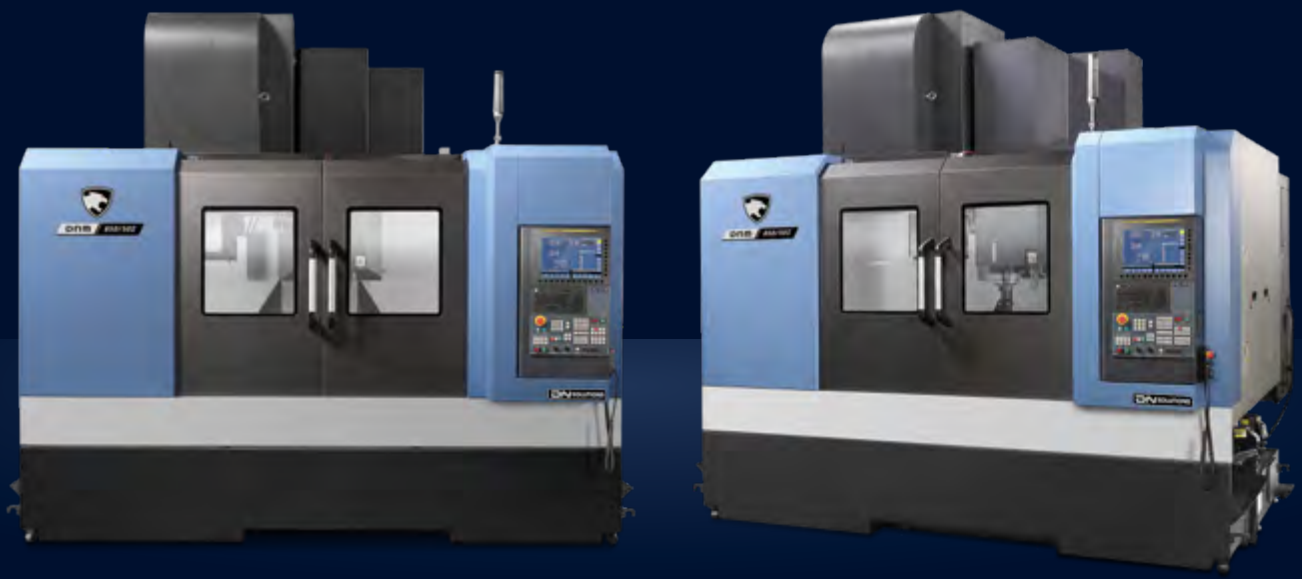
ISO #50, HIGH PRODUCTIVITY
VERTICAL MACHINING CENTER

DNM

650/50Ⅱ · **750**/50Ⅱ · **750**L/50Ⅱ



DN SOLUTIONS

DNM #50Ⅱ series

Designed to deliver high performance, DNM 50 ll series machines are equipped with directly coupled spindles, highly rigid columns and roller guideways on all their axes. In addition, the machines' Ez work functions improve operator efficiency and ease-of-use.

DIRECTLY-COUPLED SPINDLES, SUPPLIED AS STANDARD, PROVIDE EXTRA RIGIDITY AND DELIVER HIGH PRODUCTIVITY

- Directly coupled spindles reduce vibration and noise improving the machine's performance and positively impacting on the machine shop environment.
- Highly rigid columns and Roller LM guideways are incorporated for heavy duty machining operations.

EASY OPERATION OF CNC SYSTEM

- Easy operation ensures user convenience and efficiency
- The Ez work functions are user friendly ensuring ease-of-use.

BASIC STRUCTURE

A highly rigid column is adopted for heavy duty machining. This machining center provides workpiece capacities from 540 to 762 mm in the Y-axis, enabling a wide range of workpieces to be accommodated and processed.

Travel distance (X / Y / Z axis)

DNM 650/50 Ⅱ

1270 / 670 / 625 mm

50.0 x 26.4 x 24.6 inch

DNM 750/50 Ⅱ

1630 / 762 / 650 mm

64.2 x 30.0 x 25.6 inch

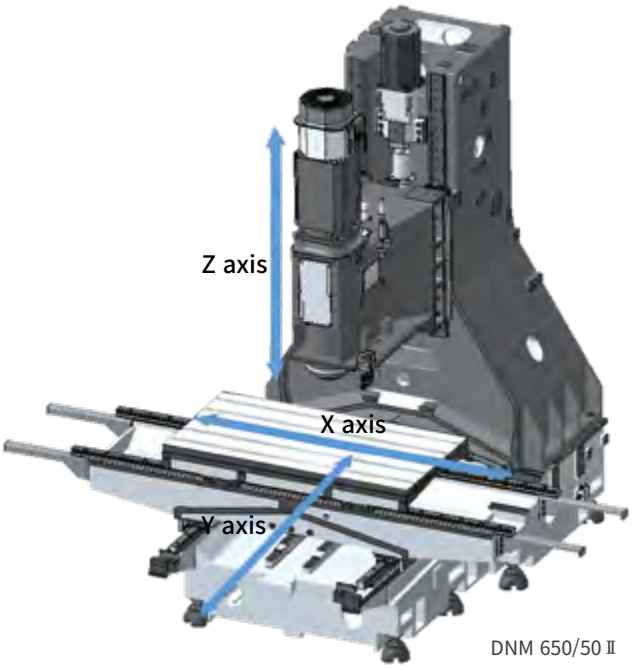
Travel distance (X / Y / Z axis)

