

YAMA SEIKI
MACHINING CENTERS by **AWEDA**

YAMA SEIKI USA, INC.

5788 Schaefer Ave., Chino, CA 91710
TEL : (888) 976-6789
(909) 628-5568
FAX : (909) 993-5378
Web : www.YAMASEIKI.com
E-mail : sales@yamaseiki.com

ISO 9001



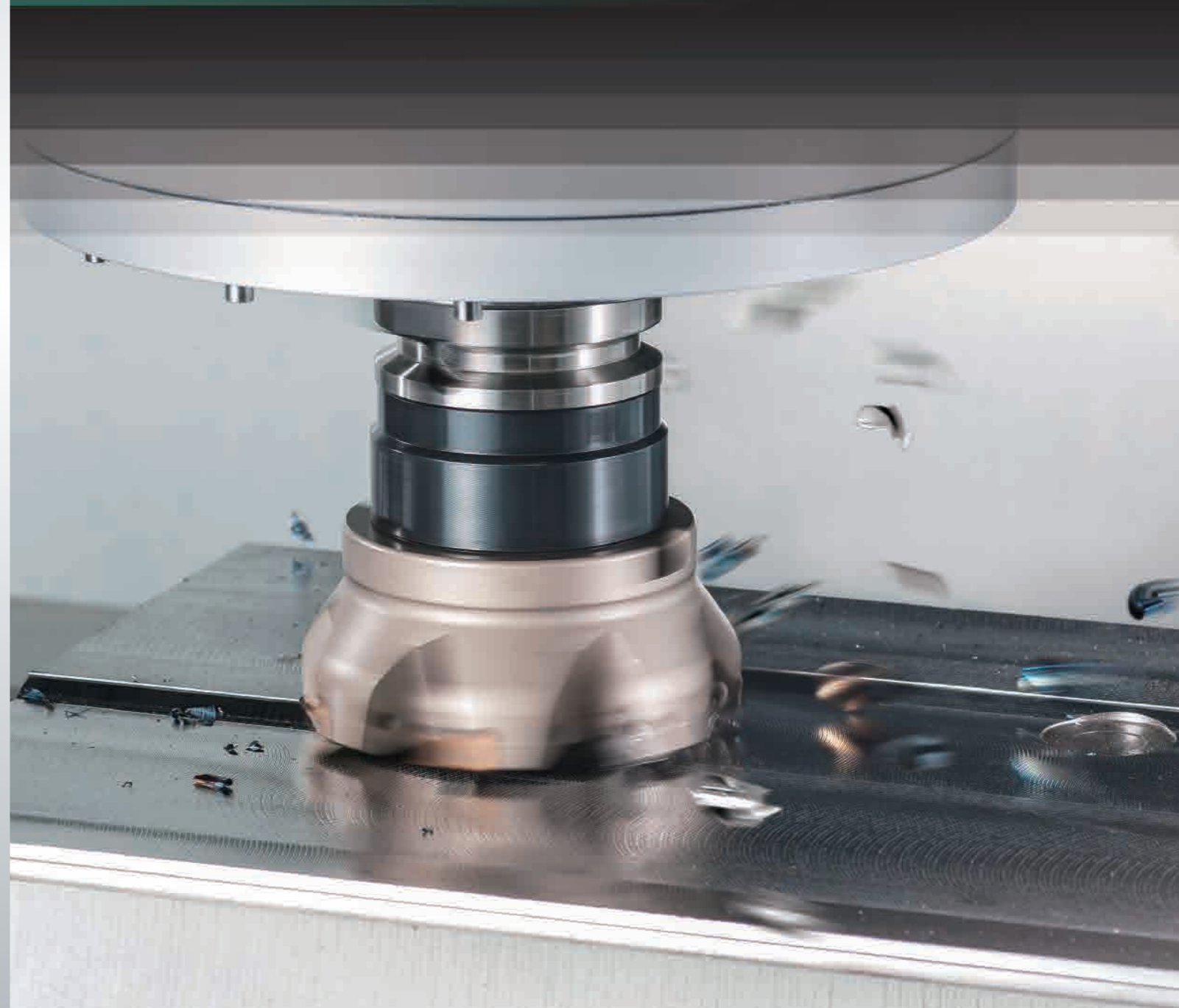
ISO 14001



AGENT

BM SERIES

Super Rigidity Vertical Machining Centers



YAMA SEIKI
MACHINING CENTERS by **AWEDA**

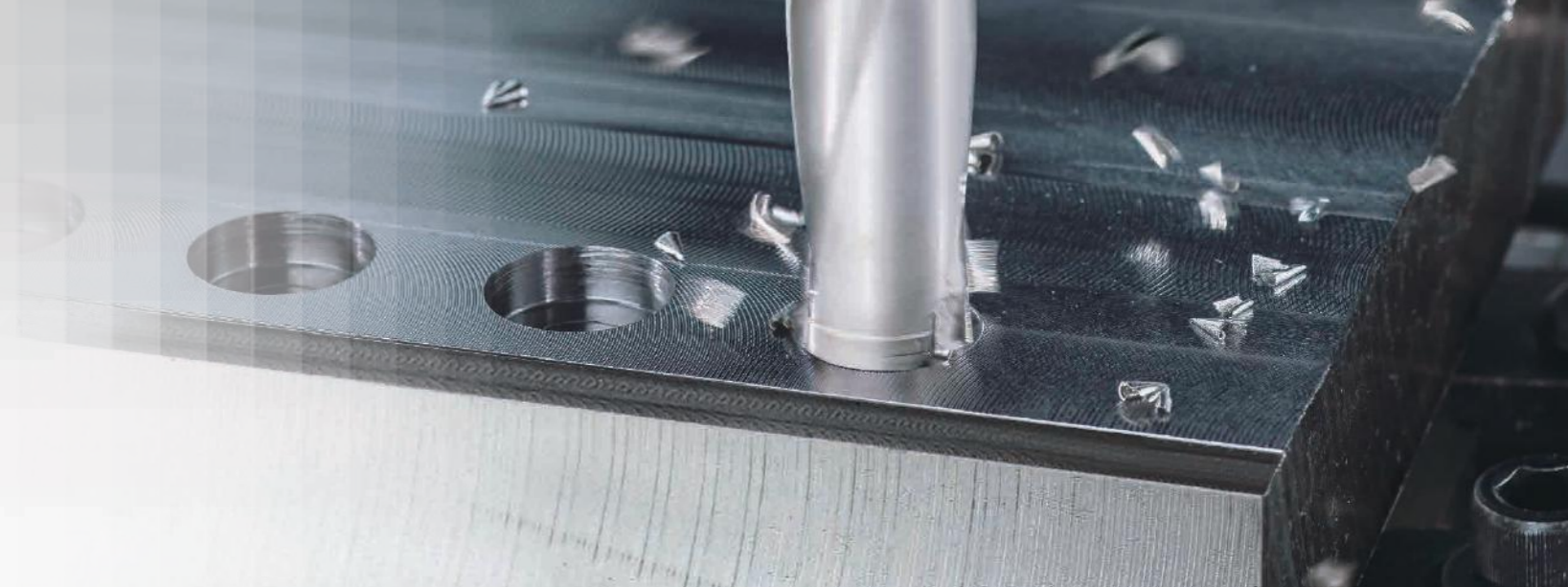
SUPER RIGIDITY

Structural Design Providing the Ultimate Heavy-Duty Cutting Performance

YAMA SEIKI in house made gear box spindle provides the best torque combination.

Box way on 3 axes to 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-2500
X : 2,500 mm (98.4")
Y : 1,000 mm (39.4)
Z : 1,000 mm (39.4)

BM-850
X : 850 mm (33.5")
Y : 600 mm (23.6")
Z : 600 mm (23.6")

BM-1400
X : 1,400 mm (55.1")
Y : 800 mm (31.5")
Z : 700 mm (27.6")

BM Series 850 / 1020 / 1200 / 1460
