

DOOSAN



DNM series

Global Standard Vertical
Machining Center

DNM series

DNM 4500/4500L

DNM 5700/5700L

DNM 6700/6700L/6700XL



**MACHINE
GREATNESS™**

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 DNM 4500/5700/6700 series 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

- DNM series provides a larger table with increased Y axis travel and maximum table load.
- Doosan machine tools offer X-axis extension version for DNM 4500L, 5700L, 6700L/XL to enhance customer's machine variation.

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 (XxYxZ axis)

DNM 4500/L

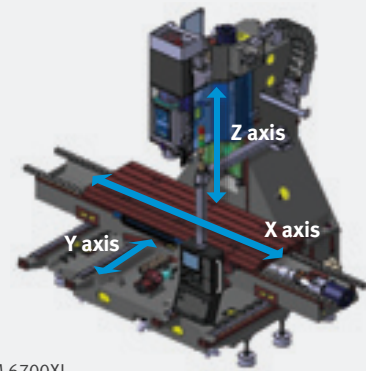
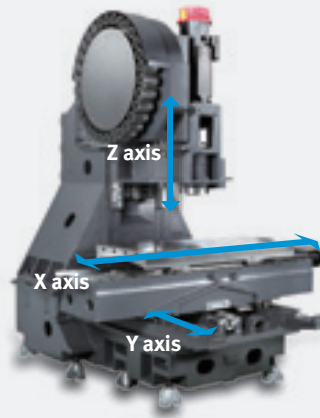
800{910} x 450 x 510 mm
(31.5{35.8} x 17.7 x 20.1 inch)

DNM 5700/L

1050{1300} x 570 x 510 mm
(41.3{51.2} x 22.4 x 20.1 inch)

DNM 6700/L/XL

1300{1500/2100} x 670 x 625 mm
(51.2{59.1/82.7} x 26.4 x 24.6 inch)



DNM 6700XL

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 / Y / Z axis)

DNM 4500 / 5700 / 6700 / 6700L

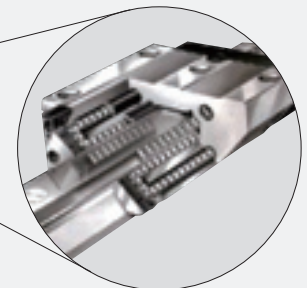
36 / 36 / 30 m/min (1417.3 / 1417.3 / 1181.1 ipm)

DNM 6700XL

30 / 30 / 30 m/min (1181.1 / 1181.1 / 1181.1 ipm)



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

Table size (A x B)

DNM 4500/L

1000{1050} x 450 mm
(39.4{41.3} x 17.7 inch)

DNM 5700/L

1300{1500} x 570 mm
(51.2{59.1} x 21.3 inch)

DNM 6700/L/XL

1500{1600/2200} x 670 mm
(59.1{63.0/86.6} x 26.4 inch)

Max weight on Table

DNM 4500/4500L

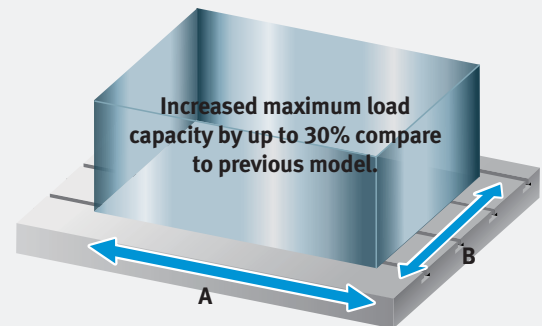
600 kg
(1322.8 lb)

DNM 5700/5700L

1000 kg
(2204.6 lb)

DNM 6700/6700L/6700XL

1300 kg
(2866.0 lb)



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

8000 r/min

12000 r/min option

15000 r/min option

Max. spindle motor power

18.5 kW (24.8 Hp)

Max. spindle motor torque

117.8 N·m (86.9 lbf-ft)

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

286 N·m (211.1 lbf-ft) option

(8000 r/min high torque version)

Basic Information

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- Cutting
- Performance

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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 **1.2s**

Chip to Chip* time **3.2s**

* 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

30 ea, 40 ea option, 60 ea option



* 30, 40ea

* 60ea



Machining performance

Cutting performance

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

Face mill (ø80mm (3.15 inch)) Carbon steel (SM45C)			
Chip removal rate cm ³ /min (inch ³ /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 cm ³ /min (inch ³ /min)	Spindle speed r/min	Feedrate mm/min (ipm)	
1901 (116.0)	1500	5940 (233.9)	
End mill (ø30mm (1.2 inch)) Carbon steel (SM45C)			
Chip removal rate cm ³ /min (inch ³ /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 cm ³ /min (inch ³ /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	
	Non-cutting time	Cutting time	Run hours
Previous model	14min. 31sec.	37min. 20sec.	51min. 51sec.
	Reduced by 17%		Reduced by 5%
New DNM series	12min. 6sec.	37min. 20sec.	49min. 26sec.

* 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

● Standard ○ Optional X/N/A

Basic Information

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

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NO.	Description	Features	DNM 4500/L	DNM 5700/L	DNM 6700/6700L/XL		
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(211.1)_FANUC	○	○	○	
4			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			12000 r/min (Unit: kW(Hp), N·m(lbf·ft))	32/15 (42.9/20.1), 203.7(150.3)_HEIDENHAIN	X	X	○
7				16.5/11 (22.1/14.8), 141(104.1)_SIEMENS	○	○	X
8				21.8/16.3 (29.2/21.9), 150.1(110.8)_SIEMENS	X	X	○
9				18.5/11(24.8/14.8), 117.8(86.9)_FANUC	○	○	○
10			15000 r/min (Unit: kW(Hp), N·m(lbf·ft))	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			60 ea	○	○	○	
15	Tool shank type	BIG PLUS BT40		●	●	●	
16		BIG PLUS CAT40		○	○	○	
17		BIG PLUS DIN40		○	○	○	
18	Raised column	150 mm (5.9 inch)		○	○	○	
19		200 mm (7.9 inch)		○	○	○	
20		300 mm (11.8 inch)		○	○	○	
21	Coolant	FLOOD	0.19 MPa(27.6 psi), 0.4 kW(0.5 Hp)	●	●	●	
22			0.69 MPa(100.1 psi), 1.8 kW(2.4 Hp)	○	○	○	
23			None	●	●	●	
24		TSC		2 MPa(290.1 psi), 1.5kW(2.0 Hp)	○	○	○
25				2 MPa(290.1 psi), 4 kW(5.4 Hp)	○	○	○
26				7 MPa(1015.3 psi), 5.5 kW(7.4 Hp)	○	○	○
27			FLUSHING		○	○	○
28		SHOWER (200 L/min (52.8 gal/min))		○	○	○	
29	Chip disposal	Chip pan		●	●	●	
30		Chip conveyor	Hinged type (Left/Right/Rear)		○	○	○
31			Magnetic scraper type (Left/Right/Rear)		○	○	○
32			Screw(AUGER) type (Left/Right)		○	○	○
33			Chip bucket		○	○	○
34	Air blower		○	○	○		
35	Air gun		○	○	○		
36	Coolant gun		○	○	○		
37	Mist collector		○	○	○		
38	Precision machining option	Linear scale	X / Y / Z axis	○	○	○	
39		AICC I (40 block)		○	○	○	
40		AICC II (200 block)		○	○	○	
41		SSP (Smooth Surface Package)		○	○	○	
42	Measurement & Automation	Automatic tool measurement	TS27R_RENISHAW	○	○	○	
43			OTS_RENISHAW	○	○	○	
44		Automatic tool breakage detection		○	○	○	
45		Automatic workpiece measurement	OMP60_RENISHAW	○	○	○	
46		Automatic front door with safety device		○	○	○	
47	Others	LED Work light		●	●	●	
48		3 Color signal tower		●	●	●	
49		4th axis auxiliary device interface		○	○	○	
50		Tool load monitoring		●	●	●	
51		EZ Guide i		●	●	●	
52		Automatic power off		○	○	○	
53	Customized Special Option	Coolant level switch	Sensing level - Low / High	○	○	○	
54		20K spindle	-	X	X	○	
55		HSK-63A	-	○	○	○	
56		ATC shutter door	30Tool / 40Tool	○	○	○	
57		ATC full cover	30Tool / 40Tool	○	○	○	
58		Bellows cover	-	○	○	○	
59		Ballscrew cover	-	○	○	○	
60		Drum	Hinge type	○	○	○	
61		chipconveyor	Scraper type	○	○	○	
62		Oil lubrication	X, Y, Z axis	○	○	○	
63		20 Bar TSC with inverter	50Hz → 60Hz	○	○	○	
64		Auto tool length measurement	LTS	○	○	○	
65		Auto tool breakage detection	OMRON / D5A	○	○	○	
66			MSC/BK9(Needle type on magazine)	○	○	○	

