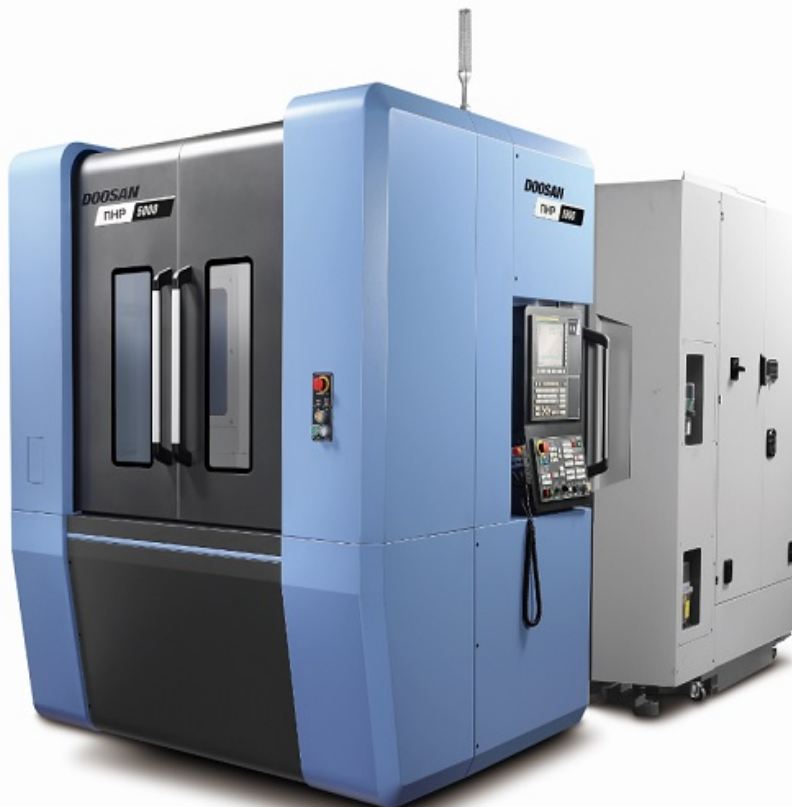


NHP 5000

High performance Horizontal Machining Center

Doosan's next generation of high-performance Horizontal Machining Centers are designed to deliver the highest levels of productivity in a compact footprint. New design features include a 15,000-rpm spindle, axes acceleration of up to 1G and a servo driven drum style magazine for fast tool changes. An eco-friendly grease lubrication system helps to maintain a clean environment by reducing the amount of waste oil generated. All of these features, and more, provide the best solution for your small to medium work piece manufacturing needs.



Main Features

- Fanuc 31i-B Control
- One-Piece Meehanite cast iron bed with step guide structure and center through chip disposal design
- Up to 15% smaller footprint over previous models
- Powerful, built-in spindle design with oil chiller and (18.5 / 37 kW \ 25 / 49.6 hp motor, 15,000 rpm)
- Spindle orientation, load meter, override and rigid tapping
- Automatic pallet changer with 2 tapped pallets (no center bushing). Pallet change time of 9 seconds
- High precision pallet location by 4, tapered conical pins and locked into position by 4 pull studs
- Heavy-duty table clamping by a hydraulic actuated curvic coupling. Full B-Axis version utilizes a hydraulic actuated rotary brake
- Manual pallet rotation with locking pins every 90 degrees at the setup station, to aid in part changeover while machine is in operation
- Qualified edge locators to aid in setting up tombstones or fixtures
- Double Arm ATC (60 tools, drum type)
- Large Linear Roller Guides (X - 45 mm \ 1.772", Y - 45 mm \ 1.772", Z - 45 mm \ 1.772")
- Servo motors mounted directly to the oversized, double pre-tensioned ball screws (X - 45 mm \ 1.77", Y - 45 mm \ 1.77", Z - 45 mm \ 1.77")
- Fast rapid traverse rate (X - 60 m/min \ 2,362 ipm, Y - 60 m/min \ 2,362 ipm, Z - 60 m/min \ 2,362 ipm)
- Ball screw shaft, ball nut and support bearing cooling for increased accuracy during long cycle times
- AICC II 200 block look ahead
- Renishaw probe ready (RMI-Q radio receiver, pop up box and GUI software only)
- Doosan Smart Thermal Monitoring software with hardware sensors on the spindle and main casting bed
- Doosan Tool Load Monitoring and Adaptive Feedrate Control
- Doosan Productivity Code and high performance tuning

