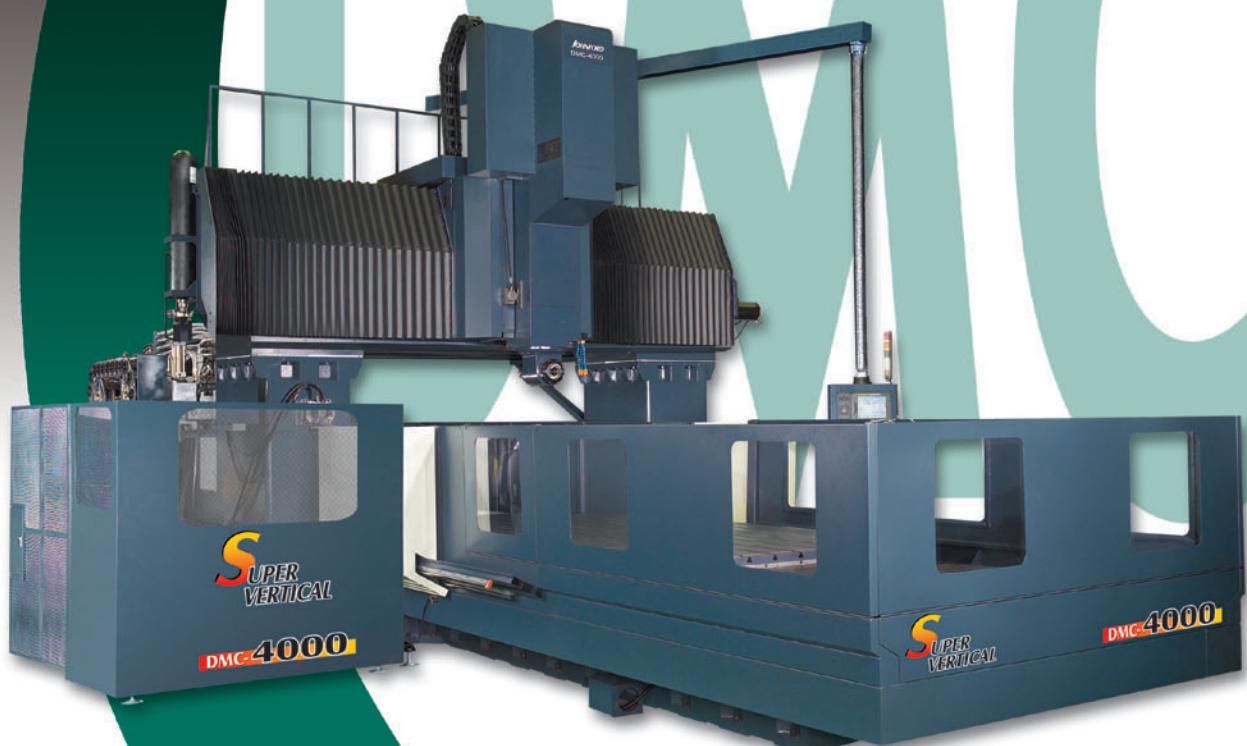




Double Column Machining Centers



DMC-4000 / SDMC-6000

Fixed / Moving Column, Multi-Axis / 5-Face Series
Order-Made

Double Column Machining Cent



Mightiest of Them All

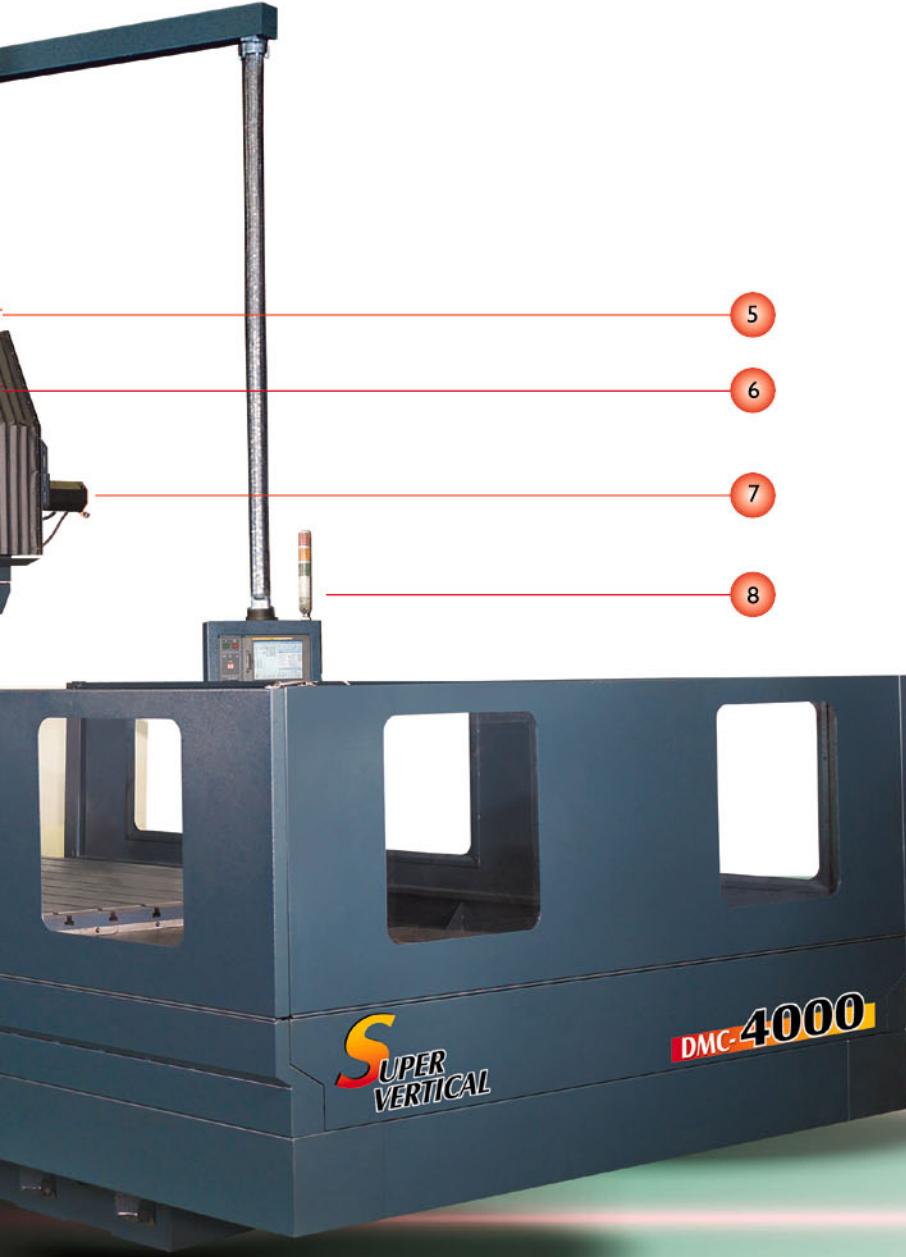
DMC-4000

Johnford DMC's are the heaviest, best built bridge mills on the planet. These are heavy machines built to last while delivering heavy cutting, high accuracy, and high speed. Check out these specs:

DMC-4000: 4000 x 2800 x 800 mm, 64200 kg
(157.5" x 110.2" x 31.5", 141400 lb)
4000 x 2800 x 1066 mm, 66200 kg
(157.5" x 110.2" x 42", 145800 lb)

When the machine is equipped with the multi-axis or 5-face heads, the machine structure is changed.

ters



1 Twin hydraulic cylinders balance the massive headstock.

2 Large diameter spindle is driven by a 26 kW (37 kW Opt.) spindle motor and 2 speed ZF helical transmission for heavy cutting. The spindle cartridge and the gearbox have their own separate oil chillers for the best thermal stability possible. Plus, it generates 662 N-m (488 lb.ft) of torque at only 375 rpm for 26 kW and 1472 N-m(1086 lb.ft) at only 240 rpm for 37 kW. Multi-axes heads are optional.

3 Johnford's ATC system is the best available. The standard ATC is 40 tools with options of 60 tools or more. The ATC is self contained and stands alone. The fixed pot system always puts the tool back in the pocket it came from. 200 mm (8") shell mills are easily accommodated in the magazine.

4 Massive one piece base castings. All major machine components are made from high quality meehanite cast iron.

5 The largest bridge and saddle in the industry! The cross rail is 1332 mm (52.4") tall x 1213 mm (47.8") deep. The saddle is 1250 mm (49.2") tall and 1200 mm (47.2") wide and holds onto a full 1250 mm (49.2") of the Z axis head for the ultimate in stability and rigidity. The massive Y axis ways are offset 250 mm (10") for stability and accuracy.

