

**BM-II**  
series

# BM-II SERIES

Super Rigidity Vertical Machining Centers



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ISO 9001



ISO 14001



# SUPER RIGIDITY

## Structure Design Providing Ultimate Heavy-duty Cutting Performance

AWEA in-house made gear box spindle provides the best torque combination. Box way on 3 axes fulfill reliable and stable heavy-duty cutting requirement. Precise hand scraping on key contact surfaces to ensure the best support and consistent machine accuracy.



### BM-2100MAX

X-axis travel : 2,100 mm  
Y-axis travel : 1,000 mm  
Z-axis travel : 1,000 mm



### BM-850II

X-axis travel : 850 mm  
Y-axis travel : 650 mm  
Z-axis travel : 610 mm



### BM-1200II

X-axis travel : 1,200 mm  
Y-axis travel : 650 mm  
Z-axis travel : 610 mm



# BM-II Series

850II / 1020II / 1200II / 1400II / 1500II  
1400MAX / 1600MAX / 1800MAX / 2100MAX / 2500MAX

## Super Rigidity Vertical Machining Centers

With the advanced R&D technology and strict quality control, BM-II series is specially made for heavy cutting which have rigid and stable machine structure for extensive application. BM-II series offers excellent performance with reasonable and affordable price.

- Depends on the different machining requirement, we provide various modular spindle combinations to achieve optimal cutting performance.
- 3 axes are equipped with box ways which are precisely grinded and thoroughly heat treated, especially suitable for heavy cutting.
- Highly efficient 24T arm type magazine design provides fast and reliable tool change system.
- The wide range BM-II series, X-axis travel start from 850 mm to 2,500 mm ; Y-axis travel start from 650 mm to 1,000 mm ; Z-axis travel start from 610 mm to 1,000 mm to meet your various machining requirements.

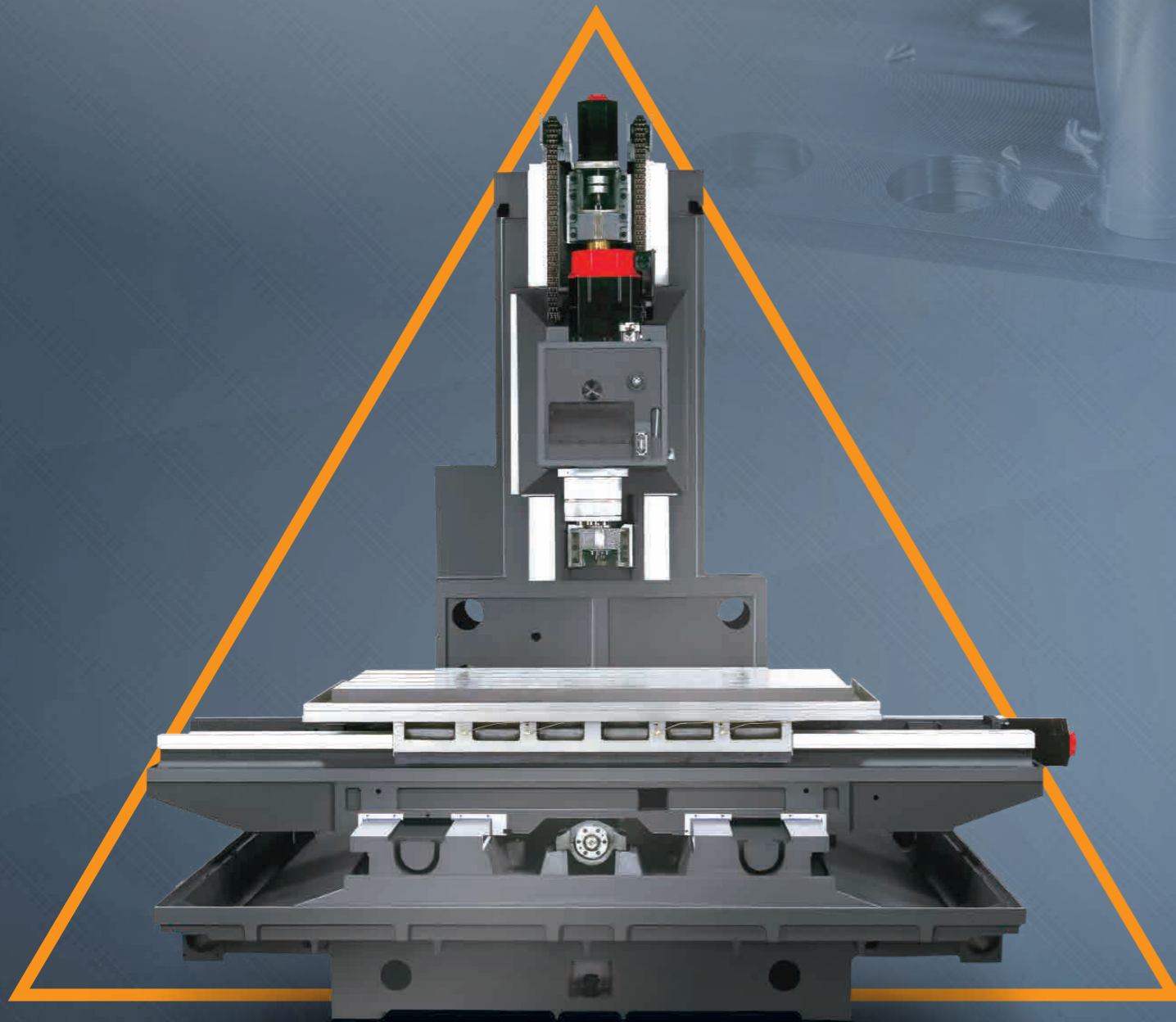




# BM-II Series

850II / 1020II / 1200II / 1400II / 1500II  
1400MAX / 1600MAX / 1800MAX / 2100MAX / 2500MAX

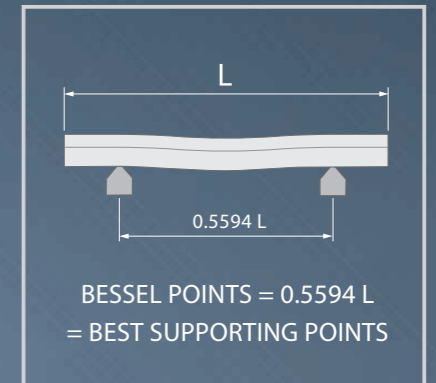
## Super Rigidity Vertical Machining Centers



