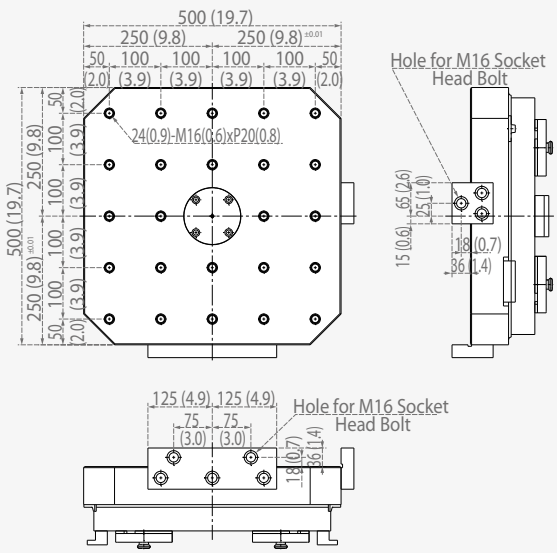
T-SLOT PALLET



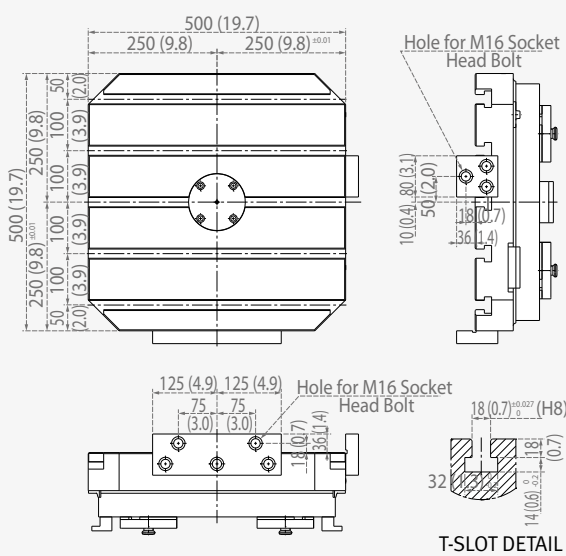
NHP 5000

Unit: mm (inch)

TAP PALLET



T-SLOT PALLET



Machine Specifications



Description			Unit	NHP 4000	NHP 5000
Travel	Travel distance	X-axis	mm (inch)	560 (22.0)	730 (28.7)
		Y-axis	mm (inch)	640 (25.2)	730 (28.7)
		Z-axis	mm (inch)	660 (26.0)	880 (34.6)
	Distance from spindle nose to table top		mm (inch)	80 ~ 720 (3.1 ~ 28.3)	80 ~ 810 (3.1 ~ 31.9)
	Spindle nose to table center		mm (inch)	80 ~ 740 (3.1 ~ 29.1)	100 ~ 980 (3.9 ~ 38.6)
Table	Pallet size		mm (inch)	400 x 400 (15.7 x 15.7)	500 x 500 (19.7 x 19.7)
	Workpiece size		mm (inch)	ø630 x 900h (ø24.8 x 35.4h)	ø800 x 1000h (ø31.5 x 39.4h)
	Tool storage capacity		kg (lb)	400 (881.8)	500 (1102.3) {700 (1543.2)}*
	Pallet change time			7	8 {12}*
Spindle	Max. spindle speed		r/min	15000 {15000, 20000}*	
	Taper		-	ISO #40	
	Spindle power (S3/Cont.)		kW (Hp)	30/18.5 (40.2/24.8) {37/22 (49.6/29.5), 37/18.5 (49.6/24.8)}*	
	Max. spindle torque		N·m (ft-lbs)	230 (169.7) {303, 221 (223.6, 163.1)}*	
Feedrate	Rapid traverse rate	X-axis	m/min (ipm)	60 (2362.2)	
		Y-axis	m/min (ipm)	60 (2362.2)	
		Z-axis	m/min (ipm)	60 (2362.2)	
	Acc./Dec.	X / Y / Z	G	1 / 1 / 1	0.9 / 0.8 / 0.8
Automatic Tool Changer (ATC)	Type of tool shank	Tool shank	-	BT 40 {CAT 40 / DIN / HSK 63A}*	
	Tool storage capa.		ea	40 {60, 80, 120, 171, 275}*	
	Max. tool diameter	Continous	mm (inch)	75 (3.0)	
		Without Adjacent Tools	mm (inch)	170 (6.7)	
	Max. tool length		mm (inch)	450 (17.7)	550 (21.7)
	Max. tool weight		kg (lb)	12 (26.5)	
	Tool change time (Tool-to-tool)		sec	0.9	
Tank Capacity	Coolant tank capacity		L (gal)	570 (150.6)	
Machine Dimensions	Height		mm (inch)	2690 (105.9)	2880 (113.4)
	Length (/w Chip Conveyor)		mm (inch)	4950 (194.9)	5450 (214.6)
	Width		mm (inch)	2300 (90.6)	2680 (105.5)
	Weight		kg (lb)	9700 (21384.5)	11500 (25352.8)
Control	NC system		-	DOOSAN FANUC 31i	

