DCM series
Five Face Double Column Machining Center

Doosan Machine Tools
Optimal Solutions for the Future
Market demand realization through the technology of Doosan!

**DCM series**

Five Face Double Column Machining Center

Various machining and widen effective width between columns
- Parts that had to be cut on several machines can be finished on one DCM
- Effective width between columns is 200 mm wider than that of competitors

Machine design to improve productivity
- Elevating type crossrail W-axis adopted as standard
- Various ram spindle line-up for handling a wide range of cutting work

Differentiated manufacturing system for quick delivery
- Quick machine delivery to customers through the modular design
- Speedy production to market requs
D: Doosan Double
C: Column
M: Machining Center

※ This machine has optional features.
Multi-tasking Machine for all your work needs the DCM Series

DCM series are the new concept machining center for all machining processes, from heavy cutting to high-accuracy finishing for mold & die works and large complex parts. To ensure such competitiveness, the precise ball-screw drive elevating type crossrail W-axis and a variety of head attachment line-up that enable complex machining are mounted.

Distinctive Option

1. Head attachments for various types of applications.
2. Spindle options for various types of applications.

High-end Processing Support

1. Intelligent machining control®
   (Automatic performance lever conversion to operator’s selection)
2. Five face machining support system®
   (Provides user convenience when five face machining)
3. Easy setup guidance®
   (Easy and quick setup functions for large and heavy workpieces)
DCM Series Line-up

W-Frame Head Attachment
C-axis Rotation : Manual Index

F-Frame Head Attachment
C-axis Rotation : Auto Index

Standard Type
W : Effective Width Between Columns
H : Table to Spindle Nose

W : 2700 mm
   (106.30 inch)
3200 mm
   (125.98 inch)
3700 mm
   (145.67 inch)

H : 1650 mm
   (64.96 inch)

High Column Type
W : Effective Width Between Columns
H : Table to Spindle Nose

W : 2700 mm
   (106.30 inch)
3200 mm
   (125.98 inch)
3700 mm
   (145.67 inch)

H : 2000 mm (78.74 inch)
2350 mm (92.52 inch)
2700 mm (106.30 inch)
3050 mm (120.08 inch)
3400 mm (133.86 inch)

Table Type

APC Type * For more details, please contact Doosan
The DCM series are the professional equipments for heavy-duty machining developed based on Doosan’s know-how in machine design and production which ensure high accuracy and long life even under heavy machining loads.

**Rigid Bed and Column Structure**

Stable bed and column structure designed for high-speed, heavy-duty machining.

**Key Features of the DCM Series**

The DCM series are the professional equipments for heavy-duty machining developed based on Doosan’s know-how in machine design and production which ensure high accuracy and long life even under heavy machining loads.

**Bed & Column Structure**

The structure of DCM series minimizes the impact of vibration on workpieces under the loads of vertical and horizontal cuttings even when all five faces are being processed. Accurate compensation and thermal symmetric design to reduce thermal displacement are applied.

**Crossrail Structure**

The crossrail guide structure upholds the moving loads of saddles, rams and head attachments. It maintains high accuracy from heavy to finish cutting.

**Bed & Table Structure**

The table moves on four guideways. Numerous guideways can prevent local deformation through load distribution.
Optimal Design Based on Structure Analysis of Saddles and Ram Spindles

The ram section is bigger than that of competitors at 380 x 380 mm (14.96 inch x 14.96 inch) which allows a superior heavy cutting under any direction of horizontal machining loads. The spindle with 6000 r/min has been equipped as a standard.