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%**

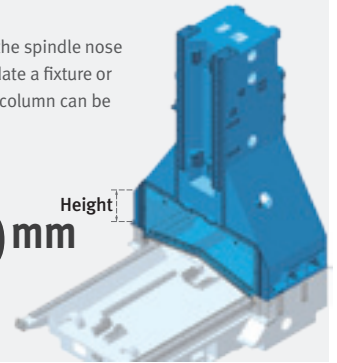


Raised column option 18-20

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

150/200/300 mm
(5.9/7.9/11.8 inch)



Chip conveyor option 29-32



Hinged belt



Magnetic scraper



Screw(Auger) type

Chip bucket option 33

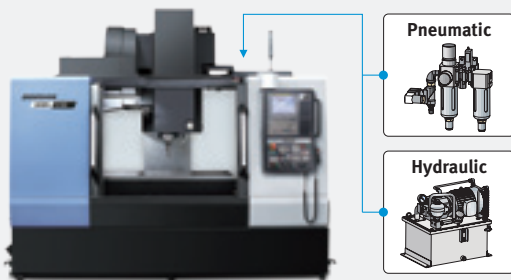
Capacity **300 L (79.3 gal)**



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.

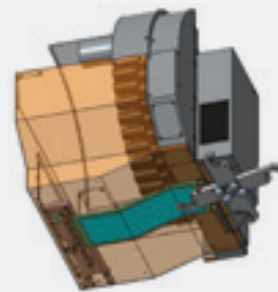
Hydraulic / Pneumatic fixture line option

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



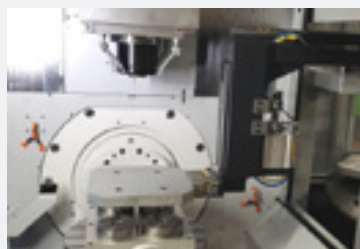
Auto shutter option 50

To prevent chips from getting inside the magazine port during aluminum workpiece cutting with a dual contact tool, an auto shutter is provided.



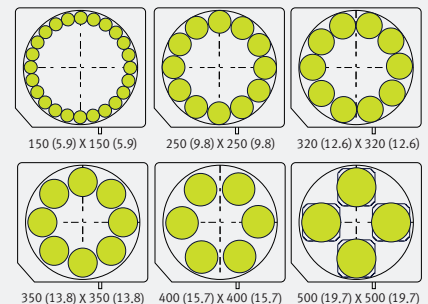
AWC system option

The optimized solution to realize compact automation system through automatic work-piece change system.



Pallet Storage-Table Configuration

Unit : mm (inch)



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DOOSAN Fanuc i Plus

DOOSAN Fanuc i Plus is optimized for maximizing customer productivity and convenience.

15 inch screen + New OP

DOOSAN Fanuc i Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.



DOOSAN Fanuc i Plus

- 15 inch color display
- Intuitive and user-friendly design

USB & PCMCIA card QWERTY keyboard

- EZ-guide i standard
- Ergonomic operator panel
- 2MB Memory
- Hot key

iHMI Touch screen option

iHMI provides an intuitive interface that utilizes a touch screen for quick and easy operation and provides a variety of applications that can help machine operation.



• PLANNING

Tool information such as tool offset and tool life can be checked and set, and scheduler function is provided.

• MACHINING

MDI, EDIT, MEM, JOG screen can be changed by using touch function, and it is quick and easy to move to sub menu by using soft key.

• IMPROVEMENT

User can set up to record data for analysis and monitor the specific signals by setting up the maintenance and inspection function. Also user can add items.

• UTILITY

View and search PDF and TEXT files, create notes from text / images / drawings, and link to web pages. For users who are familiar with the DOOSAN Fanuc i Plus screen, the screen can be switched.

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.



Tool management

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



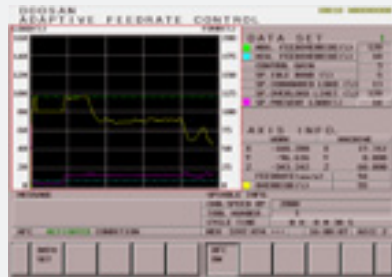
ATC recovery

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



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.

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



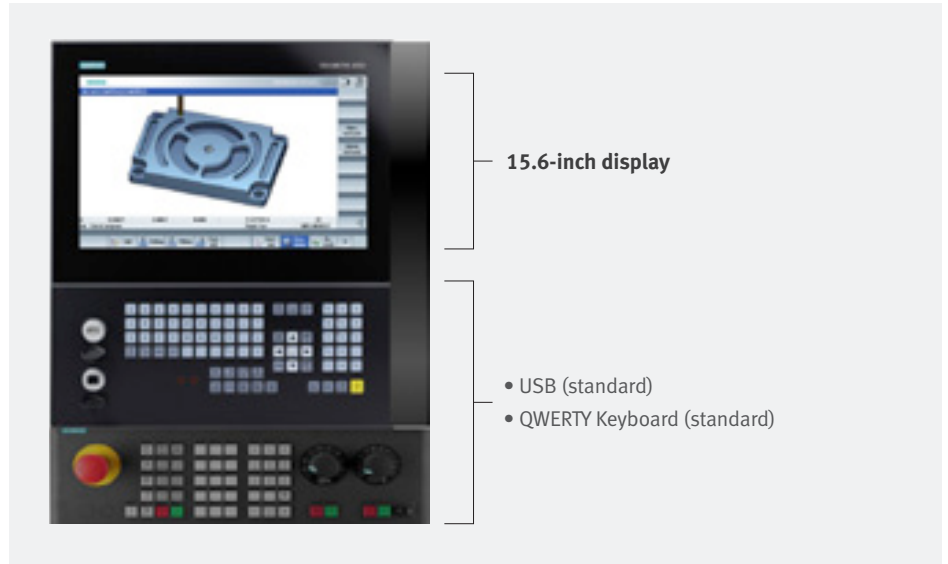


SIEMENS 828D

SIEMENS CNC optimized for DOOSAN machine tools maximizes users' productivity.

15.6 inch screen + New OP

The newly-designed operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.