6 Ballscrews are the largest in the industry 80 mm (3.1") in the X, Y and 50 mm (2") in the Z. They are pretensioned to eliminate thermal growth.

7 Servo motors are the largest in the industry too! 6 kW on X and Y with 2:1 gear reduction drives for the most axis thrust available.

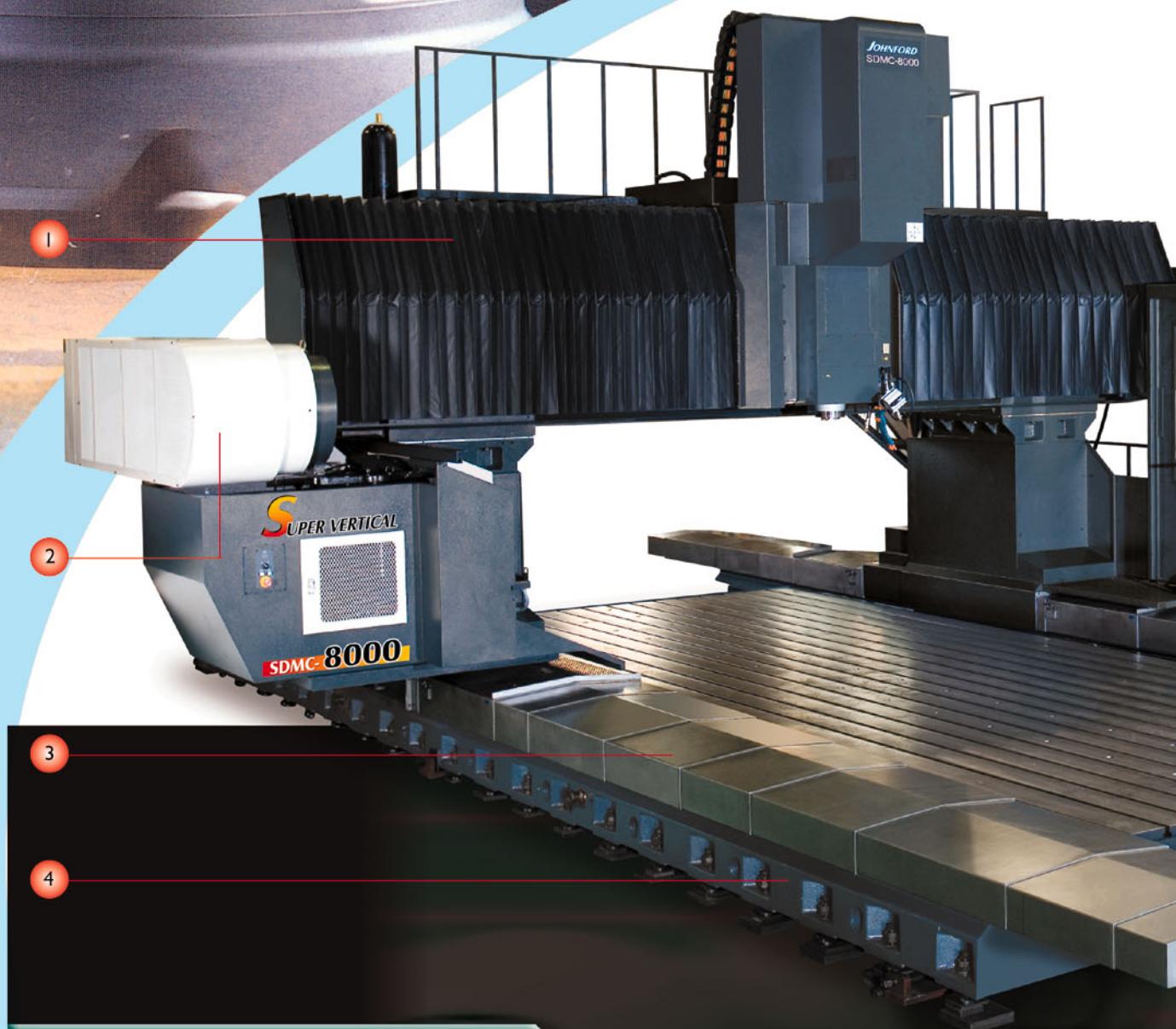
8 Fanuc 18i MB/0i MD/21i MB controls are used for reliable service and state-of-the-art technology.



7 Super Advanced Features

- Large diameter spindle with big power
- Twin hydraulic cylinders for balance
- The largest bridge and saddle in the industry
- The largest ballscrews in the industry
- The largest servo motors in the industry
- Twin chip removal systems
- Massive one piece castings
- Excellent ATC system
- The largest order-made machine available

Double Column Machining Cen



SDMC-8000

How Big is Big Enough for

Johnford SDMC's are built for the really big jobs.

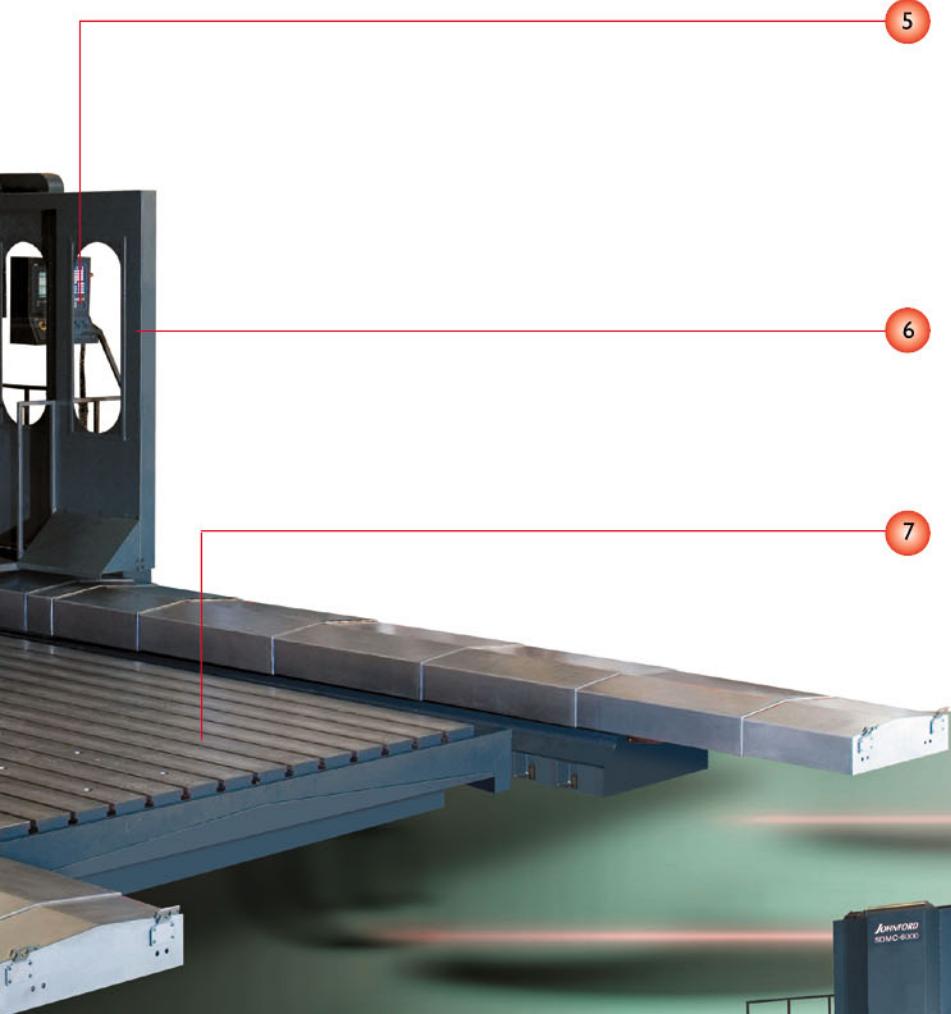
Starting with X travels of 5000 mm (196.9"), we can build it to 30000 mm (1181.1") or more.

When the machine is equipped with the multi-axis or 5-face heads, the machine structure is changed.

② Super Advanced Features

- Large diameter spindle with big power
- Twin hydraulic cylinders for balance
- The largest bridge and saddle in the industry
- The largest ballscrews in the industry
- The largest servo motors in the industry
- Twin chip removal systems
- Massive one piece castings
- Excellent ATC system
- The largest order-made machine available

ters (Rail Type)



1 Same massive bridge/saddle/head assembly as our DMC series.

2 Same excellent ATC system used on our DMC's. We mount the ATC to the column as the standard system to save ATC time.

3 Twin 80 mm (3.1") ballscrews are used on the X-axis in 11 meters. One ballscrew is under each column. The ballscrews are synchronized in a master/slave system by the Fanuc CNC control system. Due to the length of the ballscrews, the ballscrews remain stationary while the ball nuts are rotated by the powerful servo motors. When the X-axis length of machine is over 11 meters, we will use twin preloaded rack & pinion drive systems to move the X-axis of machine for standard. Because the ballscrews will have more cost made and difficulty in manufacturing.

