NHP series
NHP 5500/6300/8000
High-speed & high-productivity horizontal machining center
World-class high-speed & high-productivity horizontal machining center

NHP series

The NHP series offers a high level of productivity by a combination of heavy duty cutting and high speed machining capability. The single-piece bed structure and stepped guideway for the X-axis enhances rigidity and improves rapid traverse characteristics. The machines include a best in class specification and a wide variety of features to optimize performance and provide easy operation.

NHP 5500/6300/8000
**Features**

**Rigid structure**

The single piece bed structure is optimized through structural analysis. This provides a high level of stability which guarantees best possible accuracy and heavy duty cutting capability. The reduced mass of the travelling column means that acceleration/ deceleration axis rates are optimized.

**High reliability**

The ATC and APC systems are based on the latest servo technology. This provides a high level of reliability and makes maintenance easier at the customer’s site.

**High productivity & Operator convenience**

The machine performance has been improved over the previous model by 8% due to upgraded axis rapid traverse rates and improved ATC/APC times. In addition, many functions have been included to make operating more convenient.
Rigid Structure

The NHP series includes a one piece bed structure with heavy duty mehanite ribbed castings designed for optimized rigidity and stability.

All X, Y, Z axes are designed with roller LMG specification. The front rail of the X axis has LMG roller blocks for maximum rigidity. In addition, the spindle rigidity is optimized by using a stepped X axis guideway which reduces the distance from the spindle to the guideways. The stable structure and reduced column mass provides high axis rapid traverse rates and top class acceleration/deceleration values.

Minimum Thermal Displacement for High Accuracy

Main units of the X, Y and Z axes are designed to minimize the thermal displacement by applying cooling jackets to ball screw nut and ball screw shaft cooling.
Travel (X/Y/Z)

Previous model
800/700/750 mm
(31.5/27.6/29.5 inch)

Previous model
1000/850/850 mm
(39.4/33.5/33.5 inch)

NHP 5500
800/750/850 mm
(31.5/29.5/33.5 inch)

NHP 6300
1050/900/1000 mm
(41.3/35.4/39.4 inch)

NHP 8000
1400/1200/1370 mm
(55.1/47.2/53.9 inch)

Rapid traverse (X/Y/Z)

Previous model
48/48/48 m/min
(1889.8/1889.8/1889.8 ipm)

NHP 5500/6300
60/60/60 m/min
(2362.2/2362.2/2362.2 ipm)

NHP 8000
50/50/50 m/min
(1968.5/1968.5/1968.5 ipm)

Spindle Close Reach to Table Center

The short minimum distance from the spindle nose to table means that tool lengths can be optimized for a rigid machining setup.

Double Wall Structure

The body of the machine is designed to have a double-wall structure to prevent cutting oil from leaking. This helps maintain the machine more easily and enhance productivity.
High Performance Spindle

The high torque built-in motor type spindle provides a combination of high rigidity and high speed.
2-Face Locking Tool System

The 2-face locking tool system offers longer tool life, higher power and more precise machining by the dual contact to both of the spindle surface and toolholder flange surface, as well as both the spindle taper and toolholder taper shank. This system is based on the most currently available standards of BT50, DIN50, CAT50 and HSK-A100 flange tooling.

Key benefits
- Higher rigidity
- Improved ATC repeatability, surface finish and higher precision
- Extending tool life

HSK Holder (optional)

High Precision, High Efficiency, High Quality
This holder helps keep productivity and precision at high levels when machining curved surfaces or high value & difficult-to-cut materials (high performance parts). Also, as it disperses cutting heat along with chips, the holder helps minimize deformation of workpiece.

Tool Clamping

Spindle Cooling System

The refrigerated cooling system maintains a uniform spindle temperature required for optimum accuracy. The cooling oil circulates around the bearings and motor windings.
High Reliability

The servo driven ATC and tool magazine improve reliability and reduce tool change/tool search times. Maintenance is much easier in the field due to reduced number of parts.

Servo-driven ATC

The servo driven ATC combined with fast rapid axis speeds, provides a tool-to-tool time of under 2 seconds. The servo driven tool magazine reduces tool search time for the next tool. The NHP series offers the best in class specification of tool diameter, length and weight which can handle the most difficult tooling applications.

