

**NEW** COMPACT HORIZONTAL MACHINING CENTER

# NHC 4000·5000



# **NEW** NHC 4000·5000

Compact horizontal machining center NHC 4000/5000 is designed to provide maximum productivity, accuracy, and number of convenient features. The compact design offers flexibility to utilize limited factory space efficiently.

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## ENHANCED DESIGN



A new design was applied considering user convenience, and usability was increased with a touch screen and a wide screen.

## INCREASED PRODUCTIVITY



The 15000r/min direct spindle option was added to expand customer choice and productivity was maximized by increasing rapid traverse.

## IMPROVED ERGONOMICS



Newly designed operation panel and built-in pallet setup switch further improves ergonomics of the machine.



# BASIC STRUCTURE

Highly rigid machine structure and compact design to meet all users' needs.

## Robust machine structure

DN Solutions engineers have performed FEM analysis to design the most durable and stable structure. As a result, the machine is capable of extensive heavy cutting process.

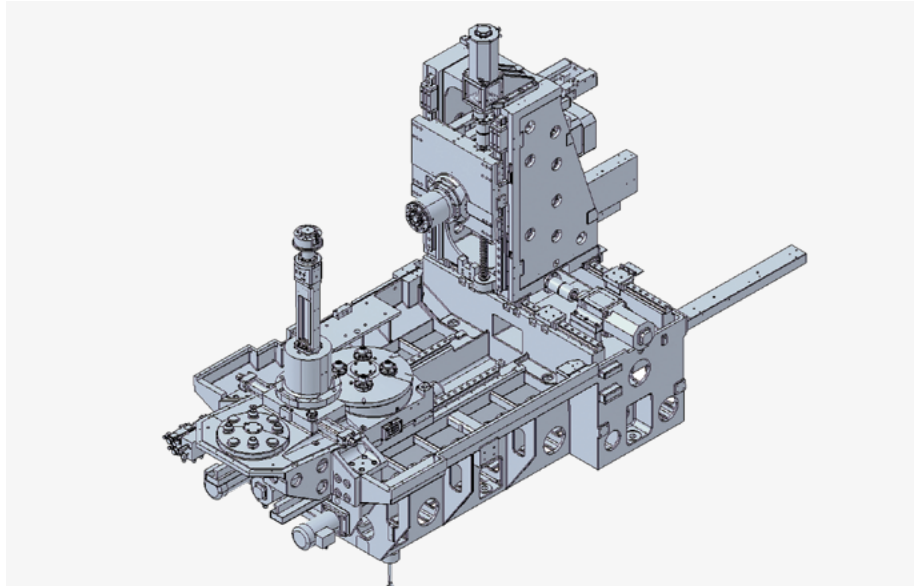
Travel distance (X / Y / Z axis)

NHC 4000

**600 / 560 / 565** mm  
(23.6 / 22.0 / 22.2 inch)

NHC 5000

**850 / 700 / 750** mm  
(33.4 / 27.5 / 29.5 inch)



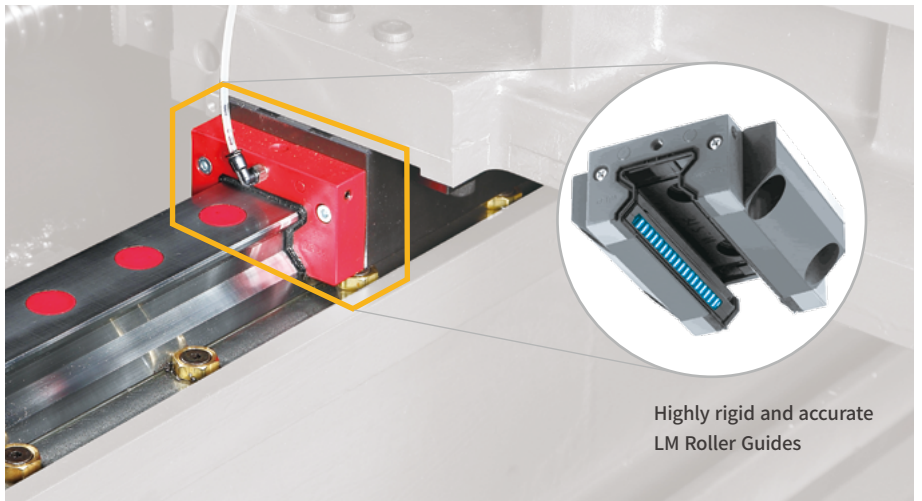
## High speed roller guides

LM roller guides on all axes increases machine reliability and productivity.

Rapid traverse (X / Y / Z axis)

NHC 4000 / NHC 5000

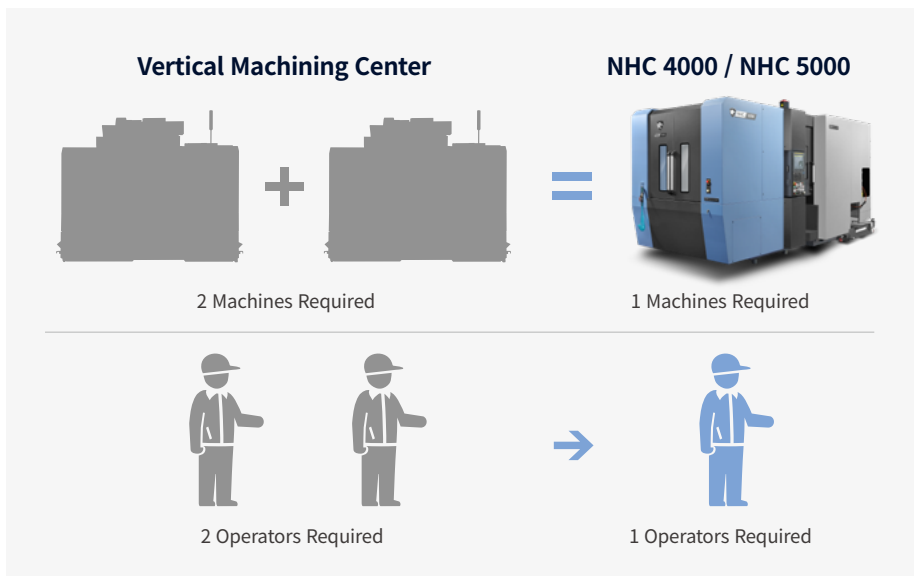
**48 / 40 / 48** m/min  
(1889.8 / 1574.8 / 1889.8 ipm)



Highly rigid and accurate LM Roller Guides

## Compact design

The compact design allows users to utilize limited factory space efficiently.



