DBC series
DBC 110S / 110Ⅱ / 130Ⅱ / 250Ⅱ
Horizontal NC Boring Machine
Column Moving Type NC Boring Machine
Featuring the Latest Technologies

**DBC series**

The DBC series, ranging from compact to super-size models, satisfies all our customers’ requirements with DOOSAN’s advanced technical prowess. A product line-up has been established for processing from middle to target size parts including die / mold parts. We are improving productivity and creating values for our customers on the basis of our design improvements including enhanced operating convenience and efficiency.

**DBC 110S / 110Ⅱ / 130Ⅱ / 250Ⅱ**
Speedy response to the market request
1. Full line-up available from compact types with minimized footprints to super-large models, for processing everything from large parts to die/mold applications
2. Diversified production line-up provides high-value-added machining

Customer orientated focus to improvement
1. Productivity improved by providing large capacity work space
2. Enhanced reliability and easy maintenance achieved by simplified design.
Diverse Line-up

The DBC series provides a full line-up of models covering compact, high-productivity, multi-functional, heavy loads and large work pieces.

Compact Type Model
DBC 110S

• Compact specifications of DBC 110S offers customers a wide range of options
• Compact structure minimizes machine footprint
• Multi-functional model offers price competitiveness

High Productivity Model
DBC 110 II

• High-productivity model features high-speed spindle
• Superior for deep cutting – boring operation is possible up to the table center due to W-axis travel
Compact Type Model
DBC 130 II / 250 II

- A steady-seller with more than 1000 sets sold to date. The standard model is regularly upgraded with our accumulated design know-how and production technologies.
- Shortest delivery time by modular production system.

Compact Type Model
DBC 130P II

- Work pieces are stably and firmly set up for efficient cutting

<table>
<thead>
<tr>
<th>Plain type table</th>
<th>Table length</th>
<th>Load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3000 mm</td>
<td>20000 kg</td>
</tr>
<tr>
<td></td>
<td>(118.1 inch)</td>
<td>(44091.8 lb)</td>
</tr>
</tbody>
</table>

Large capacity Model
DBC 130L II / DBC 250L II

- Medium, large work pieces can be cut.

<table>
<thead>
<tr>
<th>Travel (mm) X / Y / Z</th>
<th>4000 / 2500 / 2000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(157.5 / 98.4 / 78.7 inch)</td>
</tr>
</tbody>
</table>
Spindle

Nose-type head structure allows easy access to the work piece. Minimal protrusion of boring spindle enables stable cutting operation.

Spindle Head

The spindle is supported with double-row cylinder roller bearings and double-row angular contact ball bearings which are lubricated with air oil or oil mist to bear heavy lateral loads. The rigidity of the spindle head of the DBC series has been greatly improved, increasing the cutting capacity with the W-axis protruding more than double that of previous models.

* DBC 110Ⅱ, DBC 130 (L/P)Ⅱ: air oil lubricated, four double-row angular contact ball bearings
DBC 110S: oil mist lubricated, four double-row angular contact ball bearings

Max. spindle speed
DBC 110S  DBC 110Ⅱ  DBC 130 / L / P Ⅱ  DBC 250 / L Ⅱ
3000 r/min  4000 r/min  2500 r/min  6000 r/min

Spindle power-torque diagram
DBC 110S
High-speed spindle with high-rigidity

- High-speed, high-power built-in spindle
- Rigid structure for quill feeding
- Greased-type lubrication for the spindle bearings
- Stable thermal growth of the spindle bearings even for long operating times

<table>
<thead>
<tr>
<th>Model</th>
<th>Spindle speed (r/min)</th>
<th>Spindle motor (kW (Hp))</th>
<th>Torque [N·m (ft-lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBC 110S</td>
<td>3000 -</td>
<td>26/22 (15/30) (30min)</td>
<td>1137 (838.6)</td>
</tr>
</tbody>
</table>

DBC 110 II
High-speed spindle with high-rigidity

- High-power main spindle available

<table>
<thead>
<tr>
<th>Model</th>
<th>Spindle speed (r/min)</th>
<th>Spindle motor (kW (Hp))</th>
<th>Torque [N·m (ft-lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBC 110</td>
<td>4000 -</td>
<td>30/22 (40/30) (15min)</td>
<td>2835 (2091.0)</td>
</tr>
</tbody>
</table>

DBC 130 / L / P II
Heavy duty cutting spindle with high-rigidity

- High-power main spindle available

<table>
<thead>
<tr>
<th>Model</th>
<th>Spindle speed (r/min)</th>
<th>Spindle motor (kW (Hp))</th>
<th>Torque [N·m (ft-lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBC 130 / L / P II</td>
<td>2500 -</td>
<td>30/22 (40/30) (15min)</td>
<td>3392 (2501.8)</td>
</tr>
</tbody>
</table>

DBC 250 / L II
High-speed, high-power built-in spindle

- Rigid structure for quill feeding
- Greased-type lubrication for the spindle bearings
- Stable thermal growth of the spindle bearings even for long operating times

<table>
<thead>
<tr>
<th>Model</th>
<th>Spindle speed (r/min)</th>
<th>Spindle motor (kW (Hp))</th>
<th>Torque [N·m (ft-lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBC 250 / L II</td>
<td>6000 -</td>
<td>30/22 (40/30) (30min)</td>
<td>598 (441)</td>
</tr>
</tbody>
</table>

* For further details, please contact Doosan.
Structure

For heavy work pieces and high processing quality, the design has been improved with a cast structure offering excellent stiffness. Structural analysis of the inner rib structure has further upgraded machine performance.

High Rigidity Structure

For heavy work pieces and high processing quality, the design has been improved to deliver excellent dynamic performance cast structure. Structural analysis of the inner rib structure has further upgraded machine performance.

Column Structure

Low center of gravity design minimized vibration. Suitable for heavy loads due to column travel system.

Deformation and vibration minimized by M-type design of the ribs inside the bed.

High Rigidity Design of Major Units

Rigidity is enhanced by optimal design of the machine structure. Great accuracy can be achieved by minimizing deformation caused by heavy load.

Design focused on low center of gravity of column to minimize vibration during column travel.

Deformation caused by heavy work pieces minimized by optimized design of table and table base.

Deformation and vibration minimized by M-type design of the ribs inside the bed.
Stable Machine Structure

A highly rigid, stable machine structure has been realized by optimizing the design of the column and bed. Excellent wear resistance and accuracy for machining quality have been achieved by precision grinding after heat treatment.

4-row Angular Ball Bearings & Ball Screw

Both ends of the shafts are supported with 4-row angular contact bearings. A low noise, high precision ball screw has been adopted for axis travel.

Designed with narrow guide system to minimise axis torque and ensure smooth motion

Designed with narrow guide system to minimise axis torque and ensure smooth motion
Highest Accuracy

Servo load has been reduced to secure stable feed characteristics for heavy work pieces. Thrust in axis direction has been increased to improve cutting capacity.

Rotary Table

* Related patent right reserved.

A high accuracy encoder is installed at the table center to provide precise rotational position (B-axis).

* Except DBC 130P II

Transfer Axis Speed Reducer (X / Z)

- Servo load has been reduced to secure stable feed characteristics for heavy work pieces (X-axis).
- Thrust in axis direction has been increased to improve cutting capacity (Z-axis).

DBC 130L II / DBC 130P II (X AXIS) / DBC 250L II
DBC 110S / DBC 110 II / DBC 130 II / DBC 130P II (Z AXIS) / DBC 250 II

DBC series
ATC & Magazine

The adoption of a servo-motor for tool magazine and carriage drive greatly reduces hydraulic system load of the entire machine. Machine has been improved by simplifying the structure to minimize the causes of failure.

Servo-driven Auto Tool Changer opt

Servo tool magazine & servo carriage

Acceptable tool dimensions

<table>
<thead>
<tr>
<th>Spec.</th>
<th>Shape</th>
<th>Max. Tool Diameter</th>
<th>Facing Tool D=ø250 mm (9.8 inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Tool Length</td>
<td>L = 600 mm (23.6 inch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Tool Weight</td>
<td>W = 25 kg (55.1lb) W = 30 kg (66.1lb) opt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Allowable moment: 34 N·m (25.1 ft-lb)

* Please contact our engineer if you wish to extend the boring tool’s diameter.
Easy Chip Disposal

Proper chip disposal is very important for productivity and environmental protection. The DBC series provides various chip disposal systems designed to improve productivity and the working environment.

Easy Chip Removal Structure

The completely enclosed DBC series guarantee the confinement of chips and coolant to the inside of the machining area. Chips fall into the removable forward mounted chip pan for easy disposal.

Coolant Splash Guard

Semi Guard DBC 110S

Semi Guard DBC 110 I

Semi Guard DBC 130 / L / P I, DBC 250 / L I

Semi Guard with auto door DBC 130 (L) I, DBC 250 (L) I

Optional Equipment

Special specifications applicable by new development

1. Angle head (Manual) (L=365)
2. Long type angle head (Manual) (L=660)
3. Universal head (Manual)
4. Face plate (Manual)
5. Indexable angle head (90° index)*
6. Spindle support *
   * : To use ATC with attached spindle support, Indexable angle head (90° Index) please contact Doosan
7. Facing head (Cogsdill) *
   * : Manual / Automatic attach available
   * : For more details, please contact Doosan
8. Angle plate (4 types)
   • Please contact us for special specifications.
   • Please contact us for further information.

Unit : mm (inch)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 (17.7)</td>
<td>600 (23.6)</td>
<td>400 (15.8)</td>
</tr>
<tr>
<td>500 (20)</td>
<td>1000 (39.4)</td>
<td>550 (21.7)</td>
</tr>
<tr>
<td>750 (29.5)</td>
<td>1250 (49.2)</td>
<td>750 (29.5)</td>
</tr>
<tr>
<td>1000 (39.4)</td>
<td>2000 (78.7)</td>
<td>1000 (39.4)</td>
</tr>
</tbody>
</table>

Coolant gun

Coil conveyor

Hinged belt conveyor DBC 110S, DBC 110 II, DBC130/L II, DBC 130P II, DBC 250/L II

Chip pan Slope-type pan for smooth coolant drain and chip disposal.
Easy Operation Package

Process Monitoring Function

Doosan tool load monitoring

- Automatic detection of tool wear and damage under abnormal loads by M-Code command
- Individual work-piece data can be saved

Periodic Checking Function

This function informs the operator of equipment status with various instructions, e.g., oil refill, ready for machine service.

Automatic Backlash Compensation

After setting up the work piece, feed backlash is automatically detected and compensated by the G-code instruction or function screen.

Tool Control Function

- Tools are protected from abnormal load on the servo shaft, by skipping the tool or generating a freehold alarm.

Work Load Counter Control

When the operator enters the M-code for the weight of the work piece, the system automatically determines the table feed pattern to perform cutting.

<table>
<thead>
<tr>
<th>M-Code</th>
<th>Work Load</th>
<th>DBC 110S</th>
<th>DBC 110 II</th>
<th>DBC 130 II</th>
<th>DBC 130L II</th>
<th>DBC 130P II</th>
<th>DBC 250 II</th>
<th>DBC 250L II</th>
</tr>
</thead>
<tbody>
<tr>
<td>M380</td>
<td>5 Ton and less</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>M381</td>
<td>10 Ton and less</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>M382</td>
<td>15 Ton and less</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>M383</td>
<td>20 Ton and less</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
Optional Function

Easy Set-up Guidance Touch Sensor (OMP60) opt.

This function enables the simple setting up of work-piece coordinates, using an automatic or semi-automatic measurement probe. When using an auto-measuring probe, place the probe close to the set up surface, select the setup configuration, and press the cycle start button. The system touches the point and sets the work-piece coordinates automatically.

Support Function for Maintenance

Easy Operation Guidance opt.

Machine faults including problems with the ATC magazine are detected and troubleshooting suggestions are proposed for corrective action. For guidance on easy operation, display windows - including function selection, thermal error setting, program progress display, and operation report display - are provided.

Operating Performance Improvement

Productivity improved by adoption of operator panel design optimized for the operation of large machines

- Mono lever jog switches are provided at the bottom of the main operator panel for easy traverse of the long axis of large machines (standard).
- Pulse handle for the operator’s convenience and portable MPG for easy work piece setting are provided as standard features.
External Dimensions & Table Dimensions

DBC 110S

Table

1400 x 1600 (55.1 x 63)

* The specifications and information above-mentioned may be changed without prior notice.
* For more details, please contact Doosan
External Dimensions & Table Dimensions

DBC 110 II

Top View

Front View

Side View

Table std

1400 x 1800 (55.1 x 70.9)

T-Slot

APC Table opt

1400 x 1800 (55.1 x 70.9)

APC loading capacity: 6 tons

T-Slot

Unit: mm (inch)

• The specifications and information above-mentioned may be changed without prior notice.
• For more details, please contact Doosan
**APC Table**

- **1600 x 1800 (63 x 70.9)**
  - APC loading capacity: 10 tons

- **1800 x 2000 (70.9 x 78.7)**
  - APC loading capacity: 8 tons

**DBC 130P**

- **1600 x 3000 (63 x 118.1)**

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**APC Table**

- **1600 x 1800 (63.0 x 70.9)**
  - APC loading capacity: 10 tons

- **1800 x 2000 (70.9 x 78.7)**
  - APC loading capacity: 8 tons

**DBC 130P**

- **1600 x 3000 (63 x 118.1)**

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**DBC 130L / L / P II**

**Top View**

**Front View**

**Side View**

**APC Table**

- **1600 x 1800 (63 x 70.9)**
  - APC loading capacity: 10 tons

- **1800 x 2000 (70.9 x 78.7)**
  - APC loading capacity: 8 tons

**DBC 130P**

- **1600 x 3000 (63 x 118.1)**

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**T-Slot**

- **24H8**

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*The specifications and information above-mentioned may be changed without prior notice.*

*For more details, please contact Doosan*
External Dimensions & Table Dimensions

**DBC 250 / L II**

**Top View**

**Front View**

**Side View**

**APC Table**

- **1600 x 1800 (63.0 x 70.9)**  
  APC loading capacity: 10 tons
- **1800 x 2000 (70.9 x 78.7)**  
  APC loading capacity: 8 tons

**T-Slot**

- 1600 x 1800 (63 x 70.9)  
- 1800 x 2000 (70.9 x 78.7)  
- 2000 x 2200 (78.7 x 86.6)

**Unit: mm (inch)**

• The specifications and information above-mentioned may be changed without prior notice.

• For more details, please contact Doosan
## Machine Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>DBC 110S</th>
<th>DBC 110 II</th>
<th>DBC 130 II</th>
<th>DBC 130L II</th>
<th>DBC 130P II</th>
<th>DBC 250 II</th>
<th>DBC 250L II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travels</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel distance</td>
<td>X-axis</td>
<td>mm (inch)</td>
<td>2000 (78.7)</td>
<td>2500 (98.4)</td>
<td>3000 (118.1)</td>
<td>4000 (157.5)</td>
<td>4000 (157.5)</td>
<td>4000 (157.5)</td>
</tr>
<tr>
<td></td>
<td>Y-axis</td>
<td>mm (inch)</td>
<td>1500 (59)</td>
<td>2000 (78.7)</td>
<td>2500 (98.4)</td>
<td>2000 (78.7)</td>
<td>2500 (98.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Z-axis</td>
<td>mm (inch)</td>
<td>1200 (47.2)</td>
<td>1500 (59)</td>
<td>1600 (63)</td>
<td>2000 (78.7)</td>
<td>1600 (63)</td>
<td>2000 (78.7)</td>
</tr>
<tr>
<td></td>
<td>W-axis</td>
<td>mm (inch)</td>
<td>500 (19.6)</td>
<td>550 (21.7)</td>
<td>700 (27.6)</td>
<td>500 (19.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distance from spindle nose to table top</strong></td>
<td>mm (inch)</td>
<td>0-1500 (0-59)</td>
<td>0-2000 (0-78.7)</td>
<td>0-2000 (0-78.7)</td>
<td>0-2500 (0-98.4)</td>
<td>100-2100 (3.9-82.7)</td>
<td>0-2000 (0-78.7)</td>
<td>0-2500 (0-98.4)</td>
</tr>
<tr>
<td><strong>Distance from spindle nose to table center</strong></td>
<td>mm (inch)</td>
<td>550-1750 (21.7-68.9)</td>
<td>550-2050 (22.7-80.7)</td>
<td>700-2300 (27.6-90.3)</td>
<td>700-2700 (27.6-106.3)</td>
<td>700-2300 (27.6-90.5)</td>
<td>770-2370 (30.3-93.3)</td>
<td>770-2770 (30.3-109.1)</td>
</tr>
<tr>
<td><strong>Rapid Traverse Rate</strong></td>
<td>X, Y, Z-axis</td>
<td>m/min (ipm)</td>
<td>12 (4/72.4)</td>
<td>10 (393.7)</td>
<td>10 / 8 / 10</td>
<td>7 / 8 / 10</td>
<td>7 / 8 / 10</td>
<td>7 / 8 / 10</td>
</tr>
<tr>
<td></td>
<td>W-axis</td>
<td>m/min (ipm)</td>
<td>6 (236.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cutting feedrate</strong></td>
<td>X, Y, Z-axis</td>
<td>mm/min (ipm)</td>
<td>1 ~ 6000 (1~236.2)</td>
<td>1<del>4000 (1</del>157.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Table size</strong></td>
<td></td>
<td>mm (inch)</td>
<td>1400 x 1600 (55.1 x 63)</td>
<td>1400 x 1800 (55.1 x 70.9)</td>
<td>1600 x 1800 (70.9 x 78.7, 78.7 x 86.6)</td>
<td>1600 x 3000 (63 x 118.1)</td>
<td>1600 x 1800 (70.9 x 78.7, 78.7 x 86.6)</td>
<td>1600 x 3000 (63 x 118.1)</td>
</tr>
<tr>
<td></td>
<td>Semi-S/G</td>
<td>mm (inch)</td>
<td>ø2550 (10.0)</td>
<td>Ø3400 (13.38)</td>
<td>Ø3950 (15.55)</td>
<td>Ø4800 (18.85)</td>
<td>Ø3400 (13.15)</td>
<td>Ø4800 (18.85)</td>
</tr>
<tr>
<td></td>
<td>Swing Diameter</td>
<td>mm (inch)</td>
<td>1400 x 1600 (55.1 x 63)</td>
<td>1400 x 1800 (55.1 x 70.9)</td>
<td>1600 x 1800 (70.9 x 78.7, 78.7 x 86.6)</td>
<td>1600 x 3000 (63 x 118.1)</td>
<td>1600 x 1800 (70.9 x 78.7, 78.7 x 86.6)</td>
<td>1600 x 3000 (63 x 118.1)</td>
</tr>
<tr>
<td><strong>Table loading capacity</strong></td>
<td></td>
<td>kg (lb)</td>
<td>7000 (15432.1)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>10000 (22045.9)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>20000 (44091.8)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>15000 (33068.9)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>12500 (27170.4)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>20000 (44091.8)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>12000 (26455.1)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg (lb)</td>
<td>12000 (26455.1)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Max. spindle speed</strong></td>
<td>r/min</td>
<td>3000</td>
<td>4000</td>
<td>2500</td>
<td>6000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Boring spindle diameter</strong></td>
<td>mm (inch)</td>
<td>110 (4.3)</td>
<td>130 (5.1)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quill diameter</strong></td>
<td>mm (inch)</td>
<td>-</td>
<td>250 (9.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tool Storage capacity</strong></td>
<td>ea</td>
<td>40 / 60 / 90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tool shank</strong></td>
<td></td>
<td>MAS403 BT50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. tool diameter</strong></td>
<td>mm (inch)</td>
<td>ø130 (0.060)</td>
<td>(0.051 (0.2316))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. tool length</strong></td>
<td>mm (inch)</td>
<td>600 (23.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. tool weight</strong></td>
<td>kg (lb)</td>
<td>25 ( 0.055.1 (66.1) )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Method of tool selection</strong></td>
<td></td>
<td>Fixed address</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motors</strong></td>
<td></td>
<td>kw (Hp)</td>
<td>26 / 22 (30 / 22) (34.9 / 29.5 (40.2 / 29.5))</td>
<td>26 / 22 (30 / 22) (34.9 / 29.5 (40.2 / 29.5))</td>
<td>26 / 22 (30 / 22) (34.9 / 29.5 (40.2 / 29.5))</td>
<td>26 / 22 (30 / 22) (34.9 / 29.5 (40.2 / 29.5))</td>
<td>26 / 22 (30 / 22) (34.9 / 29.5 (40.2 / 29.5))</td>
<td>30 / 22 (40.2 / 49.6)</td>
</tr>
<tr>
<td><strong>Power source</strong></td>
<td>Electric power supply (rated capacity)</td>
<td>kVA</td>
<td>4050 (159.4)</td>
<td>4870 (192.9)</td>
<td>4910 (193.3)</td>
<td>5410 (213.3)</td>
<td>4910 (193.3)</td>
<td>5410 (213.0)</td>
</tr>
<tr>
<td><strong>Machine Dimensions</strong></td>
<td>Height</td>
<td>mm (inch)</td>
<td>5260 x 5900 (207.1 x 232.2)</td>
<td>7440 x 6980 (291.7)</td>
<td>8970 x 7640 (353.1 x 304.0)</td>
<td>9970 x 8760 (392.5 x 318.5)</td>
<td>9970 x 8760 (392.5 x 318.5)</td>
<td>9970 x 8760 (392.5 x 318.5)</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>kg (lb)</td>
<td>26000 (9291.02)</td>
<td>36000 (13653.7)</td>
<td>43000 (49797.4)</td>
<td>48000 (105821.9)</td>
<td>47000 (103616.0)</td>
<td>43000 (94797.4)</td>
</tr>
</tbody>
</table>

* The specifications and information above-mentioned may be changed without prior notice.
* For more details, please contact Doosan.
### Standard Feature & Optional Feature

<table>
<thead>
<tr>
<th>Standard Feature</th>
<th>Optional Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Actual Spindle Speed Display on LCD</td>
<td>• Easy Set Up Guidance® (with OMP 60)</td>
</tr>
<tr>
<td>• Automatic Backlash Compensation [Only X-axis, without Linear scale]</td>
<td>• Edge Locator (Table / Pallet)</td>
</tr>
<tr>
<td>• Automatic Table Clamping Unit</td>
<td>• Electric Aircon</td>
</tr>
<tr>
<td>• Automatic Table Locating Pin (each 90°)</td>
<td>• Electric Box Light</td>
</tr>
<tr>
<td>• Axis Gear Box for Y-axis</td>
<td>• Electric Leakage Breaker</td>
</tr>
<tr>
<td>• B-axis Rotary Encoder</td>
<td>• Electric Line Filter</td>
</tr>
<tr>
<td>• Big Plus® Spindle</td>
<td>• External M-CODE (4ea)</td>
</tr>
<tr>
<td>• Chip Disposal</td>
<td>• Linear Scale Feedback System</td>
</tr>
<tr>
<td>• Air Blow [ONLY DBC 250 (L) II ]</td>
<td>• Absolute Type</td>
</tr>
<tr>
<td>[Except DBC 110S]</td>
<td>• Machine Warming Up Function</td>
</tr>
<tr>
<td>• Column Guideway Chip cover</td>
<td>• Master Block gauge for Auto Workpiece Measurement</td>
</tr>
<tr>
<td>• Customer’s Manual</td>
<td>• Master Tool for Auto-Tool Length Measurement</td>
</tr>
<tr>
<td>• Doosan Tool Load Monitoring</td>
<td>• MPG with LCD display</td>
</tr>
<tr>
<td>• DSQ1*</td>
<td>• Operator’s Call Buzzer</td>
</tr>
<tr>
<td>• Easy pattern Cycle</td>
<td>• Raising Block</td>
</tr>
<tr>
<td>• Foot Switch for Tool Unclump</td>
<td>• Safety Fence &amp; Interlock Switches</td>
</tr>
<tr>
<td>• Leveling Blocks &amp; Anchoring Bolts [Except DBC 110S]</td>
<td>• Speed Limit Control for Attachment</td>
</tr>
<tr>
<td>• Leveling Bolt &amp; Anchoring Bolts [Only DBC 110S]</td>
<td>• Test Bar (BT 50)</td>
</tr>
<tr>
<td>• Linear Scale Feedback System</td>
<td>• Tool Breakage Detect Function</td>
</tr>
<tr>
<td>Absolute Type [Only DBC 250 / L II]</td>
<td>• Total Counter</td>
</tr>
<tr>
<td>• Main OP. Panel</td>
<td>• Work Counter</td>
</tr>
<tr>
<td>2-Linkage type</td>
<td></td>
</tr>
<tr>
<td>• Mono Lever Jog Switches</td>
<td></td>
</tr>
<tr>
<td>• Periodical Checking Function</td>
<td></td>
</tr>
<tr>
<td>• Portable-MPG</td>
<td></td>
</tr>
<tr>
<td>• Self Diagnosis Function</td>
<td></td>
</tr>
<tr>
<td>• Signal Tower</td>
<td></td>
</tr>
<tr>
<td>• Slide Way Covers (X / Y / Z)</td>
<td></td>
</tr>
<tr>
<td>• Spindle-Air Curtain [Only DBC 250 / L II]</td>
<td></td>
</tr>
<tr>
<td>• Spindle Cooling System</td>
<td></td>
</tr>
<tr>
<td>• Spindle Internal Cooling System [Only DBC 110S, DBC 110 II, DBC 130 / L / P II]</td>
<td></td>
</tr>
<tr>
<td>• Spindle Lubrication Device</td>
<td></td>
</tr>
<tr>
<td>• Spindle Thermal Compensation System [Except DBC 250 / L II]</td>
<td></td>
</tr>
<tr>
<td>• Table Chip Pan</td>
<td></td>
</tr>
<tr>
<td>• Tool Control Function</td>
<td></td>
</tr>
<tr>
<td>• Tool KIT</td>
<td></td>
</tr>
<tr>
<td>• W-axis Clamp [DBC 250 / L II]</td>
<td></td>
</tr>
<tr>
<td>• Work Light (LED Lamp)</td>
<td></td>
</tr>
<tr>
<td>• Work Load Counter Control®</td>
<td></td>
</tr>
<tr>
<td>• Z-axis Coolant Pan</td>
<td></td>
</tr>
</tbody>
</table>

* Note) DSQ1 : AICC II with High Speed Processing + Machining Condition Selection + Data Server (1GB)
* Note) DSQ2 : DSQ1 + Data Server (1GB)  
* Note) DSQ3 : AICC II with high speed processing + Machine condition selection + Data server (1GB)

※ 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 5 (X, Y, Z, W, B)
- Simultaneously controllable axes 3 axes (G00) / 2 axes (G01)
- Circular interpolation (G02, G03) : 2 axes
- Backlash compensation
- Emergency stop / overtravel
- Follow up
- Least command increment 0.001mm / 0.0001 inch
- Least input increment 0.0001mm / 0.00001 inch
- Machine lock all axes / Z axis
- Mirror image reverse axis movement (setting screen and M-function)
- Stored pitch error compensation
- Pitch offset compensation for each axis
- Stored stroke check 1 overtravel controlled by software

**INTERPOLATION & FEED FUNCTION**
- 2nd reference point return G30
- AI Contour Control 200 block preview
- Automatic corner deceleration
- Circular interpolation G02, G03
- Control axis detach
- Dual position feedback
- Dwell G04
- Exact stop check G09, G61 (mode)
- Feed per minute mm / min
- Feedrate clamp by circular radius
- Feedrate override (10% increments) 0 - 200%
- Helical interpolation
- Jog feedrate 0 - 5000 mm/min
- Linear ACC/DEC after interpolation
- Linear ACC/DEC before interpolation
- Linear interpolation G01
- Manual handle feed 1 unit
- Manual handle feedrate 0.1 / 0.01 / 0.001 mm
- Override cancel M48 / M49
- Positioning G00
- Program restart
- Rapid traverse bell-shaped acceleration / deceleration
- Rapid traverse override F0 (fine feed), 25 / 50 / 100 %
- Reference point return G27, G28, G29
- Skip function G31
- Smooth backlash compensation
- Thread cutting, synchronous cutting

**TOOL FUNCTION**
- Cutter compensation C G40, G41, G42
- Number of tool offsets 200 ea
- Tool length compensation G43, G44, G49
- Tool number command T3 digits
- Tool life management Geometry / Wear and Length / Radius offset memory
- Tool offset memory C

**PROGRAMMING & EDITING FUNCTION**
- Absolute / Incremental programming G90 / G91
- Addition of custom macro common variables
- Additional work coordinate system (48 Pair) G54.1 P1 - 48 pairs
- Auto. Coordinate system setting
- Background editing
- Canned cycle G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Coordinate system rotation G68, G69
- Custom macro B
- Custom size 512 kb
- Decimal point input
- Extended part program editing
- I / O interface USB / RS-232C
- Inch / metric conversion G20 / G21
- Label skip
- Local / Machine coordinate system G52 / G53
- Macro executor
- Maximum commandable value +99999999 mm (+999999999 inch)
- No. of Registered programs 500 ea
- Optional angle chamfering / corner R
- Optional block skip
- Optional stop M01
- Part program storage 256kb (640 m)
- Program number 0-999
- Program protect
- Program stop / end M00 / M02, M30
- Programmable data input
- Tool offset and work offset are entered by G10, G11
- Sub program Up to 4 nesting
- Tape code ISO / EIA Automatic discrimination
- Work coordinate system G54 - G59

**OPTIONAL SPECIFICATIONS**
- 3-dimensional coordinate conversion
- 3-dimensional tool compensation
- 3rd / 4th reference return
- Additional of tool pairs for tool life management 1024 pairs
- Additional controlled axes max. 6 axes in total
- Additional work coordinate system G54.1 P1 - 300 (300 pairs)
- AI Contour Control 600 block preview
- Automatic corner override G62
- Chopping function G81.1
- Cylindrical interpolation G07.1
- Data server
- Dynamic graphic display Machining profile drawing
- Exponential interpolation
- EZ Guide I (Doosan infracore Conversational Programming Solution)
- Figure copying G72.1, G72.2
- Handle interruption
- High speed skip function
- Increment system 1/10
- Interpolation type pitch error compensation
- Involute interpolation G02.2, G03.2
- Machining time stamp function
- Manual handle feed 2/3 unit
- Manual NC unit setting 512 pairs
- Number of Registered programs 1024 pairs
- Number of tool offsets 400 / 499 / 999 / 2000 ea
- Optional block skip 9 blocks
- Part program storage 512kb (1280m) / 1mb (2560m) / 2mb (5120m) / 4mb (10240m) / 8mb (20480m)
- Playback function
- Polar coordinate command G15 / G16
- Position switch
- Programmable mirror image G50.1 / G51.1
- Single direction positioning G60
- Stored stroke check 2 / 3
- Tape format for FTS1
- Tool offset G45 - G48

**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
- Loadmeter 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
- Manual handle part number display
- Search function Sequence NO. / Program NO.
- Self-diagnostic function
- Servo setting screen
- Single block

**SPINDLE & M-CODE FUNCTION**
- M-code function M3 digits
- Polar coordinate interpolation G12.1 / G13.1
- Retraction for rigid tapping
- Rigid tapping G84, G74
- Scaling G50, G51
- Spindle orientation
- Spindle serial output
- Spindle speed command 55 digits
- Spindle speed override (10% increments) 10 - 150 %
- Spindle output switching

**TOOL FUNCTION**
- Cutter compensation C G40, G41, G42
- Number of tool offsets 200 ea
- Tool length compensation G43, G44, G49
- Tool number command T3 digits
- Tool life management Geometry / Wear and Length / Radius offset memory
- Tool offset memory C

**PROGRAMMING & EDITING FUNCTION**
- Absolute / Incremental programming G90 / G91
- Addition of custom macro common variables
- Additional work coordinate system (48 Pair) G54.1 P1 - 48 pairs
- Auto. Coordinate system setting
- Background editing
- Canned cycle G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Coordinate system rotation G68, G69
- Custom macro B
- Custom size 512 kb
- Decimal point input
- Extended part program editing
- I / O interface USB / RS-232C
- Inch / metric conversion G20 / G21
- Label skip
- Local / Machine coordinate system G52 / G53
- Macro executor
- Maximum commandable value +99999999 mm (+999999999 inch)
- No. of Registered programs 500 ea
- Optional angle chamfering / corner R
- Optional block skip
- Optional stop M01
- Part program storage 256kb (640 m)
- Program number 0-999
- Program protect
- Program stop / end M00 / M02, M30
- Programmable data input
- Tool offset and work offset are entered by G10, G11
- Sub program Up to 4 nesting
- Tape code ISO / EIA Automatic discrimination
- Work coordinate system G54 - G59

**OPTIONAL SPECIFICATIONS**
- 3-dimensional coordinate conversion
- 3-dimensional tool compensation
- 3rd / 4th reference return
- Additional of tool pairs for tool life management 1024 pairs
- Additional controlled axes max. 6 axes in total
- Additional work coordinate system G54.1 P1 - 300 (300 pairs)
- AI Contour Control 600 block preview
- Automatic corner override G62
- Chopping function G81.1
- Cylindrical interpolation G07.1
- Data server
- Dynamic graphic display Machining profile drawing
- Exponential interpolation
- EZ Guide I (Doosan infracore Conversational Programming Solution)
- Figure copying G72.1, G72.2
- Handle interruption
- High speed skip function
- Increment system 1/10
- Interpolation type pitch error compensation
- Involute interpolation G02.2, G03.2
- Machining time stamp function
- Manual handle feed 2/3 unit
- Number of Registered programs 1024 pairs
- Number of tool offsets 400 / 499 / 999 / 2000 ea
- Optional block skip 9 blocks
- Part program storage 512kb (1280m) / 1mb (2560m) / 2mb (5120m) / 4mb (10240m) / 8mb (20480m)
- Playback function
- Polar coordinate command G15 / G16
- Position switch
- Programmable mirror image G50.1 / G51.1
- Single direction positioning G60
- Stored stroke check 2 / 3
- Tape format for FTS1
- Tool offset G45 - G48

**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
- Loadmeter 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
- Manual handle part number display
- Search function Sequence NO. / Program NO.
- Self-diagnostic function
- Servo setting screen
- Single block
NC Unit Specifications

Fanuc 32i

**DCS 110S**

**AXES CONTROL**
- Controlled axes 5 (X, Y, Z, W, B)
- Simultaneous controlled axes (Positioning G00) Linear interpolation (G01): 3 axes
  Circular interpolation (G02, G03): 2 axes
- Backlash compensation
- Emergency stop / overtravel
- Follow up
- Least command increment 0.001mm / 0.0001inch
- Least input increment 0.001mm / 0.0001inch
- Machine lock all axes / Z axis
- Stored pitch error compensation
  Pitch error offset compensation for each axis
- Stored stroke check 1
  Overtravel controlled by software