**Maximum tool capacity** (Max. Tool Diameter X Max. Tool Length)

<table>
<thead>
<tr>
<th>Previous model</th>
<th>NHP 5500</th>
<th>NHP 6300/8000</th>
<th>NHP 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 x 400 mm (9.8 x 15.7 inch)</td>
<td>320 x 530 mm (12.6 x 20.9 inch)</td>
<td>320 x 630 mm (12.6 x 24.8 inch)</td>
<td>320 x 800 mm (12.6 x 31.5 inch)</td>
</tr>
<tr>
<td></td>
<td>320 x 600 mm (12.6 x 23.6 inch) (HSK)</td>
<td>320 x 700 mm (12.6 x 27.6 inch) (HSK)</td>
<td>320 x 870 mm (12.6 x 34.3 inch) (HSK)</td>
</tr>
</tbody>
</table>

**Tool change time** (Less than 12kg (26.5 lb))

<table>
<thead>
<tr>
<th>Tool - to - tool</th>
<th>NHP 5500</th>
<th>NHP 6300</th>
<th>NHP 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 sec</td>
<td>5 sec</td>
<td>5.4 sec</td>
<td></td>
</tr>
<tr>
<td>Chip - to - chip</td>
<td>NHP 5500</td>
<td>NHP 6300</td>
<td>NHP 8000</td>
</tr>
<tr>
<td></td>
<td>6.2 sec</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The NHP series provide 40 tools in its standard specifications and allow you to use up to 376 tools in optional specifications.

**Pot moving type magazine**

- Previous model
  - 40/60 ea
  - NHP 5500/6300/8000

**Chain type magazine**

- Previous model
  - 90/120 ea
  - NHP 5500/6300/8000

**Matrix type magazine**

- Previous model
  - 196/256/324 ea
  - NHP 5500/6300/8000
Enhanced APC system and Pallet

The NHP series is equipped with a servo-driven rotary type pallet change system which achieves higher reliability than a hydraulic version. In addition, higher workpiece loads can be handled efficiently.

Servo-Driven APC

The NHP series’ servo-driven automatic pallet changer offers high productivity by fast pallet changing. The wide door opening allows easy access for the operator to reach the fixture and workpiece. The pallet can be manually indexed to 90 degree positions for access to all sides of the fixture.

<table>
<thead>
<tr>
<th></th>
<th>NHP 5500</th>
<th>NHP 6300</th>
<th>NHP 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pallet change time</td>
<td>8.5 s</td>
<td>12 s</td>
<td>16 s</td>
</tr>
<tr>
<td>Pallet indexing (0-&gt;90deg.)</td>
<td>1.7 s</td>
<td>2.4 s</td>
<td>3.2 s</td>
</tr>
</tbody>
</table>

Accurate Control of Pallet Position.

Chips may reduce the accuracy of the pallet changing system. A high pressure air blast is used to clean the taper cone location surfaces during the pallet change cycle.
**Fixture Features**

You can select one of the following oil & air pressure devices that can be easily set up.

**Fixture check list (for hydraulic/pneumatic fixtures)**

- Oil & air pressure ports
  - A/B Line: 2, 4, 6, 8 Pairs
    (includes solenoid valve)
  - P/T Line: 2, 4, 6, 8 Pairs
    (does not include a solenoid valve)

- Hydraulic power unit
  - 2.2 kW / 7 MPa (3.0 Hp / 1015.0 psi / bar)
  - 3.7 kW / 15 MPa (5.0 Hp / 2175.0 psi / bar)
  - 5.5 kW / 21 MPa (7.4 Hp / 3045.0 psi / bar)

- Contact Doosan for more information

Hydraulically actuated fixtures remain permanently connected during machine operation and APC cycle. This is achieved by using hydraulic rotary couplings in the central APC mechanism and also on top of both fixtures. A cantilever system supports the hydraulic lines during the machining operation.
Doosan Linear Pallet System [LPS]

LPS is designed to provide the most optimized system for the customer. The customer can choose the package solution most suitable for their production requirements and floorspace. System expansion and changes in layout are easy.