1400 / 1600 / 1800 / 2100 / 2500

Super Rigidity Vertical Machining Centers

With the advanced R&D technology and strict quality control, BM series is specially made for heavy cutting machining needs, which has a rigid and stable structure for extensive application.

BM series offers excellent performance at a reasonable and affordable price.

- We provide various modular spindle combinations depending on the different machining requirement to achieve optimal cutting performance.
- 3 axes are equipped with box ways which is 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 series, X travel start from 850 mm to 2,500 mm ; Y / Z travel start from 600 mm to 1,000 mm to meet your various machining requirements.



BM

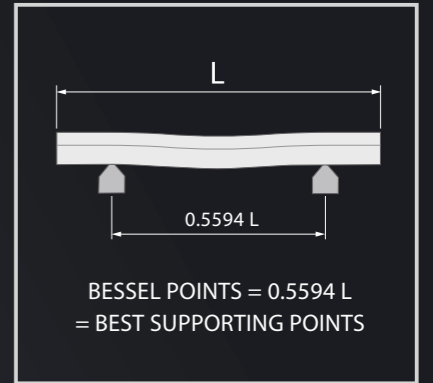
Series

850 / 1020 / 1200 / 1460
1400 / 1600 / 1800 / 2100 / 2500

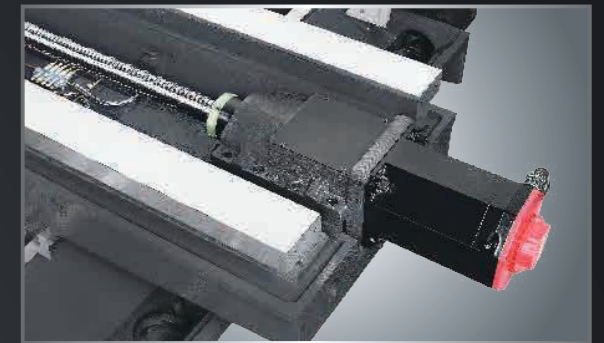
Super Rigidity Vertical Machining Centers