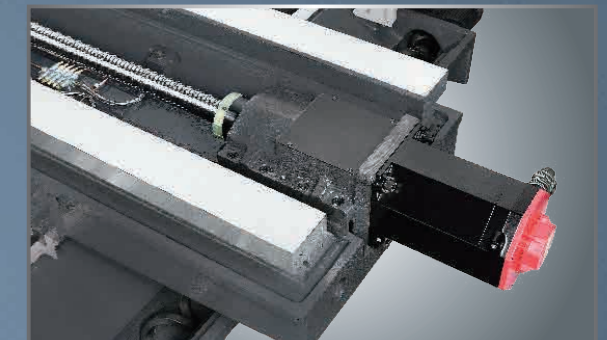
△ ( Delta ) Wide span column structure



- The Finite Element Analysis ( FEM ) provides optimal machine design and light-weight structure advantage while ensuring super rigidity of machine.
- △ ( Delta ) Wide span column construction provides superior cutting stability. The headstock retains stable even under high speed movement.
- Based on BESSEL POINTS concept, provides the stable support on Y-axis saddle to keep in minimum deformation, thus to enhance the table dynamic accuracy.



Dual-nuts secured ball screw



Direct-drive servo motor



Integrated ball screw servo motor base



Integrated ball screw bearing base

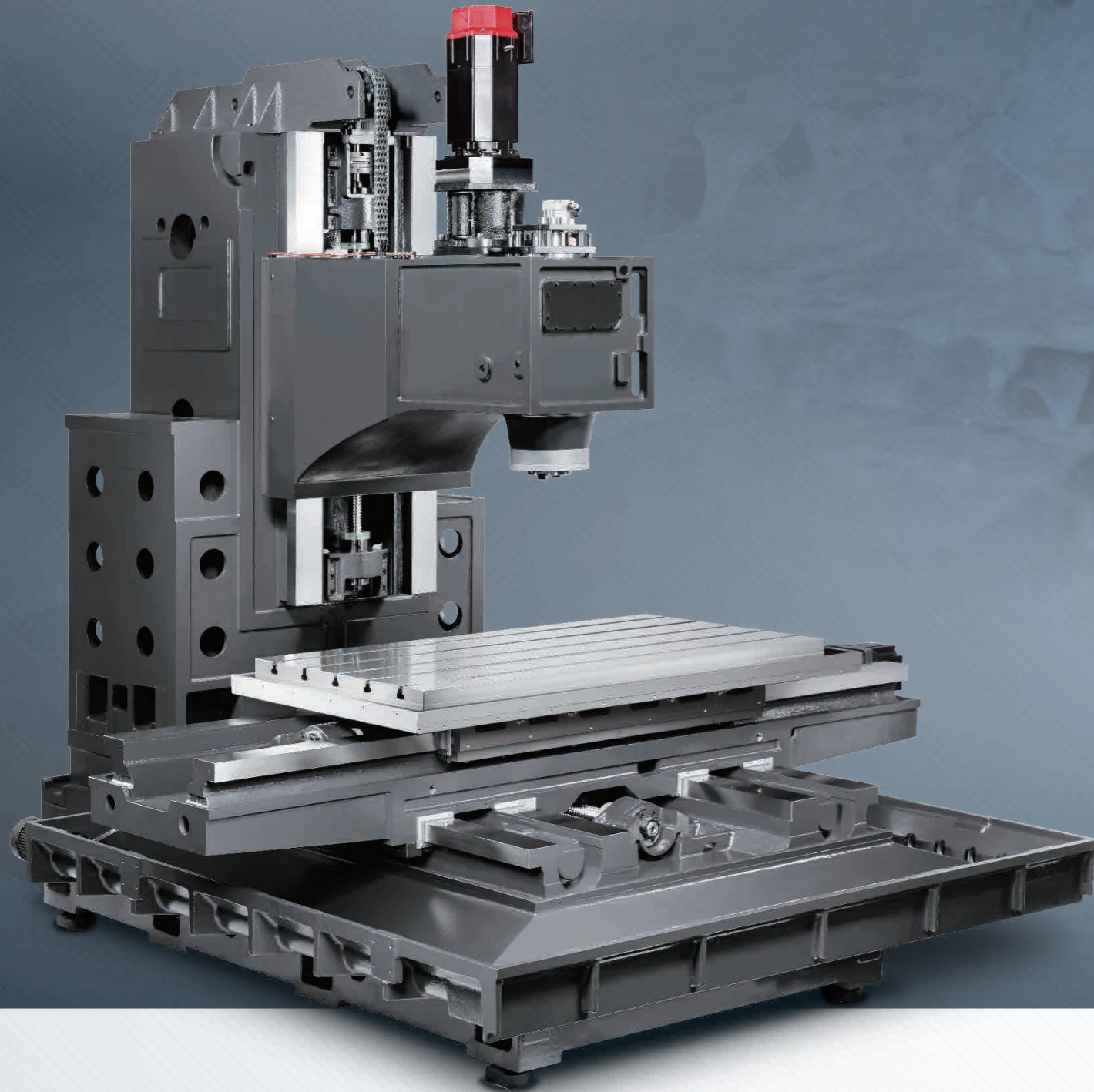
- High precision dual-nuts ball screw provides excellent heavy cutting rigidity while ensuring machining accuracy and extend durability of ball screw.
- Three axial system are adopted with FANUC  $\alpha i$  absolute AC servo motor direct drive to provide great thrust and fast acceleration / deceleration movement. Plus, it efficiently decreases motor load and reduces generation of heat while maintaining the ultimate performance and accuracy.