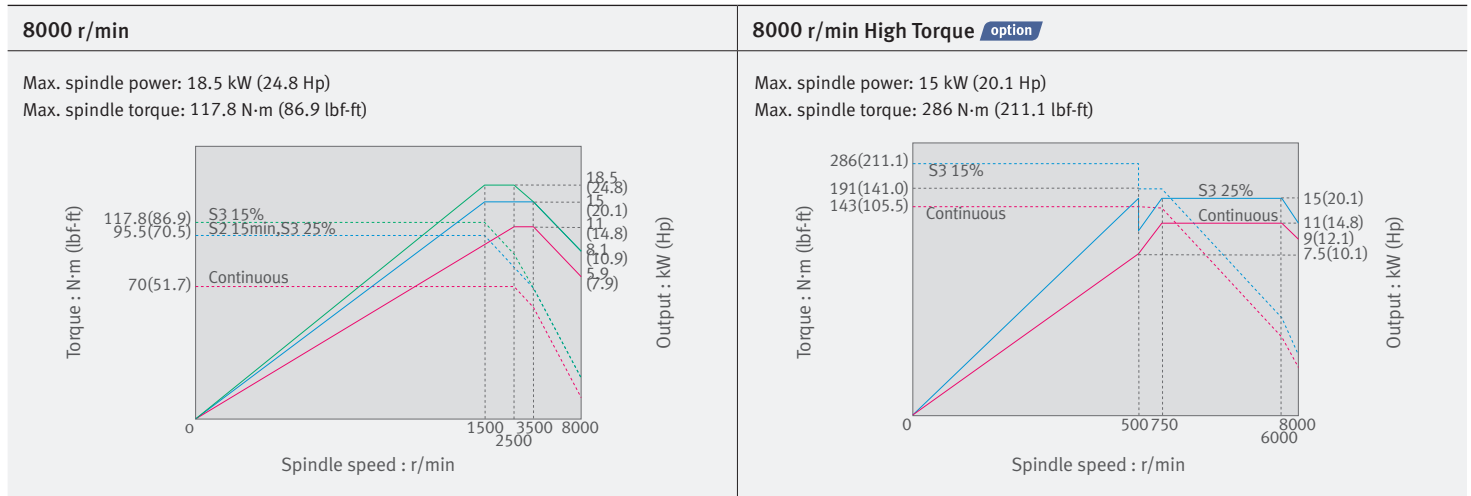
Conversational Convenient function

The machining monitoring function developed on the basis of the Shop Mill – an interactive machining support function of SIEMENS – provides users with cutting, servicing and maintenance screens for easy and convenient machine operation.

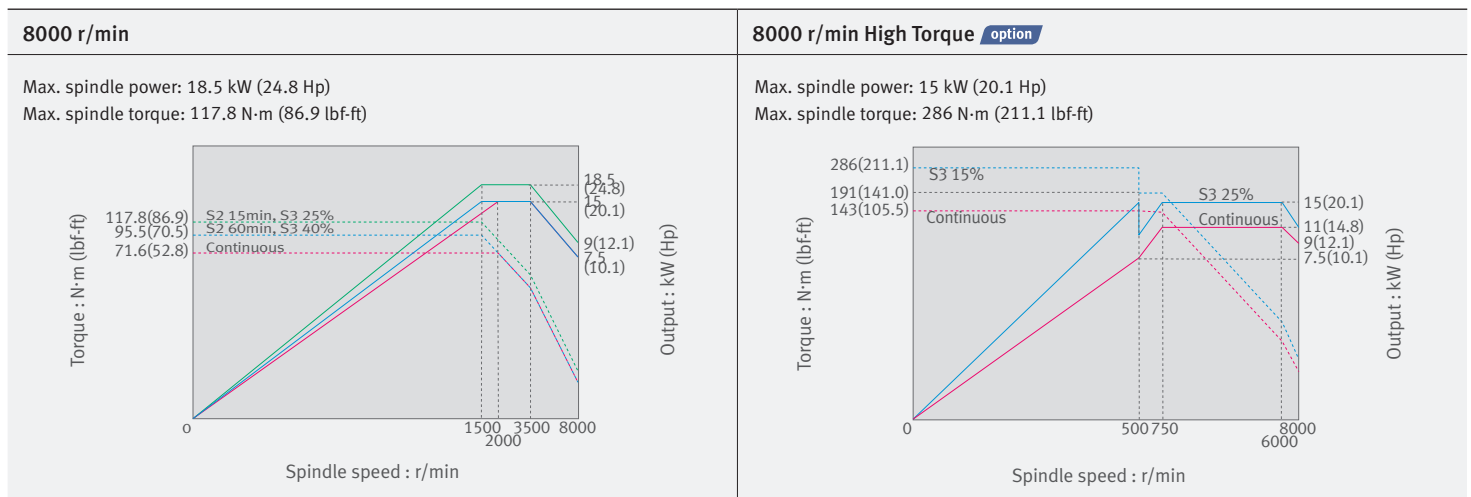
<p>Smart function Color highlighting is provided for each processing code function, and the calculator can be used easily by using the pocket calculator on display.</p>	<p>Shop Mill Part Programming It helps to write the part program and shorten the writing time.</p>
<p>Advanced program language programGUIDE Increases program flexibility, minimizing cycle time.</p>	<p>Simulation and machining contour monitoring Simulation results with different views can be checked.</p>
<p>Side screen widget Through the side widget, operator can easily monitor the current machining status.</p>	

Spindle Power – Torque Diagram (FANUC)

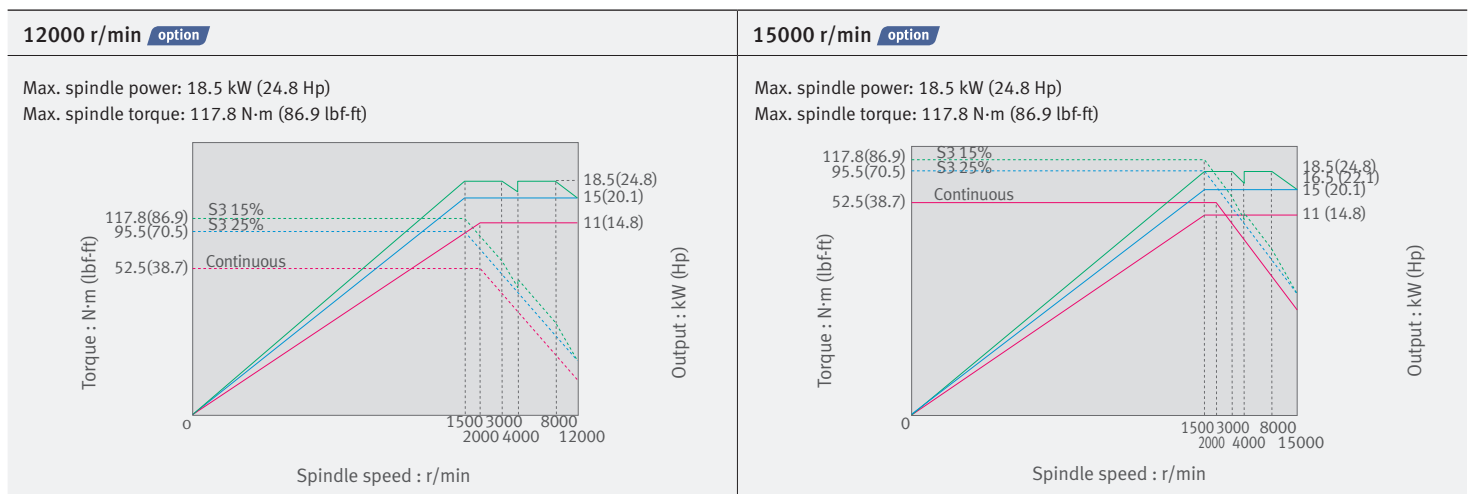
DNM 4500/L, DNM5700/L



DNM 6700/L/XL

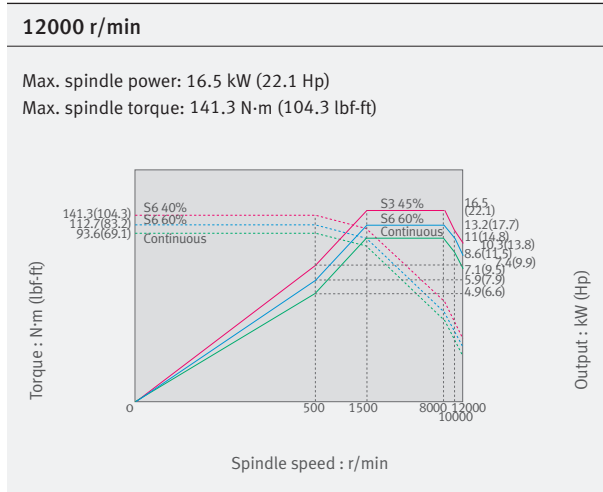


DNM 4500/L, 5700/L, 6700/L/XL

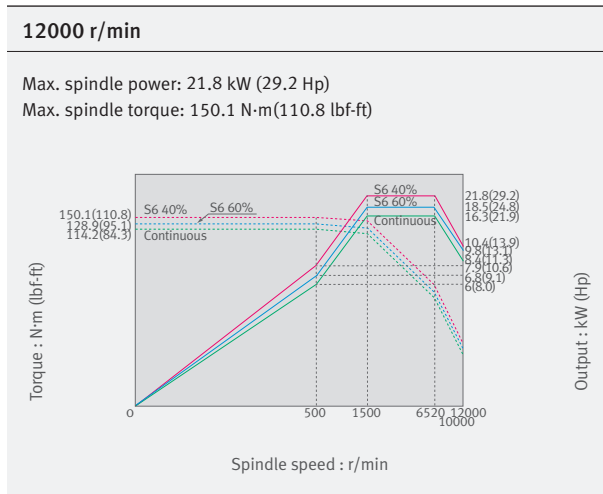


Spindle Power – Torque Diagram (SIEMENS)

