DOOSAN

MACHINE GREATNESS

DNM series

Global standard vertical machining center

DNM series

DNM 4500
DNM 5700
DNM 6700

ver. EN 170830 SU

Basic Information

Basic Structure
Cutting
Performance

Detailed Information

Options
Applications
Diagrams
Specifications

Customer Support Service

DNM series

Building on the history of the well proven and successful DNM and DNM II series, the new version DNM series boasts even greater reliability and performance. In addition, the new series includes grease lubrication to the roller guideways for more environmental-friendliness. The design concepts of the DNM4500, DNM5700 and DNM6700 are high speed, high rigidity and suitability for universal applications. Standard features are the largest machining space in its class, direct coupled spindle, roller guideways and thermal error compensation to provide optimum precision.

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A highly versatile vertical machining center offering the largest machining space in its class

- While requiring the same installation floor space as the previous model, the new DNM series provides a larger table with increased Y axis travel and maximum table load.

Standard Direct-Coupled Spindle for Higher Productivity

- The direct coupled spindle reduces vibration and noise, thereby improving the machines performance and environmental-friendliness compared to belt drive type.
- High torque and High speed spindle are available to meet material of workpiece.
- Higher productivity is achieved by reducing tool change time and improving all axes feed system acc/dec times.

An environmental-friendly machine designed for stable and easy operation

- Thermal error compensation function fitted as standard optimizes machine accuracy by reducing the effects of heat build-up during extended periods of operation.
- The EOP function can be checked in the pop-up window on the NC main screen for convenient machine operation.
- Grease lubrication for axis roller guideways is a standard feature and reduces contamination of the operator's environment.

Basic structure

Designed as a highly stable, rigid structure, the new DNM series offers a wide line-up from 400 to 670 mm in the Y axis, enabling the user to handle a wider range of workpieces.

Travel distance (X x Y x Z axis)

DNM 4500

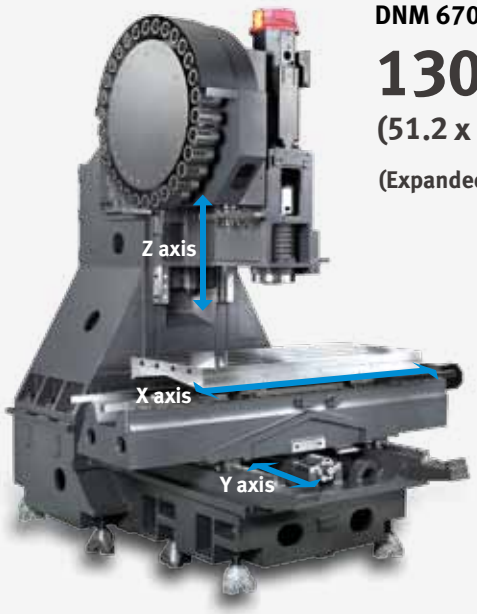
800x450x510mm (31.5 x 17.7 x 20.1 inch)

(Expanded by 8% compare to previous model)

DNM 5700

1050x570x510mm (41.3 x 22.4 x 20.1 inch)

(Expanded by 8% compare to previous model)



DNM 6700

1300x670x625mm

(51.2 x 26.4 x 24.6 inch)

(Expanded by 2% compare to previous model)

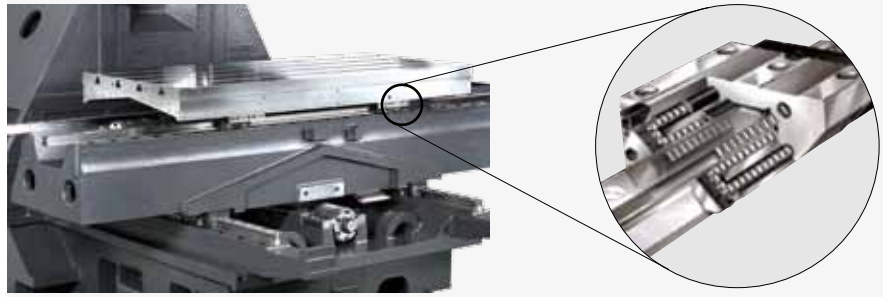
Axis system

Environmentally friendly grease lubrication is adopted as standard for all the axis feed system, and roller-type LM Guides are provided to enhance the rigidity.

Rapid traverse rate

X axis	Y axis	Z axis
36m/min	**36m/min**	**30m/min**
(1417.3 ipm)	(1417.3 ipm)	(1181.1 ipm)

Improving all axes feed system acc/dec times by up to 50% compare to previous model.



Grease lubrication for all axes is a standard feature.

Roller-type LM Guides are provided as a standard feature.

Table

Increased table size and maximum load capacity are included to offer maximum workpiece capacity even in the same floor space as previous model.

Wide machining area

Max weight on Table

DNM 4500

600kg (1322.8 lb)

DNM 5700

1000kg (2204.6 lb)

DNM 6700

1300kg (2866.0 lb)

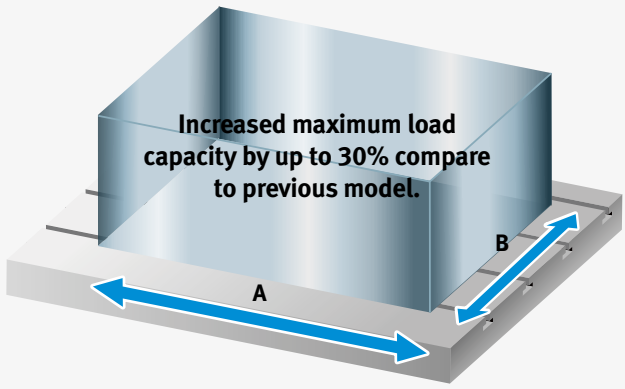


Table size (A x B)

DNM 4500

1000 x 450mm
(39.4 x 17.7 inch)

Expanded by 12% compare to previous model

DNM 5700

1300 x 570mm
(51.2 x 21.3 inch)

Expanded by 14% compare to previous model

DNM 6700

1500 x 670mm
(59.1 x 26.4 inch)

Expanded by 15% compare to previous model

Spindle

Direct-coupled type spindles have been adopted as a standard feature to further reduce vibration and noise while enhancing productivity, work environment and machining accuracy. High torque and High speed spindle are available to meet material of workpiece.

Max. spindle speed

8000r/min

12000r/min option

15000r/min option

Max. spindle motor power

18.5kW (24.8 Hp)

Max. spindle motor torque

117.8 N·m (86.9 lbf-ft)

(8000 r/min, 12000 r/min, 15000 r/min)

286N·m (206.7 lbf-ft) option

(8000 r/min high torque version)

Tool change system

Tool change time has been optimized to reduce non cutting time. The highly-reliable tool magazine can accommodate up to 30 tools as standard.

Automatic tool change arm

Tool to Tool time

Previous model	1.3s
New DNM series	1.2s

Reduced by **7.7%**

Chip to Chip* time

Previous model	3.7s
New DNM series	3.2s

Reduced by **13.5%**

* The Chip-to-Chip time has been tested in accordance with Doosan's strict testing conditions, but may vary depending on the user's operating conditions.

Magazine

Tool storage capacity

30ea

40ea option

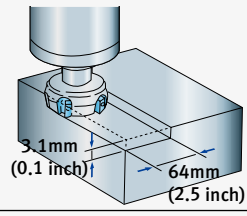
Machining performance

The DNM series delivers the best cutting performance in its class to optimize productivity.