# SPINDLE | TOOL MAGAZINE

15000 r/min spindle option has been added for optimum productivity in high speed machining application.

Max. spindle speed

**8000** r/min  
 {12000/15000} r/min OPTION

Max. spindle power

**18.5 / 11** kW (24.8 / 14.7 Hp)

Max. spindle torque

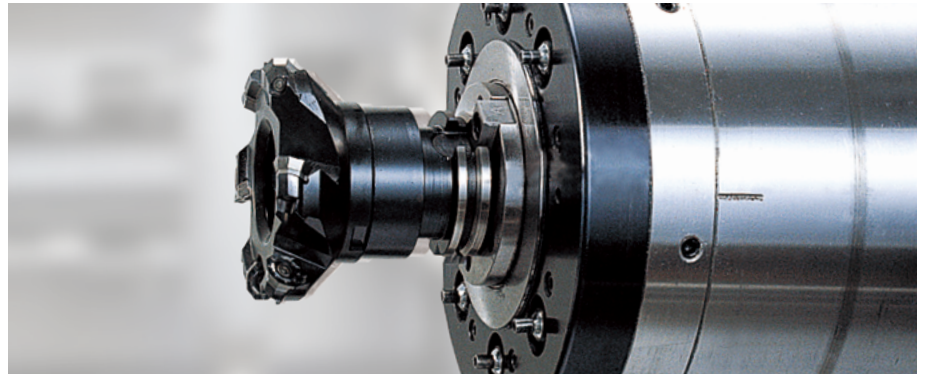
**353.4** N·m (260.6 ft-lbs)  
 117 N·m (86.3 ft-lbs) OPTION

Type

**ISO #40**

## High speed spindle

Users can select different types of high performance spindle to meet their machining needs. Standard 8000 r/min spindle can deliver up to 353.4 N·m of torque to perform extreme heavy cutting process, while 15000 r/min spindle option can provide maximum productivity in high speed cutting process.



## Automatic tool changer (ATC)

Cam-type ATC provides high reliability and durability, and minimizes non-cutting time.

Tool storage capacity

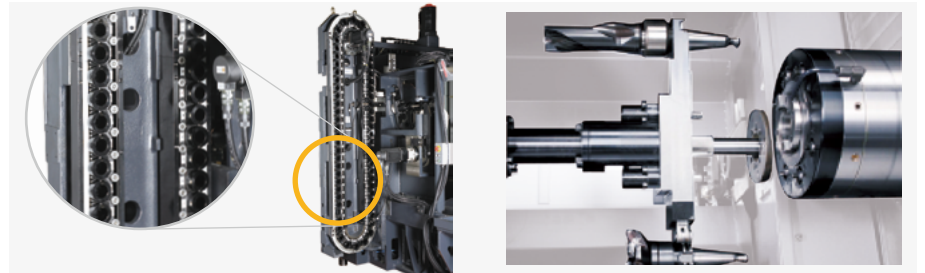
**40** tools  
 60 / 80 / 120 / 170 / 262 tools OPTION

Tool change time

**1.5** s

## Wide range of options to meet more users' needs

Wide selections of tool magazines are available per user's preference. These automatic tool magazines are operated by our newest servo motor to minimize tool change time, and the fixed address tool storage system makes it easy for users to select desired tool without confusion.



# AUTOMATIC PALLET CHANGER (APC)

More reliable and conveniently designed high speed automatic pallet changer.

## High speed automatic pallet changer

Standard high speed rotary type APC provide extreme reliability and a large work space allows users to easily setup the pallet.

	NHC 4000	NHC 5000
Pallet Size	400 x 400 mm (15.7 x 15.7 inch)	500 x 500 mm (19.7 x 19.7 inch)
Max. Workpiece Size (DXH)	Ø600 x H800 mm (23.6 x 31.5 inch)	Ø800 x H900 mm (31.5 x 35.4 inch)
Max. Load	400 kg (881 lb)	500 kg (1102.3 lb)