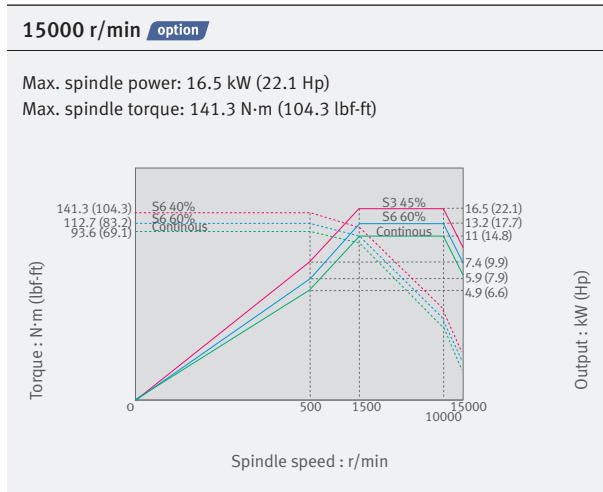
DNM 4500/L, 5700/L



DNM 6700L/XL

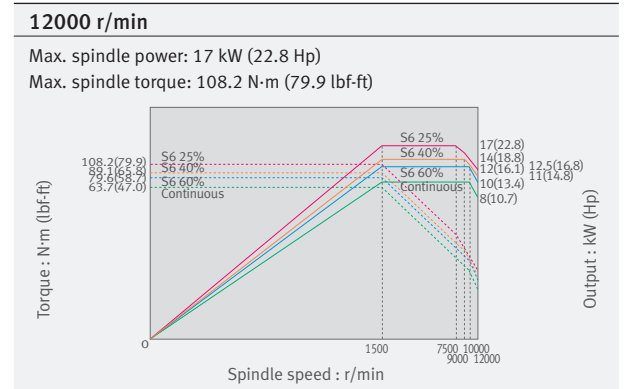


DNM 4500/L, 5700/L, 6700/L/XL

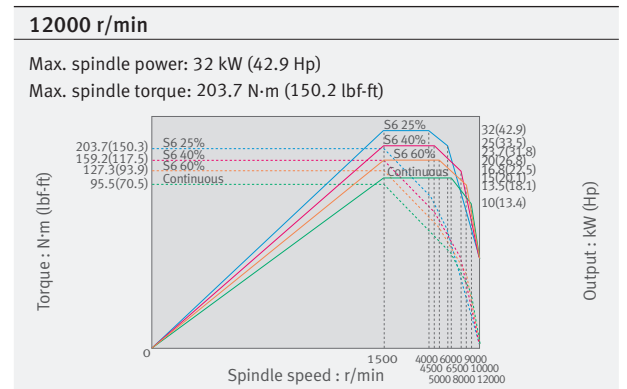


(HEIDENHAIN)

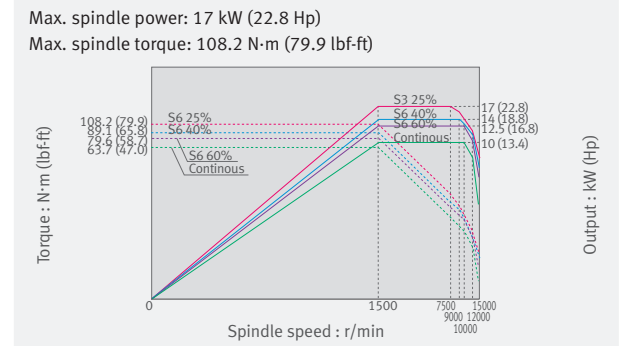
DNM 4500/L, 5700/L



DNM 6700L/XL

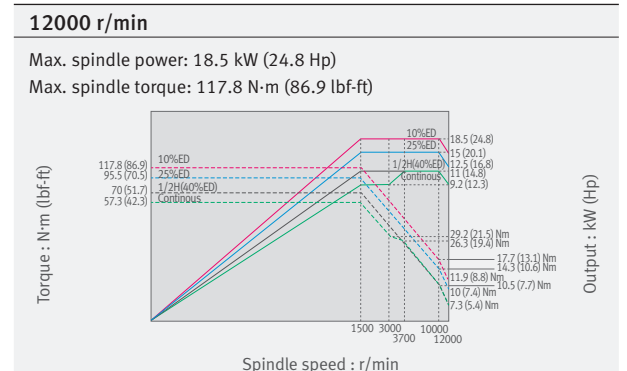


15000 r/min option



(MITSUBISHI)