Cutting performance

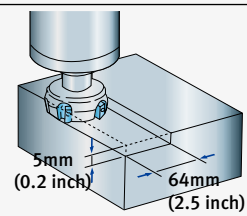
Face mill (ø80mm (3.15 inch)) Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
527 (32.2)	1500	2700 (106.3)



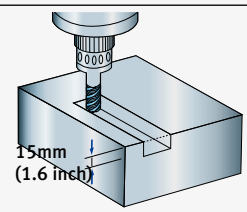
Face mill (ø80mm (3.15 inch)) Aluminium(AL6061)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
1901 (116.0)	1500	5940 (233.9)



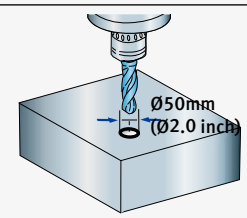
End mill (ø30mm (i.2 inch)) Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
48 (2.9)	222	107 (4.2)



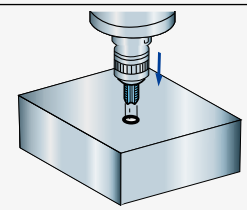
U-Drill (ø50mm (2.0 inch)) Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
501 (30.6)	1500	255 (10.0)



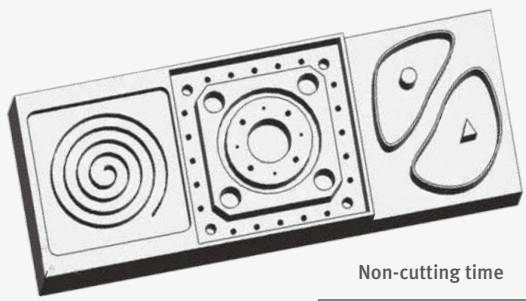
Tap Carbon steel (SM45C)

Tap size mm	Spindle speed r/min	Feedrate mm/min (ipm)
M 36 x P 4.0	221	884 (34.8)



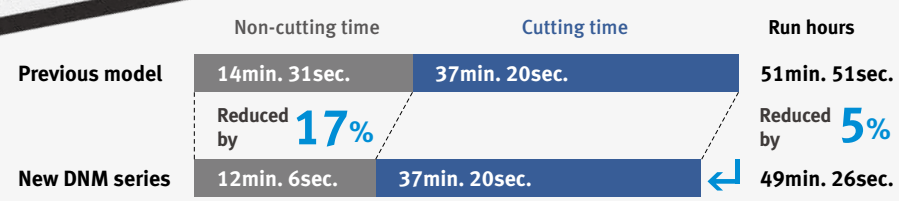
*The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

High Productivity



Sample work

Material	Aluminium (AL6061)
Material size	561 x 210 x 30 mm (22.1 x 8.3 x 1.2 inch)
Using tools	18 ea



*The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Standard / Optional Specifications

Various optional features are available to satisfy customers' specific machining applications.

● Standard ○ Optional X N/A

NO.	Description	Features		DNM 4500	DNM 5700	DNM 6700
1	Spindle	8000 r/min (Unit: kW(Hp), N·m(lbf-ft)	18.5/11(24.8/14.8), 117.8(86.9)_FANUC	●	●	X
2			18.5/15 (24.8/20.1), 117.8(86.9)_FANUC	X	X	●
3			15/11 (20.1/14.8), 286(210.9)_FANUC	○	○	○
4		12000 r/min (Unit: kW(Hp), N·m(lbf-ft)	18.5/11(24.8/14.8), 117.8(86.9)_FANUC	○	○	○
5			17/10 (22.8/13.4), 108.6(80.1)_HEIDENHAIN	○	○	X
6			32/15 (42.9/20.1), 203.7(150.2)_HEIDENHAIN	X	X	○
7			16.5/11 (22.1/14.8), 141(104.0)_SIEMENS	○	○	X
8			21.8/16.3 (29.2/21.9), 150.1(110.7)_SIEMENS	X	X	○
9		15000 r/min (Unit: kW(Hp), N·m(lbf-ft)	18.5/11(24.8/14.8), 117.8(86.9)_FANUC	○	○	○
10			17/10 (22.8/13.4), 108.2 (79.9)_HEIDENHAIN	○	○	○
11			16.5/11 (22.1/14.8), 141.3 (104.3)_SIEMENS	○	○	○
12	Magazine	Tool storage capacity	30 ea	●	●	●
13			40 ea	○	○	○
14	Tool shank type	BIG PLUS BT40		●	●	●
15		BIG PLUS CAT40		○	○	○
16		BIG PLUS DIN40		○	○	○
17	Raised column	150 mm (5.9 inch)		○	○	○
18		200 mm (7.9 inch)		○	○	○
19		300 mm (11.8 inch)		○	○	○
20	Coolant	FLOOD	0.15 MPa(21.8 psi), 0.4 kW(0.5 Hp)	●	●	●
21			0.7 MPa(101.5 psi), 1.8 kW(2.4 Hp)	○	○	○
22		TSC	None	●	●	●
23			2 MPa(290.1 psi), 1.5kW(2.0 Hp)	○	○	○
24			2 MPa(290.1 psi), 4 kW(5.4 Hp)	○	○	○
25			7 MPa(1015.3 psi), 5.5 kW(7.4 Hp)	○	○	○
26		FLUSHING		○	○	○
27		SHOWER (200 L/min (52.8 gal/min))		○	○	○
28	Chip disposal	Chip conveyor	Chip pan	●	●	●
29			Hinged type (Left/Right/Rear)	○	○	○
30			Magnetic scraper type (Left/Right/Rear)	○	○	○
31			Screw(AUGER) type (Left/Right)	○	○	○
32		Chip bucket		○	○	○
33		Air blower		○	○	○
34		Air gun		○	○	○
35		Coolant gun		○	○	○
36		Mist collector		○	○	○
37	Precision machining option	Linear scale	X / Y / Z axis	○	○	○
38		AICC I (40 block)		○	○	○
39		AICC II (200 block)		○	○	○
40		SSP (Smooth Surface Package)		○	○	○
41	Measurement & Automation	Automatic tool measurement	TS27R_RENISHAW	○	○	○
42			OTS_RENISHAW	○	○	○
43		Automatic tool breakage detection		○	○	○
44		Automatic workpiece measurement	OMP60_RENISHAW	○	○	○
45		Automatic front door with safety device		○	○	○
46	Others	LED Work light		●	●	●
47		3 Color signal tower		●	●	●
48		4th axis auxiliary device interface		○	○	○
49		Tool load monitoring		●	●	●
50		EZ Guide i		●	●	●
51		Automatic power off		○	○	○

* Please contact DOOSAN to select detail specifications.

Peripheral equipments

Grease lubrication system

The standard grease lubrication system eliminates the need for an oil skimmer and reduces lubrication costs by about 60% compared to oil lubrication.

Yearly maintenance cost

Max. 60% ↓

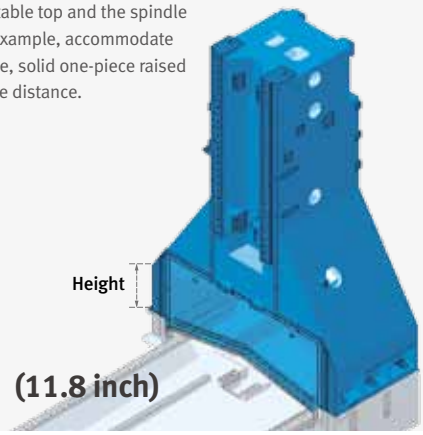
Raised column option 17~19

When the distance between the table top and the spindle nose needs to be extended, for example, accommodate a fixture or rotary axis on the table, solid one-piece raised column can be used to extend the distance.

Height 150mm (5.9 inch)

200mm (7.9 inch)

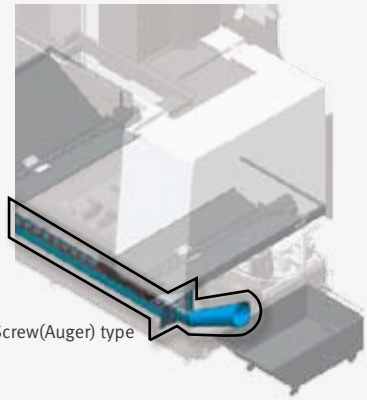
300mm (11.8 inch)



Chip conveyor option 29~31

Hinged belt

Magnetic scraper



Chip conveyor type	Material	Description
Hinged belt	Steel	Hinged belt chip conveyor, which is most commonly used for steel work [for cleaning chips longer than 30mm(1.2inch)], is available as an option.
Magnetic scraper	Cast Iron	Magnetic scraper type chip conveyor, which is ideal for die-casting work [for cleaning small chips], is available as an option.
Screw(Auger) type	Steel	Screw(Auger) type chip conveyor is suitable for minimizing installation space. About 85% floor space is required to install Screw(Auger) type chip conveyor compare to Hinged belt type.