# STANDARD | OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Division	Option	NHC 4000	NHC 5000	
Tool Magazine	40 tools	●	●	
	60 tools	○	○	
	80 tools	○	○	
	120 tools	○	○	
	170 tools	○	○	
	262 tools	○	○	
Tool Specifications	BT40	●	●	
	CAT40	○	○	
	DIN40	○	○	
	HSK A-63	○	○	
Mist Collector	Mist Collector	○	○	
Spindle	8000 r/min	18.5 / 11 kW	●	●
	12000 r/min	18.5 / 11 kW	○	○
	15000 r/min	18.5 / 11 kW	○	○
	Spindle air curtain		●	●
Hydraulic fixtures	Hydraulic fixture line	2 X 2	○	○
		4 X 4	○	○
		6 X 6	○	○
		8 X 8	○	○
	Hydraulic fixture unit	○	○	
Automatic Workpiece Measurement Device	OMP60_RENISHAW	○	○	
	RMP60_RENISHAW	○	○	
Automatic Tool Measurement Device	BK 9	○	○	
	Limit Switch (OMRON)	○	○	
	TS27R	○	○	
Chip Handling System	Chip conveyor	Hinged type	○	○
		Scraper type	○	○
		Drum type	○	○
	Chip bucket	○	○	
Coolant	FLOOD	●	●	
	FLUSHING	-	○	
	SHOWER	○	○	
	TSC	1.5 kW 2.0 MPA	○	○
		3.0 kW 3.0 MPA	○	○
		4.0kW 2.0MPA	○	○
		7.5 kW 7.0 MPA	○	○
	Water soluble Coolant Chiller**	○	○	
	Coolant gun	○	○	
Oil skimmer	○	○		
Table	Index table (1°)	●	●	
	Rotary Table (0.001°)	○	○	
Pallet	Tapped pallet	●	●	
	T-Slot pallet	○	○	
AIR	Pallet air seat	○	○	
	AIR GUN	○	○	
MPG	Portable MPG	●	●	
Customized Special Option	Coolant level switch : Sensing level - Low / High	○	○	
	Tool ID (Internal-matrix) : Balluff Sensor	○	○	
	Tool Management (TMT1, TMT2, TMT8 DIGIT)	○	○	
	Ball screw shaft cooling(X/Y/Z axis)	○	○	
	Setup shower coolant	○	○	
	Auto door w/Safty edge	○	○	
	U-axis drive : DANDREA( TA-C125)	○	○	
	MQL(Maker : VOGEL)	○	○	
	Smart thermal control: Sensor type (Spindle & Structure)	○	○	
	TSA	○	○	
	Spin window for main door (Electric type/ Maker:T2K)	○	○	

\* Please contact DN Solutions for detailed specification information.

\* When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.

\*\* Technical consultation is mandatory for the chilling of non-water soluble coolant

● Standard ○ Optional X Not applicable

# PERIPHERAL EQUIPMENT

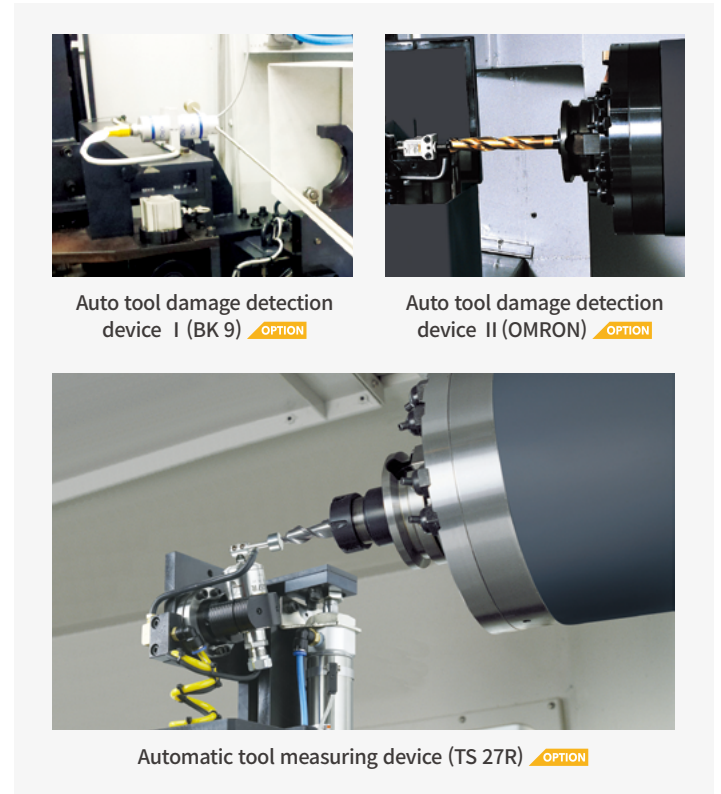
## Diverse Options

Proper chip disposal is very important for improving productivity and environment. Therefore, we recommend better chip management for users to work in a safer working environment.