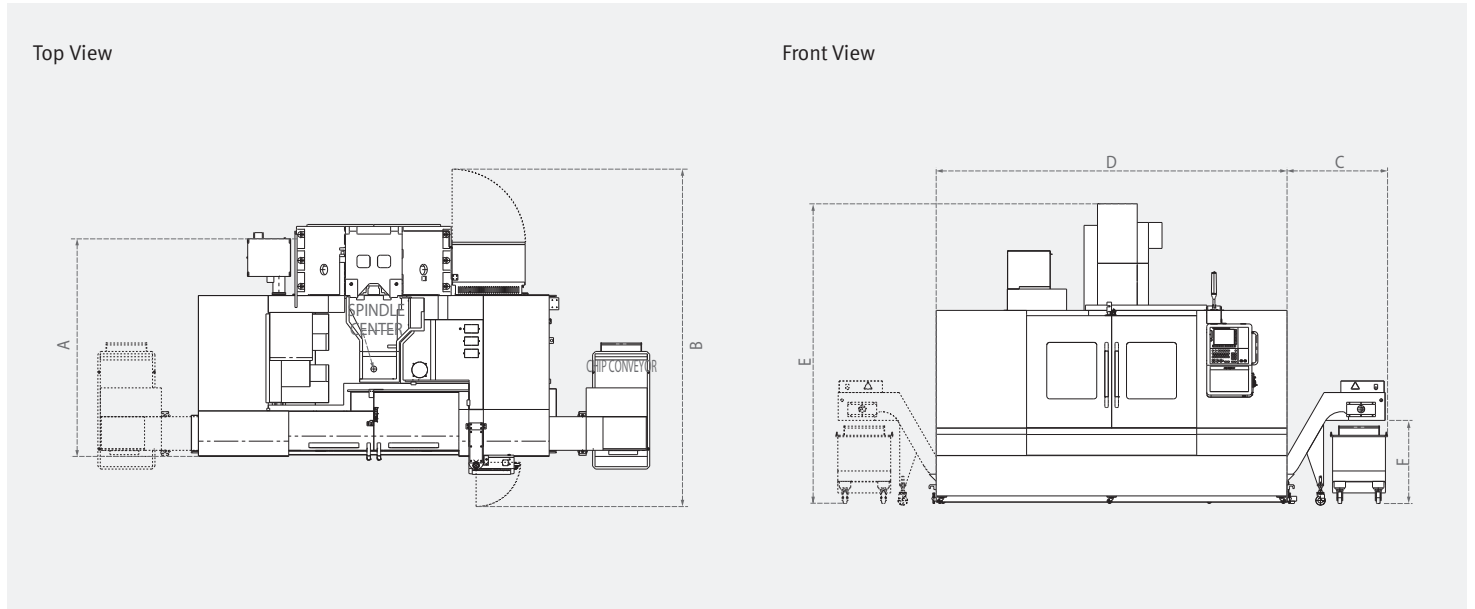
DNM 4500/L, 5700/L, 6700/L/XL



External Dimensions

DNM 4500/5700/6700 series

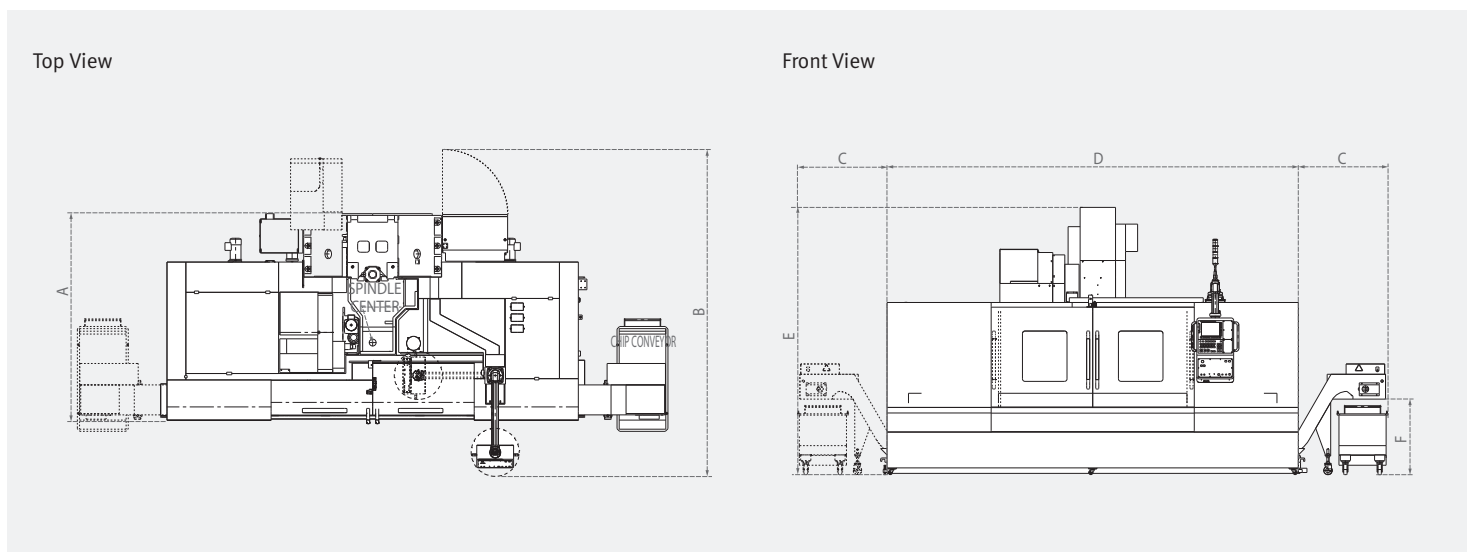
Unit: mm (inch)



Model	A (Length)	B ¹	C ²	D (Width)	E (Height)	F		
						SCRAPER	HINGED	SCREW
DNM 4500	1970 (77.6)	3200 (126.0)	1040 (415) [40.9(16.3)]	2465 (97.0)	2985 (117.5)	883 (34.8)	865 (34.1)	440 (17.3)
DNM 4500L	1970 (77.6)	3200 (126.0)	1040 (415) [40.9(16.3)]	2550(100.4)	2985 (117.5)	883 (34.8)	865 (34.1)	440 (17.3)
DNM 5700	2225 (87.6)	3365 (132.5)	1040 (415) [40.9(16.3)]	2960 (116.5)	2985 (117.5)	883 (34.8)	865 (34.1)	440 (17.3)
DNM 5700L	2225 (87.6)	3365 (132.5)	1040 (415) [40.9(16.3)]	3200 (126.0)	2985 (117.5)	883 (34.8)	865 (34.1)	440 (17.3)
DNM 6700	2415 (95.1)	3510 (138.2)	1040 (415) [40.9(16.3)]	3200 (126.0)	3120 (122.8)	883 (34.8)	865 (34.1)	440 (17.3)
DNM 6700L	2415 (95.1)	3510 (138.2)	1040 (415) [40.9(16.3)]	3650 (143.7)	3120 (122.8)	883 (34.8)	865 (34.1)	440 (17.3)

DNM 6700XL

Unit: mm (inch)



Model	A (Length)	B ¹	C ²	D (Width)	E (Height)	F		
						SCRAPER	HINGED	SCREW
DNM 6700XL	2415 (95.1)	3820 (150.4)	1045 (41.1)	4800 (189.0)	3120 (122.8)	883 (34.8)	865 (34.1)	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.

* Some peripheral equipment can be placed in other places *Rear chipconveyor need discuss with sales person

Table

Basic Information

- Basic Structure
- Cutting
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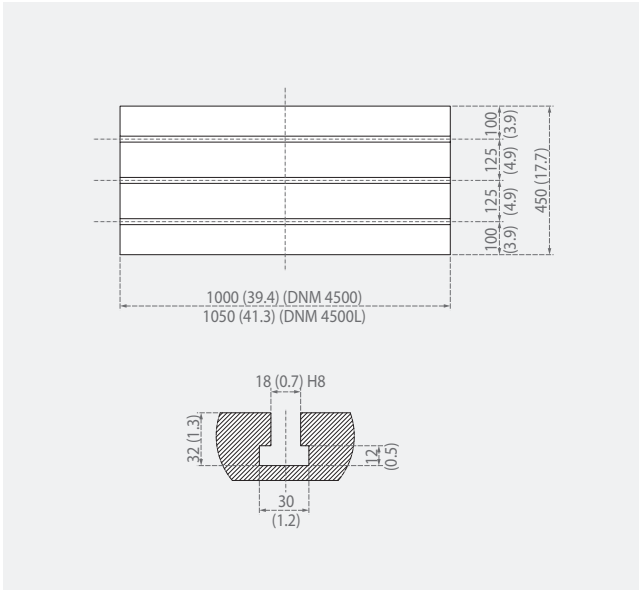
Detailed Information

- Options
- Applications
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- Specifications

Customer Support Service

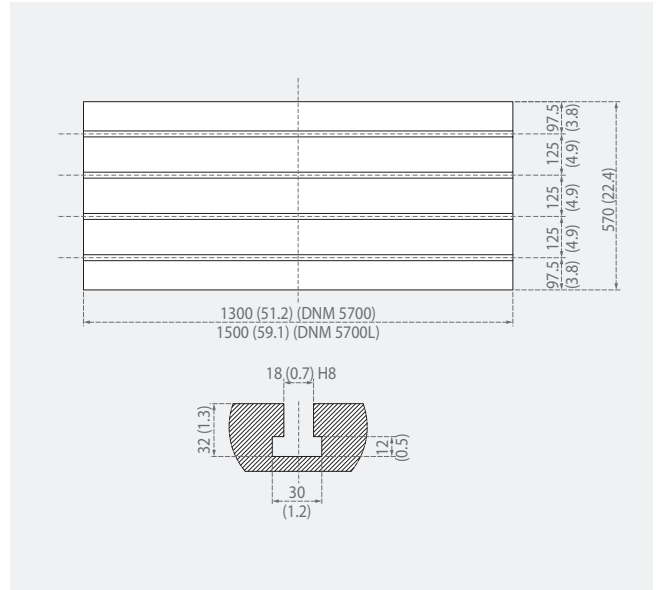
DNM 4500/L

Unit: mm (inch)