Spindle power-torque diagram

Standard Specifications
- Built-in spindle 6000 r/min
- Spindle motor 25/22 kW (34/30 Hp)
- Spindle torque 600 N-m (442.8 ft.lbf)

Various Ram Spindle line-up

Heavy cutting option I (Gear box)
- High speed spindle 6000 r/min
- Spindle motor 22/18.5 kW (30/25 Hp)
- Spindle torque 646 N-m (476.7 ft.lbf)

Heavy cutting option II (Gear box)
- High speed spindle 4000 r/min
- Spindle motor 26/22 kW (35/30 Hp)
- Spindle torque 1165 N-m (859.8 ft.lbf)

Heavy cutting option III (Gear box)
- High speed spindle 4000 r/min
- Spindle motor 37/30 kW (50/40 Hp)
- Spindle torque 1705 N-m (1258.3 ft.lbf)

Structure Design for Powerful Heavy Cutting

The ram spindle unit is designed to maintain ideal conditions under any pressure through stress analysis.

Unit stress analysis of saddle & Ram spindle

X + Direction  
X - Direction  
Y + Direction  
Y - Direction

Stress comparison of spindle sections

- FEM analysis used to design a stable body. (FEM : Finite Element Method)
- The data is based on Doosan Machine Tools standards.
Heavy Cutting Performance

Face mill

<table>
<thead>
<tr>
<th>Material : SM45C (Carbon steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RAM spindle line-up</strong></td>
</tr>
<tr>
<td>Heavy cutting option I (18+SPM22)</td>
</tr>
<tr>
<td>Heavy cutting option II (22+SPM30)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material : GC300 (Cast iron)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heavy cutting option I (18+SPM22)</strong></td>
</tr>
<tr>
<td><strong>Heavy cutting option II (22+SPM30)</strong></td>
</tr>
</tbody>
</table>

End mill

<table>
<thead>
<tr>
<th>Material : SM45C (Carbon steel)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model No.</strong></td>
</tr>
<tr>
<td>DCM series</td>
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</table>

<table>
<thead>
<tr>
<th>Material : GC300 (Cast iron)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DCM series</strong></td>
</tr>
</tbody>
</table>

* The data is based on Doosan Machine Tools standards.
* The data may vary under different test conditions.

High Accuracy for Mold & Die

<table>
<thead>
<tr>
<th>Rail-shape Plastic toy (injection mold)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model No.</strong></td>
</tr>
<tr>
<td><strong>Process material</strong></td>
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<tr>
<td><strong>Material size mm (inch)</strong></td>
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<tr>
<td><strong>Processing time</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-Door Sedan Door Trim (press mold)</th>
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</thead>
<tbody>
<tr>
<td><strong>Model No.</strong></td>
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<tr>
<td><strong>Process material</strong></td>
</tr>
<tr>
<td><strong>Material size mm (inch)</strong></td>
</tr>
<tr>
<td><strong>Processing time</strong></td>
</tr>
</tbody>
</table>
**W-axis Machining Function**

Perfect parallelism in between machine table and Y-axis movement along full stroke is maintained by this unique function composed of accurate proportional hydraulic and fine synchronous servo technology.

**Performance Comparison between 3-axis and W-axis DCM**

**Crossrail (W-axis)-vertical traverse**

Protruded part of the ram spindle can be minimized as the crossrail (W-axis) travels vertically. Therefore, cutting conditions remain stable from rough to finish cutting.

**3-axis fixed top beam**

Excessive protrusion will cause vibration during heavy cutting. This will undermine the efficiency of rough cutting and the quality of finish cutting.

**Diverse Head Attachments for Assorted Processes**

Various head attachments can be provided. ATC is applicable both vertical and horizontal attachment.
Provides numerous utilities to ensure the same performance provided by the original ram spindle even after changing a Head Attachment.

