DNM 750 series
High Productivity Vertical Machining Center
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The DNM 750 includes a spindle head cooling system which minimises thermal effects on the spindle. This enables a variety of medium to large parts to be machined to a high level of accuracy even at high speed.

In addition, the roller guideways and high strength arch structure of the column provide a highly rigid frame for stable machining conditions.
Features

1 X-axis travel and spindle torque available for various applications

DNM 750 / 750L

- X-axis travel: 1630 / 2160 mm (64.2 / 85 inch)
- Spindle speed: 8000 r/min std
  12000 r/min opt
- Spindle torque: 117.1 N-m (86.4 ft.lb)
- Max. tool weight: 1500 / 1800 kg (3306.9 / 3968.3 lb)

2 Cooling system to minimize thermal displacement

Thermal displacement of the spindle and axes is achieved by circulating cooling oil via an oil cooler to the spindle head and ball screw nuts.

- Spindle head cooling system std
- Ball screw nut cooling system std

3 Eco-friendly waste oil separation system

- Improved customer environment by separating waste lubricant and coolant.
- Reduced maintenance cost by extending the life of coolant by 80%
High Productivity

Machining capacity

**Face mill_Carbon steel (SM45C)**
- ø80mm Face mill (6Z)
- Machining rate: 570 cm³/min
- Spindle speed: 1500 r/min
- Feedrate: 2970 mm/min (116.9 ipm)

**Tap_Carbon steel (SM45C)**
- Machining rate: M30 x P3.5
- Spindle speed: 200 r/min
- Feedrate: 700 mm/min (27.6 ipm)

Rapid traverse
The linear motion guide ways and the high-speed servo motors enable fast axis movements, which reduce machining time and non-cutting time, resulting in enhanced productivity.

**Auto tool change**
Fast tool change time using a cam-type tool changer helps improve productivity.

**Machining Accuracy**

**Ball bar test** 4.7 μm

**Roughness** Ra 0.18 μm
- Spindle speed: 8000 r/min
- Feedrate: 1200 mm/min (47.2 ipm)

**Tool change time (T-T-T)** 1.3 s

**Tool storage capacity**
- 30 ea (std)
- 40 / 60 ea (opt)
High Rigidity Body

Key machine elements such as bed and column are made of Meehanite castings which have excellent vibration absorption characteristics and are designed to minimise deformation caused by heavy duty cutting. Roller type linear guideways are used to provide a combination of rigidity for heavy duty cutting and also high speed / high precision movement of each axis for high speed machining.

Arch-shaped structure

Key machine elements such as bed and column are designed to provide optimum rigidity for high speed / heavy duty machining.

High-strength roller type linear motion guide way

Key machine elements such as bed and column are made of Meehanite castings which have excellent vibration absorption characteristics and are designed to minimise deformation caused by heavy duty cutting. Roller type linear guideways are used to provide a combination of rigidity for heavy duty cutting and also high speed / high precision movement of each axis for high speed machining.

Static rigidity

The high-rigid structure of DNM 750 series had raised the static rigidity up more than previous models through FEM analysis.

Dynamic stiffness

Dynamic analysis was used in simulations of actual cutting to improve dynamic stiffness and dampen vibration during design stage.

• FEM analysis used to design a stable body.  
  (FEM: Finite Element Method)
### High Speed Spindle

**Spindle**

- **Spindle torque**: 117.1 N.m (86.4 ft.lb)
- **Spindle motor power**: 15 / 18.5 kW (20.1 / 24.8 Hp)
- **Spindle speed**: 8000 r/min std
- **Spindle speed**: 12000 r/min opt

Air which has been heated by spindle running is forced from the spindle head casting by fan to reduce the risk of thermal deformation.

### Spindle head cooling system

The refrigerated spindle cooling system circulates cooling oil around the spindle bearings to maintain a constant temperature for high accuracy, regardless of ambient temperature.

### 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 BT, DIN, CAT and HSK flange tooling.

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

### Spindle power-torque diagram

- **Max. spindle speed**: 8000 r/min
- **Motor power**: 15 / 18.5 kW
  - (20.1 / 24.8 Hp)

- **Max. spindle speed**: 12000 r/min
- **Motor power**: 15.6 / 15.6 kW
  - (20.9 / 20.9 Hp)
Operators Panel

User-friendly control panel
The control panel has been consolidated into a operator-friendly and convenient layout.

PCMCIA card
The PCMCIA card is used for downloading programmes and uses a convenient slot in the CNC control panel.