4 Efficient chip removal system consisting of 2 screw type conveyors and a caterpillar type conveyor with 1220 mm (48") discharge height is standard.

5 Fanuc 18iMB control is standard

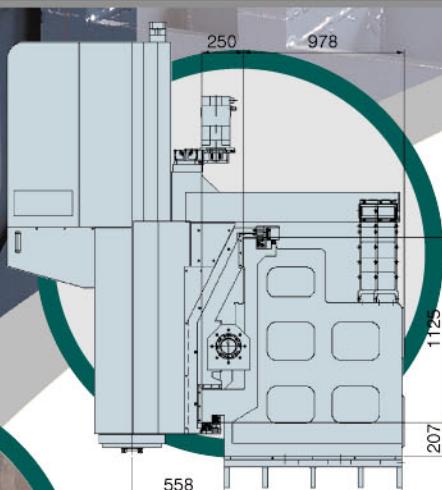
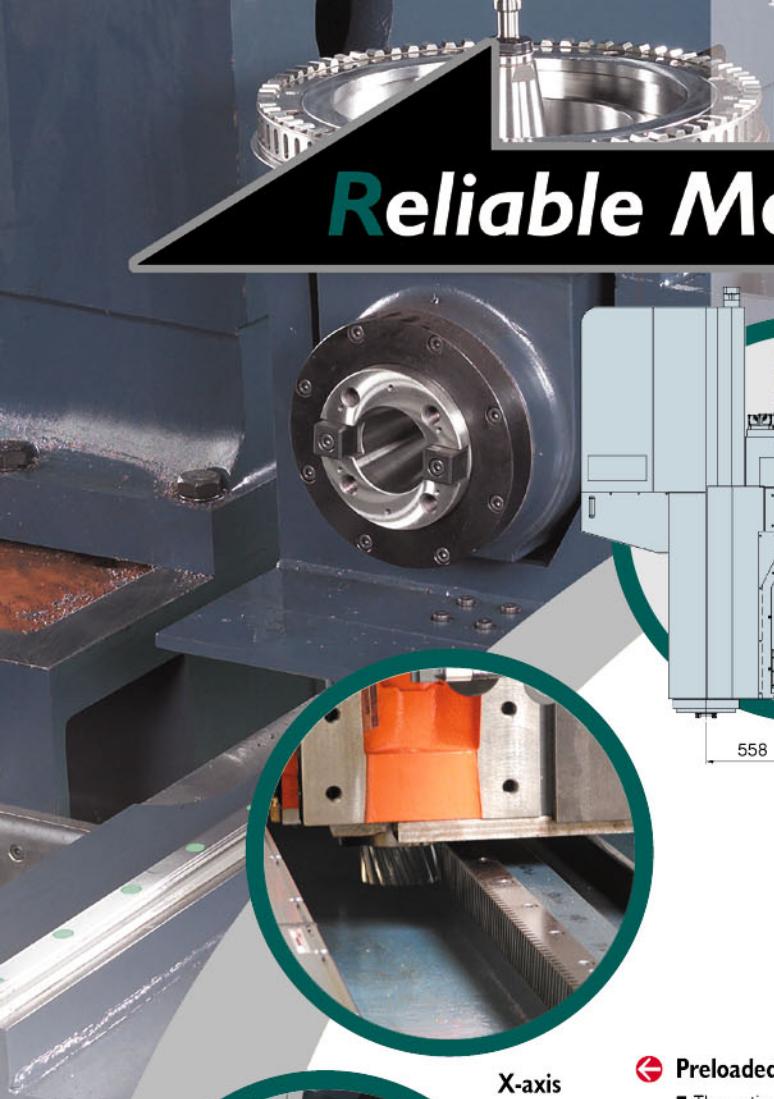
6 Operator rides along on platform attached to column.

7 Moving column/stationary table design can handle virtually unlimited table loads and conserves valuable floor space.

You?



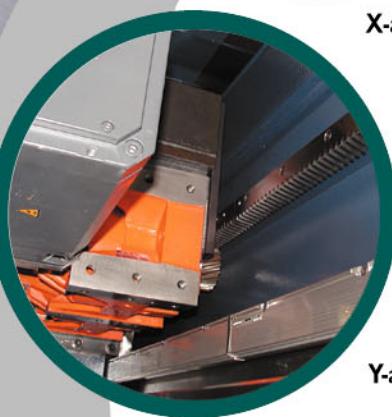
Reliable Mechanical Design



- ◀ Both Y & Z use hardened & ground box ways with turcite-B.
- Box structure ram ensures working stability and accuracy.
- Zero overhang on Z travel.
- Double support hydraulic counter balances provide high stability.



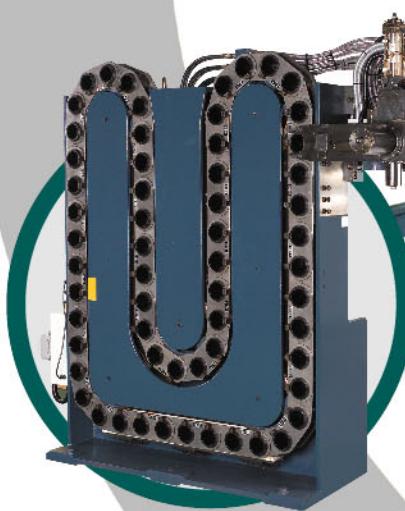
X-axis



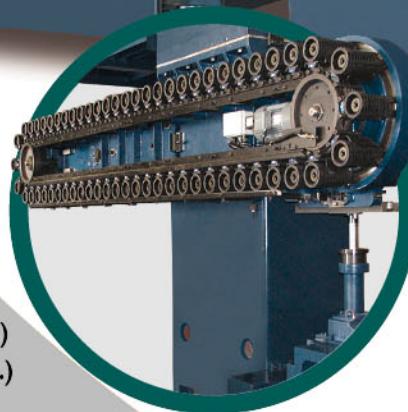
Y-axis

◀ Preloaded rack & pinion drive system (Opt.)

- The optional preloaded rack & pinion drive system is used on both X and Y-axes for large travel.
- It can prevent the machine from bad accuracy due to a long ballscrew bending and offer the SDMC machines high feeding speed.



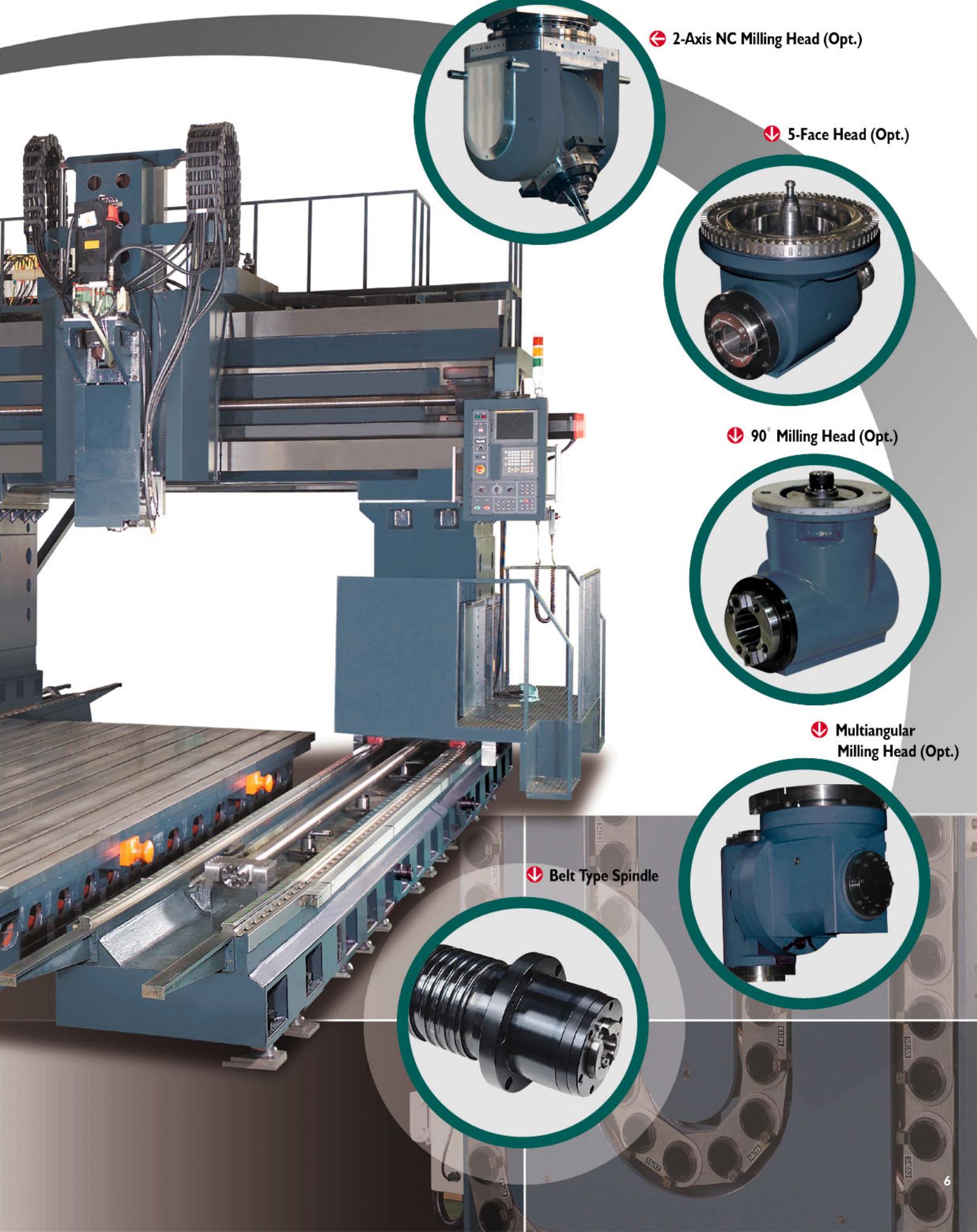
60 tools or more (Opt.)