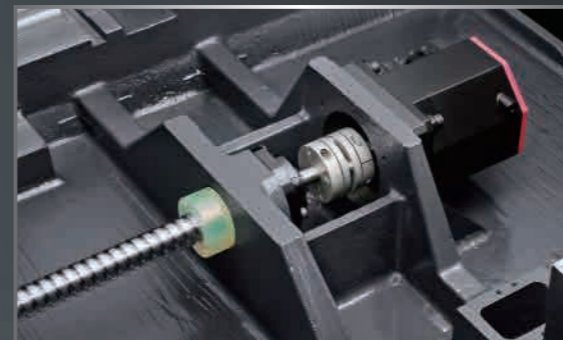
- The Finite Element Analysis (FEA) provides optimal machine design and light-weight structure advantage while ensuring super rigidity of machine.
- Δ (Delta) Wide span column construction provides superior cutting stability. The headstock retains stability even under high speed movement.
- Based on BESSEL POINTS concept which 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 extending durability of ball screw.
- Three axial system are adopted with FANUC αi 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.

Δ (Delta) Wide span column structure



BM Series 850 / 1020 / 1200 / 1460
1400 / 1600 / 1800 / 2100 / 2500

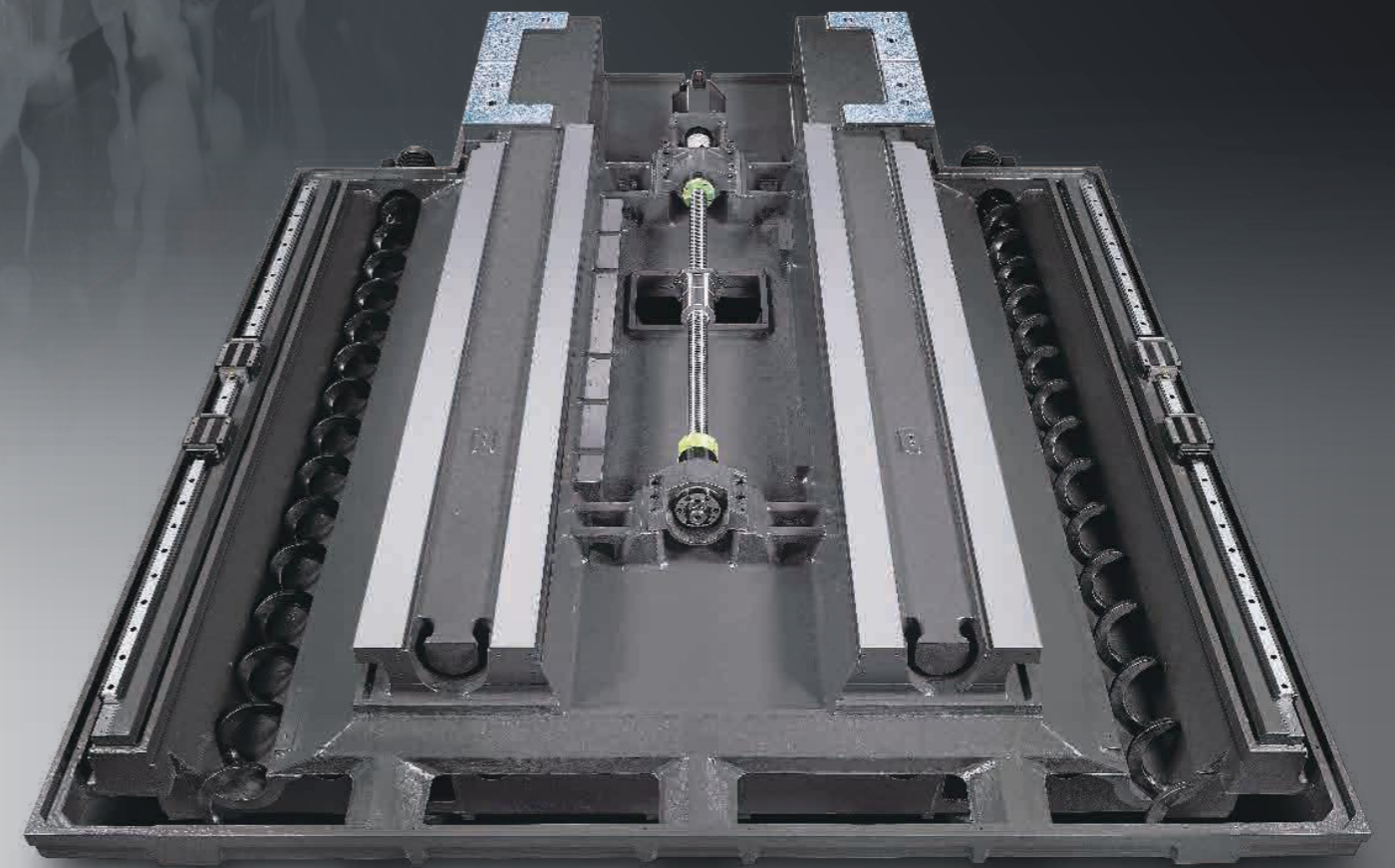
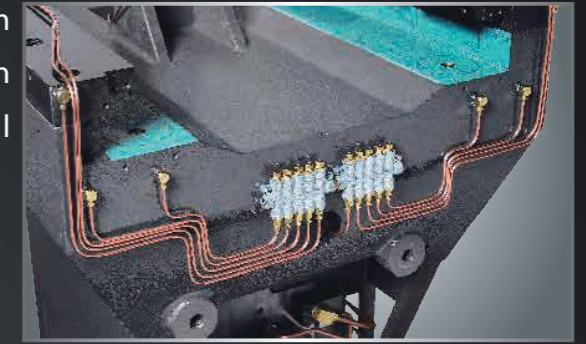
Super Rigidity Vertical Machining Centers