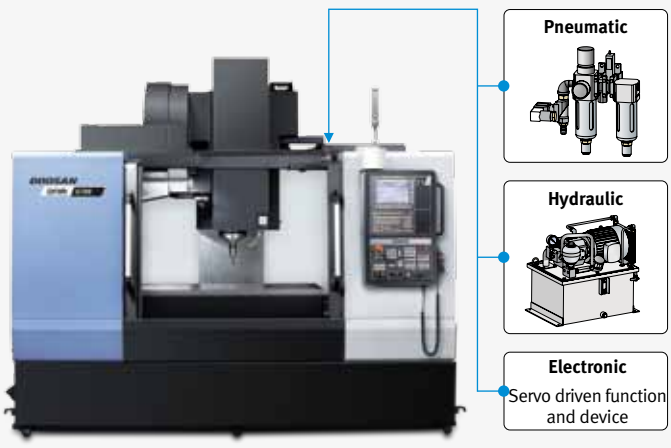
Chip bucket option 32

Capacity

300L (79.3 gal)

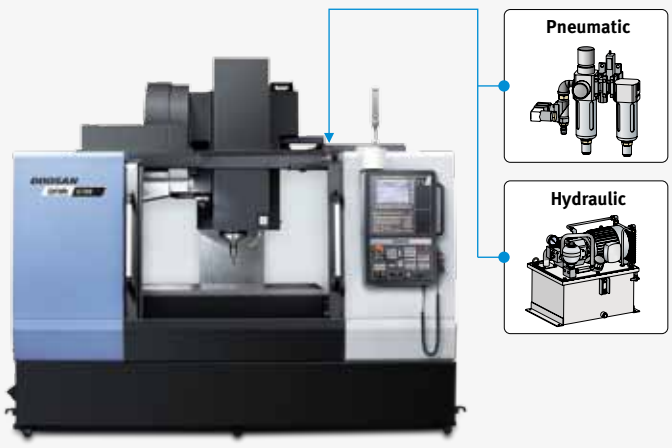
4th axis auxiliary device interface option 48

Users who wish to set up a rotary axis on the table to increase application flexibility are encouraged to contact Doosan in advance.



Hydraulic / Pneumatic fixture line option

The user should prepare pipelines for hydraulic/pneumatic fixtures whose detailed specifications should be determined by discussion with Doosan.



DOOSAN FANUC i

FANUC CNC has been optimized for Doosan's machine tools to maximize productivity.

User-friendly operation panel

The newly-designed operation panel enhances operating convenience by common-design buttons and layout. Just like a PC, the QWERTY type keyboard has been adopted for easier and faster operation.

10.4" Display

- **10.4” Display**
- **USB & PCMCIA card (Std.)**
- **QWERTY type keyboard**
- **Easy to put button switch for attached option**
- **Ergonomic new design**
- **HOT KEY** ❶
  - To quick operate, some of buttons such as return reference point and tool management etc. are installed on the operation panel.
- **Vertical Key** ❷
  - Improving convenient to use NC functions

Easy Operation Package

The software developed by Doosan's own technology provides numerous functions designed for convenient operation.

EOP Main screen

On the operation panel, press the CUSTOM1 button to make the initial EOP screen show up.

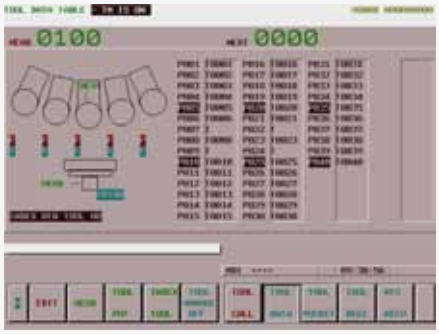
[HOT KEY of EOP Function]

1 Tool management
2 Tool Load Monitoring
3 Table moving for setup
4 Work coordinate setting
5 ATC Recovery
6 Renishaw GUI

Pop-up function

Various EOP functions can be monitored through the pop-up window on the NC main screen. (Press the CUSTOM2 button)

1 Display machining program
2 Tool Load Monitoring
3 Tool management data
4 M code list
5 G code list
6 Tool & Workpiece count



Tool management

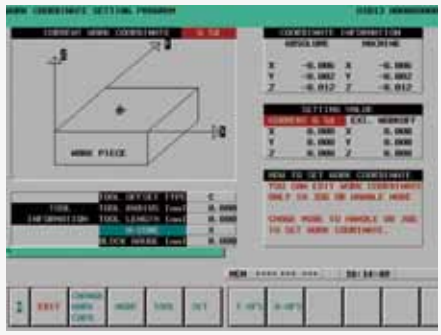
This function controls information on the tools in the tool magazine pots.

ATC recovery

In the event of an error during ATC (automatic tool changer) operation, follow the on-screen instructions for an easy and prompt solution.

Table moving for setup

Table can be moved to workpiece setup position with simple operation.

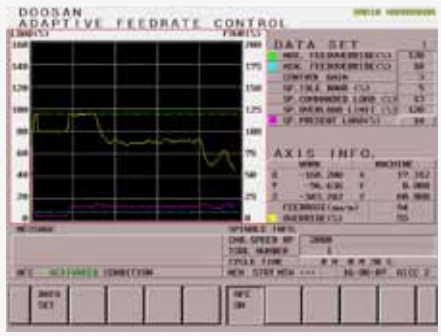


Work coordinate setting

It is easy to configure various work offset settings.

Tool load monitoring

During cutting operation, abnormal load caused by wear and tear of the tool is detected and an alarm is triggered to prevent further damage.



Adaptive Feed Control(AFC)

If tool overload is detected during operation, the feed rate is controlled to prevent the tool from being damaged.

Thermal compensation function

A thermal error compensation function is provided as a standard feature to secure stable cutting safe from potentially harmful environmental factors.

Alarm guidance

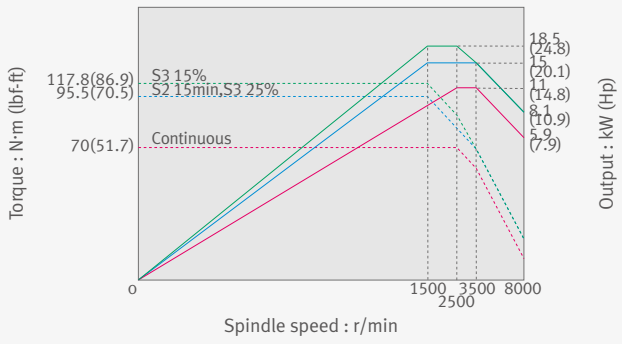
It is easy to show detailed information on frequently occurred alarms and recommended actions.

Spindle Power – Torque Diagram

[FANUC] DNM 4500/5700

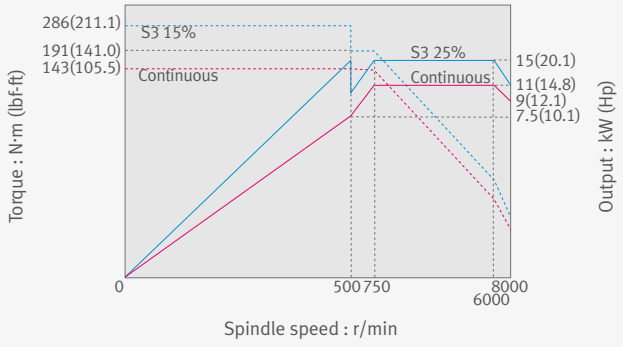
8000 r/min

Max. spindle power: 18.5 kW (24.8 Hp)
Max. spindle torque: 117.8 N·m (86.9 lbf-ft)



8000 r/min High Torque option

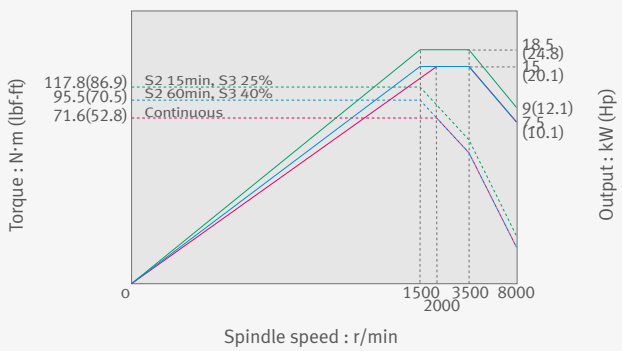
Max. spindle power: 15 kW (20.1 Hp)
Max. spindle torque: 286 N·m (211.1 lbf-ft)



[FANUC] DNM 6700

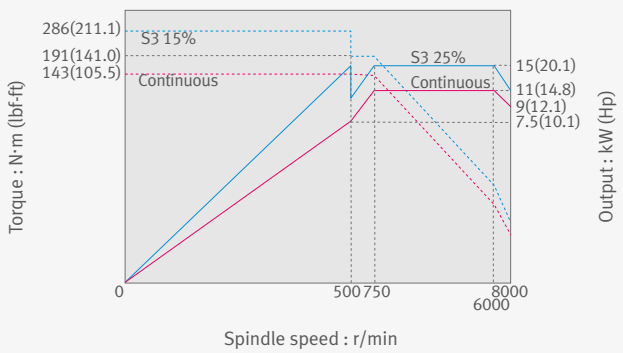
8000 r/min

Max. spindle power: 18.5 kW (24.8 Hp)
Max. spindle torque: 117.8 N·m (86.9 lbf-ft)