40 tools (Std.)
60 tools (Opt.)

◀ Automatic Tool Changer

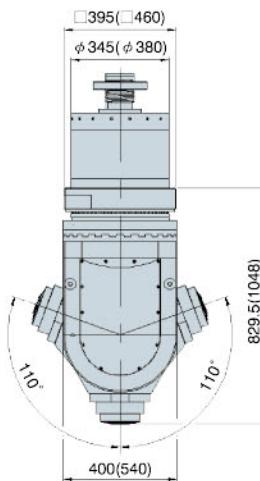
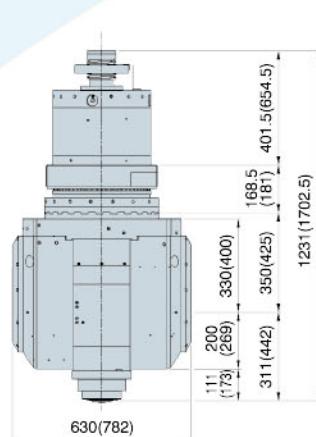
- Reliable automatic tool changer provides 7 seconds tool change time.
- Automatic tool change arm is supported by linear ways to ensure rapid & smooth traverse.
- Bi-directional tool changer without interference.
- 40 tools automatic tool changer is standard. 60 tools or more are optional.



2-Axis NC Milling Head

NC Milling Head with Motorized Spindle

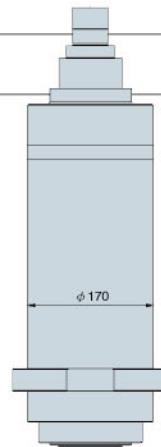
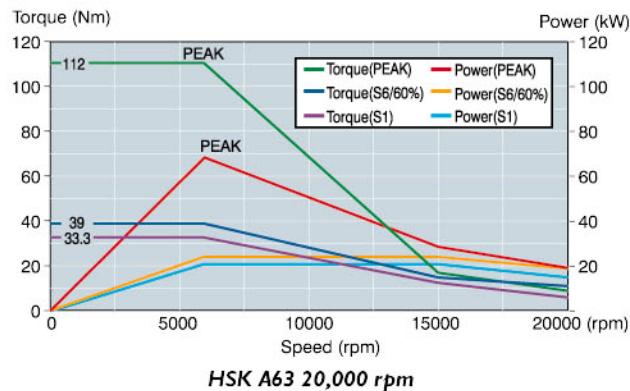
() For AC5 Tool System



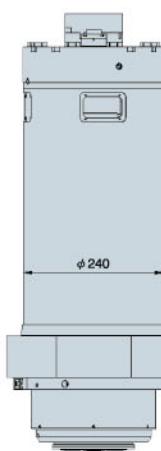
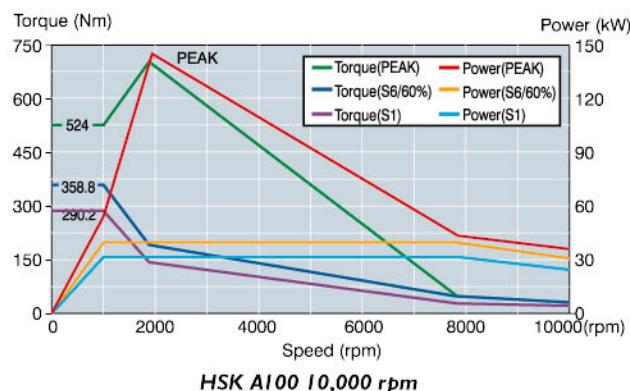
Technical Data

| Item | Model | Main Spindle | |
|-----------------------------|---------------------|-------------------------------|-----------------------------|
| | | AC4 | AC5 |
| Power | | 21 kW (S1) / 24 kW (S6-60%) | 31 kW (S1) / 40 kW (S6-40%) |
| Nominal speed | | 6,000 rpm | 1,000 rpm |
| Max. torque | | 34 Nm (cont.) / 100 Nm (max.) | 296 Nm (S1) / 401 Nm (S6) |
| Max. speed | | 20,000 rpm | 10,000 rpm |
| A-Axis swiveling angle | | ±110° | ±110° |
| C-Axis swiveling angle | | ±220° | ±220° |
| Tool system | | HSK A63 | BT-50 / CAT-50 / HSK A100 |
| Clamping system | | Hydraulic | Hydraulic |
| Clamping force | | 18 kN | 20 kN |
| Tool cleaning | | Automatic | Automatic |
| Spindle bearings front | | 2 x φ 70 Hybrid | 3 x φ 100 Hybrid |
| Bearing rigidity | | Axis / radial 512 N/μm | Axis / radial 660 N/μm |
| Bearing lubrication | | Grease | Grease |
| Spindle cooling | | Automatic | Automatic |
| Cooling performance | | 3 kW | 5 kW |
| Cooling temperature | | 20-25° | 20-25° |
| Cooling volume flow approx | | 12 l/min | 14 l/min |
| Metal removal rate | Milling | | Milling Drilling |
| Material | Steel 600-700 N/mm² | Aluminium AlMgSi 1 | Steel 600-700 N/mm² |
| Machining volume (cm³/min) | 268 | 1,026 | 568 |
| Tool/edges (φ mm) | 32 / 3 | 63 / 5 | 63 / 5 |
| Rotational speed (r.p.m.) | 3,580 | 4,460 | 1820 |
| Cutting speed (m/min) | 360 | 883 | 360 |
| Cut W x D (mm) | 25 x 4 | 50 x 4 | 50 x 5 |
| Feed (mm/min) | 2,685 | 5,129 | 2,275 |
| Cooling System | | | |
| External coolant supply | 6 Spray nozzles | | 6 Spray nozzles |
| Internal coolant supply | optional | | optional |
| Max. pressure | 70 bar | | 70 bar |
| Air | optional | | - |
| Minimal cooling lubrication | optional | | - |