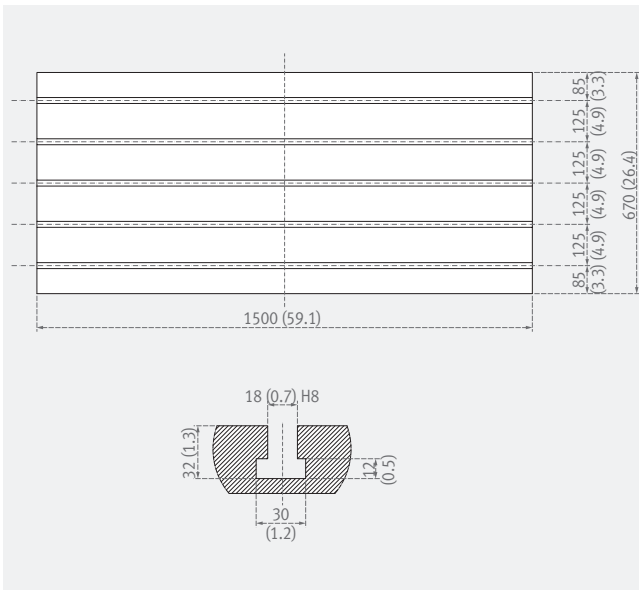
DNM 5700/L

Unit: mm (inch)



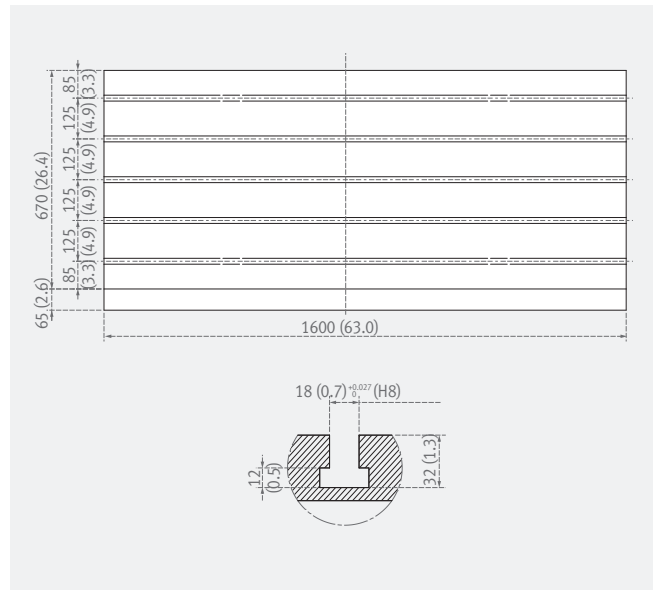
DNM 6700

Unit: mm (inch)



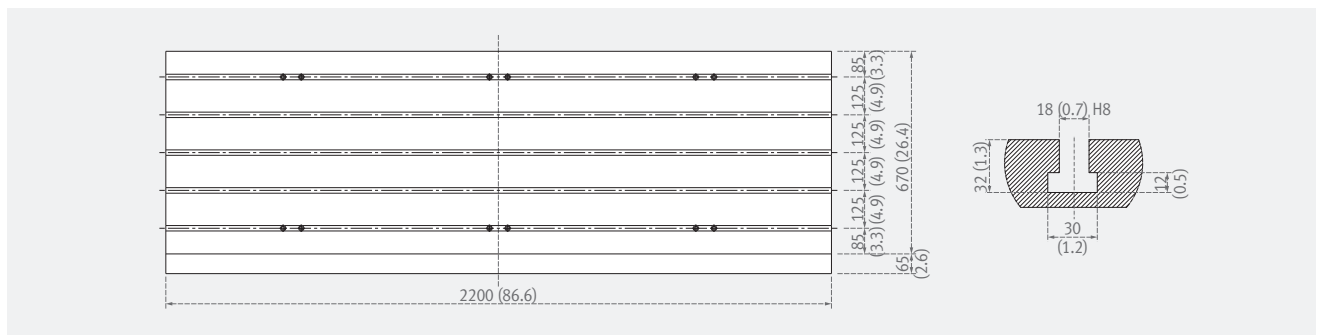
DNM 6700L

Unit: mm (inch)



DNM 6700XL

Unit: mm (inch)



Machine Specifications



Description			Unit	DNM 4500	DNM 4500L	DNM 5700	DNM 5700L	DNM 6700	DNM 6700L	DNM 6700XL	
Travels	Travel distance	X axis	mm (inch)	800 (31.5)	910 (35.8)	1050 (41.3)	1300 (51.2)	1300 (51.2)	1500 (59.1)	2100 (82.7)	
		Y axis	mm (inch)	450 (17.7)			570 (22.4)		670 (26.4)		
		Z axis	mm (inch)	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)	1050 x 450 (41.3 x 17.7)	1300 x 570 (51.2 x 22.4)	1500 x 570 (59.1 x 22.4)	1500 x 670 (59.1 x 26.4)	1600 x 670 (63.0 x 26.4)	2200 x 670 (86.6 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}							
		Mitsubishi	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)}			
		Mitsubishi	kW (Hp)	18.5/11 (24.8/14.8)							
	Max. spindle torque	Fanuc	N·m (lbf·ft)	117.8 (86.9) {286 (211.1)*, 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)}				
Mitsubishi		N·m (lbf·ft)	117.8 (86.9)								
Feedrates	Rapid traverse rate	X axis	m/min (ipm)	36 (1417.3)						30 (1181.1)	
		Y axis	m/min (ipm)	36 (1417.3)						30 (1181.1)	
		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, 60}								
	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						3.5			
Power source	Electric power supply (rated capacity)	kVA	29.6					38.1 {33.0**}		40 {35}*	
	Compressed air supply	MPa (psi)	0.54 (78.3)								
Tank capacity	Coolant tank capacity	L (gal)	260 (68.7)	285 (75.3)	310 (81.9)	350 (92.5)	325 (85.9)	430 (113.6)	440 (116.2)		
Machine Dimensions	Height	mm (inch)	2985 (117.5)						3120 (122.8)		
	Length	mm (inch)	2158 (85.0)			2413 (95.0)		2597 (102.2)		2970 (116.9)	
	Width	mm (inch)	2465 (97.0)	2701 (106.3)	2960 (116.5)	3350 (131.9)	3350 (131.9)	3650 (143.7)	4800 (189.0)		
	Weight	kg (lb)	4500 (9920.7)	5500 (12125.2)	6450 (14219.6)	7000 (15432.1)	8000 (17636.7)	9000 (19841.3)	10000 (22045.9)		
Control	NC system	-	DOOSAN Fanuc i Plus / SIEMENS S828D / HEIDENHAIN TNC620 / MITSUBISHI M80A								

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

FANUC

Basic Information

Basic Structure
Cutting
Performance

Detailed Information

Options
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Specifications

Customer Support Service

No.	Item	Spec.	DOOSAN Fanuc i Plus	
1	Controlled axis	Controlled axes	3 (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		Cylindrical 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	
14		Handle interruption		
15		Manual handle retrace		
16		AICC II	200 BLOCK	
17			400 BLOCK	○ ¹⁾
18		Spindle & M code Function	M- code function	
19	Retraction for rigid tapping			
20	Rigid tapping		G84, G74	
21	Tool Function	Number of tool offsets	400 ea	
22		Tool nose radius compensation	G40, G41, G42	
23		Tool length compensation	G43, G44, G49	
24		Tool life management		
25		Tool offset	G45 - G48	
26	Programming & Editing Function	Custom macro		
27		Macro executor		
28		Extended part program editing		
29		Part program storage	2MB (5120m)	
30		Inch/metric conversion	G20 / G21	
31		Number of Registered programs	1000 ea	
33		Optional block skip	9 BLOCK	
34		Optional stop	M01	
35		Program file name	32 characters	
36		Sequence number	N 8-digit	
37		Playback function		
38	OTHER FUNCTIONS (Operation, setting & Display, etc)	Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	
39		Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	
40		Embedded Ethernet		
41		Graphic display	Tool path drawing	
42		Loadmeter display		
43		Memory card interface		
44		USB memory interface	Only Data Read & Write	
45		Operation history display		
46		DNC operation with memory card		
47		Optional angle chamfering / corner R		
48		Run hour and part number display		
49		High speed skip function		
50		Polar coordinate command	G15 / G16	
51		Programmable mirror image	G50.1 / G51.1	
52	Scaling	G50, G51		
53	Single direction positioning	G60		
54	Pattern data input			
55	Jerk control	AI contour control II is required.		
56	Fast Data server with 1GB PCMCIA card			
57	Fast Ethernet			
58	3-dimensional coordinate conversion			
59	Figure copying	G72.1, G72.2		
60	Machining time stamp function			
61	EZ Guide i (Conversational Programming Solution)			

1) AICC2 (400block) of 0iMF must be changed to High Speed Main board. Ask R&D center for information.