# BM-II Series

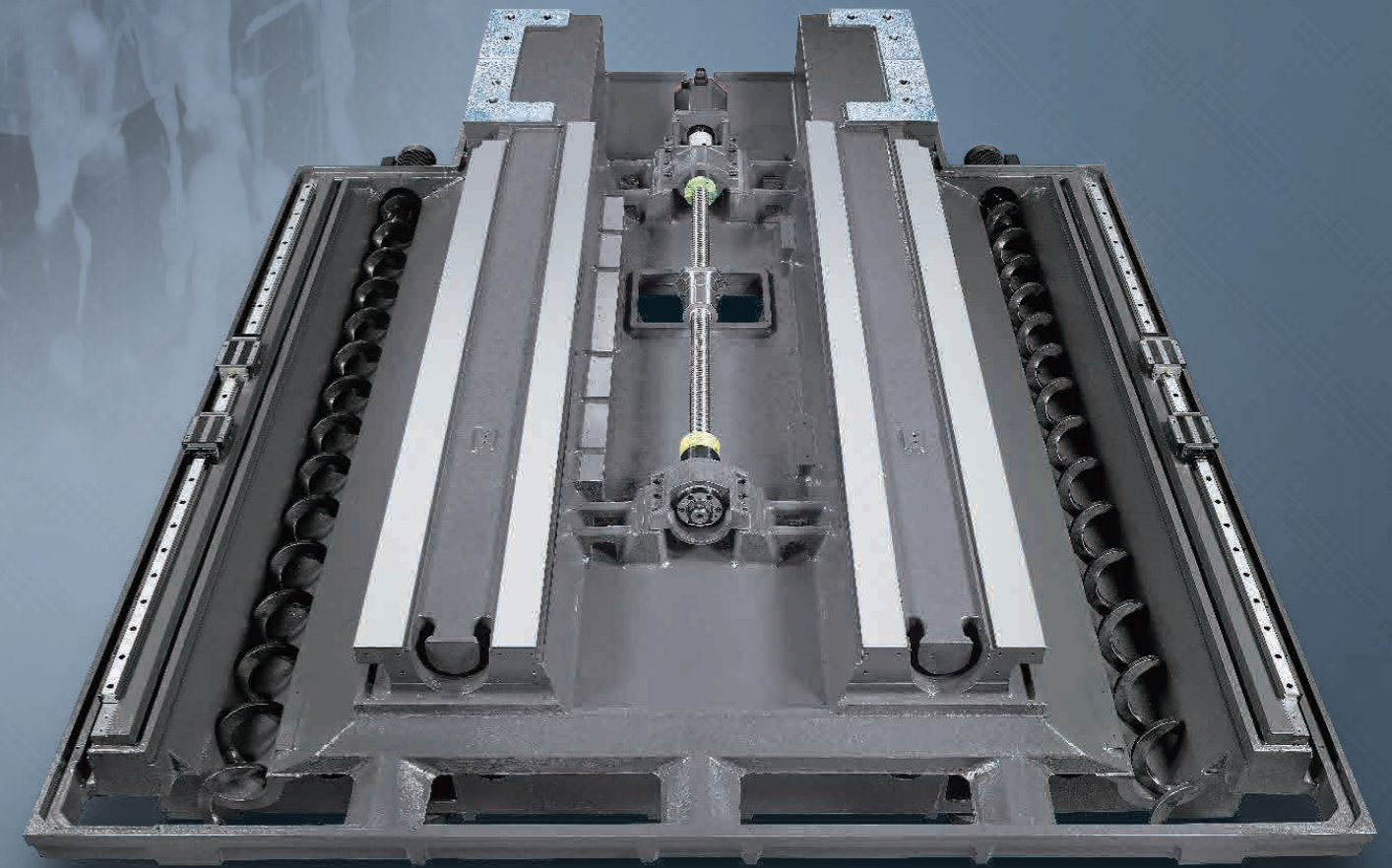
850II / 1020II / 1200II / 1400II / 1500II  
1400MAX / 1600MAX / 1800MAX / 2100MAX / 2500MAX

## Super Rigidity Vertical Machining Centers



BM-1400II super rigidity structure

- Working table with double ribbed design to enhance the structure strength, while securing the table will not deform even load heavily for a long time.
- Auto lubrication system delivers metered amounts of lubrication to the slide ways, ball screws, and vital components with ensured reliability.

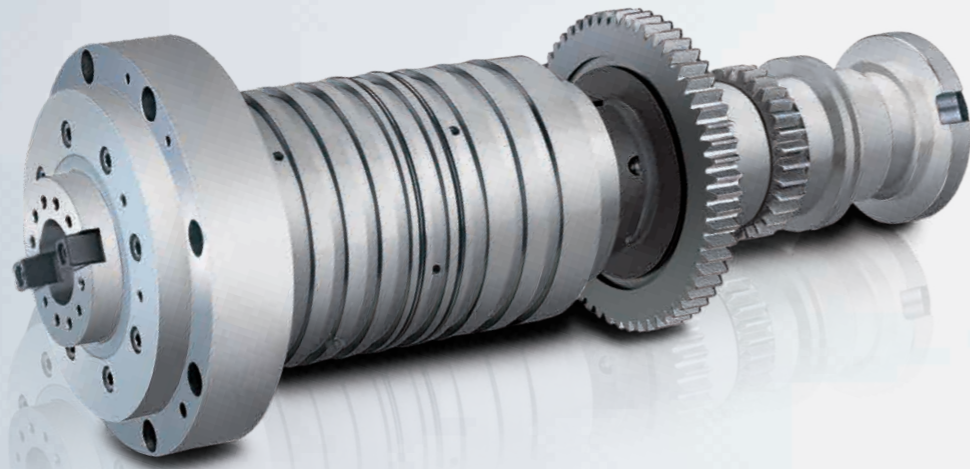


- BM-2100MAX / BM-2500MAX, the table base is equipped with 6 guideways to solve over-hang problem and provide the fully support to ensure the rigidity.



# High Performance Spindle System

- Gear spindle features High-Low 2 steps gear box design to provide large torque output.
- High hardness Nickel-molybdenum-chromium alloy gear mechanism with auto lubrication and cooling system ensures the performance and lifetime of gear transmission box.
- High speed or affordable belt type spindles can all be equipped with different types of spindle motor to fulfill a variety of requirement.



## ■ Spindle taper

Models	BM-850II	BM-1020II	BM-1200II	BM-1400II	BM-1500II
Standard			BT40		
Optional			BT50		

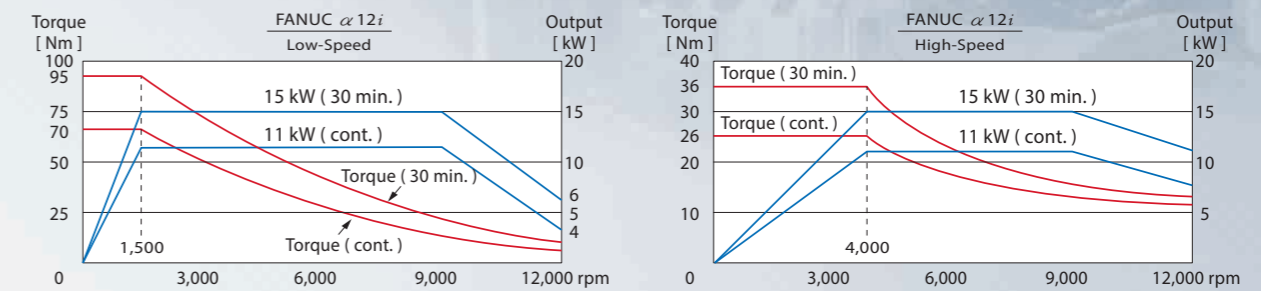
  

Models	BM-1400MAX	BM-1600MAX	BM-1800MAX	BM-2100MAX	BM-2500MAX
Standard		BT50		BT50	
Optional		BT40			