BM-1400 super rigidity structure



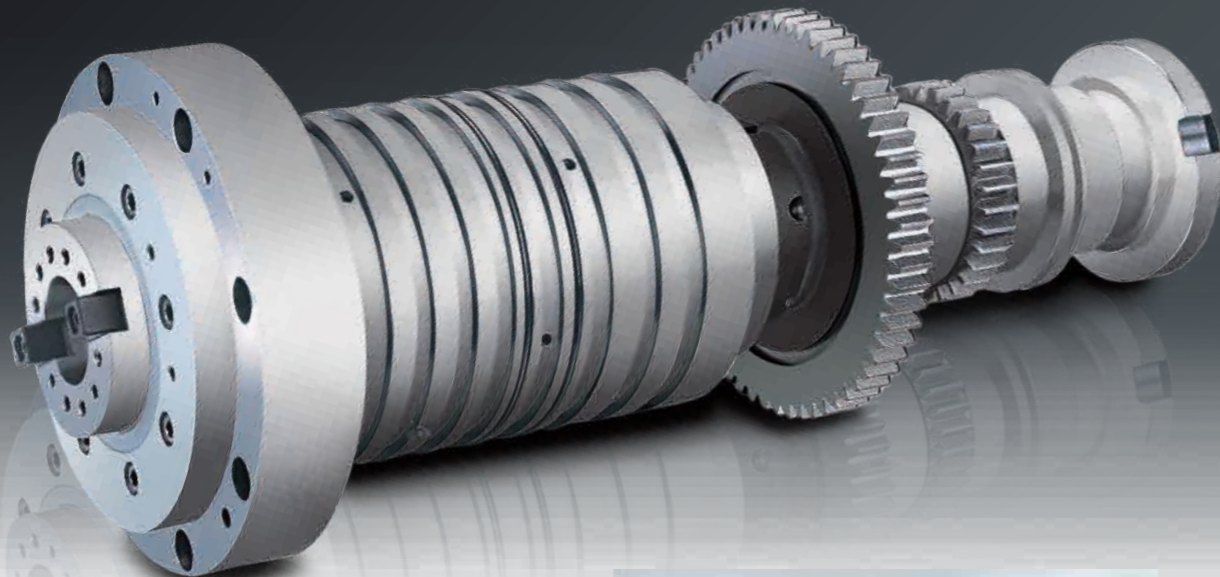
- Working table with double ribbed design to enhance the structure strength, while securing the table that will not deform even with a heavy load left on for a long time.
- Copper piping auto lubrication system delivers metered amounts of lubrication to the slide ways, ball screws, and vital components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



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

High Performance Spindle System

- Gear spindle combines with High-Low 2 steps gear box designed 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 spindle and affordable belt type spindle options, which can be adapted with different kinds of spindle motor to fulfill a variety of requirements.