### Head Attachment Line-up

**W-Frame Head Attachment**  
(Vertical spindle with multi-orientation functions)

- **#100**: Dummy Head
- **#200**: Extension Head
- **#300**: 90° Angle Head (Manual index)

**F-Frame Attachment**  
(5-face machining spindle with C-axis indexing function)

- **#150**: Dummy Head
- **#250**: Extension Head
- **#350**: 90° Angle Head (1°, 5° Index)

**U-Frame Head Attachment**  
(5-axis machining spindle with B/C-axis contouring)

- **#400**: Extension Head
- **#500**: Universal Head (Manual index)
- **#600**: Indexable 90° Angle Head (2.5° Index)
- **#700**: Universal Indexing Head (B/C-axis 5°, 1° Index)
- **#800**: Universal Contouring Head (B/C-axis 0.001° contouring)
- **#900**: Special Head (10°, 15°, 30°, 45° Head) (Manual index)
- **#950**: Special Head (10°, 15°, 30°, 45° Head)

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**W-Frame Spindle**

<table>
<thead>
<tr>
<th>Type</th>
<th>Common Part</th>
<th>Narrow and Deep Machining</th>
<th>General Job Shop</th>
<th>Mold &amp; Die</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mold &amp; Die</strong></td>
<td>Industrial Area</td>
<td>Ram : mm (inch)</td>
<td>L : mm (inch)</td>
<td>Power : kW (Hp)</td>
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<tr>
<td><strong>General Job Shop</strong></td>
<td>Industrial Area</td>
<td>Ram : mm (inch)</td>
<td>L : mm (inch)</td>
<td>Power : kW (Hp)</td>
</tr>
</tbody>
</table>

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*The provided utility line could be different as choosing the head attachment.*
W-Frame Spindle

<table>
<thead>
<tr>
<th>Type</th>
<th>Line-up</th>
<th>Applications</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>No. Ram : mm (inch)</td>
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<tr>
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<td></td>
<td>#401</td>
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<td>#601</td>
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<td>#900 Series</td>
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<tr>
<td>F-Frame Spindle</td>
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F-Frame Spindle

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<tr>
<th>Type</th>
<th>Line-up</th>
<th>Applications</th>
<th>Specification</th>
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<tbody>
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<td>No. Ram : mm (inch)</td>
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<tr>
<td>F-Frame Spindle</td>
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U-Frame Spindle

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<th>Type</th>
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<th>Specification</th>
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<td>No. Ram : mm (inch)</td>
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<td>#150 Series</td>
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* For more details, please contact Doosan
Automatic Tool Changer

One arm performs the changes for both the horizontal and vertical spindle. The next tool to be used, regardless of the spindle location, is brought to the standby position during cutting. The most reliable ATC and magazine with its servo motor minimize troubles and downtime.

Horizontal ATC operation with a 90° head attach mounted.

AAC (Automatic Head Attachment Changer) opt.

For the multi face machining, various type of head attachment is required. AAC, controlled by NC, is available to realize full automation in multi face machining.

Automatic Pallet Changer opt.

Reducing setting time for workpiece and improving productivity by using APC.

Chip Disposal opt.

Chips are rapidly and continuously discharged. Lift-up chip conveyor is optional / side chip conveyor (coil conveyor) is Standard for DCM 2740. Over DCM 2750 is optional.
**Five Face Machining Support System®**

- 3-dimensional-work coordinates conversion system
- Tool end point shift within work coordinate system
- AAC control and head attachment position control by M-Code
- ATC is applicable various head attachments.

The work coordinate system can be set easily and simply by getting the tool or test bar in touch with work and making operations on the screen. Also it can be used for the automatic measuring probe.

* The functions above are provided as package when 5-face machining head attachment is selected.

**Easy Setup Guidance** Patent pending

The work coordinate system can be set easily and simply by getting the tool or test bar in touch with work and making operations on the screen. Also it can be used for the automatic measuring probe.

**Easy Pattern Cycle** Patent pending

This software provides machining patterns required for part machining. It will greatly reduce programming time and can be used for machining on the shop floor immediately.

**Various hole patterns & milling patterns**
**Work load counter control**

This function will help upgrading machining efficiency. If customer select proper M-Code according to weight of the work piece, machine can decide itself best moving pattern of the table. And machining can progress by this decision.