2) Only with 15" LCD standard

SIEMENS

No.	Item	Spec.	S828D	
1	Controlled axis	Controlled axes	3 axes	
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		
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	
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		
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		

HEIDENHAIN

Basic Information

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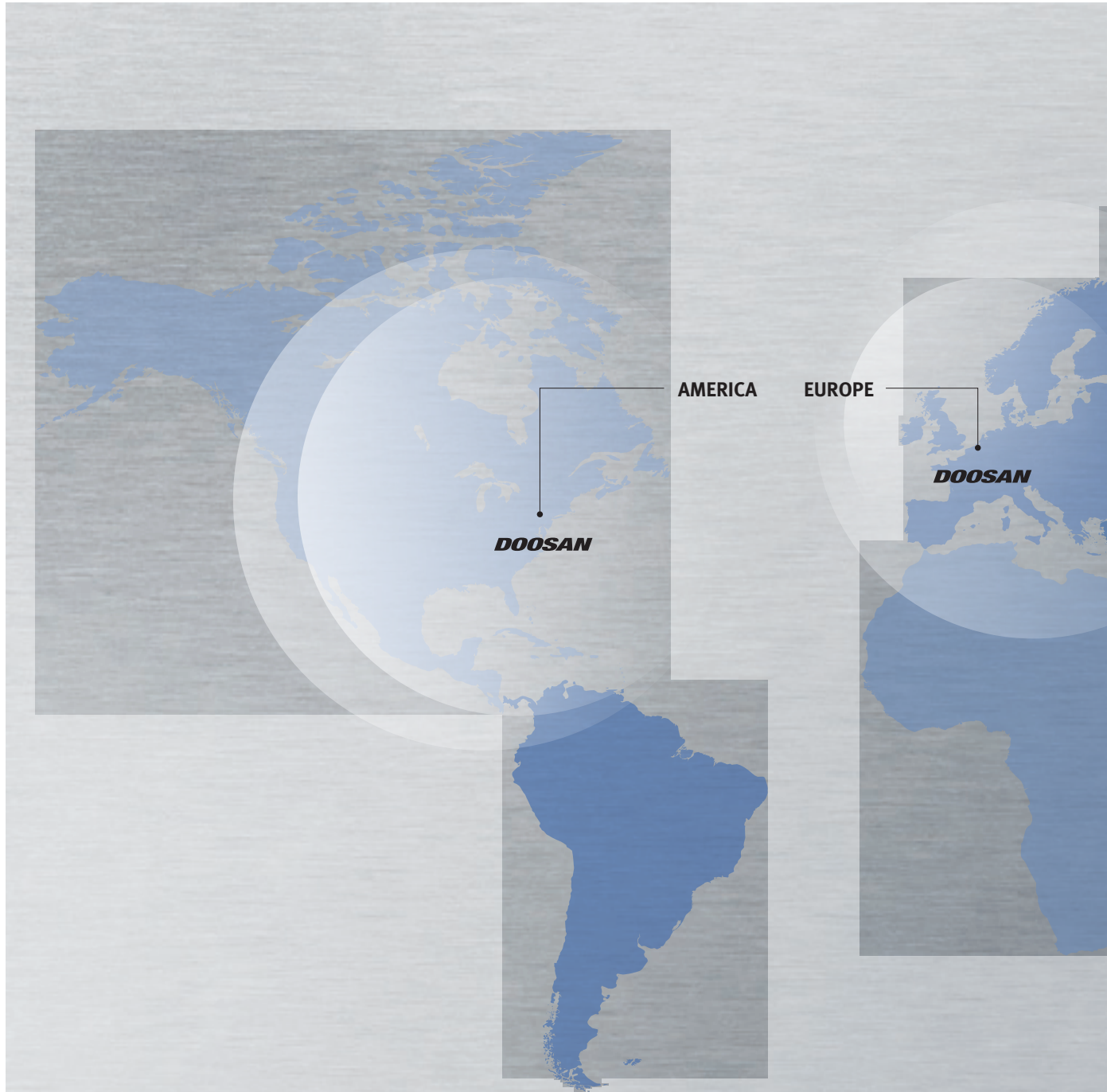
Customer Support Service

NO.	Item	Spec.	TNC 620
1	Axes	Controlled axes	3 axes
2		Additional Controlled axes	Max. 18 axes in total
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
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.
10			Max. 5000 blocks.
11		HSC filters	
12		Switching the traverse ranges	
13	User functions	Tool compensation	In the working plane and tool length
14			Radius-compensated contour look-ahead 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	
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
40		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 Enhanced 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