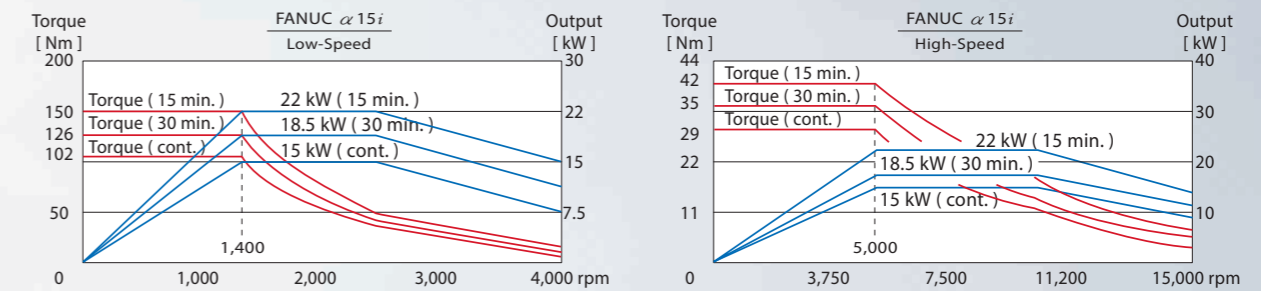
- Spindle, spindle motor and gear box ought to pass complete running test to ensure performance and lifetime.



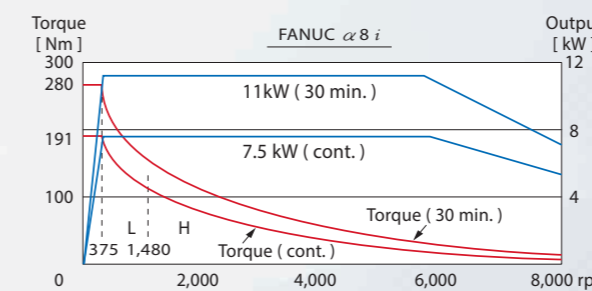
**BT40 12,000 rpm Direct-drive Spindle**



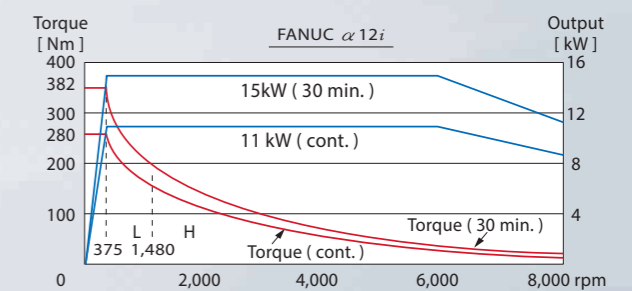
**BT40 15,000 rpm Direct-drive Spindle**



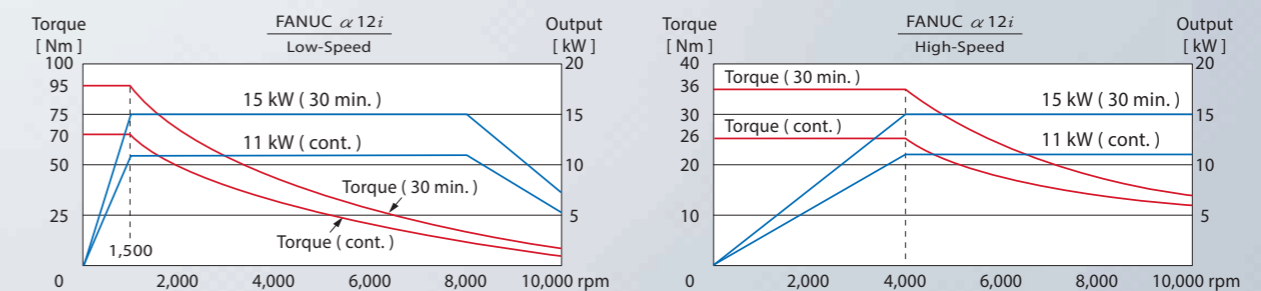
**BT40 8,000 rpm Gear Spindle**



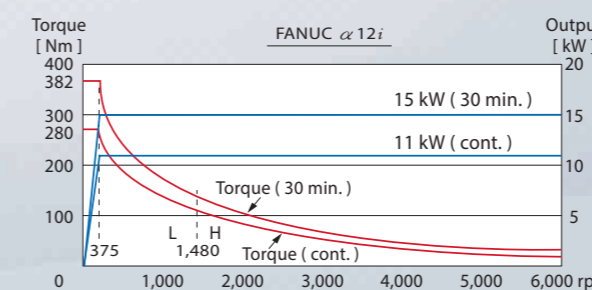
**BT40 8,000 rpm Gear Spindle**



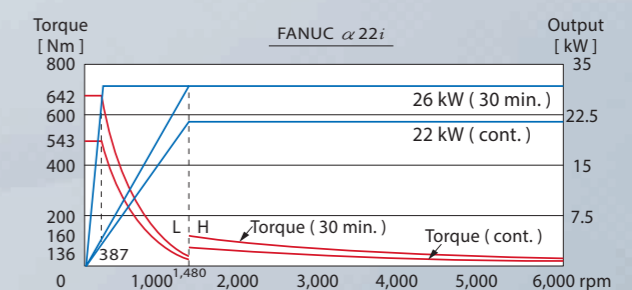
**BT50 10,000 rpm Direct-drive Spindle**



**BT50 6,000 rpm Gear Spindle**



**BT50 6,000 rpm Gear Spindle**







## Hand Scraped Craftmanship

- All the sliding or fix surface of machine bed, column, saddle, headstock, and ball screw holder are hand scraped to provide excellent assembly precision and load distribution, ensuring long term accuracy.