**INTERPOLATION & FEED FUNCTION**
- 2nd reference point return G30
- Automatic corner deceleration
- Circular interpolation G02, G03
- Dwell G04
- Feed per minute mm / min (ipm)
- Feedrate clamp by circular radius
- Feedrate override (10% increments) 0 - 200%
- Helical interpolation
- Jog feedrate 0 - 5000mm / min
- Linear ACC/DEC before interpolation
- Linear interpolation G01
- Manual handle feedrate 0.1 / 0.01 / 0.001mm
- NANO ACC (Al Contour Control) 200 block preview
- Override cancel M48 / M49
- Positioning
- Program restart
- Rapid traverse override F0 (fine feed), 25 / 50 / 100%
- Reference point return G27, G28, G29
- Skip function G31
- Thread cutting, synchronous cutting

**SPINDLE & M-CODE FUNCTION**
- M-code function M3 digits
- Polar coordinate interpolation G12.1 / G13.1
- Rigid tapping G84, G74
- Scaling G50, G51
- Spindle orientation
- Spindle serial output
- Spindle speed command S5 digits
- Spindle speed override (10% increments) 10 - 150%

**TOOL FUNCTION**
- Additional work coordinate system (48 Pair) G54.1 P1 - 48 pairs
- Auto. Coordinate system setting
- Background editing
- Canned cycle G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Coordinate system rotation G68, G69
- Custom macro B
- Custom size 512kb
- I/O interface USB / RS - 232C
- Inch / metric conversion G20 / G21
- Local / Machine coordinate system G52 / G53
- Macro executor
- Maximum commandable value ±99999.999 ( ±9999.9999 inch)

- 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 Up to 4 nesting
- Tape code ISO / EIA Automatic discrimination
- Work coordinate system G54 - G59

**OTHERS FUNCTIONS**
- Alarm display
- 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
- Loadmeter 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
- Program restart
- Search function Sequence NO. / Program NO.
- Servo setting screen

**OPTIONAL SPECIFICATIONS**
- 3rd / 4th reference return
- Addition of tool pairs for tool life management 512 pairs
- Additional controlled axes max. 6 axes in total
- Additional work coordinate system G54.1 P1 - 300 (300 pairs)
- AI HPCC ( High Precision Contour Control ) with 64 bit Risc 600 block preview
- Automatic corner override G62
- Chopping function G81.1
- Cylindrical interpolation G60.1
- EZ Guide I ( Doosan Infracore Conversational Programming Solution ) with 10.4" Color TFT
- Handle interruption
- High speed skip function
- Increment system 1 / 10
- Interpolation type pitch error compensation
- Manual handle feed 2 / 3 unit
- Machining time stamp function
- No. of Registered programs 1000 ea
- Number of tool offsets 400 ea
- Optional block skip addition 9 blocks
- Part program storage 512kb (1280m) / 1Mb (2560m)
- Polar coordinate command G15 / G16
- Position switch
- Programmable mirror image G50.1 / G51.1
- Stored stroke check 2 / 3
- Tool position offset G45 - G48
NC Unit Specifications

Heidenhain iTNC 530

DBC series

**AXES CONTROL**
- Controlled axes 5 (X, Y, Z, W, B)
- Simultaneous controlled axes
  - Positioning / Linear interpolation 5 axes
  - Circular interpolation 2 axes
  - Helical interpolation 3 axes
- Backlash compensation
- Least command increment 0.001mm / 0.0001( inch )
- Least input increment 0.001mm / 0.0001( inch )
- Linear axis error compensation
- Reversal peaks with circular movement compensation
- Stick-slip friction compensation

**INTERPOLATION & FEED FUNCTION**
- Circle In 3 axes
- Feedfoward
- Feedrate override 0 - 150 %
- Feed hold std.
- Helix interpolation
- Manual handwheel feed 1 unit
- Optional block skip
- Single block
- Straight line In 5 axes

**SPINDLE FUNCTION**
- Spindle orientation
- Spindle position control
- Spindle speed override 0 - 150%

**TOOL FUNCTION**
- 3 dimensional tool compensation
- Number of tool offset 999 ea
- Tool management

**PROGRAMMING & EDITING FUNCTION**
- Acture position capture
- Calculator
- Comment and structure blocks in the NC program
- Complete list of all current error messages
- Context-sensitive help function for error message
- Datum tables
- Graphical support for programming cycles
- Graphic simulation
- Heidenhain conversation format programmi
- Mathematical function
- No. of registered program No limit
- Plane view
- Programming graphics
- Programming with variable Q parameters
- Program memory Approx 26GB on hard disk
- Returning to the contour
- The integrated help system TNC guide

**OTHERS FUNCTIONS (Operation, Setting & Display, etc)**
- Actual speed display
- Alarm display
- Clock function
- Diagnostic function
- Display TFT 15" color
- Ethernet TCP / IP
- Integrated oscilloscope
- Log( error message and keystroke ) use PCs
- Trace function
- USB USB1.1

**OPTIONAL SPECIFICATIONS**
- Display TFT 15" color
- DCM Collision
- DXF Converter
- Heidenhain DNC
- KinematicsOpt
- Tool touch probes TT-series, TL Series
- Workpiece touch probes TS-series