Power Chart

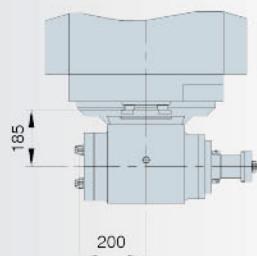


**HSK A63
(for AC42)**



**HSK A100
(for AC52)**

5-Face Head

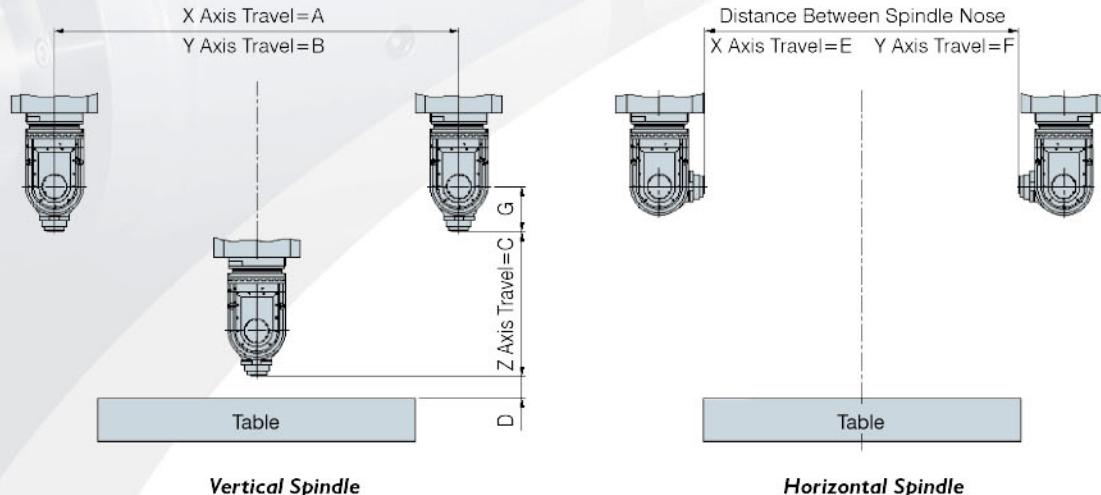


5-Face Head Specifications

| | |
|---------------------|--|
| Max. Spindle Speed | Vertical Spindle 6000 rpm Horizontal Spindle 2000 rpm / 4000 rpm (Opt.) |
| Spindle Motor | 22 / 26 kW |
| Spindle Taper | BT 50/CAT 50 |
| Spindle Lubrication | Grease / Oil-mist (Opt.) |
| Coolant | Coolant thru vertical Spindle |
| Axis Clamping | Curvic Coupling |
| Min. Indexing | 5 Degree / 1 Degree (Opt.) |
| Tool Clamping | Power Drawbar |

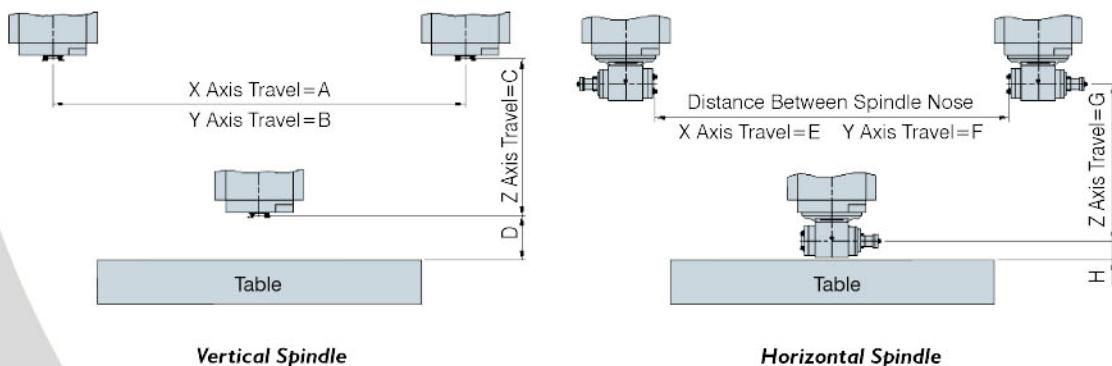
Working Range

DMC-4000x2800 - R2



| Size | Model | HSK A63 | HSK A100 |
|------|-------|------------------|------------------|
| A | | 4000 mm (157.4") | |
| B | | 3600 mm (141.7") | |
| C | | 1066 mm (42") | |
| D | | 150 mm (5.9") | |
| E | | 3370 mm (132.6") | 3100 mm (122") |
| F | | 2970 mm (116.9") | 2700 mm (106.3") |
| G | | 315 mm (12.4") | 435 mm (17.1") |

DMC-4000x2800-5F

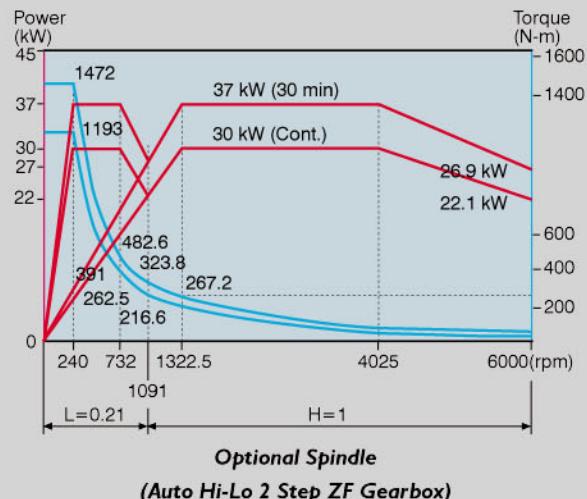
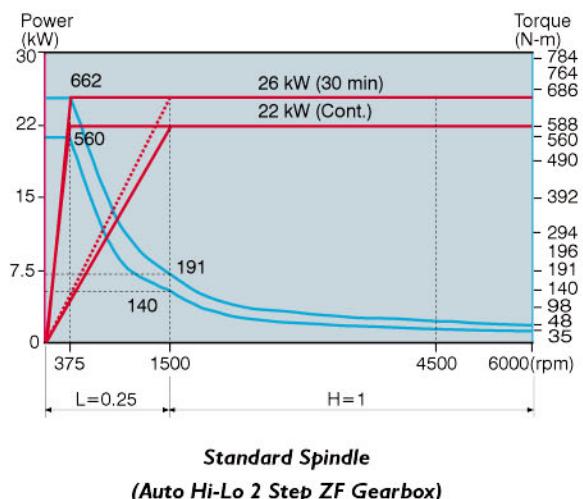


| Size | Model | DMC -4000x2800-5F |
|--------------------|-------|-------------------|
| Vertical Spindle | A | 4000 mm (157.4") |
| | B | 3600 mm (141.7") |
| | C | 1066 mm (42") |
| | D | 300 mm (11.8") |
| Horizontal Spindle | E | 3600 mm (141.7") |
| | F | 3200 mm (126") |
| | G | 1066 mm (42") |
| | H | 130 mm (5.1") |

Spindle Power & Torque Chart

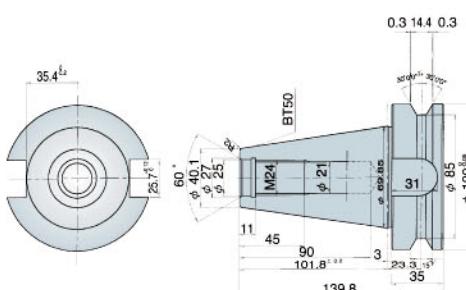
Belt Type Spindle

There are any other different kinds of spindle speeds for your choice.

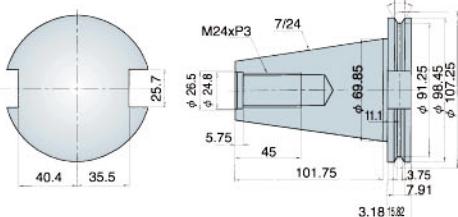


Tool & Pull Stud

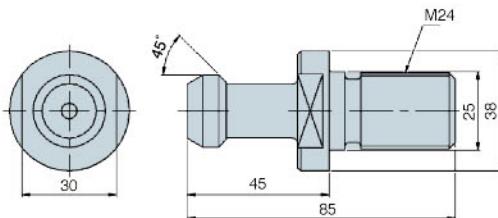
BT-50



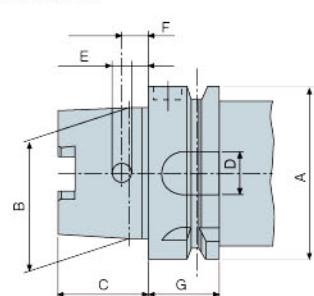
CAT-50



Pull Stud for C.T.S.