*{ } : Option

CNC Specifications

FANUC 31i

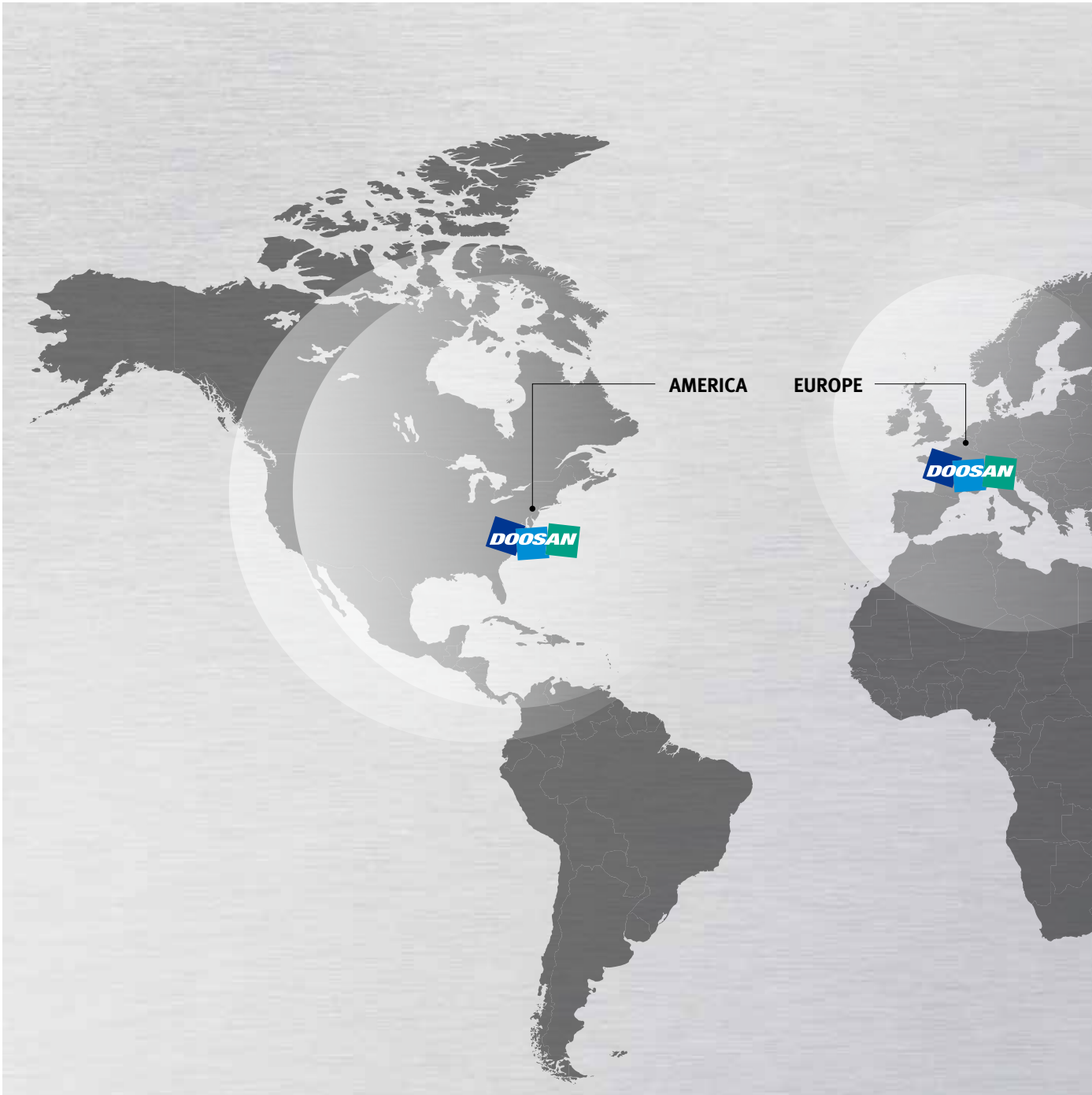
● Standard ○ Optional X Not applicable

No.	Division	Item	Spec.	FANUC 31i
1	Controlled axis	Controlled axes	4 (X, Y, Z, B)	X, Y, Z, B
2		Additional controlled axes	ADD 1 AXIS (5TH AXIS)	○
3		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes Circular interpolation(G02, G03) : 2 axes	●
4		Least command increment	0.001 mm / 0.0001"	●
5		Least input increment	0.001 mm / 0.0001"	●
6		Increment system C	IS-C	○
7		Interpolation type pitch error compensation		○
8		Position switch		○
9		Inverse time feed		○
10		Cylindrical interpolation	G07.1	○
11		NURBS interpolation		○
12		Bell-type acceleration/deceleration before look ahead interpolation	Included in AI contour control I or II (0i-MF, 31/32i)	●
13		Rigid tapping bell-shaped acceleration/ deceleration	Rigid tapping is required.	●
14		Exponential interpolation		○
15		Involute interpolation		○
16		Smooth backlash compensation		●
17		Automatic corner override	G62	○
18		Automatic corner deceleration	Included in AI contour control I or II (0i-MF, 31/32i)	●
19		Cutting feedrate clamp		●
20		Rapid traverse bell-shaped acceleration/ deceleration		●
21		Handle interruption		○