### Chip Conveyor OPTION



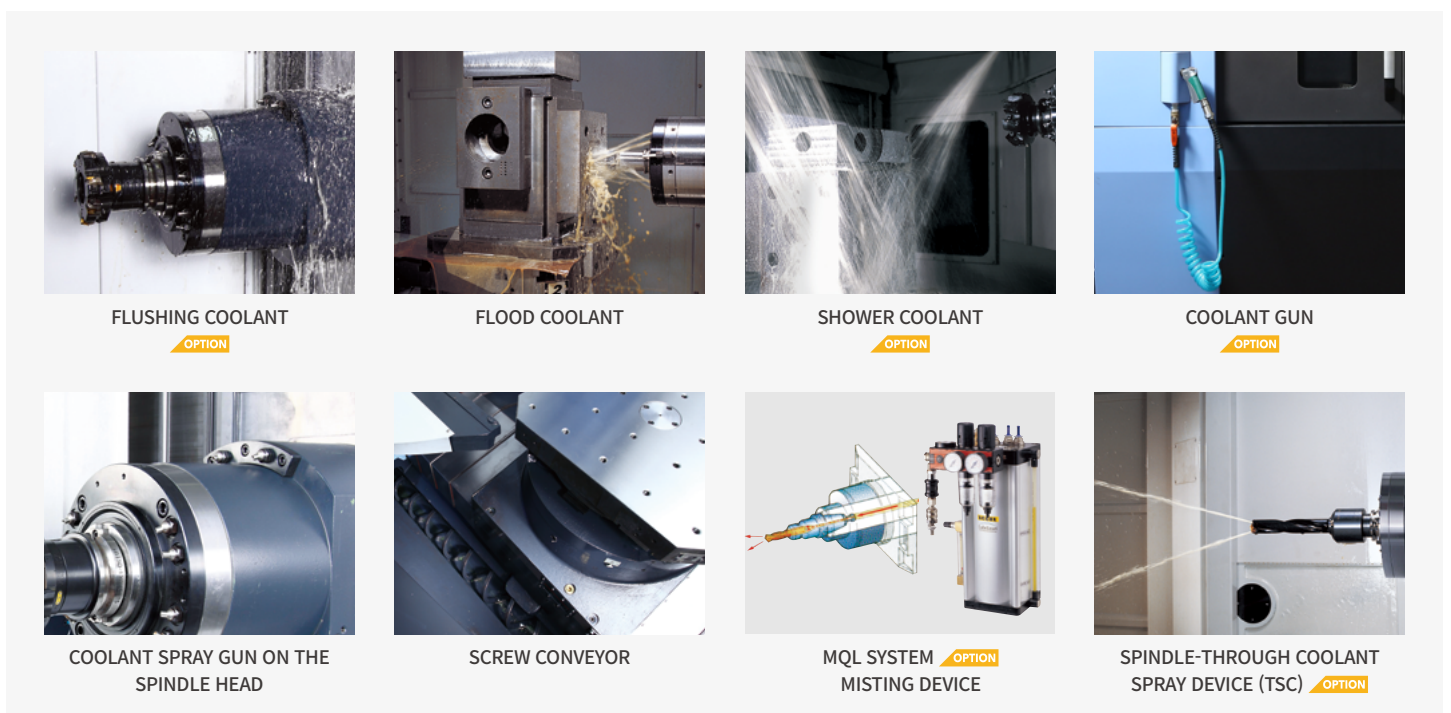
### Measurement Systems



### Environment-friendly Devices



### Chip Disposal System

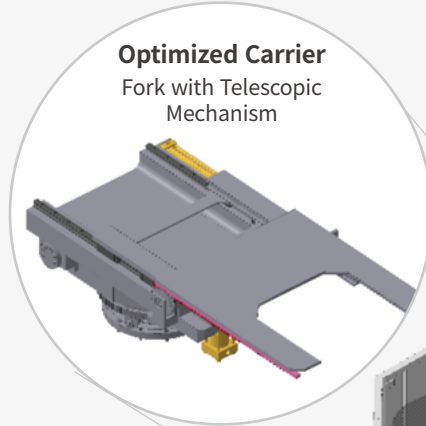


# DN ROUND STORAGE

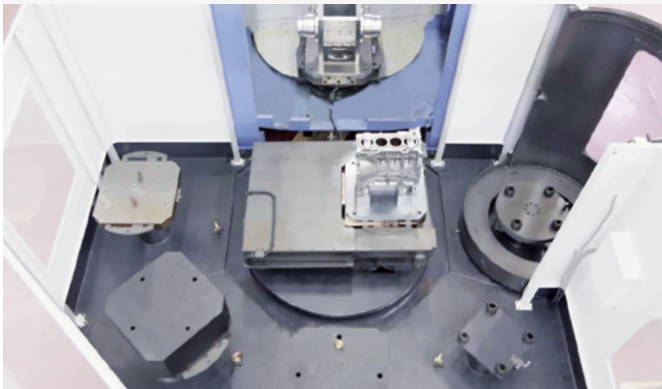
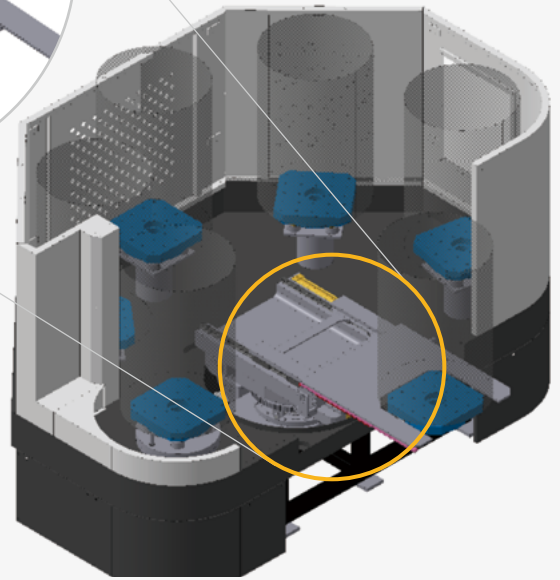
**Compact size slim multi pallet system for new HMC taper #40 series.**

**Features**

- Optimized slim design for space saving & minimal invest cost
- Telescopic mechanism fork like Linear Pallet System II
- Simple installation and easy maintenance
- Field retrofit available



**Optimized Design for Space Saving**



**Machine Specifications**

Available model		DN Round Storage 4000	DN Round Storage 5000	DN Round Storage 5500
		NHP 4000 / NHC 4000	NHP 5000 / NHC 5000	NHP 5500 <sup>2nd</sup> / NHM 5000 / DHF 5500
<b>Pallet dimension</b>	mm (inch)	400 x 400 (15.7 x 15.7)	500 x 500 (19.7 x 19.7)	
<b>Workpiece diameter</b>	mm (inch)	630 (24.8) / 600 (23.6)	800 (31.5)	850 (33.5)
<b>Workpiece height</b>	mm (inch)	900 (35.4) / 800 (31.5)	1000 (39.4) / 900 (35.4)	1100 (43.3)
<b>Workpiece weight</b>	kg (lb)	400 (881.8)	500 (1102.3) {700 (1543.2) : NHP 5000}*	800 (31.5) {1000 (39.4) : NHP 5500 <sup>2nd</sup> }
<b>Number of pallet</b>	ea	6		
<b>Magazine type</b>		Buffer Station type with Carrier		
<b>Operation</b>		PLC operation (Built-in Control)		
<b>Driving mechanism</b>	<b>Rotating Axis</b>	Servo Motor & Reduction Gear		
	<b>Lifting Axis</b>	Hydraulic Cylinder		
	<b>Forking Axis</b>	Hydraulic Cylinder & Rack/Pinion		
<b>Dimension(Basic)</b>	mm (inch)	3085 x 2015 (121.5 x 79.3)	3630 x 2415 (142.9 x 95.1)	3680 x 2440(144.9 x 96.1)

# LPS (LINEAR PALLET SYSTEM)

LPS 4000 / 5000 is deigned to provide optimized system for the user wants space saving & high productivity linear pallet system in pallet size both 400 mm x 400 mm (15.7 inch x 15.7 inch) and 500 mm x 500 mm (19.7 inch x 19.7 inch) with minimum invest cost.