8000 r/min High Torque option

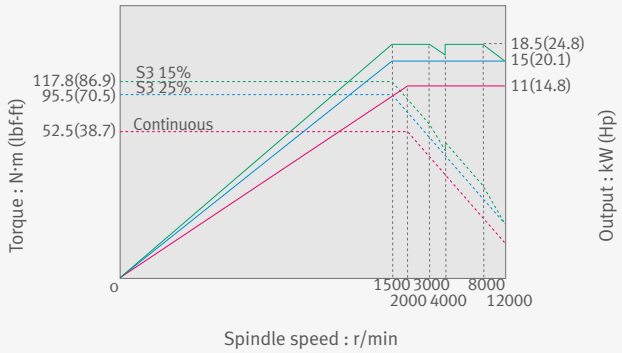
Max. spindle power: 15 kW (20.1 Hp)
Max. spindle torque: 286 N·m (211.1 lbf-ft)



[FANUC] DNM 4500/5700/6700

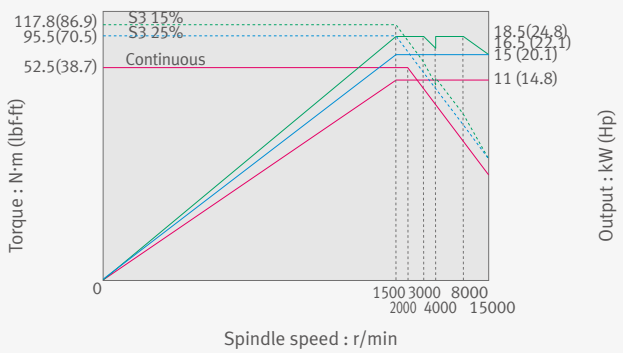
12000 r/min option

Max. spindle power: 18.5 kW (24.8 Hp)
Max. spindle torque: 117.8 N·m (86.9 lbf-ft)



15000 r/min option

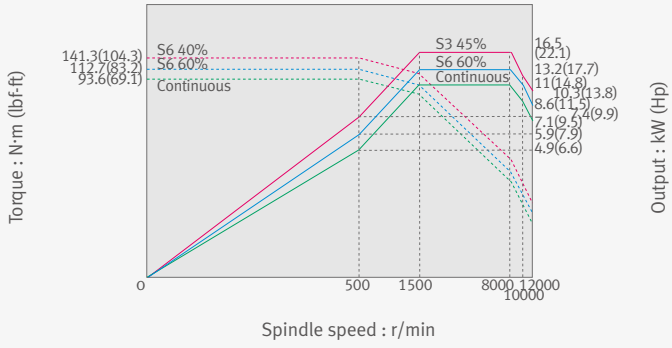
Max. spindle power: 18.5 kW (24.8 Hp)
Max. spindle torque: 117.8 N·m (86.9 lbf-ft)



[SIEMENS] DNM 4500/5700

12000 r/min

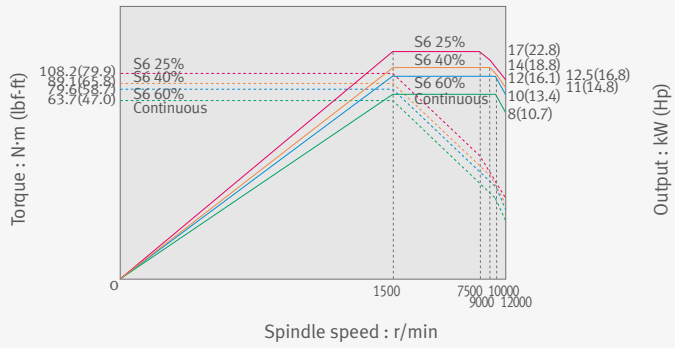
Max. spindle power: 16.5 kW (22.1 Hp)
Max. spindle torque: 141.3 N·m (104.3 lbf-ft)



[HEIDENHAIN] DNM 4500/5700

12000 r/min

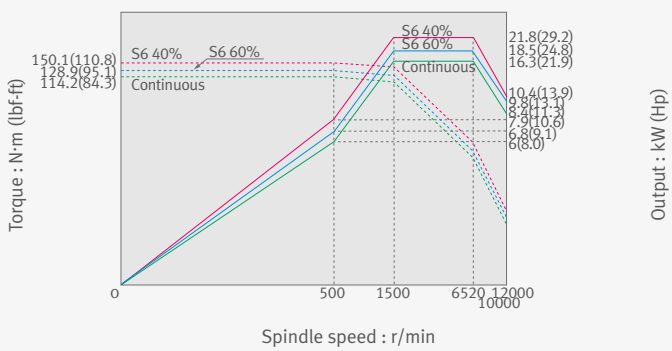
Max. spindle power: 17 kW (22.8 Hp)
Max. spindle torque: 108.2 N·m (79.9 lbf-ft)



[SIEMENS] DNM 6700

12000 r/min

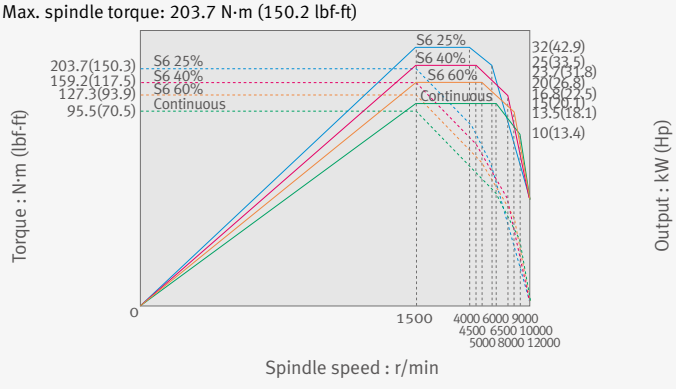
Max. spindle power: 21.8 kW (29.2 Hp)
Max. spindle torque: 150.1 N·m(110.7 lbf-ft)



[HEIDENHAIN] 6700

12000 r/min

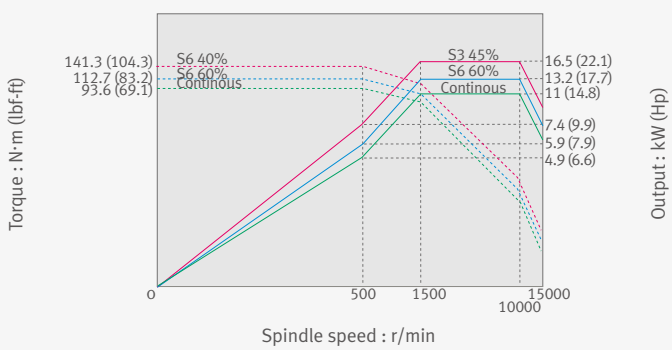
Max. spindle power: 32 kW (42.9 Hp)
Max. spindle torque: 203.7 N·m (150.2 lbf-ft)



[SIEMENS] DNM 4500/5700/6700

15000 r/min option

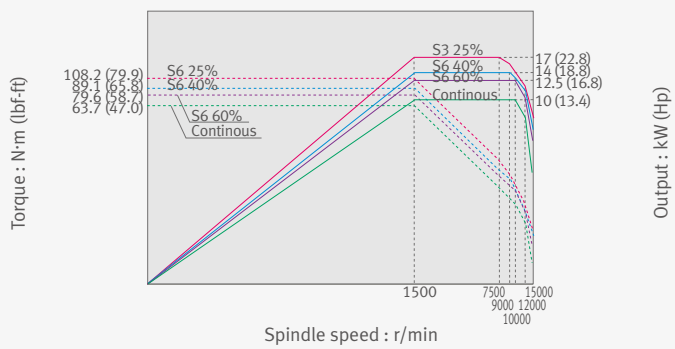
Max. spindle power: 16.5 kW (22.1 Hp)
Max. spindle torque: 141.3 N·m (104.3 lbf-ft)



[HEIDENHAIN] DNM 4500/5700/6700

15000 r/min option

Max. spindle power: 17 kW (22.8 Hp)
Max. spindle torque: 108.2 N·m (79.9 lbf-ft)