HSK A63/A100



| Size | Model | A63 | A100 |
|------|-------|----------|----------|
| A | | 63 mm | 100 mm |
| B | | 48 mm | 75 mm |
| C | | 32 mm | 50 mm |
| D | | 16.12 mm | 20.02 mm |
| E | | 7.5 mm | 12 mm |
| F | | 9 mm | 15 mm |
| G | | 26 mm | 29 mm |

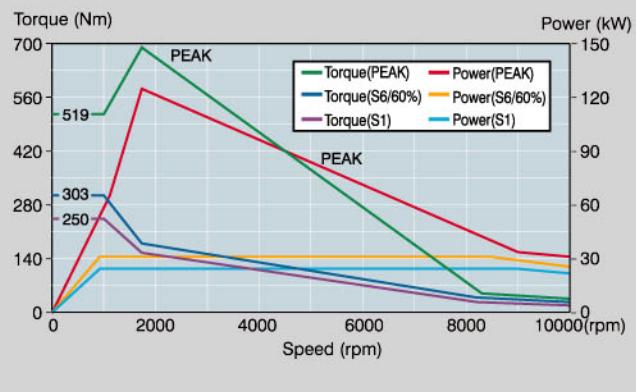
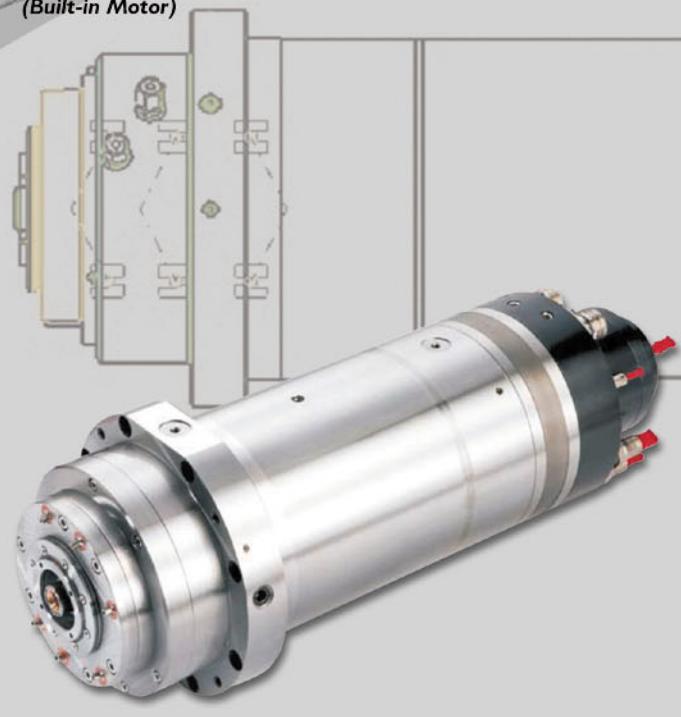
Spindle Power & Torque Chart

Technical Data

| Drive Layout | |
|--------------------------------------|------------------------------|
| Tool system | HSK A100 |
| Power | 26 (S1) / 31 (S6) kW |
| Nominal speed | 992 rpm |
| Max. Torque | 303 Nm |
| Max. Speed | 10000 rpm |
| Control | Fanuc / Siemens / Heidenhain |
| Voltage | 400V |
| Clamping system | Hydraulic |
| Clamping Force | 45 kN |
| Tool cleaning | Central + Surrounding |
| Spindle bearings | 2 x ϕ 100 Hybrid |
| Bearing lubrication | Grease |
| Spindle cooling | Water glycol |
| Cooling performance | > 7 kW |
| Cooling temperature | Temperature of machine + 2°C |
| Cooling volume approx | 15 l/min |
| Tool Cooling | |
| Internal coolant flow | Standard |
| Max. Pressure | 70 bar |
| Suitable for dry operation | Yes |
| Air | Possible |
| Min. quantities of cooling lubricant | - |

High Speed Spindle (Opt.)

(Built-in Motor)

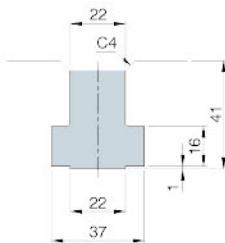


HSK A100 10,000 rpm

| Metal Removal Rate | Milling | Milling | Drilling | Threading |
|---|--------------------------------|---------------|--------------------------------|--------------------------------|
| Tool system | HSK A100 | HSK A100 | HSK A100 | HSK A100 |
| Power | 26 kW | 26 kW | 26 kW | 26 kW |
| Material | Steel 60-70 kg/mm ² | Aluminum 7075 | Steel 60-70 kg/mm ² | Steel 60-70 kg/mm ² |
| Machining volume (cm ³ /min) | 577 | 1770 | - | - |
| Tool.edges (φ mm) | φ 100 / 7 | φ 100 / 7 | φ 51 | M36 |
| Rotational speed (min ⁻¹) | 1146 | 2107 | 1435 | 330 |
| Cutting speed (m/min) | 360 | 662 | 230 | 37 |
| Cutting B x T (mm) | 80 x 4.5 | 80 x 5 | - | - |
| Feed (mm/min) | 1604 | 4425 | 287 | 1300 |

Dimensions

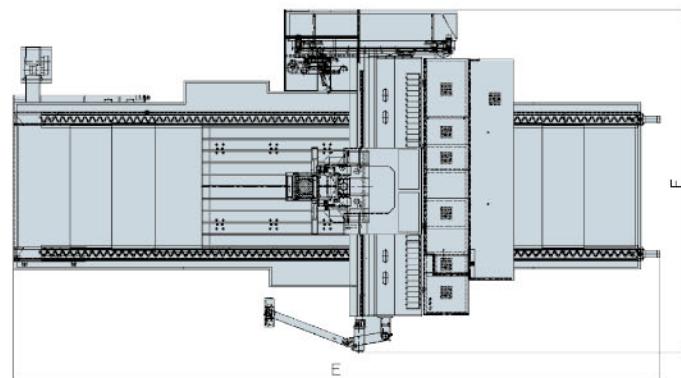
DMC-4000 x 2800



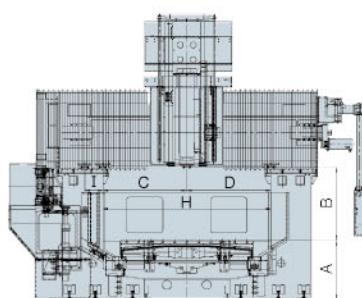
| Model Size | DMC-4000x2800x800 | DMC-4000x2800x1066 |
|------------|-------------------|--------------------|
| A | 1000 mm (39.3") | |
| B | 950 mm (37.4") | 1216 mm (47.8") |
| C | | 1400 mm (55.1") |
| D | | 1400 mm (55.1") |
| E | | 10900 mm (429") |
| F | | 5680 mm (223.6") |
| G | 4550 mm (180") | 4850 mm (191") |
| H | | 2800 mm (110.2") |
| I | | 300 mm (11.8") |
| J | | 4200 mm (165.3") |
| K | | 2200 mm (86.6") |
| L | | 200 mm (7.8") |



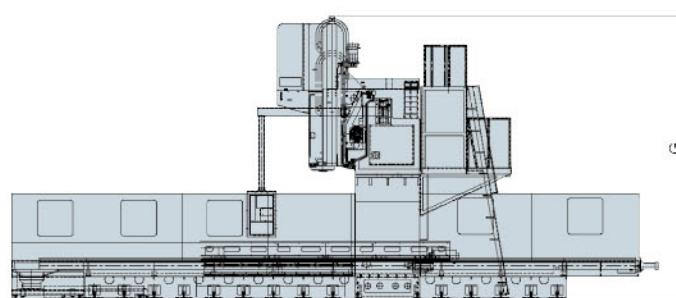
Table



Top View (floor space required)



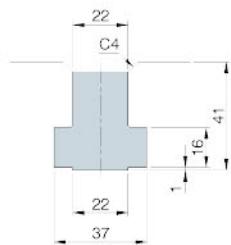
Front View



Side View

Dimensions

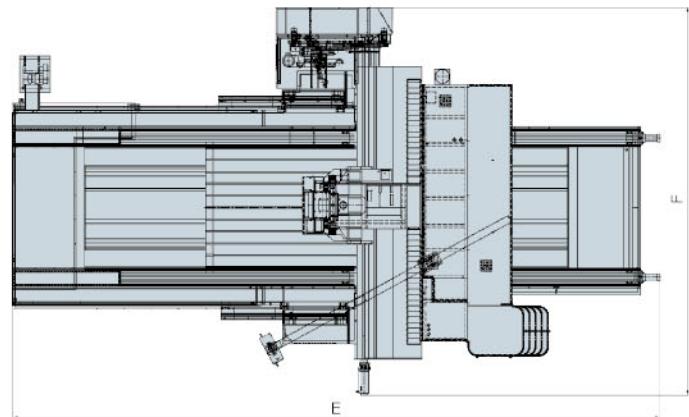
DMC-4000 x 2800 - R2



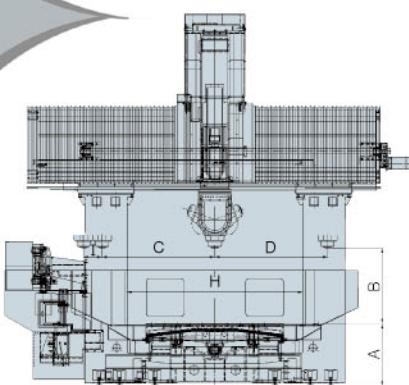
| Model Size | DMC-4000x2800-R2 (AC4) | DMC-4000x2800-R2 (AC5) |
|------------|------------------------|------------------------|
| A | 1000 mm (39.3") | |
| B | 1216 mm (47.8") | |
| C | 1800 mm (70.8") | |
| D | 1800 mm (70.8") | |
| E | 10900 mm (429") | |
| F | 6500 mm (256") | |
| G | 6280 mm (247.2") | 6500 mm (256") |
| H | 2800 mm (110.2") | |
| I | 300 mm (11.8") | |
| J | 4200 mm (165.3") | |
| K | 2200 mm (86.6") | |
| L | 200 mm (7.8") | |