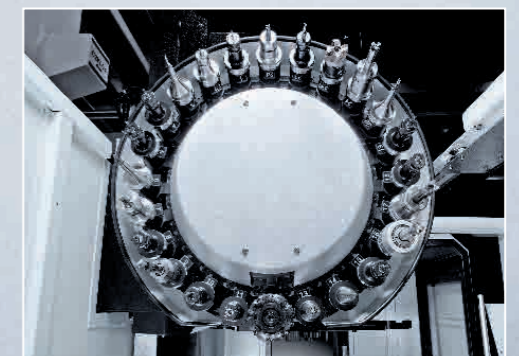






## High Speed ATC System

- BM-II series 24T arm type ATC system provide high speed tool exchange solution, and we also offer 30T / 40T arm type tool magazine to fulfill the variety of machining requirement.
- Standard shortcut tool change function can shorten tool change time and increase working efficiency.
- Ultra fast tool exchange system ( opt. )



24T Disc type tool magazine



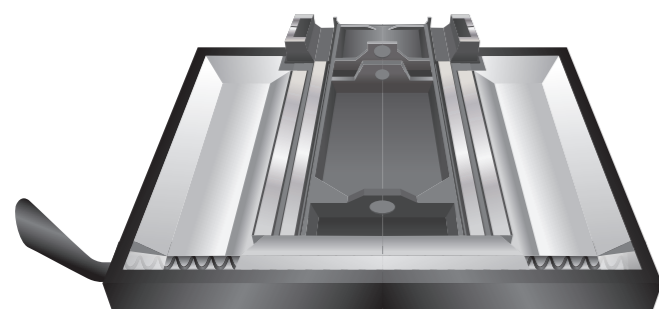


## Chip Disposal System

■ All series are equipped with 1 / 3 / 5 screw type chip auger according to the machine size, thus to provide high chip remove efficiency.

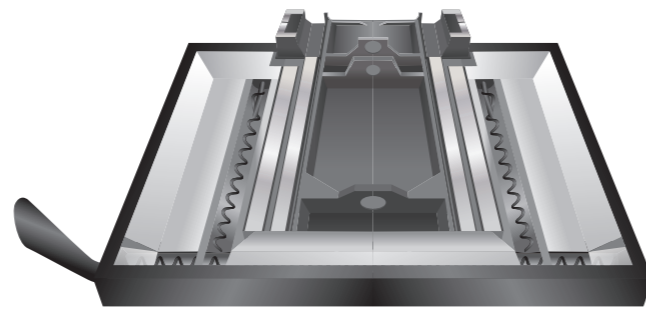
■ BM-1020II ~ BM-1800MAX with Y-axis chip augers. ( std. )

■ The optional high pressure chips flush coolant system is also available.



■ Screw chip auger x 1

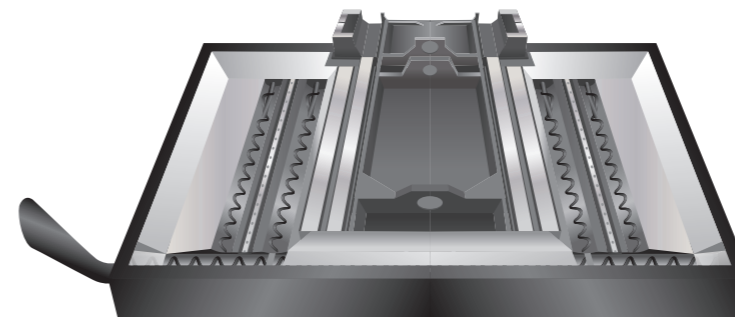
BM-850II



■ Screw chip augers x 3

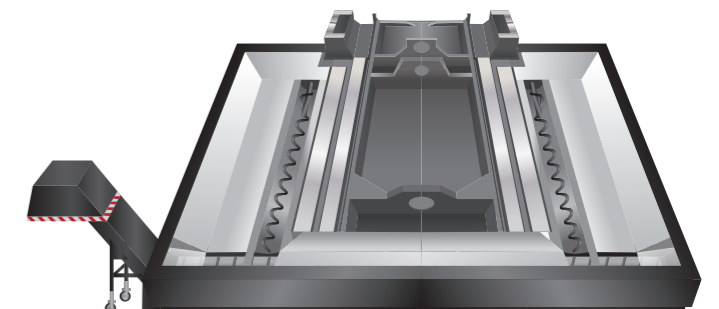
BM-1020II BM-1200II BM-1400II BM-1500II

BM-1400MAX BM-1600MAX BM-1800MAX



■ Screws chip augers x 5

BM-2100MAX BM-2500MAX



■ Chain type chip conveyor ( Opt. )



# High Efficiency APC System

In order to lower the labor cost and meet the requirement of high speed mass production, BM850-APC adapted with four box way, combines with APC system, which provides the best produce solution for automobile industry, especially suitable for gearbox, inlet manifold, or others parts.



**7 second**  
Auto pallet changing time

**0.02 mm**  
Repeatability between two tables

Model	BM850-APC	Model	BM850-APC
X / Y / Z axes travel	850 / 600 / 600 mm	Spindle taper	BT40 / BT50 ( Opt. )
Table size	460 x 800 mm	Spindle motor ( cont. / 30 min. )	7.5 / 11 kW
Table rotating range	180°	Spindle speed	10,000 rpm
Repeatability for each table	0.01 mm	X / Y / Z axes rapid feed rate	24 / 24 / 20 m/min.
Repeatability between two tables	0.02 mm	Cutting feed rate	15 m/min.
Table load capacity	200 kg	Tool magazine capacity	24 T

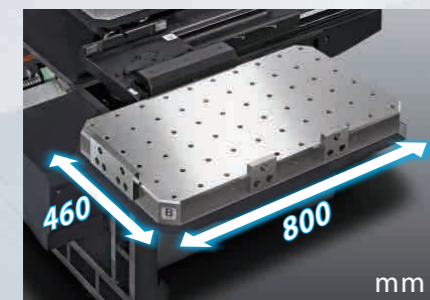


Table size

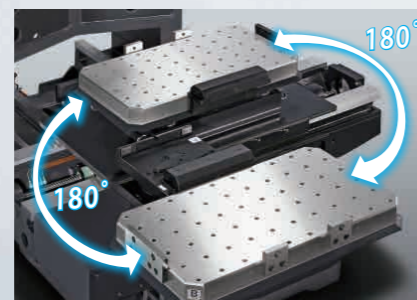


Table rotating range

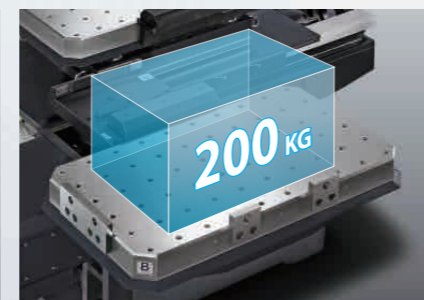
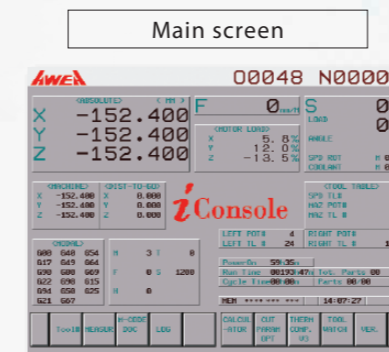