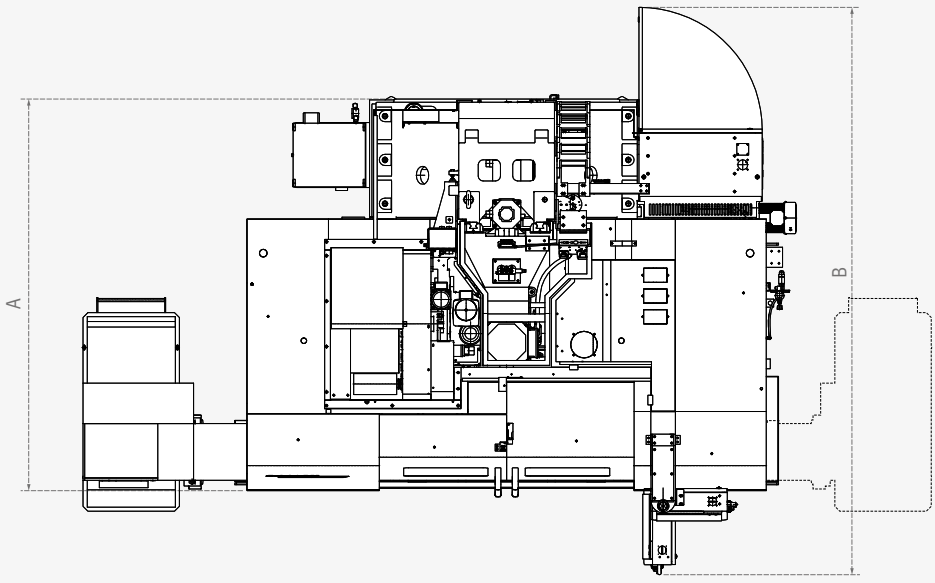


External Dimensions

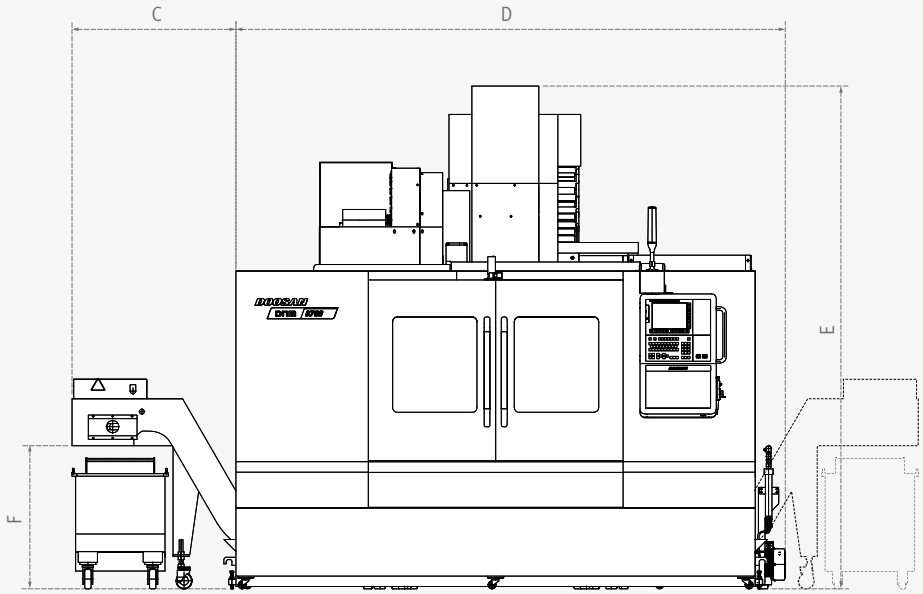
DNM series (Left or Right side chip conveyor)

Unit: mm (inch)

Top View



Front View



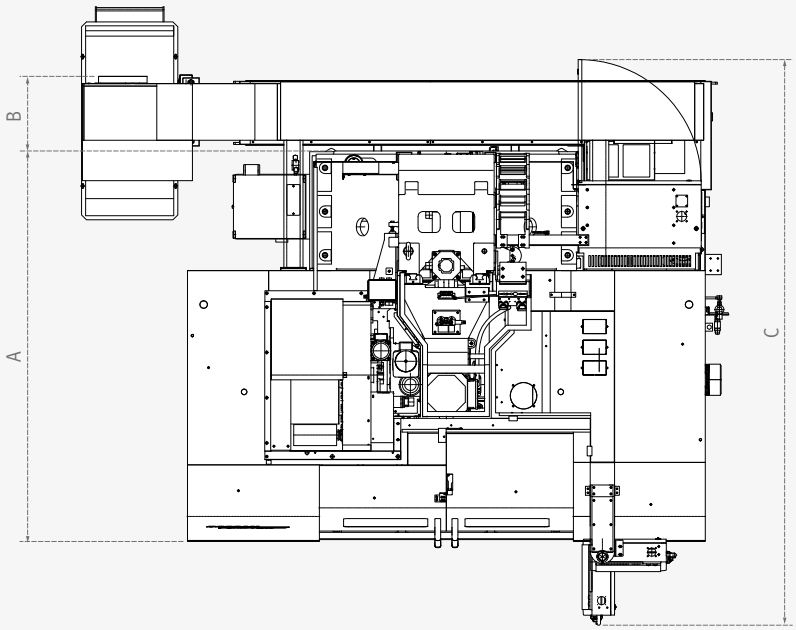
Model	A (Length)	B[1]	C[2]	D (Width)	E (Height)	F[3]
DNM 4500	1966 (77.4)	3219 (126.7)	1010 (39.8) [414 (16.3)]	2634 (103.7)	2985 (117.5)	883 (34.8) [440 (17.3)]
DNM 5700	2221 (87.4)	3349 (131.9)	1010 (39.8) [398 (15.7)]	3145 (123.8)	2985 (117.5)	883 (34.8) [440 (17.3)]
DNM 6700	2415 (95.1)	3498 (137.7)	1010 (39.8) [378 (14.9)]	3385 (133.3)	3100 (122.0)	883 (34.8) [440 (17.3)]

1 Max. machine length (including electric cabinet door and operation panel swiveling)
2 Additional width to accommodate the side chip conveyor. [ ] indicates the additional width required to accommodate a screw(auger)type chip conveyor.
3 Height from the floor to the chip outlet. [ ] indicates the height when a screw(auger) type chip conveyor is installed.

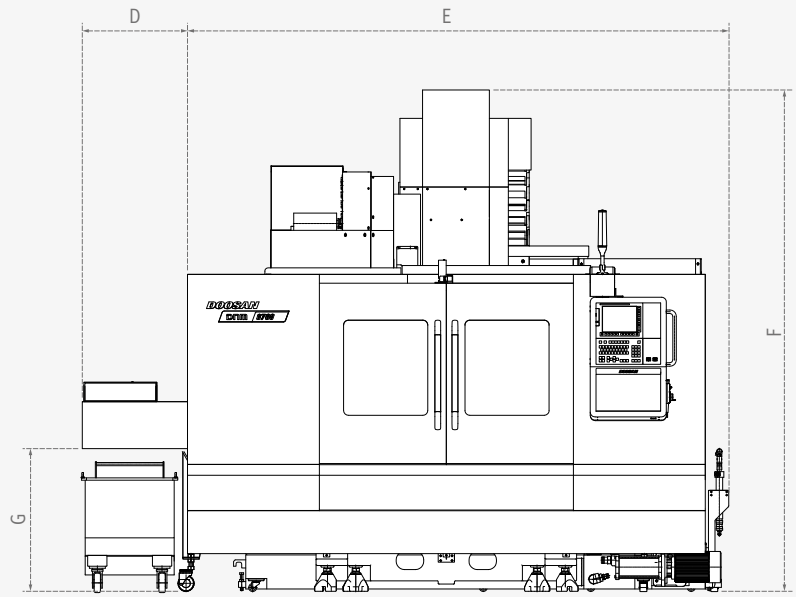
DNM series (Rear side chip conveyor)

Unit: mm (inch)