- Easily extendable up to 3 HMCs, 2 setup stations
- Highly efficient use of workpiece area
- Quick installation and sufficient time for test operation
- Modular rack system that can be adjusted in response to changing production volumes
- Stable and efficient system operation
- Easy-to-use operation system
- Easy to maintain in the field

System Options

### LPS 500 (Model : NHP 5500)

<table>
<thead>
<tr>
<th>Number of machines</th>
<th>ea</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pallets</td>
<td>ea</td>
<td>12</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Number of setup stations</td>
<td>ea</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

### LPS 630 (Model : NHP 6300)

<table>
<thead>
<tr>
<th>Number of machines</th>
<th>ea</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pallets</td>
<td>ea</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Number of setup stations</td>
<td>ea</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

### LPS 800 (Model : NHP 8000)

<table>
<thead>
<tr>
<th>Number of machines</th>
<th>ea</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pallets</td>
<td>ea</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Number of setup stations</td>
<td>ea</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*For further information and more details, contact Doosan.
Compared to a standard twin-pallet machine, the MPS offers a long period of unmanned operation and flexibility to produce many different workpieces using the work scheduling function. This system can be easily retrofitted to existing machines in the field.

**System Options**

<table>
<thead>
<tr>
<th>Model name</th>
<th>NHP 5500</th>
<th>NHP 6300</th>
<th>NHP 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 - MPS</td>
<td>9 - MPS</td>
<td>7 - MPS</td>
</tr>
<tr>
<td>Number of pallets ea</td>
<td>7</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Length (L) mm (inch)</td>
<td>9490 (373.6)</td>
<td>9970 (392.5)</td>
<td>10630 (418.5)</td>
</tr>
<tr>
<td>Width (W) mm (inch)</td>
<td>4830 (190.2)</td>
<td>4870 (191.7)</td>
<td>5320 (209.4)</td>
</tr>
</tbody>
</table>

**LPS Standard Management Software**
- Easy-to-register basic information for flexible production
- Platform management software for fast production and easy adjustment of quantity
- LPS solution for flexible & quick production and adjustment of quantity

**Doosan Production Management System [DPMS]**
The DPMS is an operation system to control and manage the LPS. The main window gives a solution to correspond flexibly and quickly in case of output change.

**LPS System Configuration**

**Doosan Multi-Pallet Station [DMPS]**
The DPMS is an operation system to control and manage the MPS. The system offers various features, such as scheduled operation, input and adjust set-up data and so on.
High Productivity & User Convenience

Machine performance enhanced by 8% compared to the previous model due to reduction in non-cutting time

Productivity
Enhanced by 8% compared to the previous model

Productivity

![Productivity Chart]

Machine performance enhanced by 8% compared to the previous model, NHP 5500 / 6300.

- Diesel engine cylinder block
- Material: Casting iron
- Number of used tools: 20ea

<p>|</p>
<table>
<thead>
<tr>
<th>Previous model</th>
<th>NHP 5500 / 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle time</td>
<td></td>
</tr>
<tr>
<td>977 s</td>
<td>900 s</td>
</tr>
<tr>
<td>Down</td>
<td>8%</td>
</tr>
</tbody>
</table>

Machining Performance

NHP 5500/6300/8000 (Motor power: 45/25 kW (24.8/20.1 Hp))

<table>
<thead>
<tr>
<th>Face mill_carbon steel (SM45C)</th>
<th>Previous model</th>
<th>NHP 5500/6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting quantity</td>
<td>440 cm/min</td>
<td>700 cm/min</td>
</tr>
<tr>
<td></td>
<td>(26.9 inch/min)</td>
<td>(42.7 inch/min)</td>
</tr>
<tr>
<td>Main spindle speed</td>
<td>350 r/min</td>
<td>500 r/min</td>
</tr>
<tr>
<td>Feed rate</td>
<td>550 mm/min</td>
<td>1400 mm/min</td>
</tr>
<tr>
<td></td>
<td>(21.7 ipm)</td>
<td>(55.1 ipm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tap_carbon steel (SM45C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining rate</td>
</tr>
<tr>
<td>M42×P4.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drill_carbon steel (SM45C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting quantity</td>
</tr>
<tr>
<td>567 cm/min</td>
</tr>
<tr>
<td>(34.6 inch/min)</td>
</tr>
<tr>
<td>Main spindle speed</td>
</tr>
<tr>
<td>600 r/min</td>
</tr>
<tr>
<td>Feed rate</td>
</tr>
<tr>
<td>100 mm/min</td>
</tr>
<tr>
<td>(3.9 ipm)</td>
</tr>
</tbody>
</table>