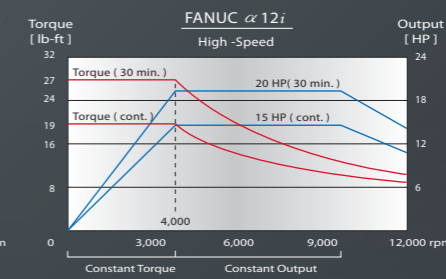
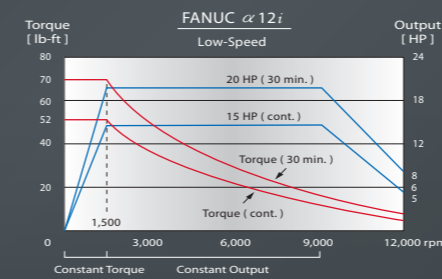
- Spindle, spindle motor, and gear box all pass through the completely running test ensures the performance and lifetime.



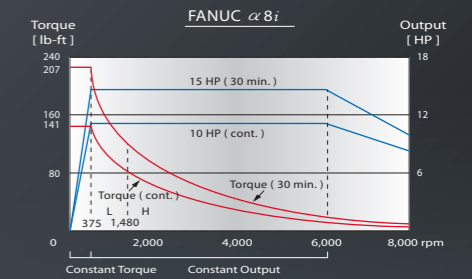
Spindle taper

Models	BM-850	BM-1020	BM-1200	BM-1460	BM-1400	BM-1600	BM-1800	BM-2100	BM-2500
Standard		CAT40				CAT50		CAT50	
Optional		CAT50				CAT40		—	

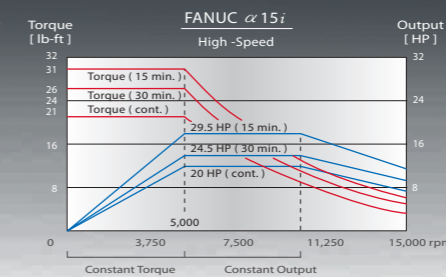
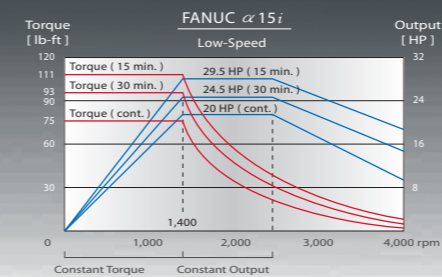
CAT40 12,000 rpm Direct-drive Spindle



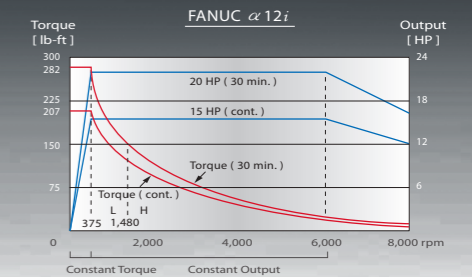
CAT40 8,000 rpm Gear Spindle



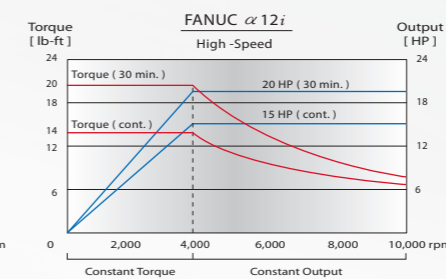
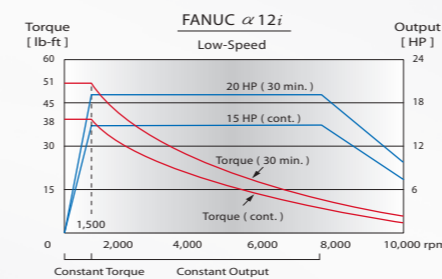
CAT40 15,000 rpm Direct-drive Spindle



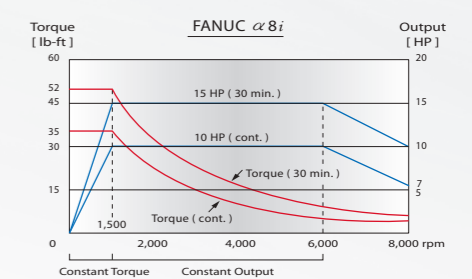
CAT40 8,000 rpm Gear Spindle



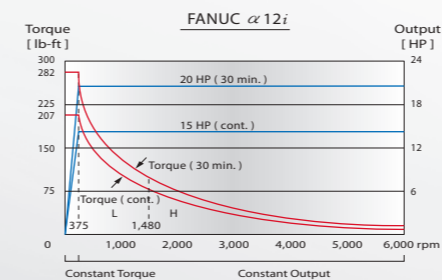
CAT50 10,000 rpm Direct-drive Spindle



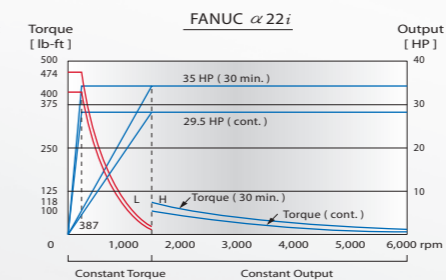
CAT40 8,000 rpm Belt-drive Spindle



CAT50 6,000 rpm Gear Spindle



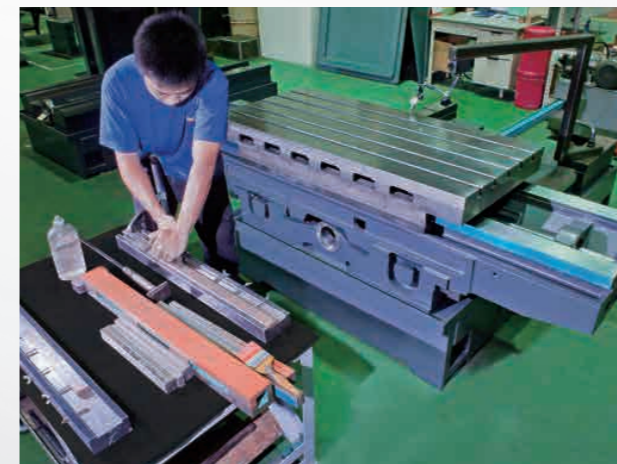
CAT50 6,000 rpm Gear Spindle



High Precision Hand Scraped Craftsmanship



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



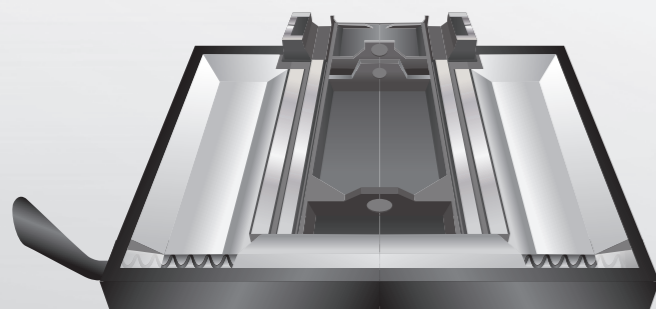
24T Disc type tool magazine



High Efficiency Chip Disposal System

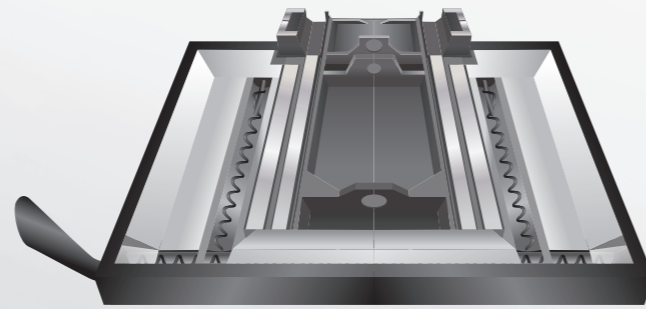
■ All series are equipped with 1 / 3 / 5 screw type chip auger according to the machine size, thus to provide high chip clearing efficiency.

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



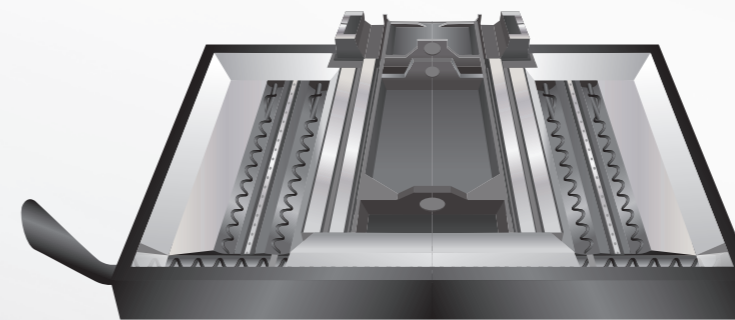
■ Screw chip auger x1

BM-850 | BM-1020 | BM-1200 | BM-1460



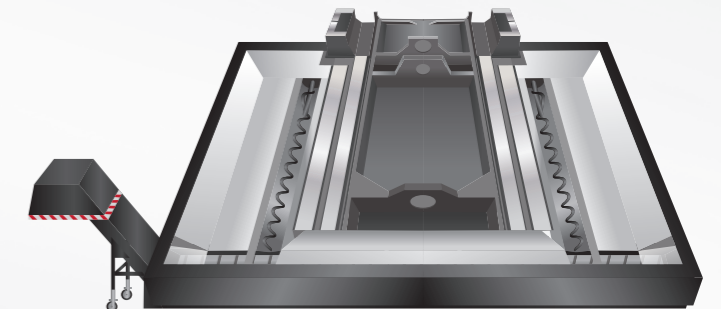
■ Screw chip auger x3

BM-1400 | BM-1600 | BM-1800



■ Screw chip auger x5

BM-2100 | BM-2500



■ Chain type chip auger (Opt.)