DNM 750L/50 Ⅱ

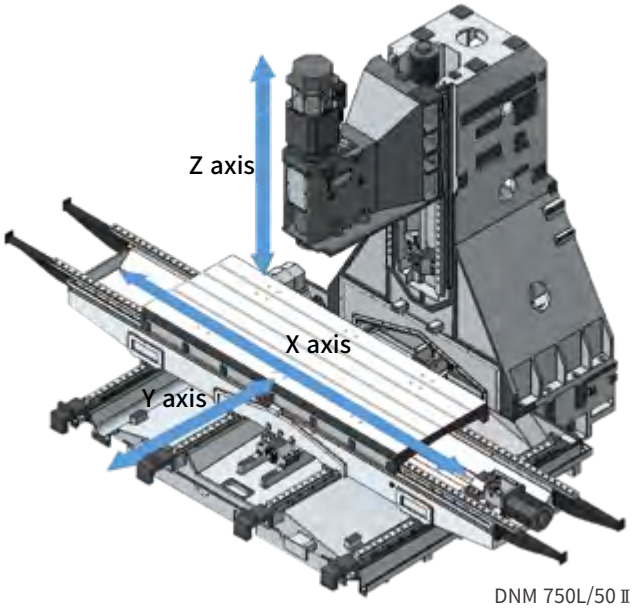
2160 / 762 / 650 mm

85.0 x 30.0 x 25.6 inch

DNM 750L/50 II has adopted 4way Roller LM guide in the Y axis for minimized overhang.



DNM 650/50 Ⅱ



DNM 750L/50 Ⅱ

Rapid traverse rate (X / Y / Z axis)

DNM 650/50 Ⅱ

36 / 36 / 30 m/min

1417.3 / 1417.3 / 1181.1 ipm

DNM 750/50 Ⅱ

30 / 30 / 24 m/min

1181.1 / 1181.1 / 944.9 ipm

DNM 750L/50 Ⅱ

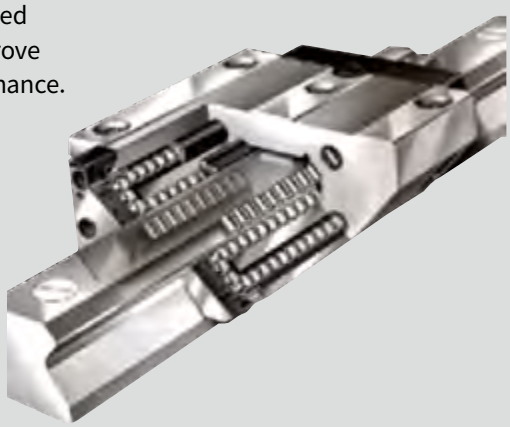
24 / 24 / 24 m/min

944.9 / 944.9 / 944.9 ipm

Axis system

Roller LM guideways are adopted as standard on all axes to improve rigidity and for ease of maintenance.

Roller LM guideway life is twice as long as that of Ball LM guideways.



SPINDLE | TABLE

The directly coupled spindle reduces vibration and noise improving the machine's performance and positively impacting on the machine shop environment. The dual contact spindle has been adopted as a standard to ensure high performance during heavy duty machining operations.

Max. spindle speed

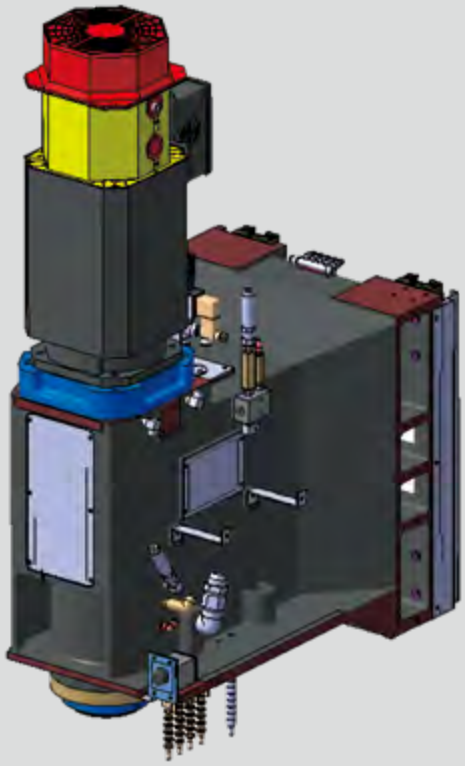
8000 r/min
10000 r/min option

Max. spindle motor power

22 kW 29.5 Hp
26 kW 34.9 Hp option

Max. spindle motor torque

353.2 N.m 260.7 ft-lbs
165.5 N.m 122.1 ft-lbs option



Direct coupled spindle of DNM 650/50 Ⅱ

Table size (A x B)

DNM 650/50 Ⅱ
1300 x 670 mm 51.2 x 26.4 inch

DNM 750/50 Ⅱ
1630 x 760 mm 64.2 x 29.9 inch

DNM 750L/50 Ⅱ
2160 x 760 mm 85.0 x 29.9 inch

TABLE

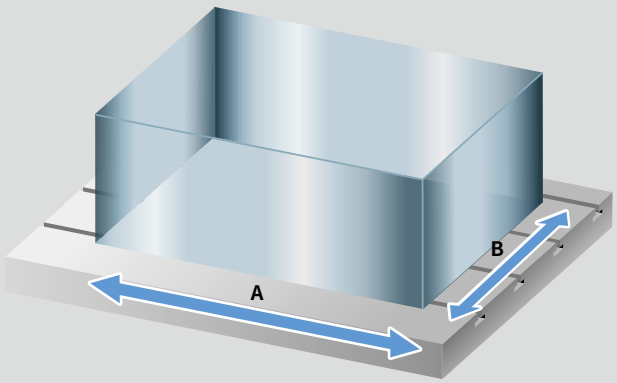
DNM #50 II series machines have good sized worktables enabling a range of workpieces to be machined.