Machining Performance

- Diesel engine cylinder block
- Material: Casting iron
- Number of used tools: 20ea

- Cycle time

![Machining Performance Diagram]

Productivity

Enhanced by 8% compared to the previous model.
Easy-to-Use Chip Conveyor

Removing chips is very important in terms of productivity and environmental protection. To achieve these goals, the NHP series use a flushing device to remove chips from the inside of the equipment as a standard and help improve the process of chip removal with a screw conveyor of extended diameter.

Chip conveyor & coolant tank

Large capacity coolant tank

<table>
<thead>
<tr>
<th>Previous model</th>
<th>NHP 5500</th>
<th>630 L (166.4 galon)</th>
<th>825 L (218.0 galon)</th>
<th>31%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous model</td>
<td>NHP 6300/8000</td>
<td>630 L (166.4 galon)</td>
<td>925 L (244.4 galon)</td>
<td>47%</td>
</tr>
</tbody>
</table>

Coolant Devices

- Flushing coolant
- Flood coolant
- Flushing for the top of the spindle

- Screw conveyor
- Shower coolant
- Coolant gun

- Through spindle coolant
- Semi Permanent TSC pump unit
- MQL system

- Air+Oil mist
- Misting device

Environmentally-friendly equipment

- Oil skimmer
- Oil mist collector

Measuring Device

- Auto. tool breakage detection I
- Auto. tool breakage detection II
- Auto. tool measurement detection
- U-axis tool application
Operator-Friendly Design

To ensure safety for users, footsteps, anti-lock mechanism, and screen panels are installed

Improved Usability

- A coolant flush is installed on the top of the spindle and the slide cover to prevent chips from building up.
- New HMC ATC screen panel operation
- The T-S-C mechanism uses semi-permanent cyclone filters to save cost and improve usability.
- Oil skimmer
- Utilities in the same place
- Centralized service unit: The service units are stored in the same place to make it easier to maintain the machine.
- Anti-lock mechanism
- Internal footplate for operator safety
Easy-to-Use Operation Panel

Swivelling operating console

The operation panel can be rotated by up to 90 degrees for convenient operator position. The control provides a wide selection of detailed alarm messages which makes fault-finding easier for better usability.

User-Friendly Operation Panel

Consolidate a variety of control panel into unified concept design to provide convenience of operation.

- Fixture clamp/unclamp button counter, timer or special option buttons can be placed on the panel.
- Partitions are placed between all buttons to prevent pushing an unintended button.

PCMCIA Card

PCMCIA card input allows the upload/download of NC programs, parameters, tool data and ladder diagrams. It also supports DNC operation.

USB Ports

With a USB memory stick, you can upload and download NC programs, NC parameters, tool information and ladder programs, but cannot operate the DNC.

Portable MPG

The portable MPG allows you to set a workpiece more easily.
Easy Operation Package

Doosan’s easy-to-use operation package offers a variety of features, to support tool management, pallet management and operator help functions

### Tool Support

- **Tool management I**
  - Manage tool magazines
  - Display tool status
  - Fastems MMS I/F (Tool Add/Remove Function)

- **Tool management II**
  - Manage tool magazines
  - Self-manage tool life
  - Estimate tool life
  - Manage tool status
  - Balluff Tool ID

- **Tool load monitor**
  - Detect tool damage
  - Detect errors during machining
  - Detect no-load air cutting

- **ATC/APC panel**
  - ATC manual
  - APC manual

### Help

- **Easy NC parameter**
  - Help topics on main parameters
  - Display parameter setting values

- **Calculator**
  - Calculator
  - Four basic operations
  - Mathematical functions