<table>
<thead>
<tr>
<th>M-Code</th>
<th>Work Load</th>
<th>DCM 2740</th>
<th>DCM2750</th>
<th>DCM 2760</th>
<th>DCM 3250</th>
<th>DCM 3260</th>
</tr>
</thead>
<tbody>
<tr>
<td>M380</td>
<td>5 Ton and less</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>
</tr>
<tr>
<td>M382</td>
<td>15 Ton and less</td>
<td>•</td>
<td>•</td>
<td>•</td>
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<td>•</td>
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<tr>
<td>M383</td>
<td>20 Ton and less</td>
<td>•</td>
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</tbody>
</table>

**Process Monitoring Function**

Minimizes the failure of material on processing through process monitoring and actualizes automation.

- **Cutting load monitoring function**
  - Automatic tracking of worn-out or broken tools when abnormal load is checked.
  - Data storage function for each workpiece.

- **Tool Maintenance Function**
  - An alarm sounds when the tool’s life reaches its end.
  - Tool management by groups and alternative tools usages are possible.

**Intelligent Machining Control®**

- Offers M-Code for differentiated operation parameters for each process.
- Offers universal functions applicable from die & mold to industrial parts.

<table>
<thead>
<tr>
<th>Application stage</th>
<th>Performance level</th>
<th>Mold market response</th>
<th>Industrial machinery market response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient mode M320</td>
<td>High speed processing</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Standard mode M321</td>
<td>High speed &amp; precision processing</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Finish cutting mode M322</td>
<td>High precision</td>
<td>•</td>
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</tr>
</tbody>
</table>

- High speed CPU use
- Servo spindle motor with superb dynamic characteristics
- Equipment structure with outstanding hardness
- High speed servo system
- Variable acceleration control
- Control in advance
- Powerful block handling capacity
- NANO level control
- CAM S/W linkage capability, NURBS function etc.
Advanced CNC system (FANUC 31i-B)

Buttons compatible with HEIDENHAIN & Siemens

Buttons are divided into vertically and horizontally by functions.

• Mono lever jog switches below the main control panel (MCP) for convenient traverse of large equipment’s major axis.
• Pulse handle for user convenience & manual handle (Portable MPG) for easy setting.

File management & editing function similar to that of a PC

Naming of programs with up to 32 characters Paging subprograms with file names Program management by folder.

Greater user friendliness

• Mono lever jog switches below the main control panel (MCP) for convenient traverse of large equipment’s major axis.
• Pulse handle for user convenience & manual handle (Portable MPG) for easy setting.

Maintenance Function

Easy Operation Guidance

This Guidance can be to operate machine easily and offer customer five detail function for convenience.

• Alarm guidance
• Useful function setting screen
• Operation report
• Thermal error compensation
• Program remaining cycle time

Periodically checking function

Provides notification of checked items including oil filling for equipment maintenance.

AAC & ATC position setting function
Installation precautions

1. Test for bearing capacity of soil should be taken more than four areas. (In particular, places for bed and column where the loads are concentrated must be tested.)
2. Basically, the bearing capacity of soil should exceed the values determined by Doosan.
   (Test for bearing capacity of soil should follow Doosan’s standards.)
3. Our engineering team may be available even during the foundation work at customer’s request.

Installation & test run

- It will take five weeks at the customer site after transportation. (Barring the third week for concreted surface curing.)
- Actual installation & test run time will be varied by site’s conditions and optional features supplied.
Maximum tool length

- With an adjacent tool
- Without an adjacent tool
- Pull Stud : MAS 403 P50T-1 (45°)

Various tooling applications

- Any type of tooling (Mas, CAT, DIN, Big-plus, HSK) can be used.
- Please contact our engineering team if necessary.