Top View



Front View



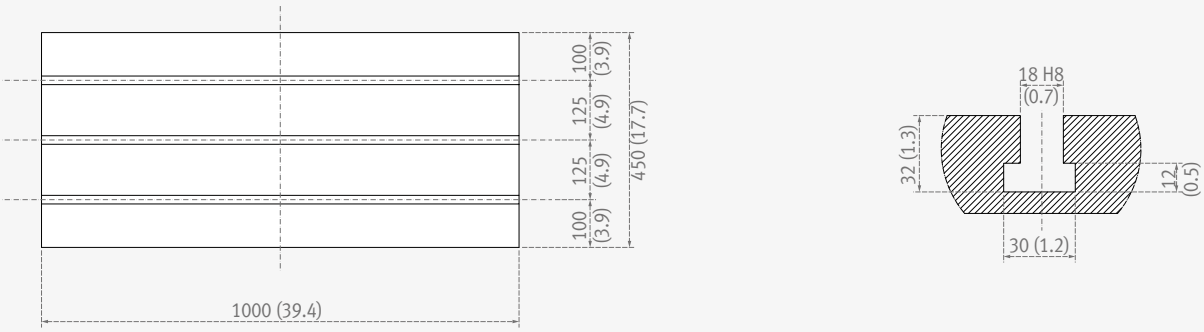
Model	A (Length)	B[1]	C[2]	D[3]	E (Width)	F (Height)	G[4]
DNM 4500	1966 (77.4)	458 (18.0)	3219 (126.7)	880 (34.6)	2607 (102.6)	2985 (117.5)	883 (34.8)
DNM 5700	2221 (87.4)	458 (18.0)	3349 (131.9)	650 (25.6)	3105 (122.2)	2985 (117.5)	883 (34.8)
DNM 6700	2415 (95.1)	461 (18.1)	3498 (137.7)	650 (25.6)	3342.5 (131.6)	3100 (122.0)	883 (34.8)

1 Additional length required to accommodate a rear-side chip conveyor.
2 Max. machine length (including electric cabinet door and operation panel swiveling)
3 Additional space required for the machine to accommodate a rear-side chip conveyor.
4 Height from the floor to the chip outlet.

Table

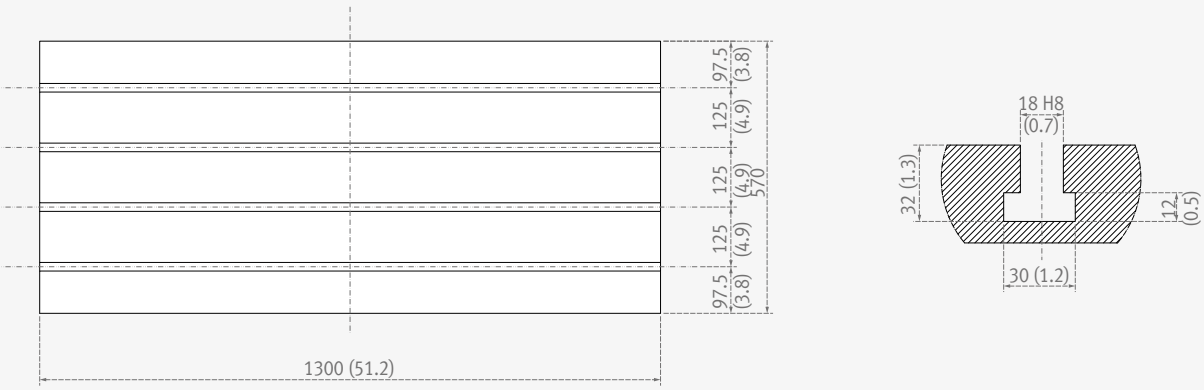
DNM 4500

Unit: mm (inch)



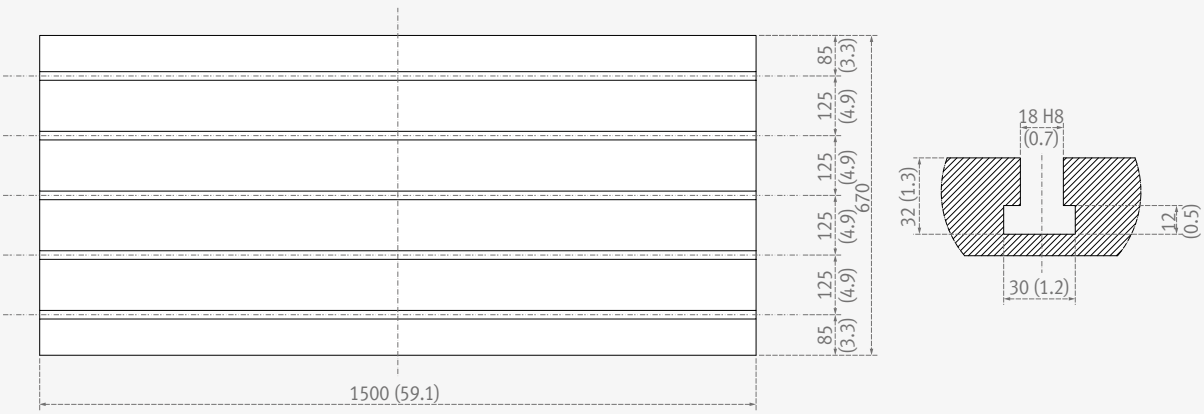
DNM 5700

Unit: mm (inch)



DNM 6700

Unit: mm (inch)



Machine Specifications

Description			Unit	DNM 4500	DNM 5700	DNM 6700
Travels	Travel distance	X axis	mm (inch)	800 (31.5)	1050 (41.3)	1300 (51.2)
		Y axis	mm (inch)	450 (17.7)	570 (22.4)	670 (26.4)
		Z axis	mm (inch)	510 (20.1)	510 (20.1)	625 (24.6)
	Distance from spindle nose to table top		mm (inch)	150~660 (5.9~26.0)		150~775 (5.9~30.5)
Table	Table size		mm (inch)	1000 x 450 (39.4 x 17.7)	1300 x 570 (51.2 x 22.4)	1500 x 670 (59.1 x 26.4)
	Table loading capacity		kg (lb)	600 (1322.8)	1000 (2204.6)	1300 (2866.0)
	Table surface type		mm (inch)	T-SLOT (3-125(4.9) x 18(0.7)H8)	T-SLOT (4-125(4.9) x 18(0.7)H8)	T-SLOT (5-125(4.9) x 18(0.7)H8)
Spindle	Taper		-	ISO #40		
	Max. spindle speed	Fanuc	r/min	8000 {8000*, 12000, 15000}		
		Siemens	r/min	12000 {15000}		
		Heidenhain	r/min	12000 {15000}		
	Max. Spindle power	Fanuc	kW (Hp)	18.5/11 (24.8/14.8) {15/11 (20.1/14.8)*, 18.5/11 (24.8/14.8), 18.5/11 (24.8/14.8)}		18.5/15 (24.8/20.1) {15/11 (20.1/14.8)*, 18.5/11 (24.8/14.8), 18.5/11 (24.8/14.8)}
		Siemens	kW (Hp)	16.5/11 (22.1/14.8) {16.5/11 (22.1/14.8)}		21.8/16.3 (29.2/21.9) {16.5/11 (22.1/14.8)}
		Heidenhain	kW (Hp)	17/10 (22.8/13.4) {17/10 (22.8/13.4)}		32/15 (42.9/20.1) {17/10 (22.8/13.4)}
	Max. spindle torque	Fanuc	N·m (lbf-ft)	117.8 (86.9) {286 (210.9)*, 117.8 (86.9), 117.8 (86.9)}		
		Siemens	N·m (lbf-ft)	141.3 (104.3) {141.3 (104.3)}		150.1 (110.7) {141.3 (104.3)}
		Heidenhain	N·m (lbf-ft)	108.2 (79.9) {108.2 (79.9)}		203.7 (150.2) {108.2 (79.9)}
Feedrates	Rapid traverse rate	X axis	m/min (ipm)	36 (1417.3)		
		Y axis	m/min (ipm)	36 (1417.3)		
		Z axis	m/min (ipm)	30 (1181.1)		
Automatic Tool Changer	Type of tool shank	Tool shank	-	BT 40 {CAT 40 / DIN 40}		
		Pull stud	-	PS806 {Modified DIN / DIN 69872 #40}		
	Tool storage capa.		ea	30 {40}		
	Max. tool diameter	Continous	mm (inch)	80 (3.1) {76 (3.0)}		
		Without Adjacent Tools	mm (inch)	125 (4.9)		
	Max. tool length		mm (inch)	300 (11.8)		
	Max. tool weight		kg (lb)	8 (17.6)		
	Max. tool moment		N·m (ft-lbs)	5.88 (4.3)		
	Tool selection			MEMORY RANDOM		
	Tool change time (Tool-to-tool)		sec	1.2		
	Tool change time (Chip-to-chip)		sec	3.2		
Power source	Electric power supply(rated capacity)		kVA	29.6		38.1 {33.0***}
	Compressed air supply		MPa (psi)	0.54 (78.3)		
Tank capacity	Coolant tank capacity		L (gal)	260 (68.7)	310 (81.9)	325 (85.9)
Machine Dimensions	Height		mm (inch)	2985 (117.5)	2985 (117.5)	3100 (122.0)
	Length		mm (inch)	2158 (85.0)	2413 (95.0)	2597 (102.2)
	Width		mm (inch)	2615 (103.0)	3110 (122.4)	3350 (131.9)
	Weight		kg (lb)	5000 (11023)	6500 (14330)	8500 (18739)
Contrel	NC system		-	DOOSAN FANUC i / SIEMENS S828D / HEIDENHAIN TNC620		