MITSUBISHI

No.	Item	Spec.	M80A	
1	Control Axes	Number of Basic Control Axes (NC Axes)	●3	
2		Number of Simultaneous Contouring Control Axes	●4	
3		Tape (RS-232C Input) Mode	●	
4		Front-side SD Card Mode	●	
5		Front-side USB Memory Mode	●	
6	Input Command	Least control increment 0.01μm(10nm)	●	
7		Least control increment 0.001μm(1nm)	●	
8		Inch/Metric Changeover	G20/G21	●
9		Absolute/Incremental Command	G90/G91	●
10	Positioning/Interpolation	Linear Interpolation	●	
11		Circular Interpolation(Center/Radius Designation)	●	
12		Helical Interpolation	●	
13		Spiral/Conical Interpolation	G02.1 /G03.1	●
14		Cylindrical Interpolation	G7.1	●
15	Feed	Feed per Minute (Asynchronous Feed)	G94	●
16		Feed per Revolution (Synchronous Feed)	G95	●
17		Override Cancel	M48 / M49	●
18		Automatic Acceleration/Deceleration after Interpolation		●
19		Thread Cutting (Lead/Thread Number Designation)		●
20		Synchronous Tapping Cycle	G84	●
21		Peckring Tapping Cycle		●
22		Deep-hole Tapping Cycle		●
23	Program Memory/Editing	Program Memory 500kB[1280m] (1000 programs)	●	
24		Color Touchscreen Display (10.4-type LCD TFT)	○	
25	Operation and Display	Absolute/Incremental Setting	G90/G91	●
26		Parameter Guidance		●
27		Alarm Guidance		●
28		Screenshot Capture		●
29		Remote Desktop Connection		●
30		VNC Server	●	
31	Input/Output Functions and Devices	Tool Offset Data Input/Output	●	
32		Common Variable Input/Output	●	
33		Parameter Input/Output	●	
34		History Data Output	●	
35		RS-232C I/F		●
36		Front-side SD Card I/F [Up to 32GB]		●
37		Ethernet I/F	●	
38		Front-side USB Memory I/F [Up to 32GB]	●	
39	Tool Compensation	Number of Tool Offset 400 sets	●	
40		Tool Shape/Wear Offset Amount	●	
41	Coordinate System	Workpiece Coordinate System Selection (6 Sets)	●	
42		Extended Workpiece Coordinate System Selection (48 Sets) G54.1P1 to P48	●	
43	Operation Support Functions	Optional Block Skip	●	
44		Auto-restart	●	
45		Manual Interruption	●	
46		Automatic Operation Handle Interruption	●	
47		Tapping Retract	●	
48	Program Support Functions	Variable Command 8000 sets	●	
49		Fixed Cycle for Drilling	●	
50		Special Fixed Cycle	●	
51		Mirror Image by Parameter Setting	●	
52		Mirror Image by External Input	●	
53		Mirror Image by G Code	G51.1	●
54		Coordinate Rotation by Program	G68/G69	●
55		3-dimensional Coordinate Conversion		●
56		Corner Chamfering/Corner R		●
57		Linear Angle Command		●
58	Polar Coordinate Command		●	
59	Chopping		●	
60	Exact Stop Check Mode	G09	●	
61	Exact Stop Check	G61	●	
62		Error Detection	●	
63		Programmable In-position Check	●	
64		High-speed Machining Mode I (G05P1) Maximum [kBPM]	337 BLOCK ●33.7	
65		High-speed Machining Mode II (G05P2) Maximum [kBPM]	675 BLOCK ●67.5	
66		High-accuracy Control (G61.1/G08)	●	
67		SSS Control	●	
68		Tolerance Control	●	
69		High-speed High-accuracy Control I (G05.1Q1) Maximum [kBPM]	337 BLOCK ●33.7	
70		High-speed High-accuracy Control II (G05P10000) Maximum [kBPM]	675 BLOCK ●67.5	
71		High-speed High-accuracy Control III (G05P20000) Maximum [kBPM]	1350 BLOCK ●135	
72		Smooth Fairing	●	
73		Machining Condition Selection I	●	
74		Playback	●	
75		Interactive Cycle Insertion	●	
76		Simple Programming (NAVI MILL/LATHE)	●	
77	Machine Accuracy Compensation	Backlash Compensation		
78		Memory-type Pitch Error Compensation[sets]	16SET	●16
79		Memory-type Relative Position Error Compensation		●
80		External Machine Coordinate System Compensation		●
81		Circular Radius Error Compensation		●
82		Ball Screw Thermal Expansion Compensation		●
83		Position-dependent Gradually Increasing-type Backlash Compensation		●
84		Bidirectional Pitch Error Compensation		●
85		Smooth High-gain (SHG) Control		●
86		Lost Motion Compensation		●
87	Automation Support Functions	Automatic Tool Length Measurement	●	
88		Workpiece Position Measurement	●	
89		Tool Life Management I / II / III	●	
90		Auto Power OFF	●	
91		Load Monitoring I	●	
92	Machine Support Functions	Ethernet Connection	●	
93		CC-Link Connection	●	

Responding to Customers Anytime, Anywhere



Global Sales and Service Support Network

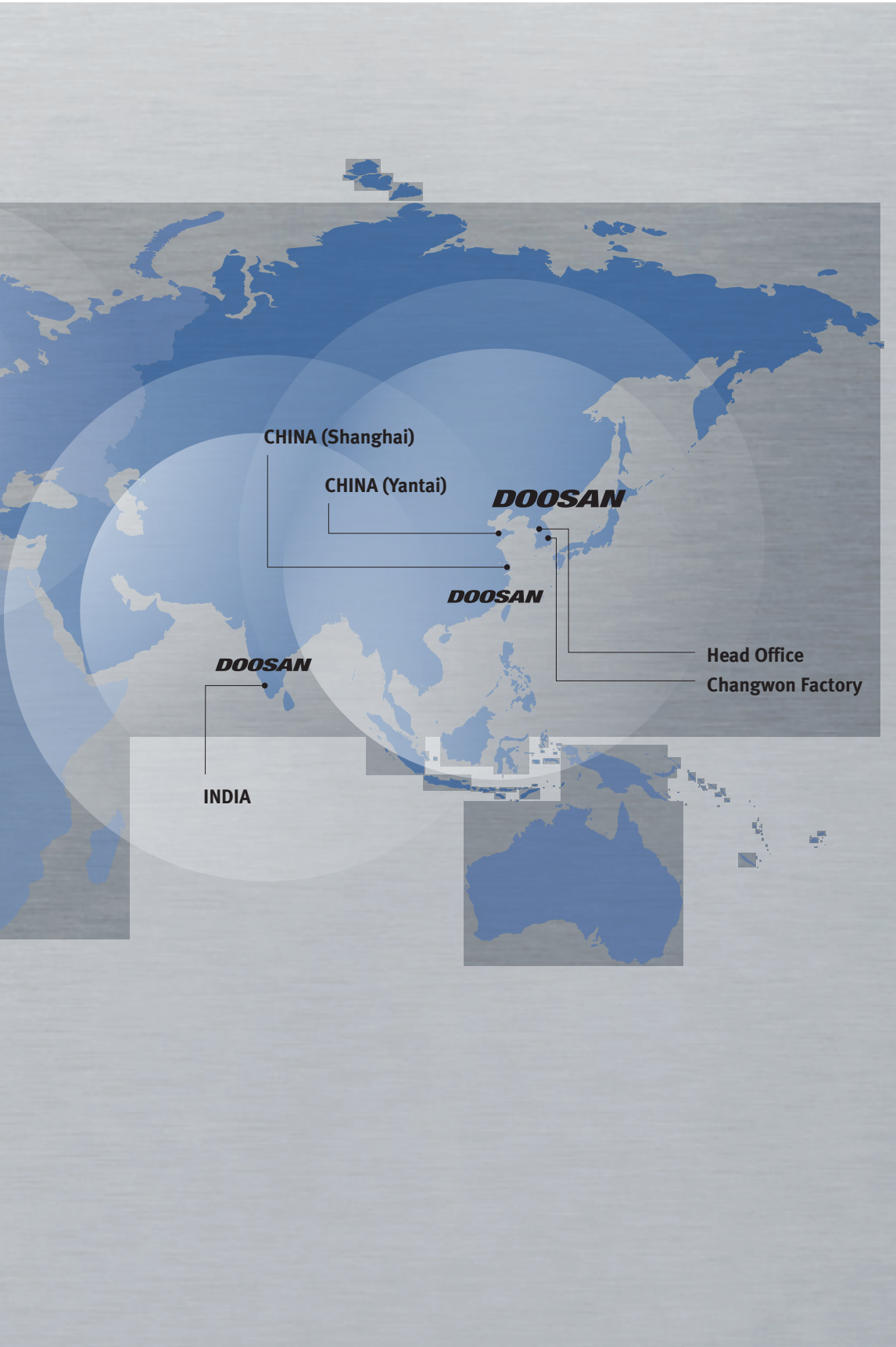
Corporations	Dealer Networks	Technical Centers	Service Post	Factories
4	164	51	198	3

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.



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 4500L	DNM 5700	DNM 5700L	DNM 6700	DNM 6700L	DNM 6700L	DNM 6700XL
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 (211.1)*, 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)	910 / 450 / 510 (35.8 / 17.7 / 20.1)	1050 / 570 / 510 (41.3 / 22.4 / 20.1)	1300 / 570 / 510 (51.2 / 22.4 / 20.1)	1300 / 670 / 625 (51.2 / 26.4 / 24.6)	1500 / 670 / 625 (59.1 / 26.4 / 24.6)	1500 / 670 / 625 (59.1 / 26.4 / 24.6)	2100 / 670 / 625 (82.7 / 26.4 / 24.6)
Tool storage capa.	ea	30 {40, 60}							
Table size	mm (inch)	1000 x 450 (39.4 x 17.7)	1050 x 450 (41.3 x 17.7)	1300 x 570 (51.2 x 22.4)	1500 x 570 (59.1 x 22.4)	1500 x 670 (59.1 x 26.4)	1600 x 670 (63.0 x 26.4)	1600 x 670 (63.0 x 26.4)	2200 x 670 (86.6 x 26.4)

{ } * 8000 r/min High torque version

Doosan Machine Tools

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

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Fire Safety Precautions

There is a high risk of 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.

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