### Features

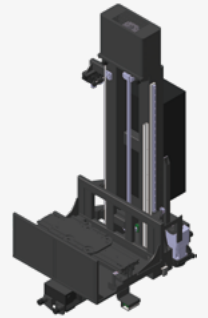
- Optimized Slim design for space saving & minimal invest cost
- Optimized AGV of single mast & single fork structure
- Simple installation in one piece
- Easy field retrofit to DN Solutions horizontal machining center
- User friendly intuitive way to register basic information for flexible manufacturing

EXPANDABLE



### Optimized AGV

- Lifting axis with ball screw & LMG
- Optimized AGV of single mast & single fork structure



## Machine Specifications

Available model		LPS 4000	LPS 5000	
		NHP 4000 / NHC 4000	NHP 5000 / NHC 5000	DVF 6500 W / APC
Pallet dimension	mm (inch)	400 x 400 (15.7 x 15.7)	500 x 500 (19.7 x 19.7)	
Number of pallet	ea	12 - 72		
Workpiece diameter	mm (inch)	630 (24.8) / 600 (23.6)	800 (31.5)	630 (24.8)
Workpiece height	mm (inch)	900 (35.4) / 800 (31.5)	1000 (39.4) / 900 (35.4)	430 (16.9)
Workpiece weight	kg (lb)	400 (881.8)	500 (1102.3) {700(1543.2) : NHP 5000}*	500 (1102.3)
Axis control		Servo		
Forking type		Single Fork (Telescopic Mechanism)		
Turntable Indexing		45°		
Power supply (AGV)		Trolley Bar		
Communication		Optical		
Number of machines		1 ~ 7		
Number of setup stations		1 ~ 4		
Dimension(Basic)	mm (inch)	6890[L] x 2380 [w] (274.8 x 93.7)		

\* Please contact DN Solutions to select detail specifications

# DN SOLUTIONS FANUC i PLUS

Fanuc i Plus maximizes customer productivity and convenience.

## 15" Touch screen + New OP

DN Solutions Fanuc i Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout. It features a Qwerty keyboard for fast and easy data input and operation.

## DN Solutions Fanuc i Plus

- 15-inch color display
- Intuitive and user-friendly design

## USB and PCMCIA card QWERTY keyboard

- EZ-Guide i standard
- Ergonomic operator panel
- 4MB Memory
- Hot keys
- Enhance AICC BLOCK
- Touch pen provided as standard



## PCMCIA Card

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

## USB Port

The USB memory stick enables uploading and downloading of the NC program, NC parameters, tool information and ladder programs. (DNC operation is not supported.)



## NUMERIC CONTROL SPECIFICATIONS



Division		Specifications	NHC 4000 / NHC 5000 DN Solutions Fanuc i Plus
Controlled axis	Controlled axes		4 axes (X, Y, Z, B)
	Simultaneously controlled axes		4 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	○
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
Interface function	Embedded Ethernet		●
	Fast Ethernet		○
	Enhanced Embedded Ethernet function		●
Operation	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
	Workpiece coordinate system	G52 - G59	●
Program input	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T2 digits
	Tilted working plane indexing command	G68.2 TWP	○
Feed function	AI contour control I	G5.1 Q_, 40 Blocks	X
		G5.1 Q_, 200 Blocks	●
		G5.1 Q_, 400 Blocks	⊕
		G5.1 Q_, 600 Blocks	X
		G5.1 Q_, 1000 Blocks	X
Operation Guidance Function	High smooth TCP		X
	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Note *1) Only with 15" Touch LCD standard	●
Setting and display	EZ Operation package		●
	CNC screen dual display function		●
Network	FANUC MTConnect		⊕
	FANUC OPC UA		⊕
Others	Display unit	10.4" color LCD	X
		15" color LCD	X
		15" color LCD with Touch Panel	●
	Part program storage size & Number of registerable programs	640M(256KB)_ 500 programs	X
		1280M(512KB)_ 1000 programs	X
		2560M(1MB)_ 1000 programs	X
		5120M(2MB)_ 1000 programs	●
		10240M(4MB)_ 1000 programs	X
		20480M(8MB)_ 1000 programs	X
		2560M(1MB)_ 2000 programs	X
		5120M(2MB)_ 4000 programs	X
		10240M(4MB)_ 4000 programs	X
		20480M(8MB)_ 4000 programs	X

# EZ WORK

The software developed by DN Solutions features numerous functions designed for convenience and ease of operation.

## EZ work

The EZ work package delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EZ work reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.



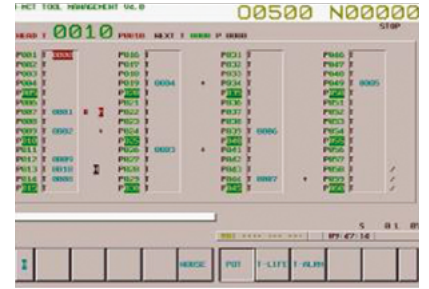
### Thermal Compensation

A function to maintain high-precision machining quality by analyzing and correcting the amount of thermal displacement of a structure through a temperature sensor



### Tool load monitor OPTION

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



### Tool management I

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



### Operation Rate

Machine operation history management function by date based on load



### Adaptive Feed Control

Function to control feedrate so that the cutting can be carried out at a constant load



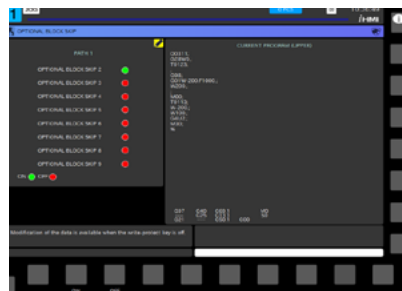
### Spindle Warm Up

A function that assists spindle warm-up for spindle life when the spindle has not been used for a certain period of time