Automatic Pallets Changer (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.

i Console

YAMA SEIKI'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 process but also increases intelligent machining abilities.

(For 10.4" LCD only)



7 second

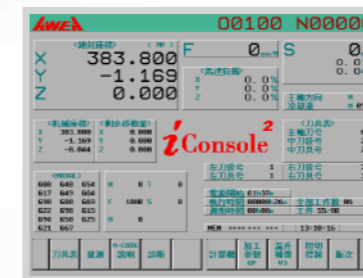
Auto pallet changing time

0.02 mm

(0.00078 inch)

Repeatability between two tables

Multiple Functions Status Display



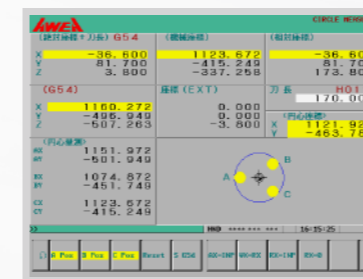
- Real time operation information
- Tool list
- Work piece measurement
- M code illustration
- PLC function
- Calculator
- CNC optimize parameter (Opt.)
- Spindle thermal compensation (Opt.)

Trouble Shooting



When the alarm appears, the program will display the breakdown cause and a troubleshooting procedure. Users can easily troubleshoot minor problems to save machine shutdown time.

Circular Work Piece Measurement



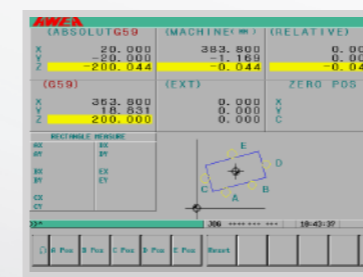
The circular work piece program can calculate the center coordinate of a work piece by measuring point A, B and C coordinates.

CNC Optimized Parameter



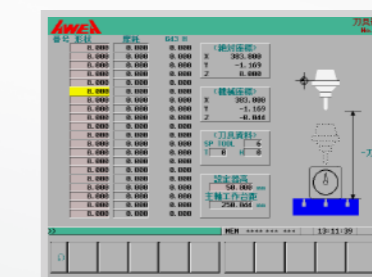
From rough cutting to fine machining, users can select different working modes, determine the allowable tolerance and the weight of the work piece, based on your desired working condition.

Rectangular Work Piece Measurement



The rectangular work piece program can calculate the center coordinate and the slant angle of a work piece by measuring point A, B, C, D and E coordinates; the calculated center coordinate can be inputted into the work piece coordinate program (G54 ~ G59).

Manual Tool Length Measurement



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

	BM850-APC
X / Y / Z axes travel	850 / 600 / 600 mm (33.5" / 23.6" / 23.6")
Table size	460 x 800 mm (18.1" x 31.5")
Table rotating range	180°
Repeatability for each table	0.01 mm (0.00039")
Repeatability between two tables	0.02 mm (0.00079")
Table load capacity	200 kg (441 lbs)

	BM850-APC
Spindle taper	CAT40 / CAT50 (Opt.)
Spindle motor (cont. / 30 min.)	7.5 / 11 kW (10 / 15 HP)
Spindle speed	8,000 rpm
X / Y / Z axes rapid feed rate	24 / 24 / 20 m/min. (945 / 945 / 788 IPM)
Cutting feed rate	10 m/min. (394 IPM)
Tool magazine capacity	24 T