- **M code list**
  - Main M CODE list

- **G code list**
  - Main G CODE list

### Operation

- **Operation rate**
  - Measure various equipment operation ratios
  - Support a three-shift system
  - Count and keep 30-day operation ratios
  - Display specific date ranges

- **PMC switch**
  - Optional features on the operation panel
  - Substitute for toggle software
  - Software for NC options

### Pallet Magazine

- **Operation**
  - Operate the MPS
  - Display information for MPS PMG
  - Set a machining schedule
  - Auto call
  - Manual operation and coordinate adjustment

- **Multi-pallet System**
  - Control display for 2 Pallet APC
Spindle Power-Torque Diagram

NHP 5500/6300/8000

SPINDLE 10000 r/min
(Motor : BiI160LL / 13000 AMP : aiSP37)

SPINDLE 6000 r/min
(Motor : BiI180L / 6000 AMP : aiSP30)

SPINDLE 15000 r/min
(Motor : BiI160LL / 20000 AMP : aiSP37)
Table Dimension

NHP 5500

Standard specification (500×500)

Optional specifications (630×630)

NHP 6300

Standard specification (630×630)

Optional specifications (800×800)

NHP 8000

Unit: mm (inch)
External Dimensions

Top View

Maximum Tool & Workpiece diagram
Machine Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Unit</th>
<th>NHP5500</th>
<th>NHP6300</th>
<th>NHP8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel distance X-axis</td>
<td>mm (inch)</td>
<td>800 (31.5)</td>
<td>1050 (41.3)</td>
<td>1400 (55.1)</td>
</tr>
<tr>
<td>Travel distance Y-axis</td>
<td>mm (inch)</td>
<td>750 (29.5)</td>
<td>900 (35.4)</td>
<td>1200 (47.2)</td>
</tr>
<tr>
<td>Travel distance Z-axis</td>
<td>mm (inch)</td>
<td>850 (33.5)</td>
<td>1000 (39.4)</td>
<td>1370 (53.9)</td>
</tr>
<tr>
<td>Distance from the spindle center to the top of the table mm (inch)</td>
<td>75 - 825 (3.0 - 32.5)</td>
<td>75 - 975 (3.0 - 38.4)</td>
<td>75 - 1275 (3.0 - 50.2)</td>
<td></td>
</tr>
<tr>
<td>Distance from the spindle nose to the table center mm (inch)</td>
<td>100 - 950 (3.9 - 37.4)</td>
<td>100 - 1100 (3.9 - 43.3)</td>
<td>150 - 1520 (5.9 - 59.8)</td>
<td></td>
</tr>
<tr>
<td>Pallet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet type</td>
<td></td>
<td>24-M16×P2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet indexing angle deg</td>
<td></td>
<td>1 (0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. allowable load kg (lb)</td>
<td>800 (1763.7)</td>
<td>1500 (3306.9)</td>
<td>2000 (4409.2)</td>
<td></td>
</tr>
<tr>
<td>Max. workpiece size mm</td>
<td>850×1100 (33.5×43.3)</td>
<td>1050×1350 (41.3×53.1)</td>
<td>1450+1500 (57.1×61.0)</td>
<td></td>
</tr>
<tr>
<td>Pallet size mm</td>
<td>500×500 (19.7×19.7)</td>
<td>630×630 (24.8×24.8)</td>
<td>800×800 (31.5×31.5)</td>
<td></td>
</tr>
<tr>
<td>Main spindle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. spindle speed r/min</td>
<td>10000 (6000, 15000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taper specifications</td>
<td></td>
<td>ISO #50, 7/24 TAPER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. torque N-m (ft·lb)</td>
<td>60 (809, 398) (442.8 (597.0, 293.7))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid Traverse Rate X-axis</td>
<td>m/min (ipm)</td>
<td>60 (2362.2)</td>
<td>50 (1968.5)</td>
<td></td>
</tr>
<tr>
<td>Rapid Traverse Rate Y-axis</td>
<td>m/min (ipm)</td>
<td>60 (2362.2)</td>
<td>50 (1968.5)</td>
<td></td>
</tr>
<tr>
<td>Rapid Traverse Rate Z-axis</td>
<td>m/min (ipm)</td>
<td>60 (2362.2)</td>
<td>50 (196.5)</td>
<td></td>
</tr>
<tr>
<td>Cutting feedrate mm/min (ipm)</td>
<td>30000 (1181.1)</td>
<td>25000 (984.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic Pallet Changer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of pallets ea</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet change method</td>
<td>Rotary shuttles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet change time s</td>
<td>8.5</td>