* 8000 r/min High torque version(FANUC only) ** Power capacity of 8000 r/min high torque and 12000 r/min spindle

NC Unit Specifications

DOOSAN FANUC i

● Standard ○ Optional X N/A

No.	Item		Spec.	DOOSAN FANUC i
1	Controlled axis	Controlled axes	3 (X,Y,Z)	X, Y, Z
2		Additional controlled axes	5 axes in total	○
3		Least command increment	0.001 mm / 0.0001"	●
4		Least input increment	0.001 mm / 0.0001"	●
5		Interpolation type pitch error compensation		○
6	Interpolation & Feed Function	2nd reference point return	G30	●
7		3rd / 4th reference return		●
8		Inverse time feed		●
9		Cylinderical interpolation	G07.1	●
10		Bell-type acceleration/deceleration before look ahead interpolation		●
11		Automatic corner override	G62	●
12		Automatic corner deceleration		●
13		Manual handle feed	Max. 3unit	1 unit
14		Handle interruption		●
15		Manual handle retrace		○
16		Nano smoothing	AI contour control II is required.	○
17		AI APC	20 BLOCK	●
18		AICC I	40 BLOCK	○
19		AICC II	200 BLOCK	○
20		AICC II(Preview block number increase)	400 BLOCK(Special hardware and AI contour control II)	○
21	Spindle & M code Function	M- code function		●
22		Retraction for rigid tapping		●
23		Rigid tapping	G84, G74	●
24	Tool Function	Number of tool offsets	400 ea	400 ea
25		Tool nose radius compensation	G40, G41, G42	●
26		Tool length compensation	G43, G44, G49	●
27		Tool life management		●
28		Tool offset	G45 - G48	●
29	Programming & Editing Function	Custom macro		●
30		Macro executor		●
31		Extended part program editing		●
32		Part program storage	512KB(1280m)	1280m
33		Part program storage	2MB(5120m)	○
34		Inch/metric conversion	G20 / G21	●
35		Number of Registered programs	400 ea	400 ea
36		Number of Registered programs	1000 ea	○
37		Optional block skip	9 BLOCK	●
38		Optional stop	M01	●
39		Program file name	32 characters	●
40		Sequence number	N 8-digit	N8 digit
41		Playback function		●
42		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs
43		Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○
44	OTHER FUNCTIONS (Operation, setting & Display, etc)	Embeded Ethernet		●
45		Graphic display	Tool path drawing	●
46		Loadmeter display		●
47		Memory card interface		●
48		USB memory interface	Only Data Read & Write	●
49		Operation history display		●
50		DNC operation with memory card		●
51		Optional angle chamfering / corner R		●
52		Run hour and part number display		●
53		High speed skip function		●
54		Polar coordinate command	G15 / G16	●
55		Programmable mirror image	G50.1 / G51.1	●
56		Scaling	G50, G51	●
57		Single direction positioning	G60	●
58		Pattern data input		●
59		Jerk control	AI contour control II is required.	○
60		Fast Data server with1GB PCMCIA card		○
61		Fast Ethernet		○
62		3-dimensional coordinate conversion		○
63		Figure copying	G72.1, G72.2	○
64		Machining time stamp function		○
65		EZ Guide I with 10.4" Color TFT	-.Doosan infracore Conversational Programming Solution -.When the EZ Guide i is used, the Dynamic graphic display cannot application "	●
66		Dynamic graphic display (with 10.4" Color TFT LCD)	-.Machining profile drawing. -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○

SIEMENS S828D

● Standard ○ Optional X N/A

No.	Item		Spec.	S828D
1	Controlled axis	Controlled axes	3 axes	X, Y, Z
2		Additional controlled axes	Max. 5 axes in total	○
3		Least command increment	0.001mm (0.0001 inch)	●
4		Least input increment	0.001mm (0.0001 inch)	●
5		Travel to fixed stop with Force Control		○
6	Interpolation & Feed Function	Reference point return	G75 FP=1	●
7		2nd reference point return	G75 FP=2	●
8		3rd / 4th reference return	G75 FP=3, 4	●
9		Inverse time feedrate	G93	●
10		Helical interpolation		●
11		Polynomial interpolation		N/A
12		Spline interpolation (A, B and C splines)		○
13		Separate path feed for corners and chamfers		●
14		Acceleration with Jerklimitation		●
15		Compressor for 3-axis machining		●
16		Temperature compensation		●
17		Look ahead number of block	150 BLOCK	●
18		Cartesian point-to-point (PTP) travel		●
19		TRANSMIT/cylinder surface transformation		○
20	Spindle Function	Tapping with compensating chuck/rigid tapping		●
21		Retraction for rigid tapping		●
22	Tool Function	Tool radius compensations in plane		●
23		Number of tools/cutting edges in tool list	256/512	●
24			600/1500	N/A
25		Tool length compensation		●
26		Operation with tool management		●
27		Tool list		●
28		Replacement tools for tool management		○
29		Monitoring of tool life and workpiece count		●
30		Manual measurement of tool offset		●
31		Magazine list		●
32	Programming & Editing Function	Number of levels for skip blocks 1		●
33		Number of levels for skip blocks 8		○
34		Program/workpiece management	On additional plug-in CF card	●
35			On integral Hard disk PCU50.3	N/A
36			On USB storage medium (e.g. disk drive, USB stick)	●
37			On network drive	○
38		Program editor	Programming support for cycles program(Program Guide)	●
39			CNC editor with editing functions: Marking, copying, deleting	●
40			Programming graphics/free contour input (contour calculator)	●
41			ShopMill Machining step programming	●
42		Technology cycles for drilling/milling		●
43		Pocket milling free contour and islands stock removal cycle		●
44		Residual material detection		●
45		Access protection for cycles		●
46		Programming support can be extended, e.g. customer cycles		●
47		2D simulation		●
48		3D simulation, finished part		●
49	OTHERS FUNCTIONS (Operation, setting & Display, etc)	Switchover: inch/metric		●
50		Manual measurement of zero/work offset		●
51		Automatic tool/workpiece measurement		●
52		Reference point approach, automatic/via CNC program		●
53		Execution from USB or CF card interface on operator panel front		●
54		Execution from network drive		○
55		10.4" color display		●
56		15.0" color display		N/A
57		Alarms and messages		●
58		Remote Control System (RCS) remote diagnostics	RCS Host remote diagnostics function	○
59			RCS Commander (viewer function)	●
60		Automatic measuring cycles		○