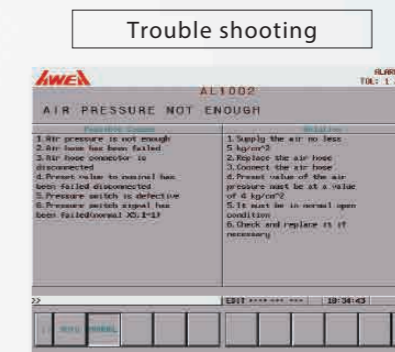
Table load capacity

# i Console Optional

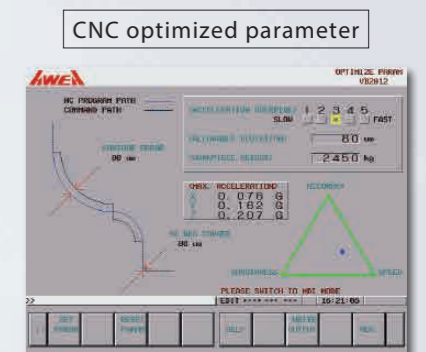
AWEA's self-developed *i Console* intelligent software enhancement system provides you with a user-friendly interface, real-time machine status information and diagnosis functions. It not only effectively reduces complex working processes but also enables intelligent machining abilities.



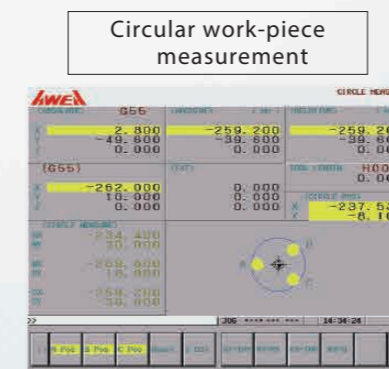
- Instant messaging system **OPT.**
- Tool list
- Work-piece measurement
- M code
- Calculator
- CNC parameter optimization
- Spindle thermal compensation
- Adoptive feed control ( AFC )



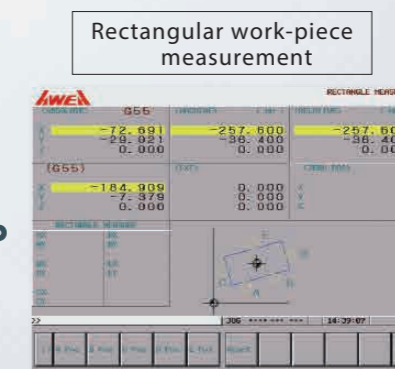
When an alarm appears, the program will display the cause for the alarm and a suitable troubleshooting procedure. Users can easily troubleshoot minor problems to avoid down time.



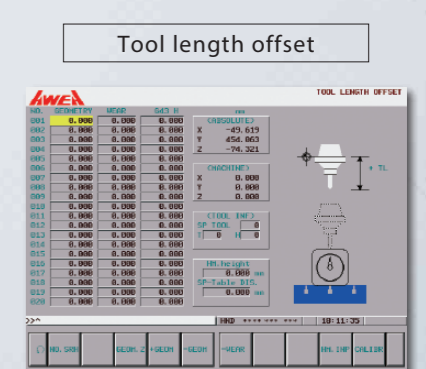
From rough cutting to fine machining, users can select different work modes, define the allowable tolerances and enter the weight of the work piece. Based on this input the *i Console* program will modify machining parameters to reduce machining time.



By measuring the A, B, C three points coordinates the circular work-piece's center point can be correctly calculated.



By measuring the A, B, C, D, and E five points coordinates, the rectangular work-piece's center point and slant angle can be calculated. Then the center point coordinate can be entered in the work-piece coordinate system.( G54 - G59 )



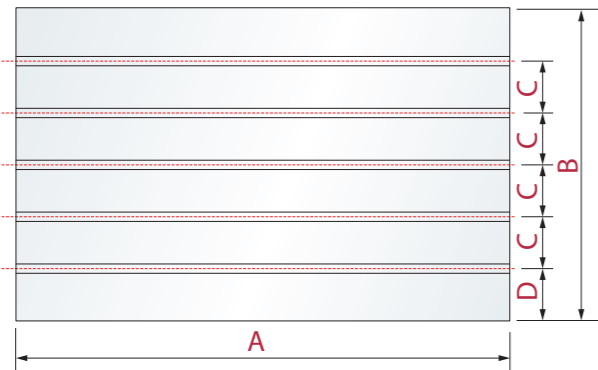
After manually measuring the tool length, the controller will automatically calculate the tool tip position and enter the data into the tool length offset table.



# Dimensions

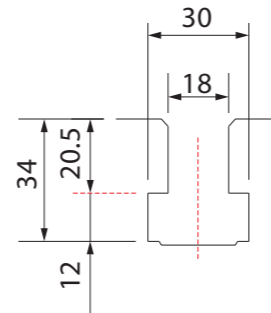
(Unit : mm)

## Table Dimensions



Models	A	B	C	D	NO.*1
BM-850II	1,050	650	100	125	5
BM-1020II	1,120				
BM-1200II	1,300				
BM-1400II	1,500				
BM-1500II	1,600	700	100	50	7
BM-850APC	800	460	—	—	5