Max. weight on Table

DNM 650/50 Ⅱ
1000 kg 2204.6 lb

DNM 750/50 Ⅱ
1500 kg 3306.9 lb

DNM 750L/50 Ⅱ
1800 kg 3968.3 lb



TOOL CHANGE SYSTEM | MACHINING PERFORMANCE

Tool change system

Higher productivity can be achieved with the CAM-type tool changer that supports faster tool changing.

Tool storage capacity

24 ea / **30** ea option

Tool to Tool

2.5 sec

Chip-to-Chip*

5.5 sec

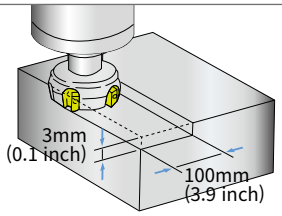
* *The Chip-to-Chip time has been tested in accordance with DN Solutions's strict testing conditions, but may vary depending on the user's operating conditions*

Cutting Performance

To provide best cutting performance by #50. Tool change time has been optimized to reduce non cutting time.
Result of cutting test on DNM 650/50 II (8000r/min, Direct, 22 / 11kW (29.5 / 14.8Hp))

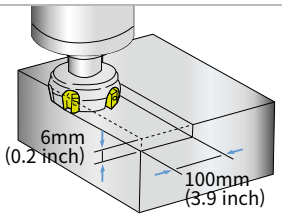
Face mill (ø125 mm (ø4.9 inch)) Carbon steel (SM45C)

Chip removal rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min)
480 (29.3)	500	1600 (63.0)



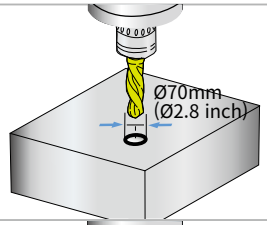
Face mill (ø125 mm (ø4.9 inch)) Carbon steel (SM45C)

Chip removal rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min)
356 (21.7)	500	594 (23.4)



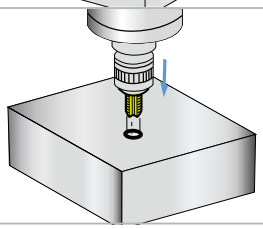
U-Drill (ø70 mm) Carbon steel (SM45C)

Chip removal rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min)
385 (23.5)	500	100 (3.9)



Tap Carbon steel (SM45C)

Tap size (mm)	Spindle speed (r/min)	Feedrate (mm/min)
M 36 x P 4.0	177	708 (27.9)



* *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 meet customers' specific machining requirements and applications.

Description	Features		DNM 650/50 Ⅱ	DNM 750/50 Ⅱ	DNM 750L/50 Ⅱ
Spindle	8000 r/min	22/11 kW (29.5/14.8 Hp) (S3 25%/Cont.)	●	●	●
	10000 r/min	26/22 kW (34.9/29.5 Hp) (S3 40%/Cont.)	○	○	○
Spindle cooling system	8000 r/min	22/11 kW (29.5/14.8 Hp)	●	●	●
	10000 r/min	26/22 kW (34.9/29.5 Hp)	●	●	●
Magazine	Tool storage capacity	24 ea	●	●	●
		30 ea	○	○	○
Tool shank type	BIG PLUS BT50		●	●	●
	BIG PLUS CAT50		○	○	○
	BIG PLUS DIN50		○	○	○
Coolant	FLOOD	0.15 Mpa (21.8 psi), 0.4 kW (0.5 Hp)	●	●	●
		0.7 MPa (101.5 psi), 1.8 kW (2.4 Hp)	○	○	○
	TSC**	None	●	●	●
		2 MPa (290.0 psi), 1.5kW (2.0 Hp)	○	○	○
		2 MPa (290.0 psi), 4.0 kW (5.4 Hp)	○	○	○
		7 Mpa (1015.0 psi), 5.5 kW (7.4 Hp)	○	○	○
	SHOWER	0.1 MPa (14.5 psi), 1.1 kW (1.5 Hp)	○	○	○
	Oil skimmer	Belt type	○	○	○
Chip disposal	Chip pan		●	●	●
	Chip conveyor	Hinged type (Left/Right/Rear)	○	○	○
		Magnetic scraper type (Left/Right/Rear)	○	○	○
	Chip bucket		○	○	○
Precision machining option	Linear scale	X / Y / Z axis	○	○	○
	AICC II (200 block)		●	●	●
	Fine surface machining	Look-ahead block is Max.200 -AI contour control II+ -Smooth tolerance control+ -Jerk control	●	●	●
Measurement & Automation	Automatic tool measurement	TS27R	○	○	○
		OTS	○	○	○
	Automatic tool breakage detection		○	○	○
	Automatic workpiece measurement	OMP60	○	○	○
	Automatic front door with safety device		○	○	○
Accessories	WORK LIGHT	LED LAMP	●	●	●
	OPERATOR CALL LAMP	3-COLOR SIGNAL TOWER(LED)	●	●	●
	LEVELING BLOCK & BOLT	-	●	●	●
	SMART THERMAL CONTROL	SENSORLESS TYPE(ONLY SPINDLE)	●	●	●
	ASSEMBLY & OPERATION TOOLS KIT	-	●	●	●
	Air blower		○	○	○
	Air gun		○	○	○
	Coolant gun		○	○	○
	Mist collector		○	○	○
Customized Special Option	ANCHORING (1)	SLIDE CLAMP & CHEMINCAL ANCHOR BOLT	○	○	○
	TSA (2)	0.54	○	○	○
	RAISING BLOCK	150	○	○	○
		200	○	○	○
		300	○	○	○
	DRUM CHIPCONVEYOR	HINGE TYPE	○	○	○
		SCRAPER TYPE	○	○	○
	20 BAR TSC with INVERTER	50Hz → 60Hz	○	○	○
	ATC AUTO SHUTTER		○	○	○
	TOOL SHANK	HSK-100A	○	○	○
	PICK UP MAGAZINE	INSTALL ON THE TABLE	○	○	○
	TOOL STORAGE CAPACITY	40T / 48T (CHAIN ATC)	○	○	○
	TOOL ID with TOOL PULL OUT SYSTEM	CHAIN ATC(30/40/48T)	○	○	○
	AUTO TOOL LENGTH MEASUREMEMT	RENISHAW / LTS	○	○	○
	AUTO TOOL BREAKAGE DETECTION	MSC/BK9(NEEDLE TYPE ON MAGAZINE)	○	○	○