### Pallet magazine support functions

- PMC Soft Panel Switch
- Manual operations that occur continuously in each stages for APC, ATC change command



### Addition of Optional Block Skip

In addition to the OPTIONAL BLOCK SKIP of the operation panel, the function to skip a specific block selected in the machining program



### APC Setting Screen

A simple automation function that supports automatic processing of the next pallet by setting the processing program for each pallet of the equipment including APC in advance

# CONVENIENT OPERATION

## Siemens SINUMERIK ONE

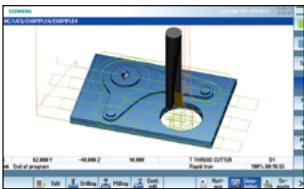
### Even Faster & Easier processing + 398mm screen

All programming, set-up, actual machining and verification process are getting easier and faster. Especially, intuitive conversational programming guidance with 3D UI(user interface) on 18.5" large touch screen is helpful for unskilled engineers.

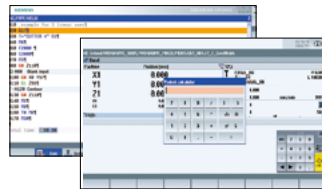
- 18.5 inch touch screen
- 50% improvement in processing speed (compared to S840D)
- Graphic programming
- PLC-based flexible automation/peripheral device expandability



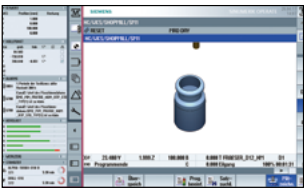
### Conversational convenient function



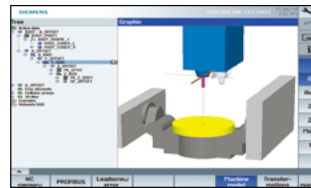
Simulation and machining contour monitoring



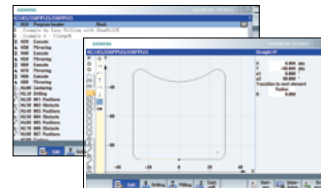
Smart function



Side screen widget



3D collision avoidance and collision avoidance ECO



Shop mill part programming

## NUMERIC CONTROL SPECIFICATIONS

SIEMENS

Division		Noto Sans KR	S-ONE
Controlled axis	Controlled axes		4 axes (X, Y, Z, B)
	Simultaneously controlled axes		4 axes
Data input/output	Memory card input/output	(Local drive)	●
	USB memory input/output		●
Interface function	Ethernet	(X130)	●
Operation	On network drive	(without EES option, Extcall)	●
	On USB storage medium, e.g. memory stick	(without EES option, Extcall)	●
Program input	Workpiece coordinate system	G54 - G57	●
	Addition of workpiece coordinate system	G505 - G599	●
Interpolation & Feed function	Top surface		○
	Look ahead number of block		1000
Programming & Editing function	3D simulation, finished part		●
	Simultaneous recording		●
	DXF Reader for PC integrated in SINUMERIK Operate		○
	ShopMill		●
Operation Guidance Function	EZ Work		●
	Operation via a VNC viewer		●
Setting and display	MTConnect		●
	Network		⊕
Others	18.5" color display with touch screen		●
	21.5" color display with touch screen		○
	CNC user memory	10 MB	●
	Max. CNC user memory	28 MB	○
	Collision avoidance (machine, working area)		○
	Collision avoidance ECO (machine, working area)		○