Work Area & Table-Shape

| Model   | Table Type | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    |
|---------|------------|------|------|------|------|------|------|------|------|------|------|------|
| DCM 2740 | 22 x 41 (0.87 x 1.61) | 2700 (106.30) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3200 (125.98) | 4250 (167.32) | 2200 (86.61) | 4100 (161.42) | 3900 (153.54) | 100 (3.94) |
| DCM 2750 | 22 x 51 (0.87 x 2.01) | 2700 (106.30) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3200 (125.98) | 5250 (206.69) | 2200 (86.61) | 5100 (200.79) | 4800 (188.98) | 150 (5.91) |
| DCM 2760 | 22 x 61 (0.87 x 2.40) | 2700 (106.30) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3200 (125.98) | 6250 (246.06) | 2200 (86.61) | 6100 (240.16) | 5700 (224.41) | 200 (7.87) |
| DCM 3250 | 27 x 51 (1.06 x 2.01) | 3200 (125.98) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3700 (145.67) | 5250 (206.69) | 2700 (106.30) | 5100 (200.79) | 4800 (188.98) | 150 (5.91) |
| DCM 3260 | 27 x 61 (1.06 x 2.40) | 3200 (125.98) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3700 (145.67) | 6250 (246.06) | 2700 (106.30) | 6100 (240.16) | 5700 (224.41) | 200 (7.87) |
| DCM 3280 | 27 x 81 (1.06 x 3.19) | 3200 (125.98) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 3700 (145.67) | 8250 (324.80) | 2700 (106.30) | 8100 (318.90) | 7800 (307.09) | 150 (5.91) |
| DCM 3780 | 32 x 81 (1.26 x 3.19) | 3700 (145.67) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 4200 (165.35) | 8250 (324.80) | 3200 (125.98) | 8100 (318.90) | 7800 (307.09) | 150 (5.91) |
| DCM 37100 | 32 x 101 (1.26 x 3.98) | 3700 (145.67) | 1650 (64.96) | 700 (27.56) | 1100 (43.31) | 4200 (165.35) | 10250 (403.54) | 3200 (125.98) | 10100 (397.64) | 9900 (389.76) | 100 (3.94) |
## Machine Specifications

### Standard Feature
- **F-Frame**
  - #350 90° Angle Head
  - C-Axis Control with BZ Sensor
  - Two Station AAC
  - 3-Dimensional Coordinate Conversion
  - 5-Faces Machining Support System®
- **Air Blower (2-Nozzle)**
- **ATC Op. Panel**
- **Auto Power Off**
- **Backside Chip Cover**
- **Coolant Tank Capacity 500L**
- **Counter Balancing Pendant Arm**
- **Datum Slot**
- **DSQ 1**
- **Dummy Head**
- **Easy Pattern Cycle**
- **External MCCODE (4 ea)**
- **Hydraulic Power Unit**
- **Intelligent Machining Control®**
- **Leveling Blocks & Anchor Bolts**
- **Main Op. Panel**
- **Mono Lever Jog Switches**
- **Operator Call Lamp (Red/Yellow/Green)**
- **Periodical Checking Function**
- **Push Button For Tool Unclamp**
- **Safely Ladder & Top beam Fence**
- **Self Diagnostic Function**
- **Side Cool Conveyor (DCM 2740 Only)**
- **Sildeway Bellows Cover (Z)**
- **Sildeway Covers (X/Y/W)**
- **Spindle Air Purge**
- **Spindle Cooling System**
- **Spindle Load Monitor**
- **Spindle Lubrication Device**
- **Standard Tooling Kit**
- **W-Axis Balancing System**
- **Work Light (LED : 2ea)**
- **Work Load Counter Control**

### Optional Feature
- **Head Attachments**
  - **W-Frame**
    - #200 Extension Head
    - #100 Manual 90° Angle Head
    - #400 Indexable 90° Angle Head
    - #600 Universal Head
    - #950 Special Head (Custom Spec.)
- **3-APG**
  - **Portable Type**
  - **AAT**
  - **Two Station, Three Station**
  - **Linear Shuttle, 5 + 7 Station**
  - **Additional 5th Axis**
  - **Package #1 : Only Aiming**
  - **Package #2 : Hyd. & Control Ready**
  - **Package #3 : Full OPT.**
  - **Air Compressor**
  - **Air Dryer**
  - **Air Gun**
  - **APC (Side Shuttle : Two Pallet)**
  - **Auto Power Off**
  - **Auto Tool Breakage Detection**
  - **Automatic Tool Measurement**
  - **CAD / CAM System Support**
  - **Cable / Chip Splash Guard**
  - **Chip (For Fan)**
  - **Chip Basket (50L)**
  - **Coolant Gun**
  - **Coolant Tank Capacity 1500L**
  - **Dassan Tool Load Monitoring**
  - **Dassan Tool Management**
  - **DSQ2 / DSQ3**
  - **Easy Operation Guidance**
  - **Easy Setup Guidance**
  - **Electric Box Aircon.**
  - **Electric Box Light (Fluorescent Lamp)**
  - **Electric Leakage Breaker**
  - **Electric Line Filter**
  - **High Column**
  - **High Up Chip Conveyor**
  - **Hinged Plate Chip Conveyor**
  - **Magnetic Scap Chip Conveyor**
  - **Linear Scale Feedback System (X/Y/Z/W)**
  - **MPG with Position Display**
  - **Oil Skimmer**
  - **Operator Call Buzzer**

Note: [ ] = are optional.

### Machine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>DCM 2740</th>
<th>DCM 2750</th>
<th>DCM 2760</th>
<th>DCM 3250</th>
<th>DCM 3260</th>
<th>DCM 3280</th>
<th>DCM 3780</th>
<th>DCM 37100</th>
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<tr>
<td><strong>Travel</strong></td>
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<td>X-axis Travel (Table Longitudinal)</td>
<td>mm (inch)</td>
<td>4250 (167.32)</td>
<td>5250 (206.69)</td>
<td>6250 (246.06)</td>
<td>5250 (206.69)</td>
<td>6250 (246.06)</td>
<td>8250 (324.80)</td>
<td>8250 (324.80)</td>
<td>10250 (403.54)</td>
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<td>Y-axis Travel (Spindle Head Cross)</td>
<td>mm (inch)</td>
<td>3200 (126.0)</td>
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<td>Z-axis Travel (Ram Vertical)</td>
<td>mm (inch)</td>
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<td>700 (27.56)</td>
<td>1000 (39.37)</td>
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<td>W-axis Travel (Vertical Movement of Crossrail)</td>
<td>mm (inch)</td>
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<td>1100 (43.33)</td>
<td>1400 (55.12)</td>
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<td>Effective width between columns</td>
<td>mm (inch)</td>
<td>2700 (106.3)</td>
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<td>3200 (125.98)</td>
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<td>Table to Spindle Nose</td>
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<td><strong>Feedrate</strong></td>
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<tr>
<td>Rapid Traverse X, Y, Z, W</td>
<td>m/min (ipm)</td>
<td>16, 16, 16</td>
<td>1629.9, 1629.9, 393.7</td>
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<td>Max. Cutting Feedrate X, Y, Z</td>
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<td>Ram Size</td>
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<td>Spindle Drive Motor (3/min. / cont.)</td>
<td>kW (hp)</td>
<td>25/22</td>
<td>33.5/29.5 {34.9/29.5, 29.5/24.8, 40.2/33.5}</td>
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<td>Tool Storage Capacity</td>
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<td>Max. Head Attachment Weight</td>
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<td><strong>Machine Size</strong></td>
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<td>Machine Height</td>
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<td>Floor Space (Machine only)</td>
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<td>7730 x 11200</td>
<td>7730 x 13757</td>
<td>7730 x 15710</td>
<td>8230 x 13375</td>
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<tr>
<td>Tool Storage Capacity</td>
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<td>Coolant Tank Capacity</td>
<td>L</td>
<td>1000</td>
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</table>

Note: [ ] = are optional.