Portable MPG
Application suitable for CNC machines by providing home mode, stop adjustment and Interruption signal.

USB port
A usb memory stick can be used for backup and restoring of CNC data. usb stick does not support DNC machine running.

Easy Operation Package
The Doosan easy operation package has been specially customized to provide user-friendly functions and control the magazine for tools and pallets.

Tool table
Work-piece set up table moving
ATC recovery help
Easy parameter
G-code help
M-code help
Sensor status monitor
Tool load monitor
Chip Disposal

Easy chip-removal structure

Separate chip conveyor and coolant tank provide for easy cleaning and maintenance. The completely enclosed DNM 750 series guarantees to keep the chips and coolant inside of the machining area. This provides a cleaner working area for the operator.

Coolant chiller

The coolant chiller lowers coolant temperature, helping to cool both the workpiece and tool during the machining operation. When using insoluble coolant, a coolant chiller is recommended to cool heated oil and preserve machining precision.

Internal screw conveyor

Large capacity coolant tank with chip pan and box filter

Coolant tank capacity: 480L

Easy to discard chips piled up

Through spindle coolant

Middle pressure: 2.0 MPa (20 bar)
High pressure: 7.0 MPa (70 bar)

Side flushing

DNM 750
DNM 750L

Chip conveyor

Scraper type
Drum filter type
Hinge type

Improved the coolant pollution environment by separating lubricating oil with a separate oil-water separation box mounted at the coolant tank to prevent lubricating and coolant from mixing.

Used lubricating oil recovery system
Optional Equipment

Various options available to meet customers’ needs and to provide efficient work and convenience.

Interface for additional equipment

Connection example of additional 1 axis interface

Connection example of fixture interface

- Rotary table size shown in example: ø320 (DNM 750)
- Hydraulic power unit may be additionally necessary according to rotary table specifications.

Fixture check list (for hydraulic / pneumatic fixtures)

- Pressure source
  - Hydraulic □ P/T □ A/B
  - Pneumatic □ P/T □ A/B

- Number of ports
  - □ 1pair (2-PT 3/8” port)
  - □ 2pair (4-PT 3/8” port)
  - □ 3pair (6-PT 3/8” port)

- Hydraulic power unit
  - Supply scope:
    User □ Doosan
(Please check the below detail specification, if you want Doosan to supply.)

☐ Use Doosan standard unit
24 L/min (6.3 gal/min) / 4.9 MPa (711 psi)

☐ Special requirement
  _____ L/min (gal/min) at _____ MPa (psi)

Automatic tool length measurement
Automatic workpiece measurement
Minimum quantity lubrication
Oil skimmer
External Dimensions