Standard Equipment and Warranty

- 20 bar (230 psi) Through spindle coolant
- Flood coolant with large separate coolant tank and way oil skimmer (760 liter \ 200 gallon)
- Base flushing and overhead shower coolant wash-down
- Full enclosure splash guard
- Telescopic covers
- Eco friendly grease lubrication with 1 cartridge pre-installed on the machine
- Portable Manual pulse generator
- Program and data protection key
- Work light and 3 color tower signal light
- Leveling pads included
- Two-year machine parts warranty, one-year labor warranty. See warranty pages for details
- Two-year control warranty: Parts and Labor
- Doosan instruction, operation, parts list and electrical drawing manuals in hardcopy format
- FANUC manuals provided on USB drive (Hardcopy available for purchase, contact parts department)

SPECIFICATIONS:

CAPACITY:

X axis travel	730 mm (28.74")
Y axis travel	730 mm (28.74")
Z axis travel	880 mm (34.64")
Table loading area	500 mm x 500 mm (19.7" x 19.7")
Allowable table load	500 kg (1,100 lbs)
Maximum Part Diameter	800 mm (31.5")
Maximum Part Height (with no hydraulic interface)	1,000 mm (39.37")

INDEXING TABLE AND PALLET CHANGER:

Indexing (Standard)	1 Degree
1-degree table positioning accuracy	+/- 3"
1-degree table repeatability	+/- 1"

Indexing time (includes clamp\unclamp)	NHP 4000\5000
0 – 90 Degrees	1.4 seconds
0 – 180 Degrees	1.9 seconds
0 – 270 Degrees	2.3 seconds
0 – 360 Degrees	2.6 seconds

Indexing (Optional)	Full B-Axis
B-axis table positioning accuracy	+/- 6"
B-axis table repeatability	+/- 4"

Indexing time (includes clamp\unclamp)	NHP 4000	NHP 5000
0 – 90 Degrees	1.1 seconds	1.20 seconds
0 – 180 Degrees	1.45 seconds	1.72 seconds
0 – 270 Degrees	1.83 seconds	2.22 seconds
0 – 360 Degrees	2.18 seconds	2.71 seconds

Pallet Surface (Standard, no center bushing)	(24) M16 x 2.0 tapped holes
Pallet Surface (Optional, no center bushing)	(5) - 100 mm (3.937") x 18H8 T-Slots
Changing method	Rotary shuttle
Pallet change time	9 seconds

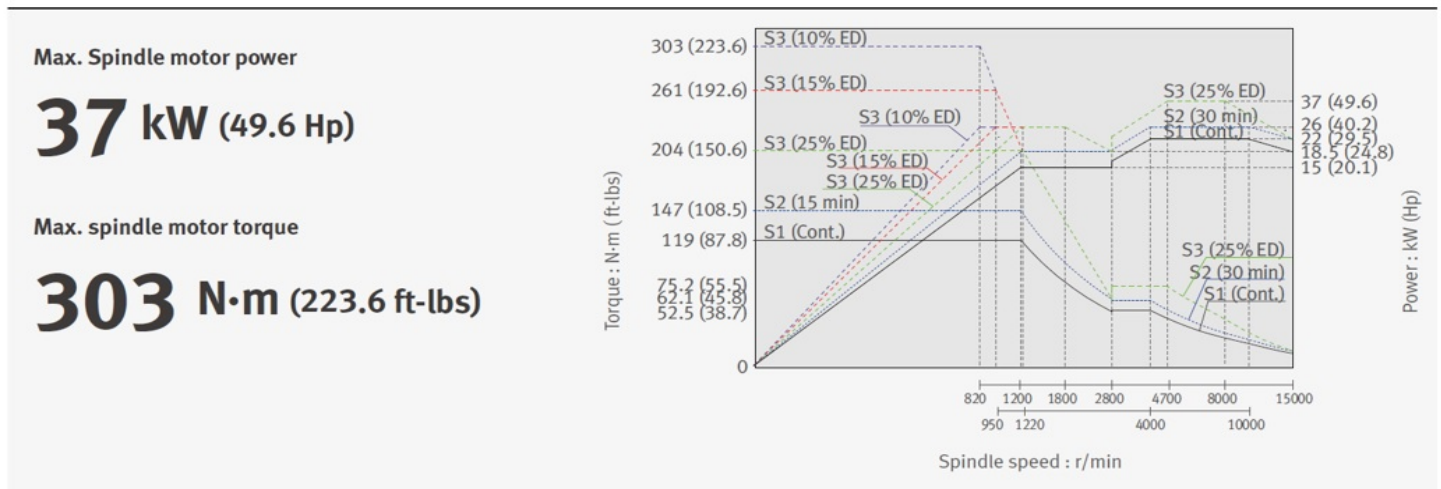
MOTION:

X axis rapid traverse rate	60 m/min (2,362 ipm)
Y axis rapid traverse rate	60 m/min (2,362 ipm)
Z axis rapid traverse rate	60 m/min (2,362 ipm)
X\Y\Z axis acceleration	110\120\120 milliseconds (.9G\.8G\.8G)
Cutting feed rate	1 - 60,000 mm/min (.04 - 2,362 ipm)
Least command increment	.001 mm (.0001")
X-axis feed thrust (Continuous)	2,113 lbs
Y-axis feed thrust (Continuous)	1,551 lbs
Z-axis feed thrust (Continuous)	2,113 lbs
Positioning accuracy (Full Stroke)*	+/- .003 mm (+/- .00015")
Repeatability	+/- .0015 mm (+/- .000060")

SPINDLE:

Spindle nose to pallet center
 Spindle center to pallet top
 Big Plus Spindle System
 Spindle speed
 Spindle Motor (S3 25%)
 Spindle Torque (S3 10%)
 Spindle Acceleration \ Deceleration time

100 mm - 980 mm (3.937" - 38.58")
 80 mm - 810 mm (3.15" - 31.88")
 CAT 40 Big Plus
 15,000 rpm
 18.5 / 37 kW (25 / 49.6 hp)
 303 nm (223.6 ft-lbs)
 0 - 15k (1.5 sec) \ 15k - 0 (1.99 sec)



AUTOMATIC TOOL CHANGER SPECIFICATIONS (60 ATC, DRUM TYPE):

Number of Tools	60 tools, drum type
Tool Selection	Random Access
Tool Call Time	2.9/5 seconds (Nearby/Furthest)

(See section on tool changer and factory option list for available styles and sizes)

Pull Stud (See options list for kits)	711-23
Max. Tool Dia. \ Adjacent pots are empty	75 mm \ 170 mm (2.9" \ 6.69")
Max. Tool Length	550 mm (21.65")
Max. Tool Weight	12 kg (26.45 lbs)
Tool change time (tool to tool, less than 8 kg \ 16.5 lbs)	.9 seconds
Tool change time (tool to tool, more than 8 kg \ 16.5 lbs)	1.3 seconds
Tool change time (chip to chip, less than 8 kg \ 16.5 lbs)	2.8 seconds
Tool change time (chip to chip, more than 8 kg \ 16.5 lbs)	3.2 seconds

GENERAL:

Machine Height	2,880 mm (113.4")
Floor Space Required (L x W*)	5,450 mm x 2,680 mm (215" x 105.51")

**See layout drawings for more information. Floor space requirements will change depending on style of conveyor.*

Machine Weight	11,500 kg (25,353 lbs)
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UTILITY:

Power required	80 kVA / 210 amps @ 220v
Voltage required – Fanuc	205-235 Volts / 3 Phase

TANK CAPACITY:

Coolant tank capacity	760 liters (200 gallons)
Lubrication tank capacity (Grease Cartridge)	.7 liter (.18 gallon)
Grease Cartridge	LHL-X100-7 (Lube Corp. part number)
Air Required	.54 mpa (80 psi) * 15.89 cfm

(See instruction\operation manual for full list of required lubricants)

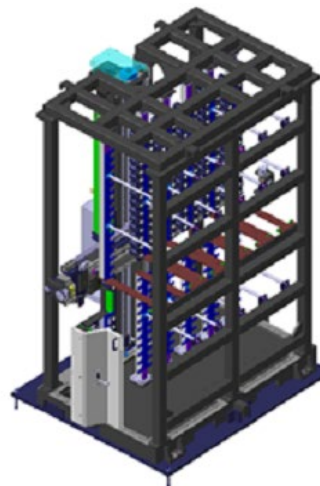
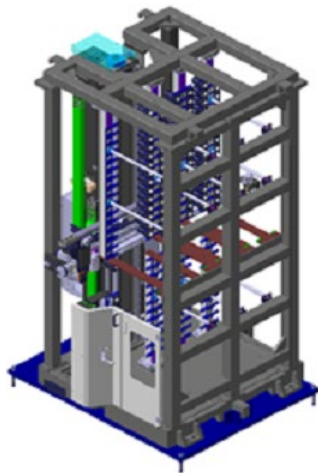
* Geometric accuracies guaranteed only if machine installed on a foundation meeting the minimum requirements of Doosan Machine Tools America. Please see your dealer for the current machine requirements.