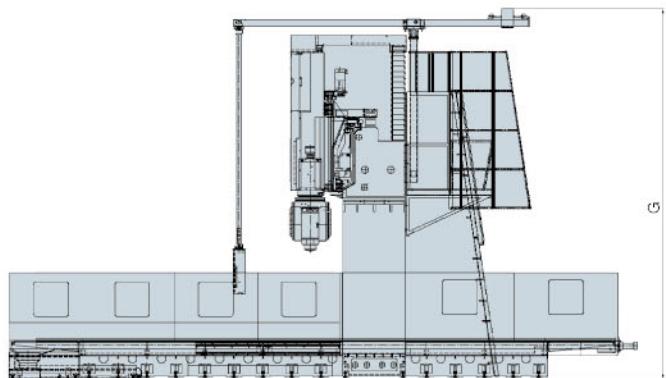
Front View



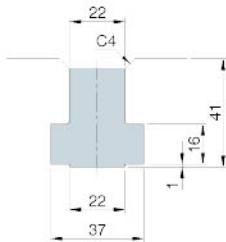
Top View (floor space required)



Side View



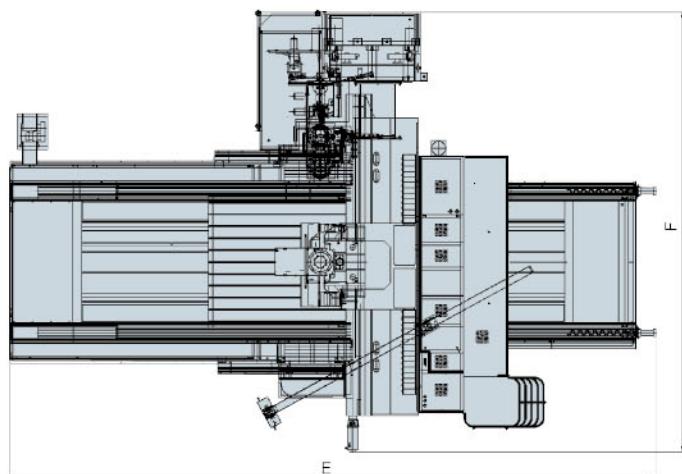
DMC-4000 x 2800 - 5F



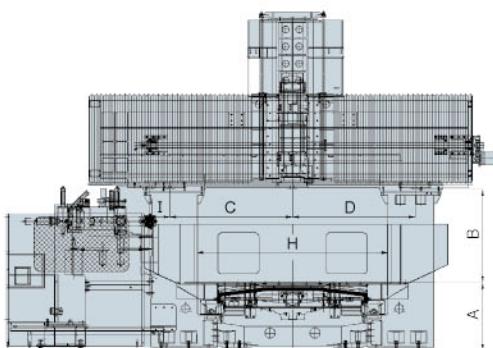
| Model Size | DMC-4000x2800-5F |
|---------------|------------------|
| A | 1000 mm (39.3") |
| B | 1366 mm (53.7") |
| C | 1800 mm (70.8") |
| D | 1800 mm (70.8") |
| E | 10900 mm (429") |
| F | 7400 mm (291.3") |
| G | 5800 mm (228.3") |
| H | 2800 mm (110.2") |
| I | 300 mm (11.8") |
| J | 4200 mm (165.3") |
| K | 2200 mm (86.6") |
| L | 200 mm (7.8") |



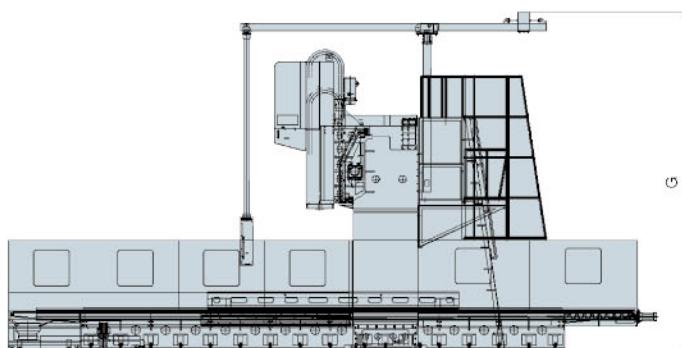
Table



Top View (floor space required)



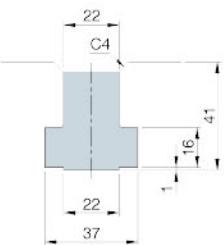
Front View



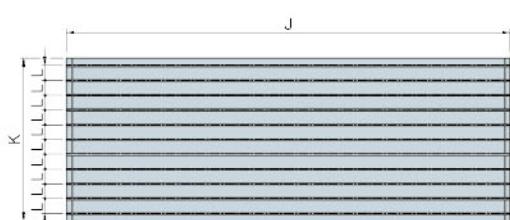
Side View

Dimensions

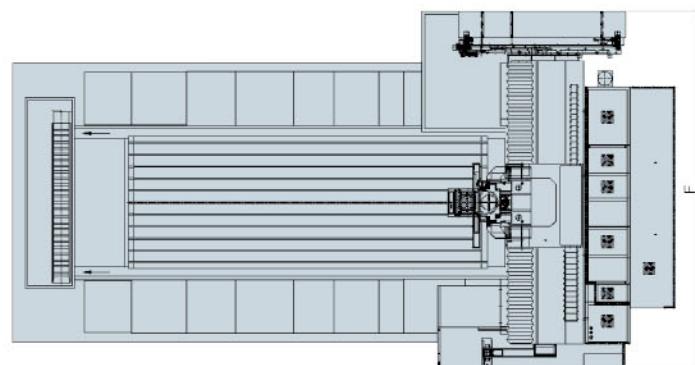
SDMC-6000 x 2800 x 800 / SDMC-6000 x 2800 x 1066



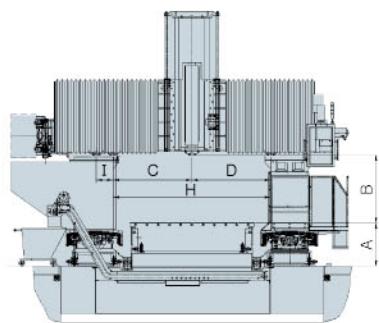
| Model Size | SDMC-6000x2800x800 | SDMC-6000x2800x1066 |
|------------|--------------------|---------------------|
| A | 765 mm (30.1") | |
| B | 950 mm (37.4") | 1216 mm (47.8") |
| C | 1400 mm (55.1") | |
| D | 1400 mm (55.1") | |
| E | 11200 mm (441") | |
| F | 6000 mm (236.2") | |
| G | 4265 mm (167.9") | 4531 mm (178.3") |
| H | 2800 mm (110.2") | |
| I | 300 mm (11.8") | |
| J | 6000 mm (236.2") | |
| K | 2200 mm (86.6") | |
| L | 200 mm (7.8") | |



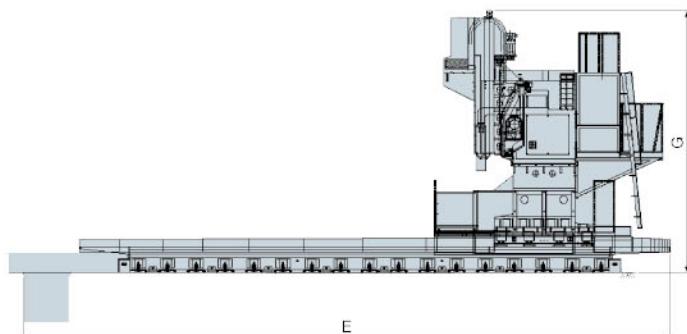
Table



Top View (floor space required)