## T-slot Dimensions

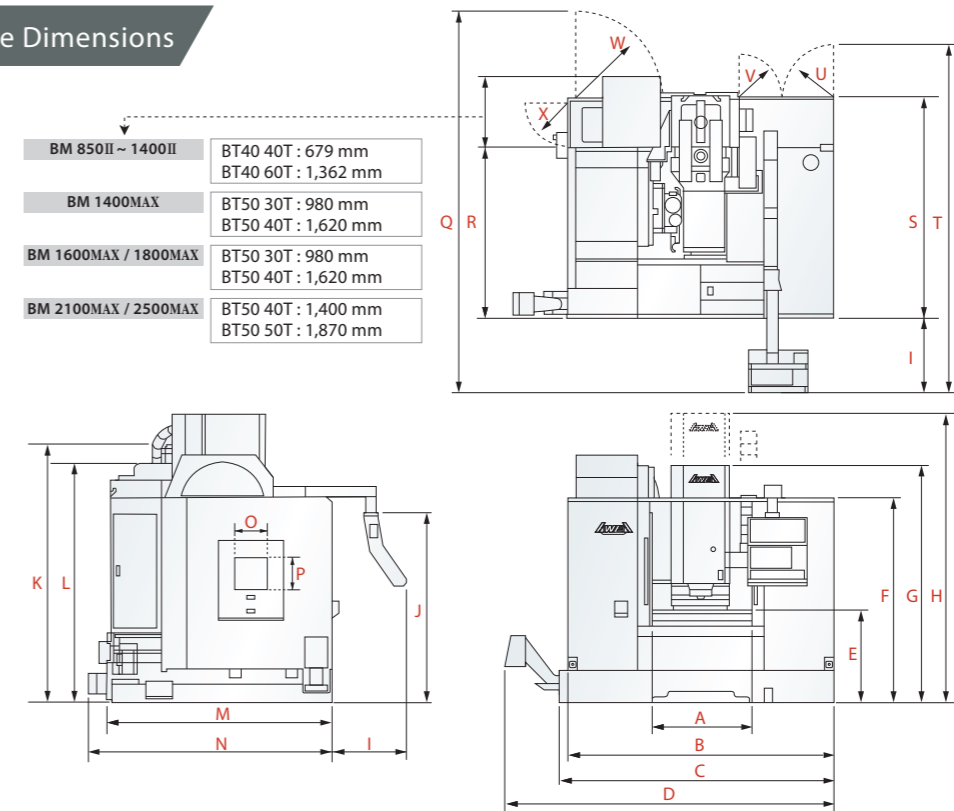


Models	A	B	C	D	NO.*1
BM-1400MAX	1,500	800	150	100	5
BM-1600MAX	1,700			100	5
BM-1800MAX	2,000			100	5
BM-2100MAX	2,300	1,000	50	7	7
BM-2500MAX	2,700				

\*1 : No. = Number of T-slots

## Machine Dimensions

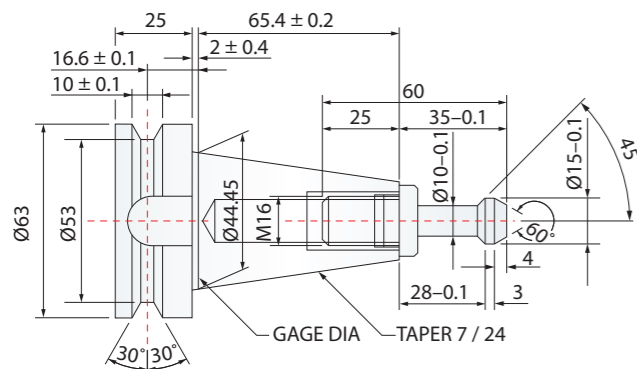
BM 850II ~ 1400II	BT40 40T : 679 mm BT40 60T : 1,362 mm
BM 1400MAX	BT50 30T : 980 mm BT50 40T : 1,620 mm
BM 1600MAX / 1800MAX	BT50 30T : 980 mm BT50 40T : 1,620 mm
BM 2100MAX / 2500MAX	BT50 40T : 1,400 mm BT50 50T : 1,870 mm



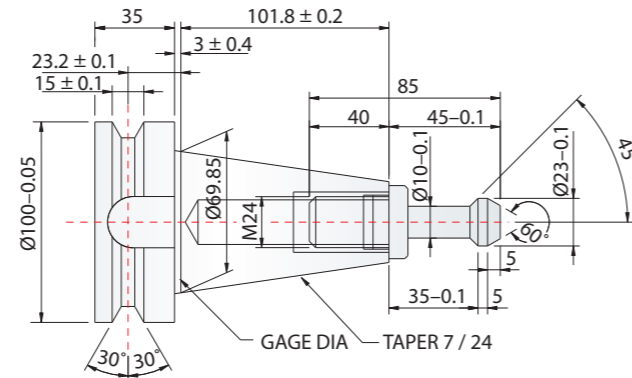
(Unit : mm)

## Tool Shank Dimensions

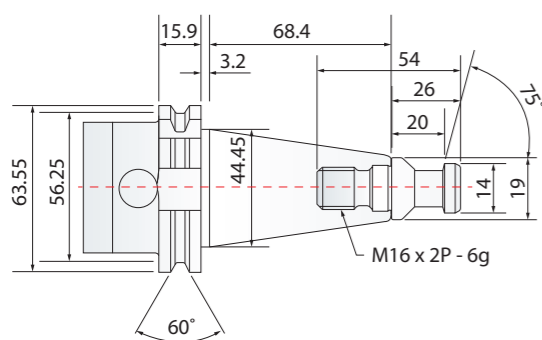
### BT40



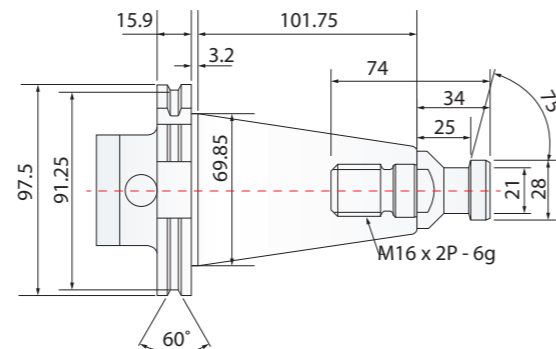
### BT50



### DIN40



### DIN50



Models	A	B	C	D	E	F	G	H	I	J	K	L
BM-850II	1,040	2,600	2,059	3,376	900	2,000	2,532	3,142	656	1,730	2,492	2,389
BM-1020II	1,220	3,000	3,000	3,547								
BM-1200II	1,410	3,380	3,380	3,897								
BM-1400II	1,560	3,850	3,850	4,367								
BM-1500II	1,640	3,850	3,850	4,368	900	2,000	2,532	3,142	780	1,730	2,492	2,389
BM-1400MAX	1,570	3,950	3,950	4,308	960	2,180	2,621	3,321	735	1,830	2,836	2,749
BM-1600MAX	1,785	4,400	4,400	5,089	1,050	2,330	2,645	3,445	875	1,860	3,296	3,205
BM-1800MAX	2,085	4,880	4,880	5,200								
BM-2100MAX	2,385	5,200	5,200	5,751	1,100	2,600	2,865	3,865	870	1,930	3,501	3,405
BM-2500MAX	2,720	6,500	6,500	7,041								
BM-850APC	900	2,600	2,800	—	1,050	2,150	2,465	3,065	865	1,700	2,734	2,438