<td>12</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Indexing angle when APC rotates deg</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic Tool Changer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of tool shank</td>
<td>BT50 (CAT50/DIN50/HSK-A100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool storage capa.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pot moving Type ea</td>
<td>40 (60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chain type ea</td>
<td>(90/120/150)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matrix type ea</td>
<td>(196/256/316/376)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool diameter 40/60tools mm (inch)</td>
<td>125 (4.9) (continuous.) (60/60 tools), 130 (5.1) (continuous.) (90-376 tools)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool diameter 90~376tools mm (inch)</td>
<td>320 (12.6) (adjacent pots empty)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool length mm (inch)</td>
<td>530 (20.9) (BT/CAT/DIN), 600 (23.6) (HSK)</td>
<td>630 (24.8) (BT/CAT/DIN), 700 (27.6) (HSK)</td>
<td>630 (248.3 (31.5)) (BT/CAT/DIN), 700 (807.6 (34.3) (HSK)</td>
<td></td>
</tr>
<tr>
<td>Max. tool weight kg (lb)</td>
<td>25 (55.1) (60/60 tools), 30 (66.1) (90-376 tools)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool change time (Tool-to-tool, less than 12kg) s</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool change time (Chip-to-chip, less than 12kg) s</td>
<td>5.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spindle motor power kW (Hp)</td>
<td>45/25 (37/25, 37/30) (60.3/33.5 (49.6/33.5, 49.6/40.2))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant pump motor power kW (Hp)</td>
<td>1.5 (2.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power source</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric power supply (rated capacity) kVA</td>
<td>79</td>
<td></td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Compressed air supply Mpa (psi)</td>
<td>0.54 (78.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant tank capacity L (galon)</td>
<td>825 (218.0)</td>
<td>925 (244.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication tank capacity L (galon)</td>
<td>7.2 (1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Dimensions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height mm (inch)</td>
<td>3270 (128.7)</td>
<td>3420 (134.6)</td>
<td>3760 (148.0)</td>
<td></td>
</tr>
<tr>
<td>Length mm (inch)</td>
<td>6035 (237.6)</td>
<td>7300 (287.4)</td>
<td>8350 (328.7)</td>
<td></td>
</tr>
<tr>
<td>Width mm (inch)</td>
<td>3670 (144.5)</td>
<td>3930 (154.7)</td>
<td>4325 (170.3)</td>
<td></td>
</tr>
<tr>
<td>Weight kg (lb)</td>
<td>16800 (70317.1)</td>
<td>18000 (39682.6)</td>
<td>26000 (57319.3)</td>
<td></td>
</tr>
</tbody>
</table>

Standard Feature
- Coolant tank & chip fan
- Equipment status light
- Machine installation parts
- Oil skimmer
- Screw conveyor
- Spindle head cooling system
- Work light

Optional Feature
- Air gun
- Auto power cutoff device
- Auto tool length measurement device
- Auto workpiece measurement device
- Chip conveyor / Bucket
- Coolant gun
- Hyd. Fixture Interface
- Linear scale
- Shower Coolant
- Test bar
- 5axis preparation
- Through spindle coolant (In case of water soluble)

{ } : option

The specifications and information above-mentioned may be changed without prior notice.
For more details, please contact Doosan.
NC Unit Specifications

FANUC 31i

AXES CONTROL
- Controlled axes 4 (X, Y, Z, B)
- Simultaneous controlled axes 4 axes
- Positioning (G00)/Linear interpolation (G01): 3 axes
- Circular interpolation (G02, G03): 2 axes
- Backlash compensation
- Emergency stop / overtravel
- Follow up
- Least command increment 0.001 mm (inch) / 0.0001"
- Least input increment 0.001 mm (inch) / 0.0001"
- Machine lock all axes / Z axis
- Mirror image Reverse axis movement
- Stored pitch error compensation Pitch error offset compensation for each axis
- Overtravel controlled by software