Front View



Side View

Specifications

| Item | Model | DMC- | DMC- | DMC-4000x2800-R2 | | DMC-4000x2800-5F | SDMC- | SDMC- | | |
|--------------------------|---------------------------------|---|-----------------------------|------------------------------|-------------------------------|--|--|-----------------------------|------------------|--|
| | | 4000x2800x800 | 4000x2800x1066 | AC4 | AC5 | | 6000x2800x800 | 6000x2800x1066 | | |
| Distance between columns | | 2800 mm (110.2") | | | | | 2800 mm (110.2") | | | |
| Table size | | 4200 x 2200 mm (165.3" x 86.6") | | | | | 6000x2200 mm (236.2"x86.6") | | | |
| X axis travel | | 4000 mm (157.4") | | | | | | | | |
| Y axis travel | | 2800 mm (110.2") | | 3600 mm (141.7") | | | 2800 mm (110.2") | | | |
| Z axis travel | | 800 mm (31.5") | 1066 mm (42") | 1066 mm (42") | | 1066mm (42") | 800 mm (31.5") | 1066 mm (42") | | |
| Spindle nose to table | | 150~950 mm (5.9"~37.4") | 150~1216 mm (5.9"~47.9") | 150~1216 mm (5.9"~47.9") | | 300~1366 mm (11.8"~53.7") | 150~950 mm (5.9"~37.4") | 150~1216 mm (5.9"~47.9") | | |
| Spindle taper | | BT-50 / CAT-50 | | AC41: No.40 AC42: HSK A63 | AC51: No.50 AC52: HSK A100 | BT-50 / CAT-50 | BT-50 / CAT-50 | | | |
| Spindle diameter | | ϕ 90 mm (ϕ 3.5") | | — | | ϕ 90 mm (ϕ 3.5") | ϕ 90 mm (ϕ 3.5") | | | |
| Spindle speed | | 6000 rpm Hi-Lo Gear | | 50~20000 rpm | 50~10000 rpm | 10~6000 rpm (Vertical) 10~2000 rpm(Horizontal) | 6000 rpm Hi-Lo Gear | | | |
| Spindle motor | | 22 / 26 kW | | 21 / 24 kW | 30 / 36 kW | 22 / 26 kW | 22 / 26 kW | | | |
| X-Y-Z rapid traverse | | 12~12~10 m/min | | | | 12~12~10 m/min | 10~10~10 m/min | | | |
| X-Y-Z cutting feed | | 1-10000 mm/min | | | | 1-10000 mm/min | 1-10000 mm/min | | | |
| ATC | Adjacent pockets max. tool dia. | ϕ 125 mm (ϕ 4.9") | | ϕ 75 mm (ϕ 3") | ϕ 125 mm (ϕ 4.9") | ϕ 125 mm (ϕ 4.9") | ϕ 125 mm (ϕ 4.9") | | | |
| | No.of tools | 40 tools Std. (60, 80, 120 Opt.) | | | | 40 tools Std. (60, 80, 120 Opt.) Vertical & Horizontal tool change | 40 tools Std. (60, 80, 120 Opt.) | | | |
| | Max. tool diameter | ϕ 200 mm (ϕ 7.8") | | ϕ 100 mm (ϕ 3.9") | ϕ 200 mm (ϕ 7.8") | | | | | |
| | Max. tool length | 400 mm (15.7") | | 320 mm (12.6") | 400 mm (15.7") | | | | | |
| | Max. tool weight | 20 kg (44 lb) | | 10 kg (22 lb) | 20 kg (44 lb) | | | | | |
| | Tool selection | Bi-direction random type, Shortest path | | | | | | | | |
| Table load capacity | | 20000 kg (44000 lb) | | 20000 kg (44000 lb) | | 20000 kg (44000 lb) | 3000 kg/m ² (614 lb/ft ²) | | | |
| Dimensions | Length | 10900 mm (429") | | | 10900 mm (429") | | 10900 mm (429") | | 11200 mm (441") | |
| | Width | 5680 mm (223.6") | | | 6500 mm (256") | | 7400 mm (291.3") | | 6000 mm (236.2") | |
| | Height | 4550 mm (180") | 4850 mm (191") | 6280 mm (247.2") | 6500 mm (256") | 5800 mm (228.3") | 4265 mm (167.9") | 4531 mm (178.3") | | |
| Machine weight | | 64200 kg (141400 lb) | 66200 kg (145800 lb) | 71000 kg (156400 lb) | 74000 kg (162800 lb) | 74000 kg (162800 lb) | 63000 kg (138600 lb) | 65000 kg (143000 lb) | | |

■ All data subject to change without notice.

■ All the specifications are listed with the FANUC CNC system.

Standard Accessories:

1. Coolant system
2. Spindle air blast
3. Heat exchanger
4. Twin screw-type chip conveyors
5. A chain-type chip conveyor
6. Operation box
7. Tools, tool box and various manuals
8. Rigid tapping
9. Spindle oil cooler
10. FANUC 0i-MD controller (for DMC-series)
11. FANUC 18i-MB controller (for SDMC-series)

Optional Accessories:

1. Contact tool setting system (Renishaw TS-27R or BULM NT-A2 / NT-A3)
2. High pressure coolant thru tool tip
3. High pressure coolant thru spindle
4. 60, 80, 120 tools
5. Workpiece measuring system (Renishaw OMP-60 or BULM TC-50)
6. Z travel 1066mm.
7. 5-Face head
8. 2-Axis NC milling head
9. 90° milling head
10. Multiangular milling head
11. Twin spindle-2H
12. Manual guide i / 0i (0/MD) ; Manual guide i (18i/MB / 21i/MB)

CNC Control Specs



Siemens Controller



Fanuc Controller

■ CNC system type

| Type | Model | DMC Series | DMC Series-R2 | DMC Series-5F | SDMC Series |
|-------------------------------|-------|------------|---------------|---------------|-------------|
| FANUC 0iMD | | ○ | - | - | - |
| FANUC 21iMD | | △ | - | - | - |
| FANUC 18iMB | | △ | - | ○ | ○ |
| FANUC 18iMB5 | | △ | △ | △ | △ |
| Heidenhain iTNC530 with MC420 | | △ | - | △ | △ |
| Heidenhain iTNC530 with MC422 | | △ | △ | △ | △ |
| Siemens 810D | | △ | - | - | - |
| Siemens 840D (572.5) | | △ | ○ | △ | △ |
| Siemens 840D (573.5) | | △ | △ | △ | △ |

■ Fanuc specifications

| | Item | Specifications | 0iMD | 18iMB | 21iMB |
|--------------|---|-------------------------------|------|-------|-------|
| Display unit | 8.4" color LCD | | ○ | - | - |
| | 10.4" color LCD | | △ | ○ | ○ |
| Function | Data Server with 1GB CF card | | △ | △ | △ |
| | HPCC by 64 bits Risc card (only for 18iMB) | | - | △ | - |
| Function | Conversational programming with graphic function | Manual guide 0i 0iMD | ○ | - | - |
| | | Manual guide i (10.4" LCD) | △ | ○ | ○ |
| | NC program memory | 640 meter (about 256 KB) | ○ | ○ | ○ |
| | 4 th interface | | ○ | ○ | ○ |

■ Siemens specifications

| | Item | Specifications | 810D | 840D |
|-----------------|---|-----------------------|------|------|
| Operation Panel | 10.4" color LCD | | ○ | ○ |
| | 12.1" color LCD | | △ | △ |
| | 15.1" color LCD | | ○ | ○ |
| | KB 483C full CNC keyboard | | △ | △ |
| | PCU 20 without hard disk | | ○ | ○ |
| | Network / disk drive management | CF card | △ | △ |
| Function | PCU 50 with hard disk | Include HD & Ethernet | △ | △ |
| | ShopMill programming (copy licence) | | △ | △ |
| | Automatic residual material detection | | △ | △ |
| | Universal interpolator NURBS | | ○ | ○ |
| | 4 th axis interface | | ○ | ○ |
| | Spline interpolation for 3 - axes | | △ | △ |
| Software | Machining package milling: Export license required | | | |
| | Machining package five axes, multi-axis interpolation, spline interpolation for Multi - Axis machining, 3D tool radius compensation | Only for DMC - R2 | - | △ |
| | | | | |
| | | | | |
| | | | | |

■ Heidenhain specifications

| | Item | Specifications | i TNC530 | |
|-------------------|---|-------------------------------------|----------|-------|
| | | | MC420 | MC422 |
| Function | Display unit | Visual display unit 15" TFT display | ○ | ○ |
| | Main computer | MC420 3.6 ms block processing time | ○ | - |
| | | MC422 0.5 ms block processing time | - | ○ |
| Software option 1 | NC programming memory | 26GB on hard disk | ○ | ○ |
| | 4 th additional axes | | △ | △ |
| Software option 2 | ● Cylindrical surface interpolation | | | |
| | ● Feed rate in mm/min | | | |
| | ● Tilting the working plane | | △ | ○ |
| | ● Circular interpolation in 3 axes with tilted working plane | | | |
| | ■ HSC path control with special nominal-position value filters | | | |
| | ■ 3-D tool compensation through surface normal vectors | | | |
| | ■ Tool Center Point Management (TCPM) | | | |
| | ■ Keeping the tool normal to the contour | | | |
| | ■ Tool radius compensation normal to the direction of the tool | | △ | ○ |
| | ■ Linear interpolation in Multi - Axis (export license required) | | | |
| | ■ Spline interpolation execution of splines (3 rd degree polynomial) | | | |
| | ■ 0.5 ms block processing time | | | |



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