22		Manual handle retrace		○
23		Manual handle feed 2/3 unit		○
24		Nano smoothing		○
25		AICC II	200BLOCK	●
26		AICC II	400 BLOCK	○
27		High-speed processing	600 BLOCK	○
28		Look-ahead blocks expansion	1000 BLOCK	○
29		Linear ACC/DEC before cutting feed interpolation		●
30	Spindle & M code Function	M-code function	M 3 digits	●
31		Spindle orientation		●
32		Retraction for rigid tapping		●
33		Rigid tapping	G84, G74	●
34	Tool Function	Number of tool offsets	200-pairs	●
35		Number of tool offsets	400-pairs	○
36		Number of tool offsets	499 / 999 / 2000 -pairs	○
37		Tool nose radius compensation	G40, G41, G42	●
38		Tool length compensation	G43, G44, G49	●
39		Tool life management		●
40		Addition of tool pairs for tool life management		○
41		Tool number command	T3 digits	●
42		Tool offset memory C	Geometry / Wear and Length / Radius offset memory	●
43		Tool length measurement		●
44		Tool length offset		●
45		Tool offset	G45 - G48	○
46		Rotary table dynamic fixture offset		○
47		Work setting error compensation		○
48	Programming & Editing Function	Absolute / Incremental programming	G90 / G91	●
49		Automatic Coordinate system setting		●
50		Background editing		●
51		Canned cycle	G73, G74, G76, G80 - G89, G99	●