INTERPOLATION & FEED FUNCTION
- 2nd reference point return
- Automatic acceleration/deceleration
- Automatic corner deceleration
- Circular interpolation G02, G03
- DSQ (AICC II + Machine condition selection function) 200 block preview
- Dwell G04
- Exact stop check G09, G61 (mode)
- Feedrate clamp by circular acceleration
- Feedrate override (10% increments) 0 - 200%
- Feed per minute mm / min (rpm)
- Helical interpolation
- Jog override (10% increments) 0 - 200%
- Linear ACC/DEC after interpolation
- Linear ACC/DEC before interpolation
- (Specify AI Contour control II)
- Linear interpolation G01
- Manual handle feedrate 0.1/0.01/0.001 mm (inches)
- Manual handle feed (1 unit)
- Override cancel M48 / M49
- Positioning
- Program restart
- Rapid traverse bell-shaped acceleration
- Rapid traverse override F0 (fine feed), 25 / 50 / 100%
- Reference point return G27, G28
- Skip function G31
- Thread cutting, synchronous cutting

SPINDLE & M-CODE FUNCTION
- M-code function M 3 digits
- Retraction for rigid tapping
- Rigid tapping G84, G74
- Spindle orientation
- Spindle serial output
- Spindle speed command 55 digits
- Spindle speed override (10% increments) 10 - 150%
- Spindle output switching

TOOL FUNCTION
- Number of tool offsets 200 ea
- Tool length compensation G43, G44, G45
- Tool length measurement
- Tool life management Geometry / Wear and Length / Radius offset memory
- Tool nose radius compensation G40, G41, G42
- Tool number command T3 digits
- Tool offset memory C

PROGRAMMING & EDITING FUNCTION
- Absolute / Incremental programming G90 / G91
- Addition of custom macro common variables
- Auto. Coordinate system setting 200 ea
- Background editing
- Canned cycle G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Custom macro B
- Custom size 2MB
- Decimal point input
- / I / O interface RS - 232C
- Inch / metric conversion G20 / G21
- Label skip
- Local / Machine coordinate system G52 / G53
- Maximum commandable value ±99999.999mm
- No. of Registered programs 500 ea
- Optional block skip
- Optional stop M01
- Part program storage 256kb (640m)
- Program number 04-digits
- Program protect
- Program stop / end M00 / M02, M30
- Programmable data input Tool offset and work offset are entered by G10, G11
- Sub program
- Work coordinate system G54 - G59

OTHERS FUNCTIONS (Operation, Setting & Display, etc)
- Alarm display
- Alarm history display
- Clock function
- Cycle start / Feed hold
- Display of PMC alarm message Message display when PMC alarm occurred
- Dry run
- Ethernet function (Embedded)
- External data input
- Graphic display Tool path drawing
- Help function
- Loadiameter display
- MDI / DISPLAY unit 10.4" color LCD, Keyboard for data input, soft-keys
- Memory card interface
- Multi language display
- Operation functions Tape / Memory / MDI / Manual
- Operation history display
- Program restart
- Run hour and part number display
- Search function Sequence NO. / Program NO.
- Self- diagnostic function
- Servo setting screen
- Single block

OPTIONAL SPECIFICATIONS
- 3-dimensional coordinate conversion
- 3-dimensional tool compensation
- 3rd / 4th reference return
- Additional controlled axes max. 12 axes per 1 path
- Addition of tool pairs for tool life management 1024 pairs
- Additional working coordinate system G54.1 P1 - 300 (300 pairs)
- Automatic corner override G62
- Cylindrical interpolation G01.1
- DSQ 2 200 block preview
- DSQ 3 600 block preview
- Dynamic graphic display Machining profile drawing
- EZ Guide (Doosan Infracore Conversational Programming Solution) with 10.4" Color TFT
- Interpolation type pitch error compensation
- Part Program Storage 512kb (1MB) / 2MB / 4MB / 8MB

Note: { } are optional.
Doosan Machine Tools

Optimal Solutions for the Future

http://www.doosaninfracore.com/machinetools/

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