MATRIX TOOL MAGAZINE

Matrix Type tool magazines are used on extra-large automatic tool changers. This design allows for the maximum amount of tools in the smallest possible space and increase productivity. These systems include both “off the shelf”, standard configurations, as well as custom engineered units tailored to your specific needs. Please consult product manager for details.

MATRIX TOOL MAGAZINE – Standard Specifications:

Number of Tools	171	275
Tool Selection	Fixed Address	
Max. Tool Dia. \ Adjacent pots are empty	Ø75 mm \ Ø170 mm (Ø2.9" \ Ø6.69")	
Max. Tool Length	450 mm (17.71")	
Max. Tool Weight	12 kg (26.45 lbs)	
Max. Tool Moment	11.8 N-m (104.4 inch-lbs)	
Tool change time (tool to tool, less than 8 kg \ 16.5 lbs)	0.9 Seconds	
Tool change time (tool to tool, more than 8 kg \ 16.5 lbs)	1.3 Seconds	
Tool change time (chip to chip, less than 8 kg \ 16.5 lbs)	2.3 Seconds	
Tool change time (chip to chip, more than 8 kg \ 16.5 lbs)	2.7 Seconds	

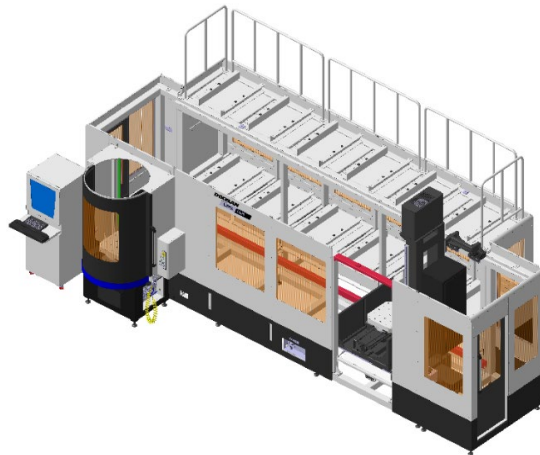


LINEAR PALLET SYSTEM

The Doosan Linear Pallet System (LPS) is a cost effective solution to providing multiple pallets between multiple horizontals. The system is driven by a simple, easy to operate controller that provides real time system monitoring and smart production scheduling capability. The system can be ordered from the factory complete or can be added in the field (conditions apply).

Standard Specifications:

Number of Machines	1-7 Units
Number of Pallets	12~72 Pallets
Number of Setup stations	1~4 Units
Max Traveling (X) Speed [m/min] (ipm)	60 [Loading], 90 [Unloading] (2362.2, 3543.3)
Max Lifting (Y) Speed [m/min] (ipm)	10 [Loading], 20 [Unloading] (393.7, 787.4)
Max Forking (Z) Speed [m/min] (ipm)	20 [Loading], 50 [Unloading] (787.4, 1968.5)
Pallet Dimensions	500mm x 500mm (19.78x 19.78)
Load Diameter x Height x Weight	□800mm x 930mm x 700kg max (□31.58x 36.68x 1540 lb)
Length (including End Modules)	6,980mm (274.88)
Length b Each Additional Rack	5,580mm (219.78)
Width (including machine)	7,870mm (309.88)
Height (including max fixture)	3,473mm (136.78)
Power Supply for AGV	Trolley Busbar System



ROTARY PALLET SYSTEM

The Doosan Rotary Pallet System (RPS) is a cost effective solution providing multiple pallets for longer periods of unmanned operation or reduced set-up times when producing many different work pieces in low lot sizes. The system can be ordered from the factory complete or can be added in the field (conditions apply).

Standard Specifications:

Number of Machines	1 Unit
Number of Pallets	6 Pallets
Number of Setup stations	1 Unit
Pallet Size	500 x 500mm (19.7&sq)
Load Diameter	800mm (31.5&)
Load Height	930mm (36.6&)
Load Weight	700kg max (1540 lb)
Length (including machine)	8142mm (320.6&)
Width (ATC60/ATC120/ATC171)	3,630/3,800/4578mm (142.9/149.6/180.2&)