# POWER | TORQUE

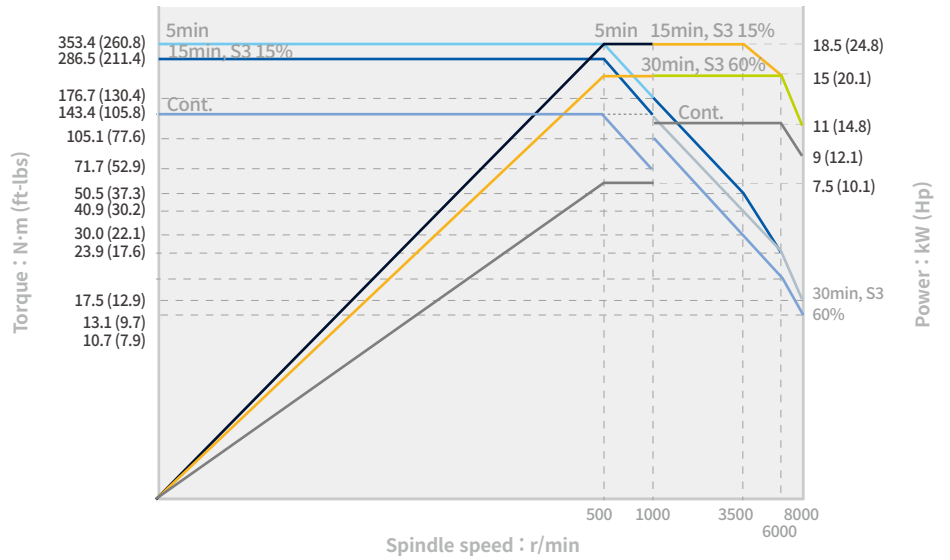
## 8000 r/min

Spindle motor

**18.5/7.5 kW**  
(24.8 / 10.1 Hp)

Power torque

**353.4 N·m**  
(260.8 ft-lbs)



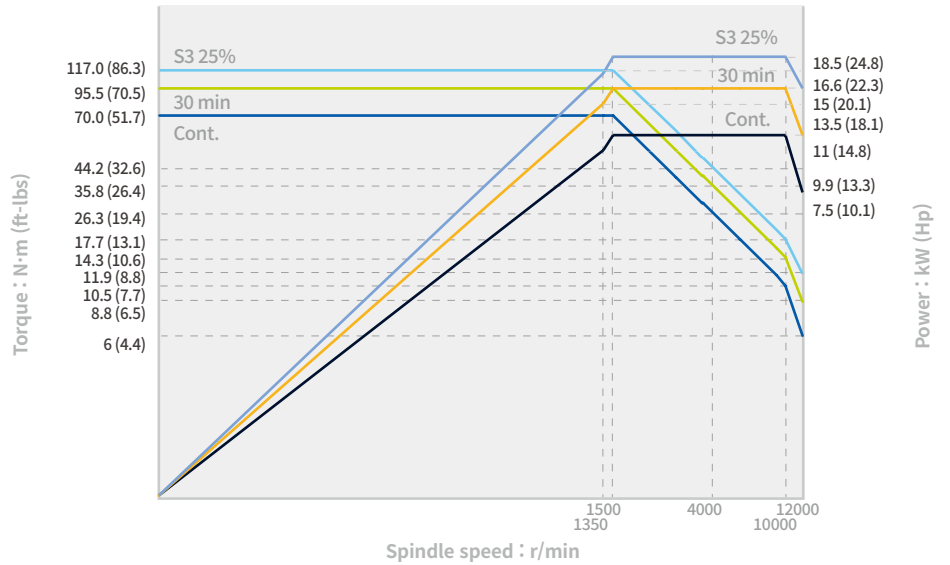
## 12000 r/min

Spindle motor

**18.5/7.5 kW**  
(24.8 / 10.1 Hp)

Power torque

**117.0 N·m**  
(86.3 ft-lbs)



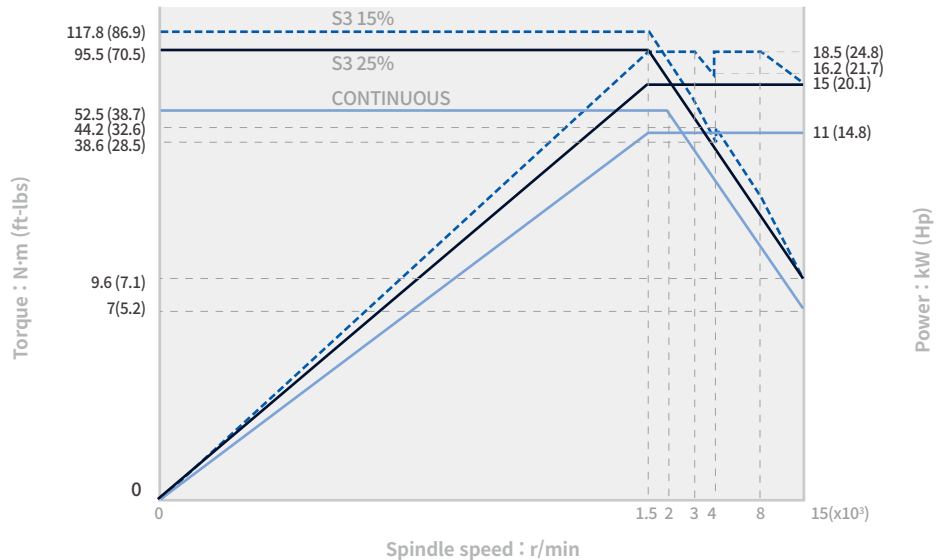
## 15000 r/min

Spindle motor

**18.5/11 kW**  
(24.8 / 14.7 Hp)

Power torque

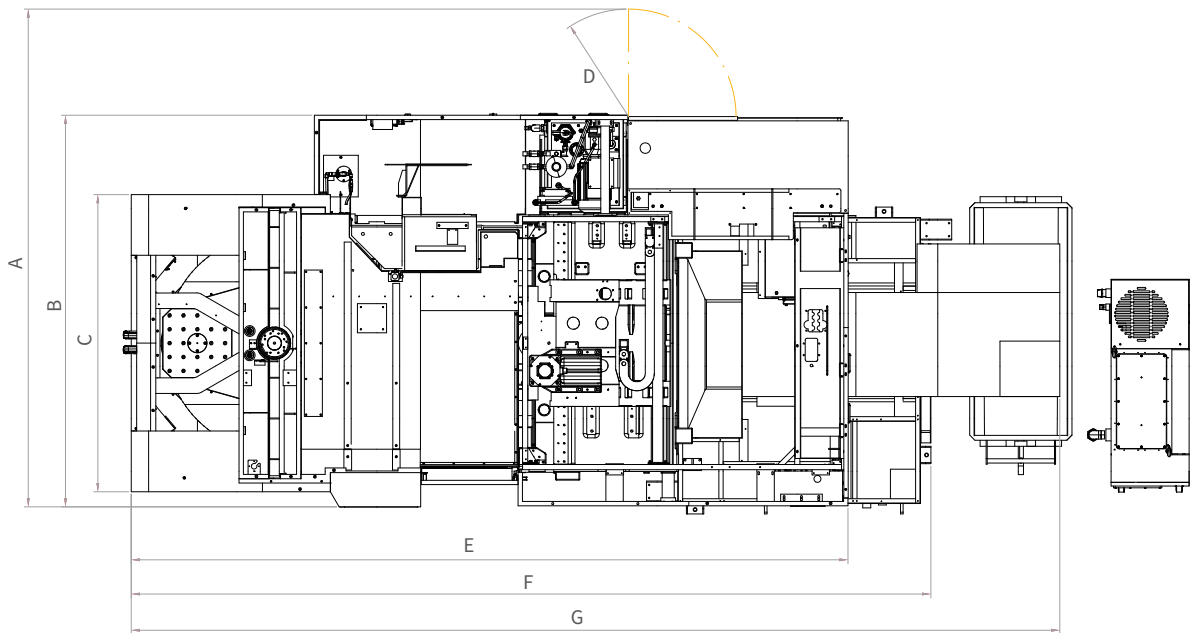
**117.8 N·m**  
(86.9 ft-lbs)