● *Standard* ○ *Optional* X *Not applicable*

※ Please contact DN Solutions for detailed specification information.
**If this option is selected, the TSA(Through Spindle Air) Max.pressure is 0.54MP*
(1) Please refer to foundation drawing in relation to anchoring. If more detailed information is required consult with DN Solutions service
(2) If TSC is not required - TSA can be selected as an option.
***When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.*

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

PERIPHERAL EQUIPMENT

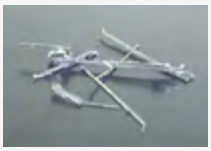
Oil Cooler

An oil cooler correlated to room temperature can be equipped for a long-term operation at high speed. Cooling oil circulates around the spindle bearings to prevent thermal error of the spindle and maintain machining accuracy.

Chip conveyor option

Long

Short



Needle

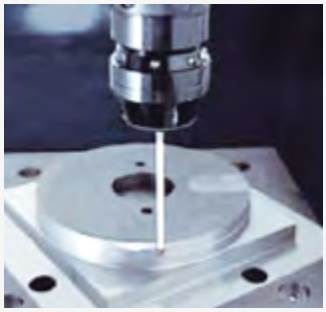
Sludge

Chip conveyor type \ Material		Carbon steel			Cast iron		Aluminium		
		Long	Short	Needle	Short	Sludge	Long	Short	Needle
Hinged belt type		○	△	X	△	X	○	△	X
Scrapper type	Normal	X	○	△	○	△	X	△	X
	Magnetic	X	○	○	○	○	–	–	–
Drum filter type	Hinged type	○	△	X	△	X	○	△	X
	Scrapper	X	○	△	○	△	X	○	△

○ : Suitable, △ : Possible, X : Not suitable

Measurement & Automation option

Automatic tool measurement

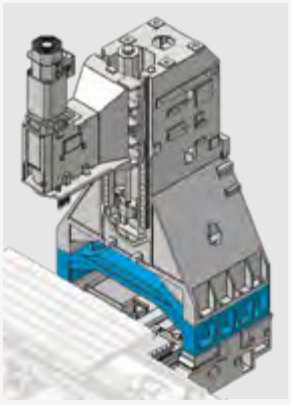


Automatic workpiece measurement

Raised block option

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, raised block can be used to extend the distance.

Height **150** mm (5.9 inch)
200 mm (7.9 inch)
300 mm (11.8 inch)



4th axis auxiliary device interface option

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

Hydraulic / Pneumatic fixture line option

The user should prepare pipelines for hydraulic/pneumatic fixtures whose detailed specifications should be determined through discussions with DN Solutions.

DN SOLUTIONS FANUC i PLUS

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

15 inch screen + new operation panel

DN Solutions 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.

DN Solutions Fanuc i Plus

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

USB & PCMCIA card

QWERTY keyboard

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

iHMI touchscreen option

iHMI provides an intuitive interface that uses a touchscreen for quick and easy operation.

Range of applications

Providing various applications related to planning, machining, improvement and utility, for customer convenience.

NUMERIC CONTROL SPECIFICATIONS

FANUC

Item		Specifications	DN Solutions Fanuc i (0i Plus) DNM 4digit
Controlled axis	Controlled axes		3 (X,Y,Z)
	Simultaneously controlled axes		4 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	●
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
	Large capacity memory(2GB)*2	Available Option only with 15” Touch LCD (iHMI Only) *2)	○
Interface function	Embedded Ethernet		●
	Fast Ethernet		○
	Enhanced Embedded Ethernet function		●
Operation	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
Program input	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T4 digits
	Tilted working plane indexing command	G68.2 TWP	○
Feed function	AI contour control I	G5.1 Q_, 40 Blocks	X
	AI contour control II	G5.1 Q_, 200 Blocks	●
	AI contour control II	G5.1 Q_, 600 Blocks	X
	AI contour control II	G5.1 Q_, 1000 Blocks *1)	X
	High smooth TCP		X
Operation guidance function	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Only with 15” Touch LCD standard *2)	X
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MTConnect		✪
	FANUC OPC UA		✪
Others	Display unit	10.4" color LCD	X
		15" color LCD	X
		15" color LCD with Touch Panel	●
	Part program storage size & Number of registerable programs	640M(256KB)_500 programs	X
		1280M(512KB)_1000 programs	X
		2560M(1MB)_1000 programs	X
		5120M(2MB)_1000 programs	●
		10240M(4MB)_1000 programs	X
		20480M(8MB)_1000 programs	X
		2560M(1MB)_2000 programs	X
		5120M(2MB)_4000 programs	X
		10240M(4MB)_4000 programs	X
		20480M(8MB)_4000 programs	X

*1) The number of look-ahead blocks may be changed or limited depending on the peripheral device or the configuration of the internal NC system.
*2) Available Option only with Fanuc i plus iHMI

● Standard ○ Optional X N/A ✪ Available
Network: FANUC MT Connect and FANUC OPC UA available.

EZ WORK

The software developed by DN Solutions features numerous functions designed for convenience and ease of operation.

EZ work

The EZ work delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EZ work reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.

Thermal Compensation

A function to maintain high-precision machining quality by analyzing and correcting the amount of thermal displacement of a structure through a temperature sensor

M/G-Code List

Functional description of M code and G code

Tool Management

Function to manage tool information [Tool information / Tool No. / Tool condition (normal, large diameter, worn / damaged, used for the rst time, manual) / Tool name]

Operation Rate

Machine operation history management function by date based on load

Adaptive Feed Control

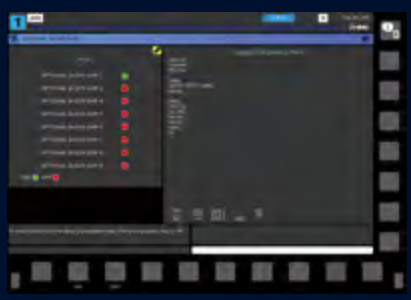
Function to control feedrate so that the cutting can be carried out at a constant load (To adapt to the spindle load set up with constant load feedrate control function)

Spindle Warm Up

A function that assists spindle warm-up for spindle life when the spindle has not been used for a certain period of time

ATC Recovery

Function to view detailed info with recommended actions and to perform step-by-step operation manually (when an alarm is triggered during an ATC operation)



Addition of Optional Block Skip

In addition to the OPTIONAL BLOCK SKIP of the operation panel, the function to skip a specific block selected in the machining program

POWER | TORQUE

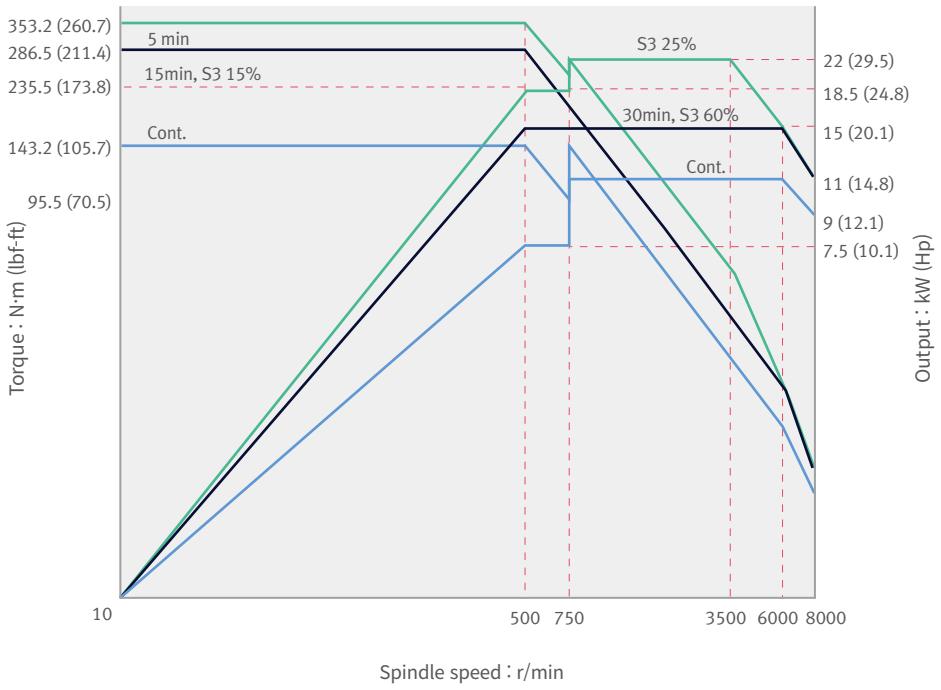
DNM 650/50Ⅱ, DNM 750/50Ⅱ, DNM 750L/50Ⅱ

8000 r/min

SPEED: **8000** r/min

POWER: **22** kW
29.5 Hp

TORQUE: **353.2** N·m
260.7 ft-lbs

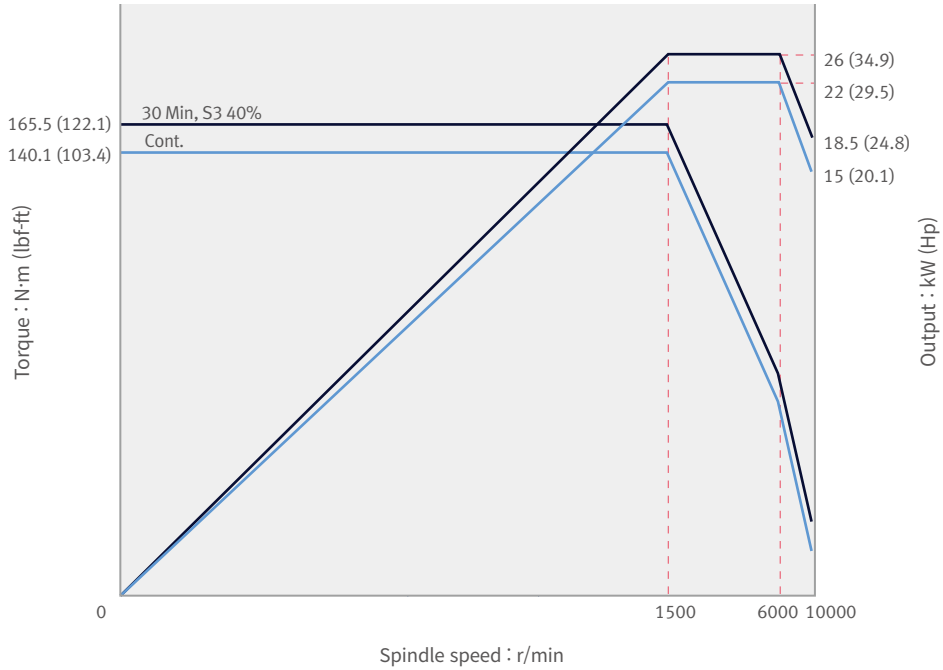


10000 r/min option

SPEED: **10000** r/min

POWER: **26** kW
34.9 Hp

TORQUE: **165.5** N·m
122.1 ft-lbs

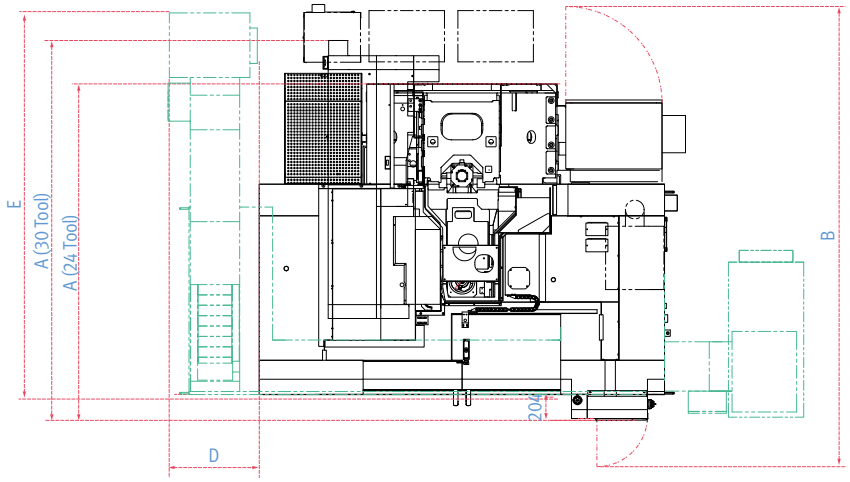


DIMENSIONS

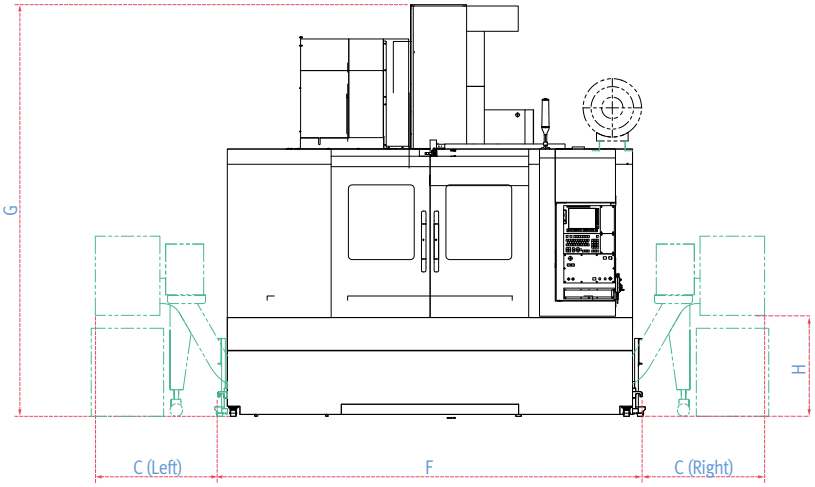
DNM 650/50Ⅱ

Units : mm (inch)

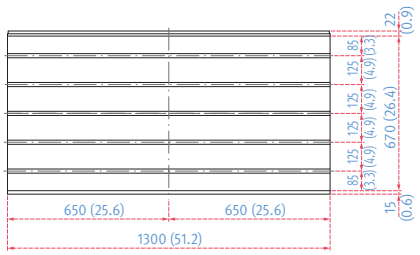
TOP

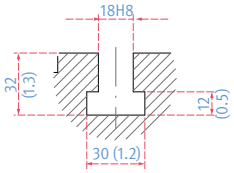


FRONT



TABLE





T-SLOT SECTION

Model	A (Length)	B (Max. machine length)	C (Additional width to accommodate the side chip conveyor)	D (Additional width to accommodate the rear chip conveyor)	E (Length to accommodate the rear chip conveyor)	F (Width)	G (Height)	H (Height from the floor to the chip outlet)
DNM 650/50Ⅱ	2656 (104.6) (24 Tool) 2999 (118.1) (30 Tool)	3633.5 (143.1)	Left & Right : 967.6 (38.1)	710 (28.0)	3010 (118.5)	3350 (131.9)	3250 (128.0)	805 (31.7)

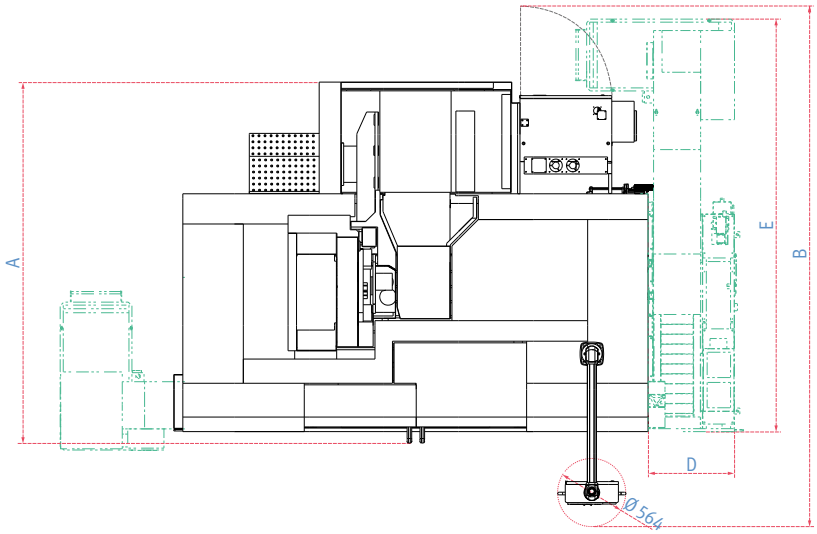
** Some peripheral equipment can be placed in other places*

DIMENSIONS

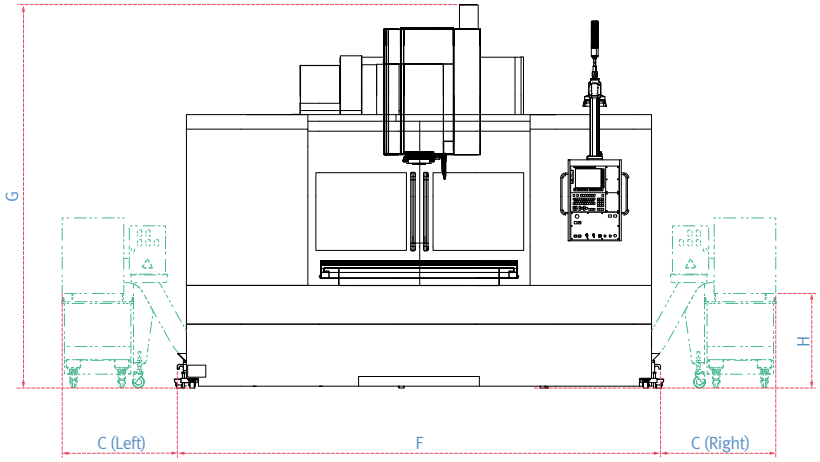
DNM 750/50Ⅱ, DNM 750L/50Ⅱ

Units : mm (inch)