● Standard ○ Optional X Not applicable

No.	Division	Item	Spec.	FANUC 31i
52	Programming & Editing Function	Circular interpolation by radius programming		●
53		Custom macro		●
54		Addition of custom macro common variables	#100 - #199, #500 - #999	●
55		Macro executor		●
56		Custom software	8MB	●
57		Custom software	12MB, 16MB	○
58		Decimal point input		●
59		Extended P-code variables 512Kbyte		●
60		Extended part program editing		●
62		Part program storage	512KB (1280m)	○
63		Part program storage	1MB (2560m)	○
64		Part program storage	2MB (5120m)	○
65		Part program storage	4MB (10240m)	○
66		Part program storage	8MB (20480m)	○
67		Inch/metric conversion	G20 / G21	●
68		Label skip		●
69		Maximum commandable value	±99999.999mm (±9999.9999 inch)	●
70		Number of Registered programs	500 ea	●
71		Optional block skip	1 BLOCK	●
72		Optional block skip	9 BLOCK	○
73		Optional stop	M01	●
74		Program file name	32 characters	●
75		Sequence number	N 8-digit	N8 digit
76		Playback function		○
77		Workpiece coordinate system	G52 - G59	●
78		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	●
79		Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○
80		Tilted working plane indexing command	G68.2	○
81	OTHERS FUNCTIONS & Display, etc	Embeded Ethernet		●
82		MDI / DISPLAY unit	10.4" Color LCD, Keyboard for data input, soft-keys	●
83		MDI / DISPLAY unit	15" Color LCD, Keyboard for data input, soft-keys	○
84		I/O interface	RS - 232C	●
85		USB memory interface	Only Data Read & Write	●
86		Stored stroke check 2		○
87		Multi language display		●
88		3rd / 4th reference return		○
89		Cs contouring control		○
90		Reader/Puncher interface (for 2ch)		●
91		Retraction for 3-dimensional rigid tapping		○
92		Extended Spindle orientation (Spindle Multi Orientation)		●
93		Chopping function	G81.1	○
94		High speed skip function		○
95		Polar coordinate command	G15 / G16	○
96		Polar coordinate interpolation	G12.1 / G13.1	○
97		Programmable mirror image	G50.1 / G51.1	○
98		Scaling	G50, G51	○
99		Single direction positioning	G60	○
100		Pattern data input		○
101		Jerk control	AI contour control II is required.	○
102		Fast Data server with1GB PCMCIA card		○
103		Fast Ethernet		○
104		3-dimensional coordinate conversion		○
105		3-dimensional tool compensation		○
106		3-dimensional manual feed		○
107		Tape format for FS15		○
108		Figure copying	G72.1, G72.2	○
109		Machining time stamp function		○
110		Machining quality level adjustment		○
111		EZ Guide I with 10.4" Color TFT	-.Doosan infracore Conversational Programming Solution -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○
112		Dynamic graphic display (with 10.4" Color TFT LCD)	-.Machining profile drawing. -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○

Responding to Customers Anytime, Anywhere



Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
5	122	18	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

NHP 4000/5000



Description	Unit	NHP 4000	NHP 5000
Max. spindle speed	r/min	15000 {15000, 20000}*	
Max. Spindle motor power	kW (Hp)	30 (40.2) {37, 37 (49.6, 49.6)}*	
Max. Spindle motor torque	N·m (ft-lbs)	230 {303, 221}*	
Taper	-	ISO #40	
Travel distance (X / Y / Z)	mm (inch)	560 / 640 / 660 (22.0 / 25.2 / 26.0)	730 / 730 / 880 (28.7 / 28.7 / 34.6)
Acc./Dec. (X / Y / Z)	G	1 / 1 / 1	0.9 / 0.8 / 0.8
No. of Tool Storage	ea	40 {60, 80, 120, 171, 275}*	
Table size	mm (inch)	400 x 400 (15.7 x 15.7)	500 x 500 (19.7 x 19.7)
NC system	-	DOOSAN FANUC 31i	

*{ } : optional

Doosan Machine Tools

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* For more details, please contact Doosan Machine Tools.
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