NC Unit Specifications

HEIDENHAIN TNC620

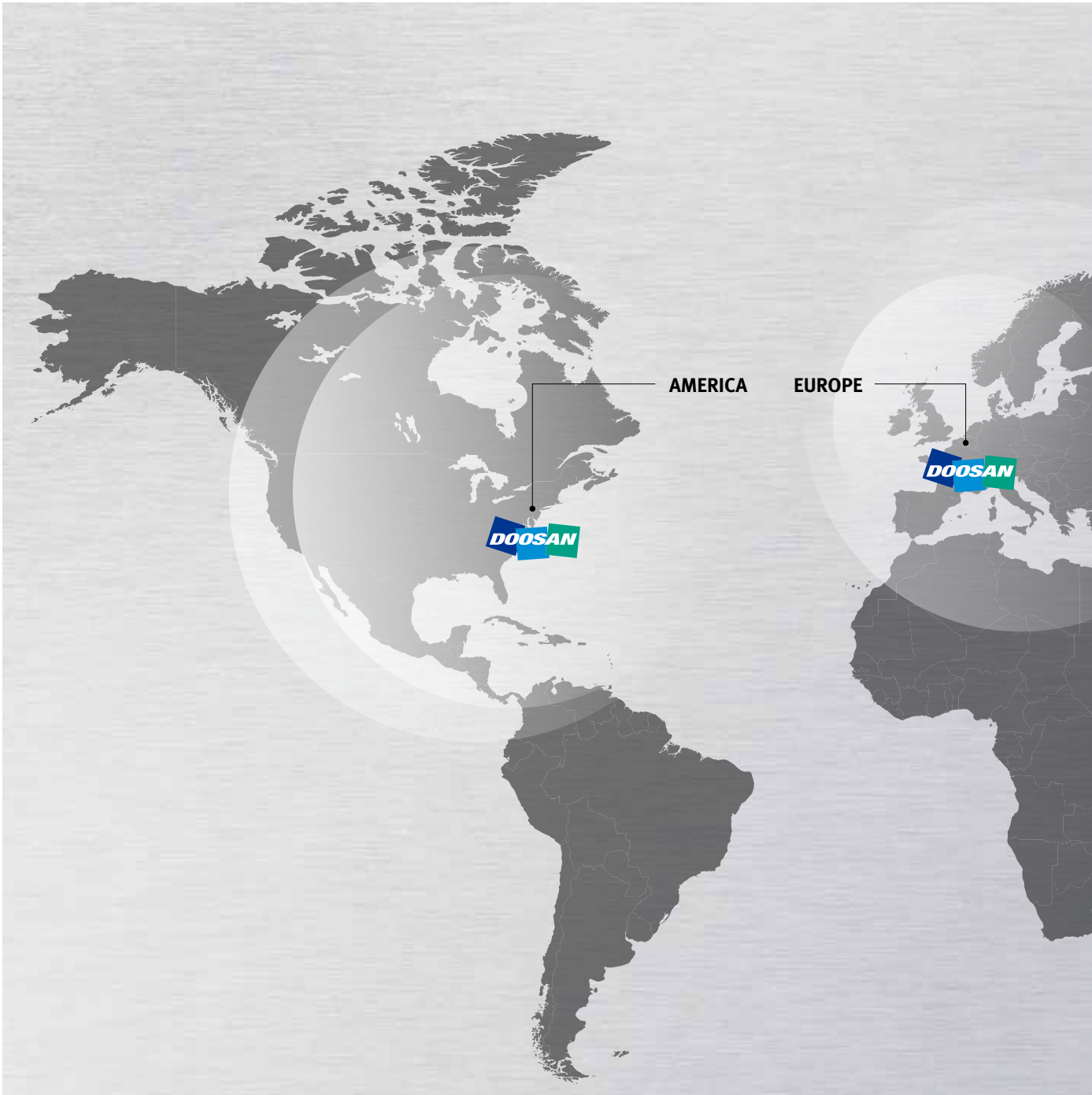
● Standard ○ Optional X N/A

NO.	Item		Spec.	TNC 620
1	Axes	Controlled axes	3 axes	X, Y, Z
2		Additional Controlled axes	Max. 18 axes in total	○ (Max. 6axes)
3		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●
4		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●
5		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●
6		Program memory for NC programs	SSDR	8GB
7	Commissioning and diagnostics	Data interfaces	Ethernet interface	●
8			USB interface (USB 2.0)	●
9	Machine functions	Look-ahead (Intelligent path control by calculating the path speed ahead of time)	Max. 1024 blocks.	N/A
10			Max. 5000 blocks.	●
11		HSC filters		●
12		Switching the traverse ranges		N/A
13	User functions	Tool compensation	In the working plane and tool length	●
14			Radius-compensated contour lookahead for up to 99 blocks (M120)	○
15			Three-dimensional tool radius compensation	○
16		Tool table	Central storage of tool data	●
17			Multiple tool tables with any number of tools	●
18		MDI mode		N/A
19		Tilting the working plane with Cycle 19		○
20		Tilting the working plane with the PLANE function		○
21		Manual traverse in tool-axis direction	after interruption of program run	●
22		Function TCPM	Retaining the position of tool tip when positioning tilting axes	○
23		Rotary table machining	Programming of cylindrical contours as if in two axes	○
24			Feed rate in distance per minute	○
25		New 3-D simulation graphics in full detail		●
26		Program verification graphics	Plan view, view in three planes, 3-D view	●
27			3-D line graphics	●
28		Enhanced file management		●
29		Context-sensitive help for error messages		●
30		TNCguide	Browser-based, context-sensitive helpsystem	●
31		Calculator		●
32		"Save As" function		●
33	Fixed cycles	Pecking	Cycle 1	●
34		Tapping	Cycle 2	●
35		Slot milling	Cycle 3	●
36		Pocket milling	Cycle 4	●
37		Circular pocket	Cycle 5	●
38		Datum shift	Cycle 7	●
39		Mirror imaging	Cycle 8	●

● Standard ○ Optional X N/A

NO.	Item		Spec.	TNC 620
40	Fixed cycles	Dwell time	Cycle 9	●
41		Rotation	Cycle 10	●
42		Scaling factor	Cycle 11	●
43		Program call	Cycle 12	●
44		Oriented spindle stop	Cycle 13	●
45		Rigid tapping (controlled spindle)	Cycle 17	●
46		Working plane	Cycle 19	○
47		Cylinder surface	Cycle 27	○
48		Cylinder surface slot milling	Cycle 28	○
49		Cylinder surface ridge milling	Cycle 29	○
50		Tolerance (HSC mode, TA)	Cycle 32	○
51		Rigid tapping, new	Cycle 207	●
52		Tapping with chip breaking	Cycle 209	●
53		Polar pattern	Cycle 220	●
54		Cartesian pattern	Cycle 221	●
55		Engraving	Cycle 225	●
56		Multipass milling	Cycle 230	●
57		Face milling	Cycle 233 Eenhanced with side walls, milling direction and strategy	●
58		Centering	Cycle 240	●
59		Single-lip deep-hole drilling	Cycle 241	●
60		Datum setting	Cycle 247	●
61		Rectangular pocket, complete	Cycle 251	●
62		Circular pocket, complete	Cycle 252	●
63		Slot, complete	Cycle 253	●
64		Circular slot, complete	Cycle 254	●
65		Rectangular stud, complete	Cycle 256	●
66		Circular stud, complete	Cycle 257	●
67		Thread milling	Cycle 262	●
68		Thread milling/countersinking	Cycle 263	●
69		Thread drilling/milling	Cycle 264	●
70		Helical thread drilling/milling	Cycle 265	●
71		Outside thread milling	Cycle 267	●
72		Trochoidal milling	Cycle 275	●
73	Touch probe cycles	Calibrating the effective radius on a circular stud		●
74		Calibrating the effective radius on a sphere		●
75	Cycles for automatic workpiece inspection	Save kinematics		○
76		Measure kinematics		○
77		Preset compensation		○
78		TS calibration of length		○
79		TS calibration in a ring		○
80		TS calibration on stud		○
81	Options	Software option 1	Rotary table machining, Coordinate transformation, Interpolation	○
82		Software option 2	3-D machining, Interpolation	○

Responding to Customers Anytime, Anywhere



Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
5	122	18	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.

Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

DNM series

Description	Unit	DNM 4500	DNM 5700	DNM 6700
Max. spindle speed	r/min	8000 {8000*, 12000, 15000}		
Max. spindle power	kW (Hp)	18.5(24.8) {15(20.1)*, 18.5(24.8), 18.5(24.8)}		
Max. spindle torque	N·m (lbf-ft)	117.8 (86.9) {286 (210.9)*, 117.8 (86.9), 117.8 (86.9)}		
Taper	-	ISO #40		
Travel distance (X / Y / Z)	mm (inch)	800 / 450 / 510 (31.5 / 17.7 / 20.1)	1050 / 570 / 510 (41.3 / 22.4 / 20.1)	1300 / 670 / 625 (51.2 / 26.4 / 24.6)
Tool storage capa.	ea	30 {40}		
Table size	mm (inch)	1000 x 450 (39.4 x 17.7)	1300 x 570 (51.2 x 22.4)	1500 x 670 (59.1 x 26.4)
NC system	-	DOOSAN FANUC i / SIEMENS S828D / HEIDENHAIN TNC620		

{ } Optional * 8000 r/min High torque version

Doosan Machine Tools

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MACHINE GREATNESS

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Fire Safety Precautions | There is a high risk or fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.