Models	M	N	O	P	Q	R	S	T	U	V	W	X
BM-850II	2,234	2,414	300	300	3,662	1,726	2,231	3,361	474	436	775	411
BM-1020II												
BM-1200II												
BM-1400II												
BM-1500II	2,475	2,655	450	400	3,983	1,970	2,471	3,725	474	436	741	392
BM-1400MAX	2,955	3,135										
BM-1600MAX	2,685	2,865	450	400	—	2,230	2,930	4,250	600	600	—	—
BM-1800MAX												
BM-2100MAX												
BM-2500MAX	3,380	3,560	—	—	3,063	2,450	2,710	4,135	560	560	—	—
BM-850APC	3,065	—										

Specifications are subject to change without notice.



## BM-II Series

		BM-850II	BM-1020II	BM-1200II	BM-1400II	BM-1500II
<b>SPECIFICATIONS</b>						
X-axis travel	mm	850	1,020	1,200	1,400	1,500
Y-axis travel	mm	650				740
Z-axis travel	mm	610				
Distance from spindle center to column	mm	710				780
Distance from spindle nose to table top	mm	125 ~ 735				
<b>WORK TABLE</b>						
Table size ( X direction )	mm	1,050	1,120	1,300	1,500	1,600
Table size ( Y direction )	mm	650	650	650	650	700
Table load capacity	kg	850	1,000	1,200	1,400	1,450
<b>SPINDLE</b>						
Spindle taper		BT40 / BT50 ( Opt. )				
Spindle motor ( cont. / 30 min. )	kW	7.5 / 11				
Spindle speed	rpm	Belt-drive 10,000				
<b>FEED RATE</b>						
X / Y axes rapid feed rate	m/min.	30				30
Z-axis rapids feed rate	m/min.	24				24
Cutting feed rate	m/min.	1- 15				
<b>TOOL MAGAZINE</b>						
Tool magazine capacity	T	24				
Max. tool length	mm	250				
Max. tool weight	kg	7				
Max. tool diameter / adj. pocket empty	mm	Ø 75 / Ø 150				
<b>ACCURACY</b>						
Positioning accuracy ( ISO230-2 )	mm	0.008				
Repeatability ( ISO230-2 )	mm	0.006				
<b>GENERAL</b>						
Control system		FANUC Oi- MF PLUS				
Pneumatic pressure requirement	kg/cm <sup>2</sup>	6				
Power requirement	kVA	25				
Coolant tank capacity	liter	360	370	380	390	500
Machine weight	kg	6,700	6,900	7,500	8,100	8,700

### Standard Accessories

- 3 axes auto lubrication system
- 3 axes ball screw pretension
- Spindle air curtain
- Spindle oil chiller
- Coolant nozzles around spindle
- Front side chip auger
- Y-axis chip augers BM-1020II ~ 2500MAX
- Roof enclosed splash guard
- Air blow system
- Rigid tapping
- Centralized automatic lubrication ( X / Y / Z )
- Air tank for tool magazine
- Lubricant recovering system
- Oil skimmer
- Heat exchanger for electric cabinet
- RJ-45 ethernet interface
- RS-232 interface
- Coolant equipment
- Air gun & coolant gun
- Alarm light & work light
- Automatic power-off system
- Tool box
- Foundation bolt kit
- CE version

## BM-MAX Series

		BM-1400MAX	BM-1600MAX	BM-1800MAX	BM-2100MAX	BM-2500MAX
<b>SPECIFICATIONS</b>						
X-axis travel	mm	1,400	1,600	1,800	2,100	2,500
Y-axis travel	mm	800			1,000	
Z-axis travel	mm	700	800		1,000	
Distance from spindle center to column	mm	900			1,100	
Distance from spindle nose to table top	mm	200 ~ 900	200 ~ 1,000		200 ~ 1,200	
<b>WORK TABLE</b>						
Table size ( X direction )	mm	1,500	1,700	2,000	2,300	2,700
Table size ( Y direction )	mm	800	800	800	1,000	1,000
Table load capacity	kg	1,800	2,000	2,200	3,000	4,000
<b>SPINDLE</b>						
Spindle taper		BT50 / BT40 ( Opt. )			BT50	
Spindle motor ( cont. / 30 min. )	kW	11 / 15			15 / 18.5	
Spindle speed	rpm	Gear Spindle 6,000			Gear Spindle 6,000	
<b>FEED RATE</b>						
X / Y axes rapid feed rate	m/min.	20			15	
Z-axis rapids feed rate	m/min.	18			12	
Cutting feed rate	m/min.	1-12				
<b>TOOL MAGAZINE</b>						
Tool magazine capacity	T	24				
Max. tool length	mm	250				
Max. tool weight	kg	15				
Max. tool diameter / adj. pocket empty	mm	Ø 105 / Ø 210				
<b>ACCURACY</b>						
Positioning accuracy ( ISO230-2 )	mm	0.008				
Repeatability ( ISO230-2 )	mm	0.006				
<b>GENERAL</b>						
Control system		FANUC Oi- MF PLUS				
Pneumatic pressure requirement	kg/cm <sup>2</sup>	6				
Power requirement	kVA	35		40		
Coolant tank capacity	liter	770	570	620	950	1,040
Machine weight	kg	13,000	15,000	17,000	20,000	22,000

Specifications are subject to change without notice.

### Optional Accessories

- Gear spindle  
BT40 8,000 rpm / BT50 6,000 rpm
- Direct-driven spindle  
BT40 12,000 rpm / 15,000 rpm  
BT50 10,000 rpm
- Arm type tool magazine 30 / 40 / 60 T
- Coolant through spindle ( CTS )
- Spindle thermal compensation
- X / Y / Z axes linear scale
- 4<sup>th</sup> axis interface
- CNC rotary table
- Transformer
- Thru the tool with M function
- Chip wash down coolant
- Caterpillar type chip conveyor
- Scraper type chip conveyor
- Automatic tool length measurement
- Automatic work piece measurement
- Air conditioner for electric cabinet
- Oil mist collector
- Coolant chiller
- MITSUBISHI / HEIDENHAIN / SIEMENS / FAGOR control system