TOP

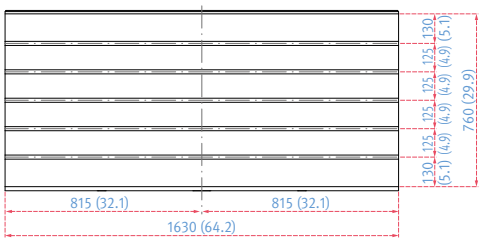


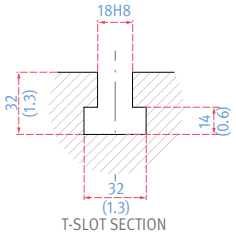
FRONT



TABLE

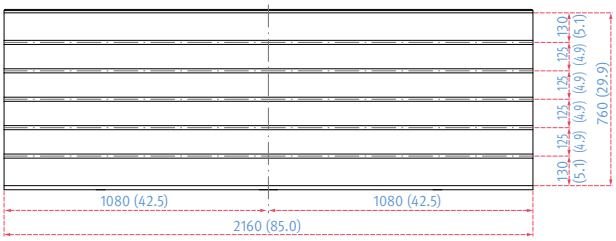
DNM 750/50 Ⅱ

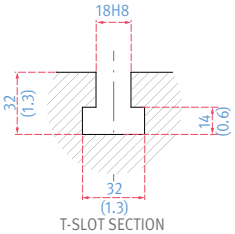




T-SLOT SECTION

DNM 750L/50 Ⅱ





T-SLOT SECTION

Model	A (Length)	B (Max. machine length)	C (Additional width to accommodate the side chip conveyor)	D (Additional width to accommodate the rear chip conveyor)	E (Length to accommodate the rear chip conveyor)	F (Width)	G (Height)	H (Height from the floor to the chip outlet)
DNM 750/50Ⅱ	2986 (117.6)	4309 (169.6)	Left & Right : 953 (37.5)	790 (31.1)	3413 (134.4)	4000 (157.5)	3373 (132.8)	805 (31.7)
DNM 750L/50Ⅱ	2986 (117.6)	4309 (169.6)	Left & Right : 953 (37.5)	790 (31.1)	3413 (134.4)	5050 (198.8)	3373 (132.8)	805 (31.7)

** Some peripheral equipment can be placed in other places*

MACHINE SPECIFICATIONS

Description			Unit	DNM 650/50 Ⅱ	DNM 750/50 Ⅱ	DNM 750L/50 Ⅱ
Travels	Travel distance	X axis	mm (inch)	1270 (50.0)	1630 (64.2)	2160 (85.0)
		Y axis	mm (inch)	670 (26.4)	762 (30.0)	762 (30.0)
		Z axis	mm (inch)	625 (24.6)	650 (25.6)	650 (25.6)
	Distance from spindle nose to table top		mm (inch)	200 ~ 825 (7.9 ~ 32.5)	200 ~ 850 (7.9 ~ 33.5)	200 ~ 850 (7.9 ~ 33.5)
Table	Table size		mm (inch)	1300 x 670 (51.2 x 26.4)	1630 x 760 (64.2 x 29.9)	2160 x 760 (85.0 x 29.9)
	Table loading capacity		kg (lb)	1000 (2204.6)	1500 (3306.9)	1800 (3968.3)
	Table surface type		mm (inch)	T-SLOT [5-125 (4.9) x 18(0.7)H8]		
Spindle	Max. spindle speed		r/min	8000 {10000}*		
	Taper		-	ISO #50		
	Spindle power		kW (Hp)	22/11 (29.5/14.8) (S3 25%/Cont.) {26/22 (34.9/29.5) (S3 40%/Cont.)}*		
	Max. spindle torque		N·m (lbf-ft)	353.2 (260.5) (5min) {165.5 (122.0)(S3 40%)}*		
Feedrates	Rapid traverse rate	X axis	m/min (ipm)	36 (1417.3)	30 (1181.1)	24 (944.9)
		Y axis	m/min (ipm)	36 (1417.3)	30 (1181.1)	24 (944.9)
		Z axis	m/min (ipm)	30 (1181.1)	24 (944.9)	24 (944.9)
Automatic Tool Changer	Type of tool shank	Tool shank	-	BT 50 {CAT50/DIN50}*		
		Pull stud	-	MAS403 P50T-1 (45°)		
	Tool storage capa.		ea	24 {30}*		
	Max. tool diameter	Continous	mm (inch)	125 (4.9)		
		Without Adjacent Tools	mm (inch)	220 (8.7)		
	Max. tool length		mm (inch)	350 (13.8)		
	Max. tool weight		kg (lb)	20 (44.1)		
	Max. tool moment		N·m (lbf-ft)	22 (16.2)		
	Tool seletion		-	MEMORY RANDOM		
	Tool change time (Tool-to-tool)		sec	2.5		
	Tool change time (Chip-to-chip)		sec	5.5		
Power source	Electric power supply (Rated capacity)		kVA	36.2 {50.2}*	39.5 {53.5}*	
	Compressed air supply		Mpa (psi)	0.54 (78.3)		
Tank capacity	Coolant tank capacity		L (gal)	380 (100.4)	520 (137.4)	590 (155.9)
Machine Dimensions	Height		mm (inch)	3250 (128.0)	3385 (133.3)	3385 (133.3)
	Length		mm (inch)	3350 (131.9)	3435 (135.2)	3435 (135.2)
	Width		mm (inch)	2740 / 3000 (107.9 / 118.1)	3850 (151.6)	4900 (192.9)
	Weight		kg (lb)	9000 (19841.3)	13800 (30423.8)	15300 (33730.7)
Control	CNC system		-	DN Solutions Fanuc i Plus, HEIDENHAIN TNC 620		

*{ } : Option

RESPONDING TO CUSTOMERS
ANYTIME, ANYWHERE

DN Solutions Global Network

DN Solutions provides systems-based professional support services, before and after the machine tool sale, by responding quickly and efficiently to customers. By supplying spare parts, product training, field service and technical support, we provide the expert care, attention and assistance our customers expect from a market leader.

Global sales and service support network		51	Technical centers Technical center, Sales support, Service support, Parts support
4	Corporations	200	Service posts
155	Dealer networks	3	Factories

CUSTOMER SUPPORT AND SERVICES

We're there for you whenever you need us.

We help our customers operate at maximum efficiency by providing them with a range of tried, tested and trusted services - from pre-sales consultancy to post-sales support.

Field services

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

Parts supply

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

Training

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

Technical support

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

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* Specifications and information contained within this catalogue may be changed without prior notice.

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