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

For more details, please contact Doosan
NC Unit Specifications
FANUC 31i-B

AXES CONTROL
- Controlled axes 4 (X, Y, Z, W)
- 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 / 0.0001"
- Simultaneous controlled axes
- 2nd reference point return
- Least input increment 0.001mm / 0.0001"
- 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
- 3rd/4th reference point return G30P3 / P4
- Circular interpolation G02, G03
- Dwell G04
- Exact stop check G09, G61 (model)
- Feed per minute mm / min
- Feedrate override (10% increments)
- Jog override (10% increments)
- Linear interpolation G01
- Manual handle feed (1 unit)
- Manual handle feedrate 0.1 / 0.01 / 0.001 mm
- Override cancel M48 / M49
- Positioning G00
- Rapid traverse override F0 (fine feed), 25 / 50 / 100 %
- Reference point return G27, G28, G29
- Skip function G31
- Helical interpolation
- AI Contour Control II 300 block preview
- Thread cutting, synchronous cutting
- Program restart
- Automatic corner deceleration
- Feedrate clamp by circular radius
- Linear ACC / DEC before interpolation
- Linear ACC / DEC after interpolation
- Control axis detach
- Rapid traverse bell-shaped acceleration/deceleration
- Dual position feedback

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

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
- Tool offset memory C

PROGRAMMING & EDITING FUNCTION
- 3-dimensional coordinate conversion
- Absolute / Incremental programming G90 / G91
- Auto. Coordinate system setting
- Background editing
- Canned cycle G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Custom macro B
- Custom size 512kb
- Addition of custom macro common variables
- Decimal point input
- Linear interpolation
- Linear interpolation
- Jog override (10% increments)
- Feedrate override (10% increments)
- Circular interpolation
- Reference point return
- Rapid traverse override
- Positioning
- Spindle speed override (10% increments)
- Spindle speed command
- Spindle serial output
- M 3 digits

OTHERS FUNCTIONS (Operation, Setting & Display, etc)
- Program reset
- Run hour and part number display
- Search function Sequence NO. / Program NO.
- Self - diagnostic function
- Servo setting screen
- Single block
- External data input
- Multi language display

OPTIONAL SPECIFICATIONS
- 3-dimensional tool compensation
- 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 Contour Control II 600 block preview
- Automatic corner override G62
- Chopping function G81.1
- Cylindrical interpolation G07.1
- Data server
- Dynamic graphic display (This can’t use with the EZ Guide-I)
- Machining profile drawing
- Exponential interpolation
- Interpolation type pitch error compensation
- EZ Guide I (Doosan Infracore Conversational Programming Solution) with 10.4” Color TFT
- Tape format for FS15
- Increment system 1/10
- Figure copying G72.1, G72.2
- Manual handle feed 2/3 unit
- Handle interruption
- High speed skip function
- Involute interpolation G06.2, G07.2
- Look ahead control (Include : AI Contour Control) G08
- Machining time stamp function
- No. of Registered programs 500 / 1000 ea
- Number of tool offsets 400 / 499 / 999 / 2000 ea
- Optional block skip addition 9 blocks
- Part program storage 1280 / 2560 m
- Playback function
- Polar coordinate command G15 / G16
- Polar coordinate interpolation G12.1 / G13.1
- Programmable mirror image G50.1 / G51.1
- Remote buffer
- Scaling G50, G51
- Single direction positioning G60
- Stored stroke check 2 / 3
- Tool load monitoring function (doosan)
- Doosan tool management package I
- Tool position offset G45 - G68
- Tool length measurement
- Position switch
- High speed HRV3 function
- High speed HRV4 function
- Minirimage Reverse axis movement (setting screen and M - function)
- HRV2 Control

* ) Pre discussion required
http://www.doosaninfracore.com/machinetools/

Doosan Machine Tools
Optimal Solutions for the Future

EN 140829SU

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- For more details, please contact Doosan.