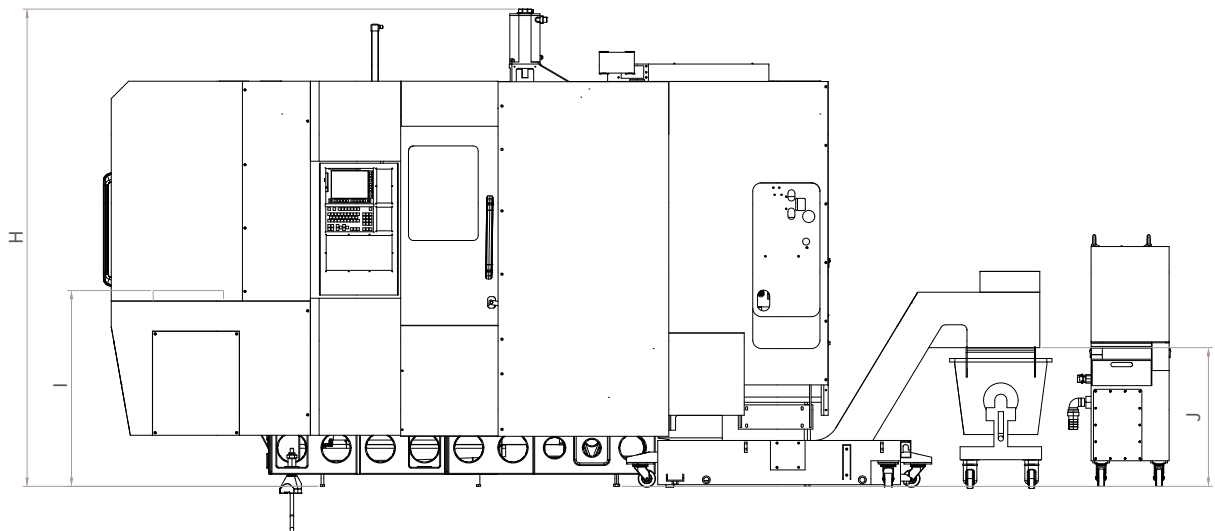
# EXTERNAL DIMENSIONS

Unit: mm (inch)

Top



Front



Model	A	B	C	D	E	F	G	H	I	J
NHC 4000	2872 (113.1)	2259 (88.9)	1714 (67.5)	R620 (R24.4)	4134 (162.8)	4612 (181.6)	5356 (210.9)	2760 (108.7)	1130 (44.5)	800 (31.5)
NHC 5000	3309 (130.3)	2678 (105.4)	2084 (82.0)	R629 (R24.8)	4877 (192.0)	5292 (208.3)	5940 (233.9)	3017 (118.8)	1160 (45.7)	841 (33.1)

# MACHINE SPECIFICATIONS

Description		Unit	NHC 4000	NHC 5000	
Machining Capacity	Travel distance	X-axis	mm (inch)	600 (23.6)	850 (33.5)
		Y-axis	mm (inch)	560 (22)	700 (27.6)
		Z-axis	mm (inch)	565 (22.2)	750 (29.5)
	Distance from spindle nose to table center		mm (inch)	150 ~ 715 (5.9 ~ 28.1)	150 ~ 900 (5.9 ~ 35.4)
	Distance from spindle center to table top		mm (inch)	50 ~ 610 (1.9 ~ 24)	50 ~ 750 (1.9 ~ 29.5)
Feedrate	Rapid Feedrate	X-axis	m/min (ipm)	48 (1889.8)	
		Y-axis	m/min (ipm)	40 (1574.8)	
		Z-axis	m/min (ipm)	48 (1889.8)	
	Cutting feedrate		mm/min (ipm)	20000 (787.4)	
Pallet	Pallet type		24-M16 X P2.0		
	Pallet indexing angle		deg	1 {0.001}	
	Max. loading capacity		kg (lb)	400 (881.8)	500 (1102.3)
	Max. workpiece size		mm (inch)	600 x 800 (23.6 x 31.5)	800 x 900 (31.5 x 35.4)
	Pallet size		mm (inch)	400 x 400 (15.7 x 15.7)	500 x 500 (19.7 x 19.7)
Spindle	Max. spindle speed		r/min	8000 {12000, 15000}	
	Data specification		ISO #40, 7/24 TAPER		
	Max. torque		N·m (ft·lbs)	353.4 {117} (260.6 {86.3})	
Automatic Pallet Changer (APC)	No. of pallets		ea	2	
	Pallet change time		s	8	8.5
Automatic Tool Changer (ATC)	Tool shank type		BT40 {CAT40 / DIN 40 / HSK-A63}		
	Tool storage capacity		ea	40 {60 / 80 / 120}	
		Matrix Type	ea	{170 / 262}	
	Max. tool diameter	W/O adjacent tool	mm (inch)	75 (2.9)	
		With adjacent tool	mm (inch)	140 (5.5)	
	Max. tool length		mm (inch)	300 (11.8)	400 (15.7)
	Max. tool weight		kg (lb)	10 (22)	
	Max. tool moment		N·m (ft·lbs)	11.8 (8.7)	
	Tool change time(T-T-T, tool weight less than 7.5Kg)		s	1.5	
Tool change time (C-T-C, tool weight less than 7.5 Kg)		s	4		
Motor	Spindle motor power		kW (Hp)	18.5 / 11 (24.8 / 14.7)	
Power Source	Power consumption		kVA	65.52	
	Compressed air pressure		Mpa (psi)	0.54 (78.3)	
Tank Capacity	Coolant tank capacity		L (gallon)	550 (145.3)	640 (169.1)
	Lube tank capacity		L (gallon)	1.4 (0.37)	
Machine Dimensions	Height		mm (inch)	2760 (108.7)	3017 (118.8)
	Length		mm (inch)	5356 (210.9)	5940 (233.9)
	Width		mm (inch)	2259 (88.9)	2678 (105.4)
	Weight		kg (lb)	11000 (24250.8)	12500 (27557.8)



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