Top view

Side view

Table dimensions

[ ]: DNM 750

Tool shank

BT40

CAT40

DIN40

Unit: mm (inch)
Machine Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Unit</th>
<th>DNM 750</th>
<th>DNM 750L</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-axis</td>
<td>mm (inch)</td>
<td>1630 (64.2)</td>
<td>2160 (85.0)</td>
</tr>
<tr>
<td>Y-axis</td>
<td>mm (inch)</td>
<td>762 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Z-axis</td>
<td>mm (inch)</td>
<td>650 (25.6)</td>
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<tr>
<td>Distance from spindle nose to table top</td>
<td>mm (inch)</td>
<td>150-800 (5.9 - 31.5)</td>
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<tr>
<td>Distance from spindle center to column</td>
<td>mm (inch)</td>
<td>1050 (41.3)</td>
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<tr>
<td>Table size</td>
<td>mm (inch)</td>
<td>1630 x 760 (64.17 x 29.9)</td>
<td>2160 x 760 (85.0 x 29.9)</td>
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<tr>
<td>Table loading capacity</td>
<td>kg (lb)</td>
<td>1500 (3306.9)</td>
<td>1800 (3968.3)</td>
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<tr>
<td>Table surface</td>
<td>-</td>
<td>6-125 x 18H8</td>
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<tr>
<td>Max. spindle speed</td>
<td>r/min</td>
<td>-</td>
<td>8000 (12000)</td>
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<tr>
<td>Spindle taper</td>
<td>-</td>
<td>ISO #40 7/24 Taper</td>
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<tr>
<td>Max. spindle torque</td>
<td>Nm (ft-lb)</td>
<td>171.1 (156.7) (86.4 (115.6))</td>
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</tr>
<tr>
<td>Spindle motor</td>
<td>kW (hp)</td>
<td>15 / 18.5 (15.6 / 15.6) (20.1 / 24.8 (20.9 / 20.9))</td>
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<tr>
<td>Rapid traverse rate (X / Y / Z)</td>
<td>m/min (ipm)</td>
<td>30/30/24 (1181/1181/949.9)</td>
<td>24/24/24 (949.9/949.9/949.9)</td>
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<tr>
<td>Cutting feedrate</td>
<td>m/min (ipm)</td>
<td>1-12000 (1-472.4)</td>
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<tr>
<td>Type of tool shank</td>
<td>-</td>
<td>BT / CAT / DIN 40</td>
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<tr>
<td>Tool storage capacity</td>
<td>ea</td>
<td>30 (40 / 60)</td>
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<tr>
<td>Max. tool diameter (without adjacent tools)</td>
<td>mm (inch)</td>
<td>Ø80 (Ø125) (Ø3.1 (4.9))</td>
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<tr>
<td>Max. tool length</td>
<td>mm (inch)</td>
<td>300 (11.8)</td>
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<tr>
<td>Max. tool weight</td>
<td>kg (lb)</td>
<td>8 (17.6)</td>
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<tr>
<td>Method of tool selection</td>
<td>-</td>
<td>memory random</td>
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<td>Tool change time (tool-to-tool)</td>
<td>s</td>
<td>1.3</td>
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<tr>
<td>Tool change time (chip-to-chip)</td>
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<td>3.7</td>
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<tr>
<td>Electric power supply (Rated capacity)</td>
<td>kW</td>
<td>43.1</td>
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<tr>
<td>Machine height</td>
<td>mm (inch)</td>
<td>3170 (124.8)</td>
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<tr>
<td>Machine dimension (L x W)</td>
<td>mm (inch)</td>
<td>3850 x 3435 (151.57 x 135.24)</td>
<td>4900 x 3435 (192.9 x 135.2)</td>
</tr>
<tr>
<td>Machine weight</td>
<td>kg (lb)</td>
<td>13500 (29762.0)</td>
<td>15000 (33068.9)</td>
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</tbody>
</table>

Standard feature

- Assembly & operation tools
- Coolant tank & chip pan
- Door interlock
- Full enclosure splash guard
- Flood coolant system
- Installation parts
- Portable MPG
- Screw conveyor
- Signal tower (red, yellow, green)
- Spindle head cooling system
- USB port, PCMCIA
- Work light

Optional feature

- Automatic power off
- Automatic tool length measurement
- Hydraulic line for fixture
- Oil skimmer
- Pneumatic line for fixture
- Rotary table
- Test bar
- Through spindle coolant

NC Unit Specifications

Doosan fanuc i series

Axes control
- Controlled axes 3 (X, Y, Z)
- Simultaneously controllable axes
  Positioning (G00)/Linear interpolation (G01) - 3 axes
  Circular interpolation (G02, G03) - 2 axes
- Backlash compensation
- Follow up
- Least command increment 0.001mm
- Least input increment 0.001mm
- Machine lock all axes / Z axis
- Mirror image Reverse axis movement (setting screen and M-function)
- Stored pitch error compensation
- Pitch error offset compensation for each axis
- Stored stroke check 1 Overtravel controlled by software
- Absolute pulse coder

Interpolation & Feed function
- 2nd reference point return G30
- Circular interpolation G02, G03
- Cylindrical interpolation G07.1
- Dwell G04
- Exact stop check G09, G61 (mode)
- Feed per minute
- Feedrate override (10% increments) 0 - 200%
- Helical interpolation
- Jog override (10% increments) 0 - 200%
- Linear interpolation G01
- Manual handle feed 1 units
- Manual handle feedrate x1, x10, x100 (per pulse)
- Override cancel M48/M49
- Positioning G00
- Rapid traverse override F0 (fine feed), 25/50/100%
- Reference point return G27, G28, G29
- Skip function G31

Features
- Assembly & operation tools
- Coolant tank & chip pan
- Door interlock
- Full enclosure splash guard
- Flood coolant system
- Installation parts
- Portable MPG
- Number of tool offsets: 400 ea
- Tool life management: 128 sets
- Tool offset memory C:
  Geometry / Wear and Length / Radius offset memory
- No. of Registered programs: 400 ea
- Part program storage: 1280 m
- Additional work coordinate system:
  G54.1 P1 - 48 (48 pairs)
- ACC1: 40 block preprocess
- DISPLAY unit: 10.4” Color TFT LCD
- Embedded ethernet

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Note: ( ) are optional.
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- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan.