



DOUBLE COLUMN MACHINING CENTER

# BM

1530M · 2035M · 2740M



**DN SOLUTIONS**

**Basic Information**

Basic Structure  
Cutting  
Performance

**Detailed Information**

Options  
Optimized Tool  
Processing Solution  
Capacity Diagram  
Specifications



# BM series

The BM Series is a large double-column type machining center designed to process molds. Equipped with a low-vibration built-in spindle, the machining center is suitable for a variety of works from roughing to finishing. The new improved design delivers greater efficiency, thereby raising customers' productivity and creating maximum added value.

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### Equipped with a high-speed, high-rigidity spindle as a standard feature

- 12000 r/min high-speed spindle
- Long-nose type ideal for deep pocket mold cutting
- Equipped with a dual contact spindle as a standard feature for high rigidity and minimum vibration



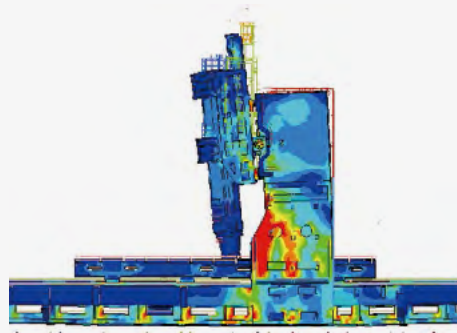
### Standard feed axes equipment for higher level of precision

- All axes provided with a linear scale as a standard feature
- Ball screw bearings and nut cooling system



### Adoption of structure and control solution for high-quality mold cutting

- Covers provided to minimize the impact of ambient temperature
- Thermal displacement compensation for spindle and structure included as a standard feature



### Sample work



Press mold



Injection mold



Refrigerator mold



Automotive mold

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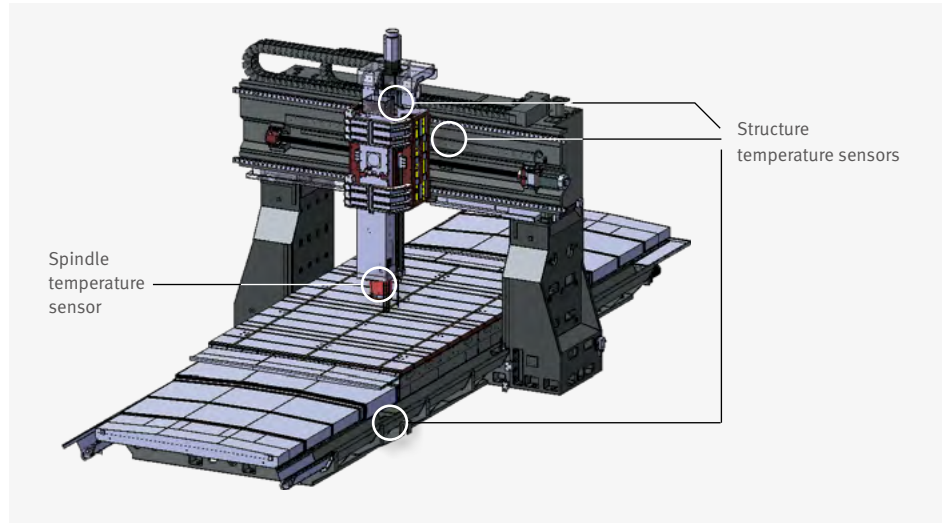


### Basic Structure

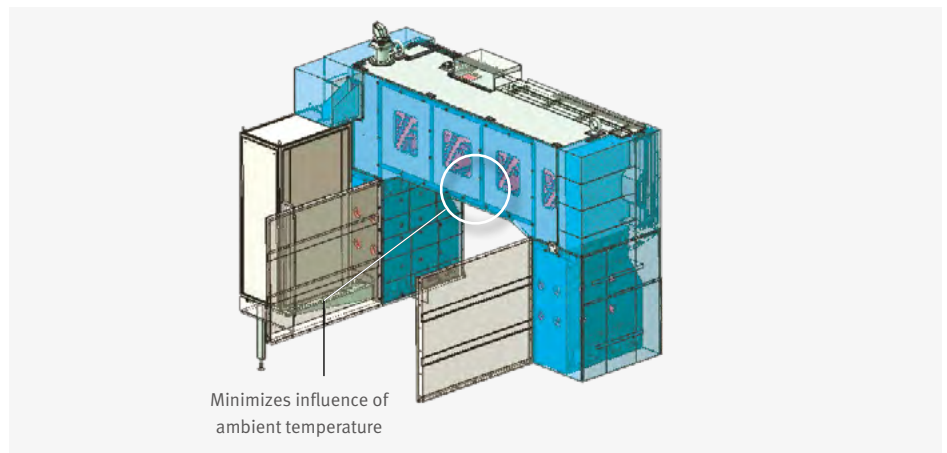
Double-column structure for stable precision level

### Thermal Displacement Compensation for Spindle and Structure Included as a Standard Feature

Multiple thermal sensors are attached to minimize and compensate thermal displacement of the spindle and the structure.



Important parts of the structure are covered to minimize the impact of ambient temperature

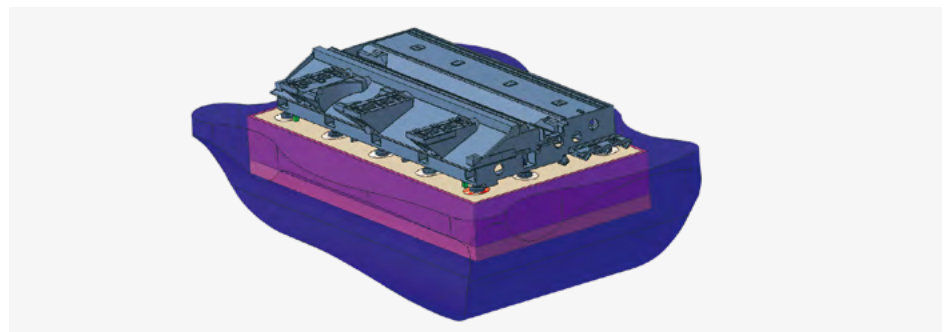


### Foundation

Anchoring is recommended to ensure machining accuracy over a long time.

### Machine Foundation\*

Since machining accuracy is highly dependent on the machine's foundation, anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items.



\* Please consult with DN Solutions sales technicians regarding ground and operating conditions.

## Spindle

A high-speed, high-rigidity built-in spindle is provided as a standard feature to enhance the productivity of machining large works as well as smaller parts.

### Built-in Spindle Optimized for Cutting Molds

- Vibration and noise minimized with built-in spindle
- Long-nose spindle protrudes by 293 mm (11.5 inch), making it ideal for cutting deep pocket molds
- Dual contact spindle included as a standard feature for high rigidity and vibration

**Advantaged with Deep pocket cutting**

Long nose  
**293mm**  
(11.5 inch)



General → BM series

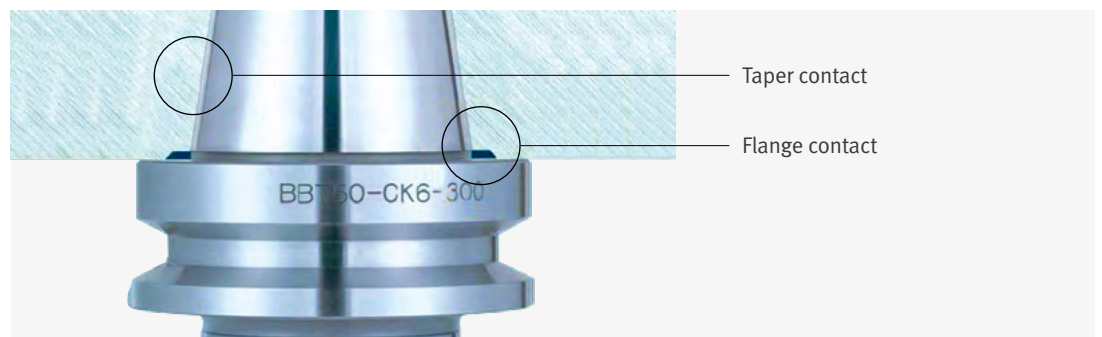
**Max. spindle speed**  
**12000r/min**  
**30000r/min** option

**Spindle motor**  
**30 / 25kW**  
(40.2 / 33.5 Hp)

Type	Speed	Spindle	Specifications
Built-in ISO #50	12000 r/min	Power (30 min/cont.)	30 / 25 kW (40.2 / 33.5 Hp)
		Max. torque	420 N·m (310.0 ft·lbs)

### Dual Contact Spindle

Tool rigidity is enhanced by the firm clamping of the spindle. Tool lifecycle and cut-surface roughness have been improved as a result of the reduced vibration realized by the dual contact spindle.



\* Universal Head is available : Please contact DN Solutions to select detail specifications





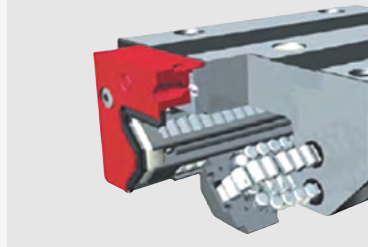
## Feed Axes

Equipped with roller LM Guideways for increased rigidity and a cooling system as a standard feature to minimize thermal displacement.

### Stable and Fast Feed Shaft Structure

Roller-type LM Guideways deliver high rigidity to guarantee the outstanding accuracy of the linear feed system.

#### High-rigidity feed system structure



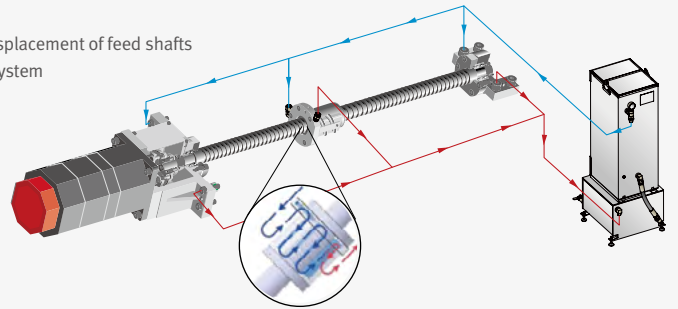
Roller guides



Rigid coupling

#### Ball screw nut cooling

Greatly reduced thermal displacement of feed shafts  
Stable rigidity of the feed system



#### Linear scale – standard for all axes

All axes are equipped with the linear scale as a standard feature to maintain the highest degree of accuracy over many hours of operation.



Additional 200mm (7.9 inch) Y-axis for table self-cutting & extended cutting area.

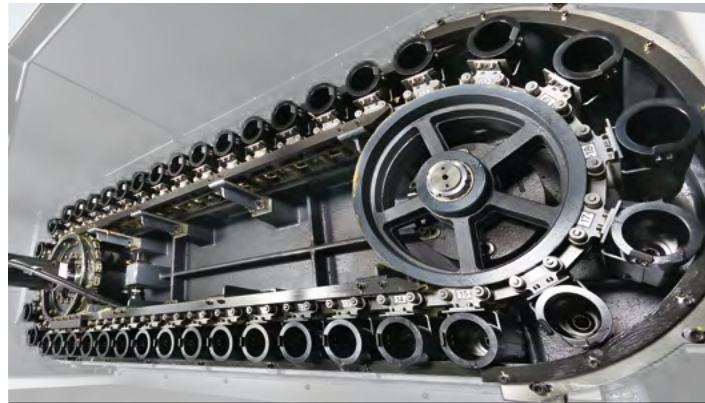


Description	Unit	BM 1530M	BM 2035M	BM2740M
Stroke (X / Y / Z)	mm (inch)	3000 / 1550 / 800 (118.1 / 61.0 / 31.5)	3500 / 2050 / 800 (137.8 / 80.7 / 31.5)	4000 / 2700 / 800 (157.5 / 106.3 / 31.5)
Rapid traverse (X / Y / Z)	m/min (ipm)	16 / 16 / 16 (629.9 / 629.9 / 629.9)	16 / 16 / 16 (629.9 / 629.9 / 629.9)	12 / 16 / 16 (472.4 / 629.9 / 629.9)

## Magazine and Table

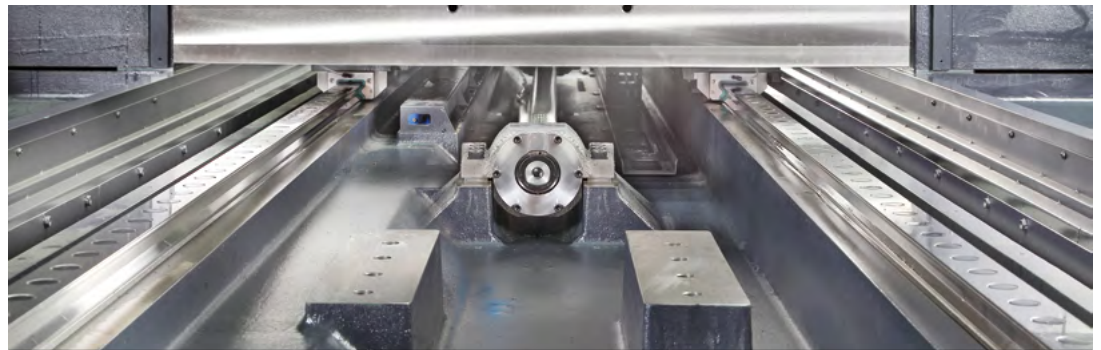
### Tool Magazine

Enhanced productivity realized with the CAM-type tool changer (standard) for quicker tool changing.



Description	Unit	BM Series	Max. tool diameter	mm (inch)	125 / 220 (4.9 / 8.7)
Tool storage capacity	ea	40 {60}	Max. tool length	mm (inch)	400 (15.7)
Tool-to-Tool	sec	3.0	Max. tool weight	kgf (lbs)	18 (8.8)

The table is fitted with 2 or 3 lanes of roller-type LM Guideways for highest machining stability.



Description	Unit	BM1530M	BM 2035M	BM 2740M
Size (X x Y)	mm (inch)	3000 x 1350 (118.1 x 53.1)	3500 x 1850 (137.8 x 72.8)	4000 x 2500 (157.5 x 98.4)
Load capacity	kgf (lbs)	8000 (17637.0)	10000 (22046.2)	15000 (33069.3)

## Cutting Performance

### Machining Performance

Enhanced productivity realized with the CAM-type tool changer (standard) for quicker tool changing.

Cutting Process	Tool mm (inch)	Spindle Speed r/min	Feedrate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Cutting capability cm <sup>3</sup> /min (inch)
FACEMILL (SM45C)	D125 (D4.9)	500	2900 (114.2)	100 (3.9)	3.0 (0.1)	820 (50.0)
		500	1800 (70.9)	100 (3.9)	4.0 (0.2)	720 (43.9)
		500	1300 (51.2)	100 (3.9)	5.0 (0.2)	650 (39.7)
		500	1100 (43.3)	100 (3.9)	6.0 (0.2)	660 (40.3)
		400	720 (28.3)	100 (3.9)	7.0 (0.3)	504 (30.8)
Cutting Process	Tool mm (inch)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Cutting capability cm <sup>3</sup> /min (inch)		
U-DRILL	D80 (D3.1)	500 (2.9)	100 (3.9)	40 (2.4)		
		600 (23.6)	100 (3.9)	40 (2.4)		
TAP	M42 x 4.5	113 (4.4)	508 (20.0)	50 (3.1)		

\* 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.

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## Standard / Optional Specifications

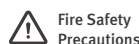
Various options are available to satisfy the customers' requirements.

● Standard ○ Optional

NO.	Description	Features	BM Series
1	Spindle	12000 r/min, 30 / 25 kW (30min / Cont.)	●
2		FLOOD COOLANT PUMP_0.9 kW_0.45 MPA	●
3		FLOOD COOLANT PUMP_3.7 kW_2.0 MPA	○
4		THROUGH SPINDLE COOLANT_None	●
5		THROUGH SPINDLE COOLANT_1.5 kW_2.0 MPA	○
6		THROUGH SPINDLE COOLANT_3.7 kW_2.0 MPA	○
7	Travels	LINEAR SCALE (X, Y, Z-AXIS)	●
8		RAISING BLOCK 200 mm	○
9		RAISING BLOCK 300 mm	○
10	Magazine	MAGAZINE CAPACITY: 40 TOOLS	●
11		MAGAZINE CAPACITY: 60 TOOLS	○
12	Control System	FANUC 31I-B	●
13		DSQ1 (AICC II_200 BLOCKS)	●
14		DSQ2 (DSQ1 & DATA SERVER 1GB)	○
15		DSQ3 (DSQ2 & 600 BLOCKS)	○
16		DSQ4 (DSQ3 & 1000 BLOCKS)	○
17		EXTRA M CODE	○
18		FLASH MEMORY CARD	○
19		Others	SEMI SPLASH GUARD
20	FULL SPLASH GUARD		○
21	OIL SKIMMER		○
22	COOLANT GUN		●
23	CHIP CONVEYOR		○
24	AIR BLOWER		●
25	AIR GUN		○
26	AIR CONDITIONER		○
27	ELECTRIC CABINET LIGHT		○
28	WORK & TOOL COUNTER		○
29	1 MPG		●
30	3 MPG		○
31	LCD Display MPG		○
32	TRANSFORMER		○
33	3-STAGE SIGNAL TOWER		●
34	WORK LIGHT		●
35	Coolant level switch : Sensing level - Low **		○

\* Please contact your DN Solutions representative for detailed machine information. \*\* Special Quotation.

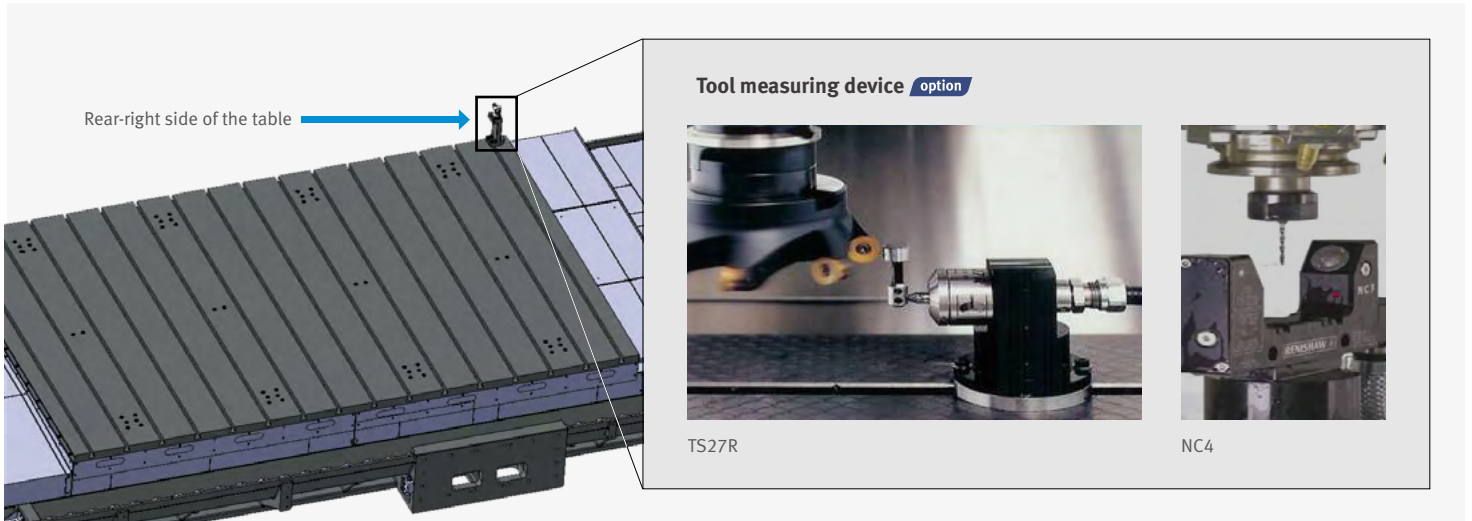
\* When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.





## Optional Devices

Various solutions are available for better machining performance and higher-quality.



### MPG MPG suitable for large works



Manual handle Portable MPG



Manual handle Portable 3 MPG option



Manual handle MPG with LCD option



Manual operation panel option  
HMOP  
(Handy Machine Operator's Panel)

### 3-Stage Signal Tower



**Warning lamp**

Reports abnormal operational conditions of the machine

**Work completion indicator**

Indicates that the work has been completed

**In-progress lamp**

Indicates that the work is being carried out

### Linear scale



### Power saving function

This function saves electricity when the machine is not in use.

### Swing arm MAC (Manual Attachment Change)



## Optimized Tool Processing Solution

Superior surface finishes and machining accuracy are achieved through using standard processing solutions such as high-speed / high-precision contour control and thermal displacement compensation.

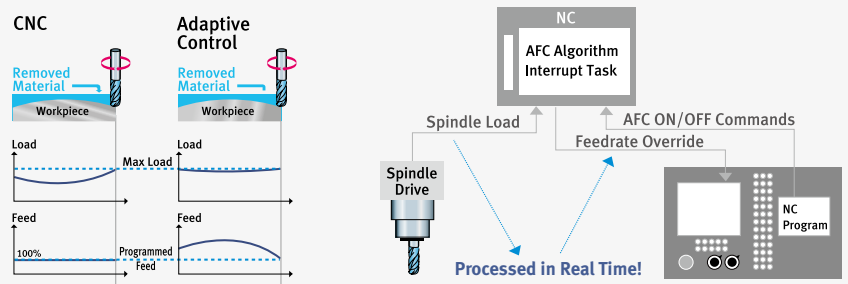
### DSO High Speed / High Precision Contour Control

- AICC2\_1000 BLOCK + Machining condition selection function (Standard)
- Data server 1GB or 2GB **option**

### DAFC The Optimal Feed Control **option**

\* DAFC : DN Solutions Adaptive Feedrate Control

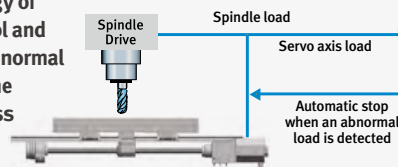
Optimal feed control is ensured by real-time spindle load detection.



### DTMM Tool Load Monitoring System (DTMM\*) **option**

\* DTMM : DN Solutions Tool load Monitoring for Machining Centers

The technology of protecting tool and machine in abnormal load during the cutting process



DTMM\* software

- ✓ Detection cycle = Program interpolation cycle
- ✓ Automatic stop when an abnormal load is detected
- ✓ Select an alternative tool and command to NC

### DSTC Smart thermal displacement multi compensation technology

\* DSTC : DN Solutions Smart Thermal Control

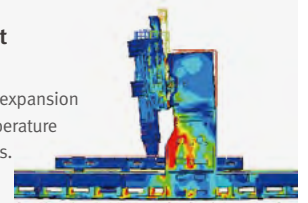
Realizes high-quality, high-precision machining with smoothing thermal displacement compensation of the spindle and structure.

#### Compensation of static displacement of spindle

Compensates changes in tool position caused by expansion of the spindle shaft at high speed.

#### Structure thermal displacement compensation

Compensates irregular deflection or expansion of the structure due to ambient temperature using a multiple temperature sensors.

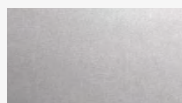


#### Compensation of structure thermal displacement

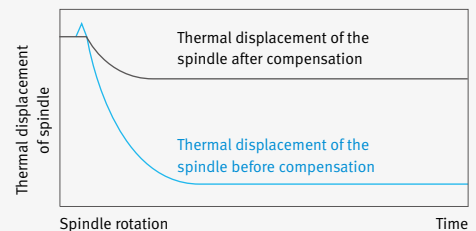
Thermal error of the spindle caused by heat accumulation is compensated with 5 algorithms including a smoothing function.



Without smoothing



With smoothing



## FANUC 31i PLUS

FANUC 31i PLUS maximizes customer productivity and convenience.

### 15" Touch screen + New OP

DN Solutions Fanuc 31iB/B5 Plus' operation panel enhances operating convenience by incorporating commondesign buttons and layout. It features a Qwerty keyboard for fast and easy data input and operation.




**Fanuc 31i Plus**

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

**USB & PCMCIA card QWERTY keyboard**

- EZ-Guide i standard
- Ergonomic operator panel
- 4MB Memory
- Hot keys
- Enhance AICC BLOCK
- Touch pen provided as standard



**iHMI touchscreen**

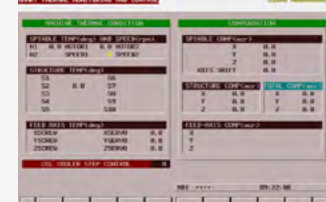
- iHMI provides an intuitive interface that uses a touchscreen for quick and easy operation.

**Range of applications**

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


## EZ work

Tool load monitoring, Setup guide, Status monitoring, Operation and Recovery guide can provide more convenience and efficiency increasing for user operation.




**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




**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



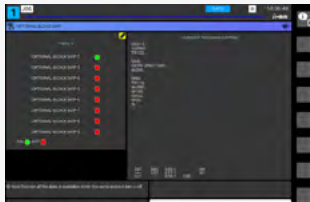
**Adaptive Feed Control**

Function to control feedrate so that the cutting can be carried out at a constant load



**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 Diagram / Tool Shank

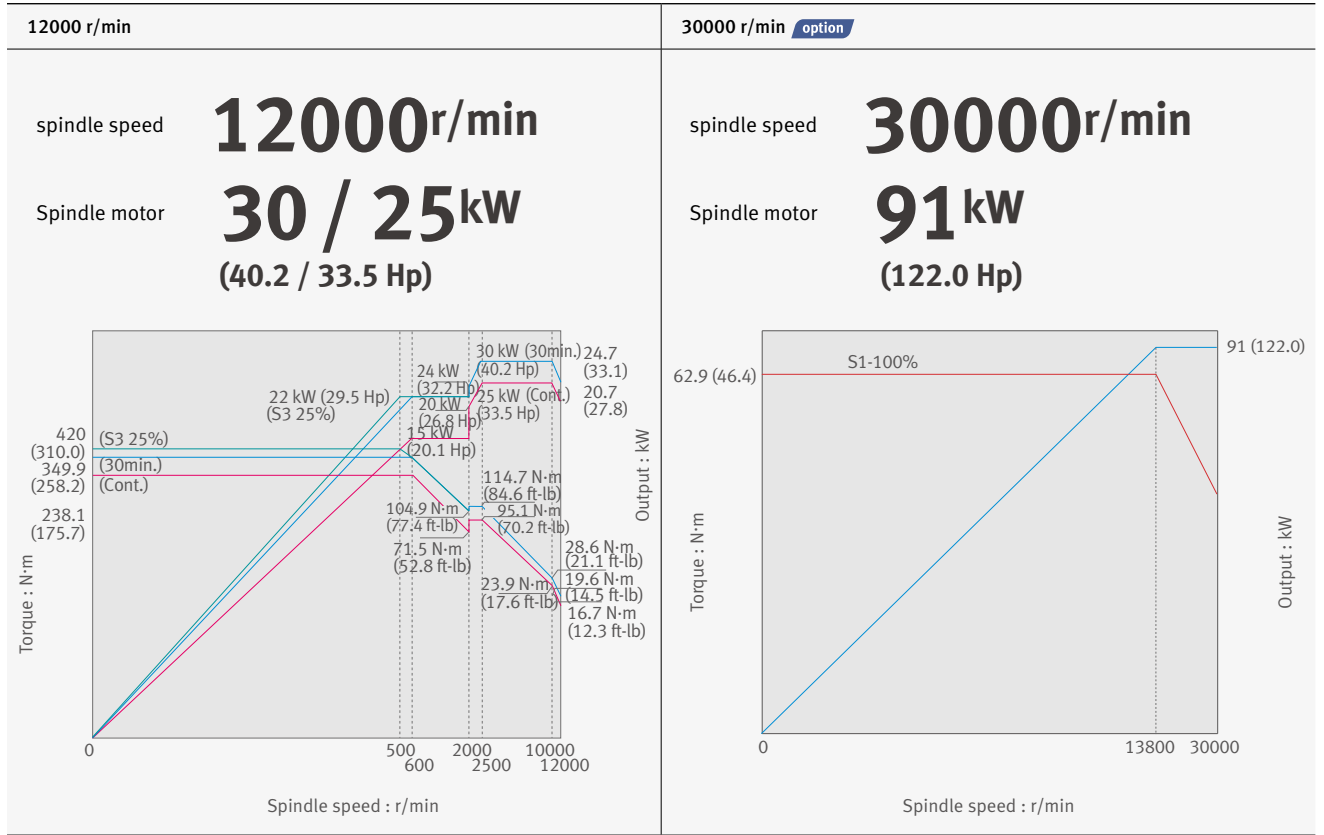
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## Spindle Power – Torque Diagram



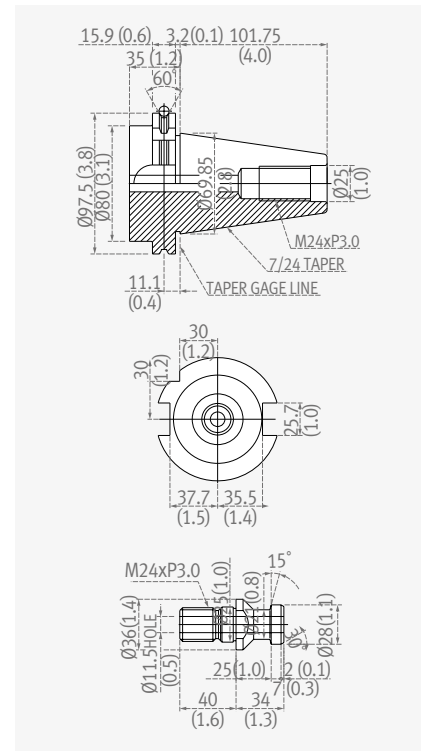
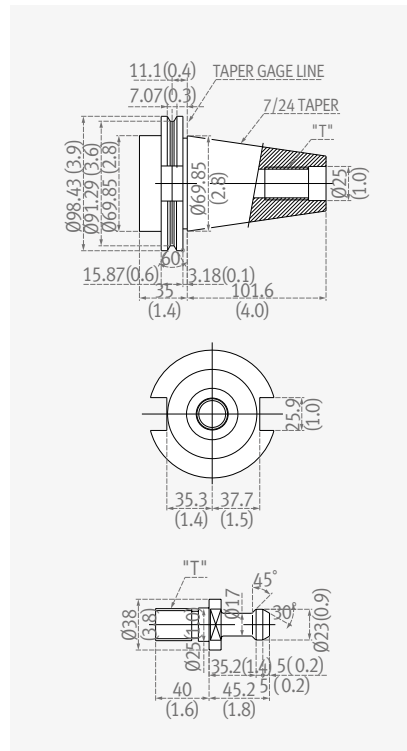
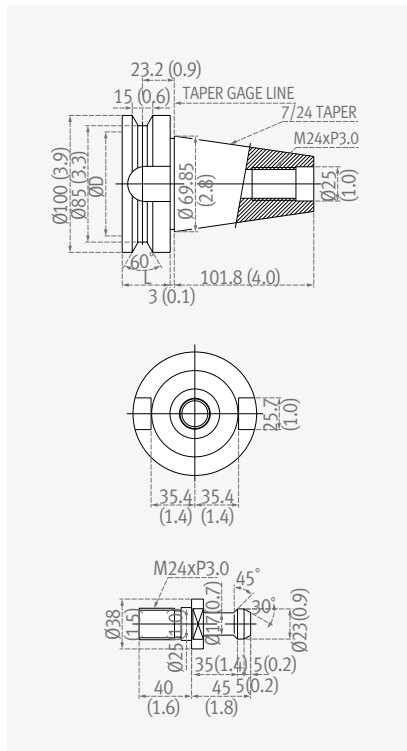
## Tool Shank

BT 50

CAT 50

DIN 50

Unit: mm (inch)

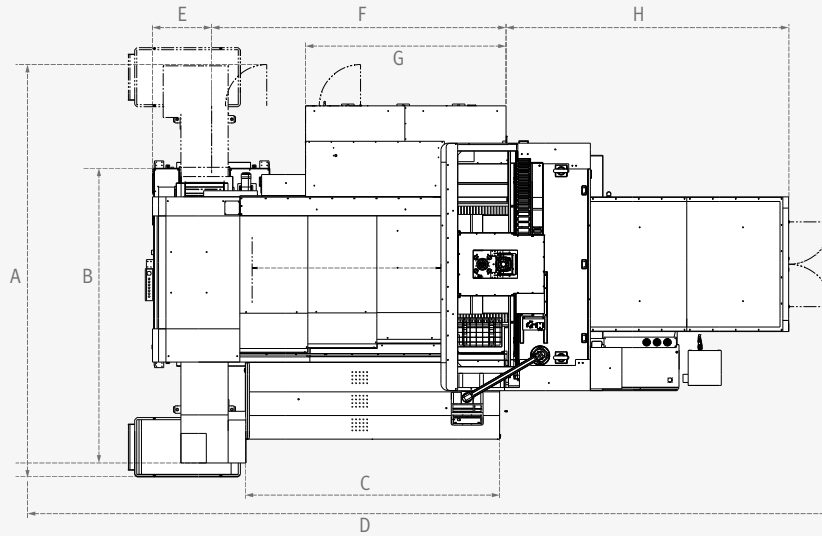


## External Dimensions / Table

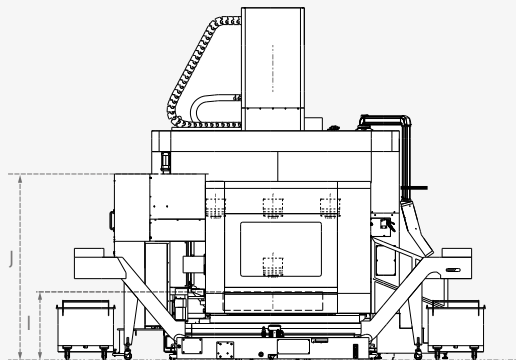
### External Dimensions

Unit: mm (inch)

Top View



Front View



\* Please comply with our company's installation guideline, such as ground condition and anchoring, in order to achieve the maximum precision and performance of the machine.

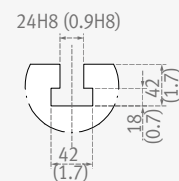
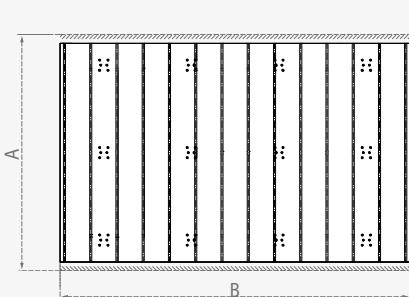
Model	A	B	C	D	E	F	G	H	I	J
BM 1530M	5543 (218.2)	4282 (168.6)	2768 (109.0)	10944 (430.9)	677 (26.7)	3985 (156.9)	2715 (106.9)	3826 (150.6)	2520 (99.2)	923 (36.3)
BM 2035M	5943 (234.0)	4682 (184.3)	3000 (118.1)	11963 (471.0)	1036 (40.8)	3985 (156.9)	2715 (106.9)	4246 (167.2)	2520 (99.2)	923 (36.3)
BM 2740M	6636 (261.3)	5042 (198.5)	3500 (137.8)	13459 (529.9)	1772 (69.8)	3983 (156.8)	2712 (106.8)	4733 (186.3)	2550 (100.4)	953 (37.5)

\* Some peripheral equipment can be placed in other places

\*\* Providing anchoring bolts. Foundation work must be done.

### Table

Unit: mm (inch)



Model	A	B	C	T-SLOT distance	Quantity
BM 1530M	1350 (53.1)	3000 (118.1)	210 (8.3)	300	10 ea
BM 2035M	1850 (72.8)	3500 (137.8)	210 (8.3)	300	11 ea
BM 2740M	2500 (98.4)	4000 (157.5)	210 (8.3)	300	14 ea

\* T-slot direction can be changed



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Description		Unit	BM 1530M	BM 2035M	BM2740M
Travel	X-axis	mm (inch)	3000 (118.1)	3500 (137.8)	4000 (157.5)
	Y-axis	mm (inch)	1550 (61.0)	2050 (80.7)	2700 (106.3)
	Z-axis	mm (inch)	800 (31.5)	800 (31.5)	800 (31.5)
Table	Spindle to table surface	mm (inch)	200~1000 (7.9~39.4)		150~950 (5.9~37.4)
	Distance between columns	mm (inch)	1700 (66.9)	2200 (86.6)	2700 (106.3)
	Table size	mm (inch)	3000 x 1350 (118.1 x 53.1)	3500 x 1850 (137.8 x 72.8)	4000 x 2500 (157.5 x 98.4)
	Loading capacity	kg (lb)	8000 (17636.7)	10000 (22045.9)	15000 (33068.9)
	Table surface	-	T-SLOT (10-300 x 24H8)	T-SLOT (11-300 x 24H8)	
Spindle	Speed	r/min	12000 {30000}*		
	Taper	-	ISO #50, 7/24		
	Max. torque	N-m (ft-lb)	420 (310.0)		
	Spindle power	kW (Hp)	30 / 25 (40.3 / 33.6) [30min / Cont.]		
Feed rate	Rapid feedrate (X / Y / Z)	m/min (ipm)	16 / 16 / 16 (629.9 / 629.9 / 629.9)		12 / 16 / 16 (472.4 / 629.9 / 629.9)
	Cutting feedrate	mm/min (ipm)	8000 (315.0)		6000 (236.2)
ATC	Tool shank type	-	BT / CAT / DIN 50		
	Tool storage capacity	ea	40 {60}*		
	Max. tool diameter [w/o adjacent tool]	mm (inch)	125 [220] (4.9 [8.7])		
	Max. tool length	mm (inch)	400 (15.7)		
	Max. tool weight	kg (lb)	20 (44.1)		
	Max. tool moment	N-m (ft-lb)	12.74 (9.4)		
	Tool selection type	-	MEMORY RANDOM		
Tool change time (T-T)	s	3.0			
Machine Size	Height	mm (inch)	4770 (187.8)	4770 (187.8)	4675 (184.1)
	Dimension (L x W)	mm (inch)	8690 x 4450 (342.1 x 175.2)	9540 x 4960 (375.6 x 195.3)	10825 x 5535 (426.2 x 217.9)
	Weight	kg (lb)	29000 (63933.1)	35500 (78262.9)	48000 (105820.3)

\* { } : Option

## NC Unit Specifications

● Standard ○ Optional X N/A ✚ Available

### F31iB Plus

구분	항목	상세	BM 1530M/2035M/2740M
			F31iB PLUS
Controlled axis	Controlled axes		3 (X,Y,Z)
	Simultaneously controlled axes		3 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	●
Data input/output	Fast data server		●(1GB)
	Memory card input/output		●
	USB memory input/output		●
	Large capacity memory(2GB) <sup>12</sup>	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	X
Feed function	AI contour control I	G5.1 Q, 40 Blocks	X
	AI contour control II	G5.1 Q, 200 Blocks	X
	AI contour control II	G5.1 Q, 600 Blocks	X
	AI contour control II	G5.1 Q, 1000 Blocks *1)	●
	High smooth TCP		X
Operation Guidance Function	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Only with 15" Touch LCD standard *2)	●
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MTConnect		✚
	FANUC OPC UA		✚
Others	Display unit	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	X
		10240M(4MB)_1000 programs	●
		20480M(8MB)_1000 programs	○
		2560M(1MB)_2000 programs	○
		5120M(2MB)_4000 programs	○
10240M(4MB)_4000 programs	○		
20480M(8MB)_4000 programs	○		



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