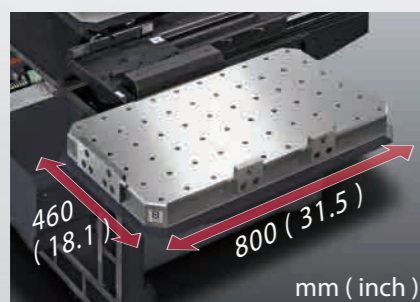


Table size

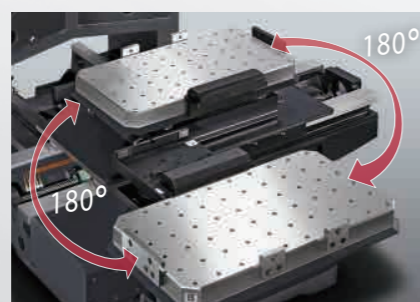


Table rotating range

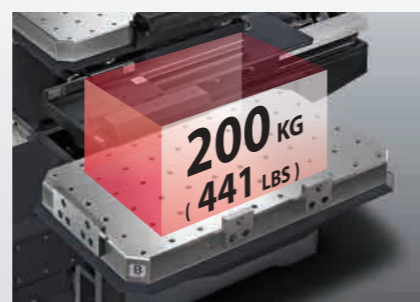
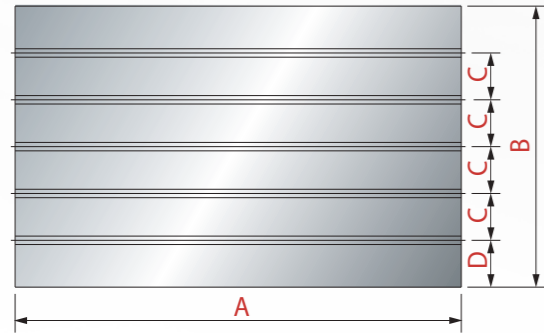


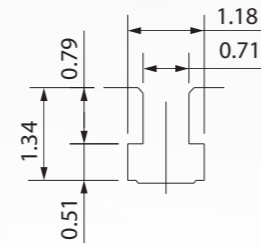
Table load capacity

Dimensions

Table Dimensions



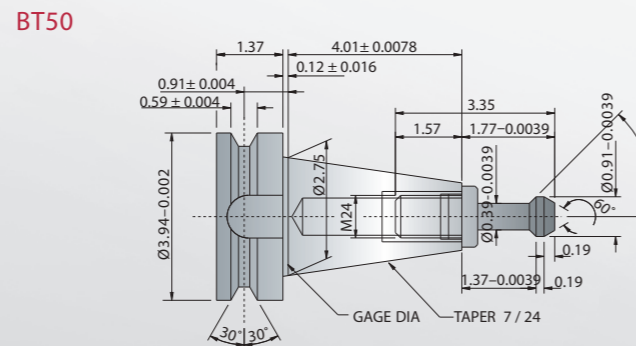
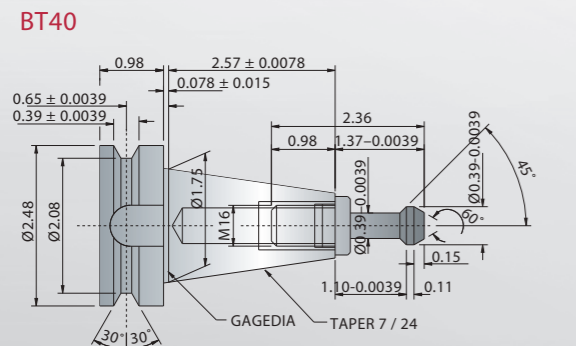
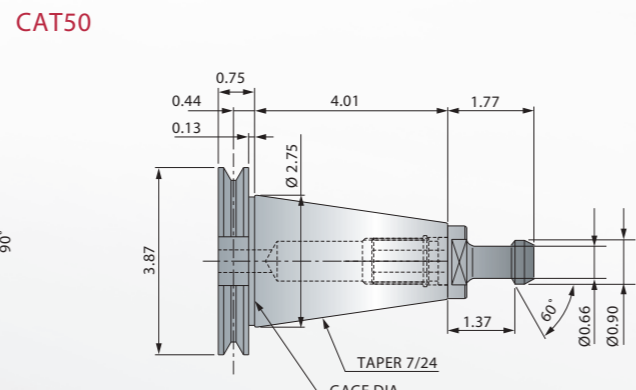
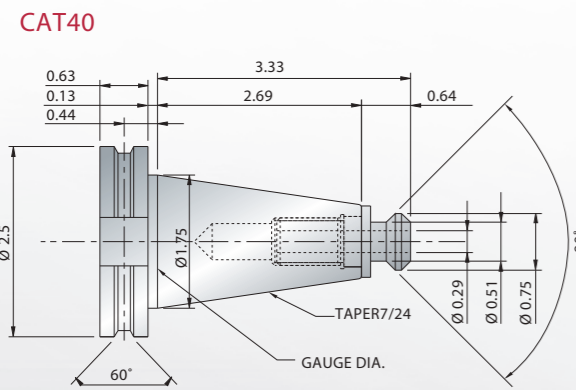
T-slot Dimensions



Unit	
mm	inch

Models	A		B		C		D	
BM-850	1,050	41.3						
BM-1020	1,120	44.1	600	23.6	100	3.9	100	3.9
BM-1200	1,300	51.2						
BM-1460	1,500	59.1	650	25.6			125	4.9
BM-1400								
BM-1600	1,700	66.9	800	31.5			100	3.9
BM-1800	2,000	78.7			150	5.9		
BM-2100	2,300	90.5					50	1.96
BM-2500	2,700	106.2	1,000	39.3				
BM850-APC	800	31.5	460	18.1	-	-	-	-

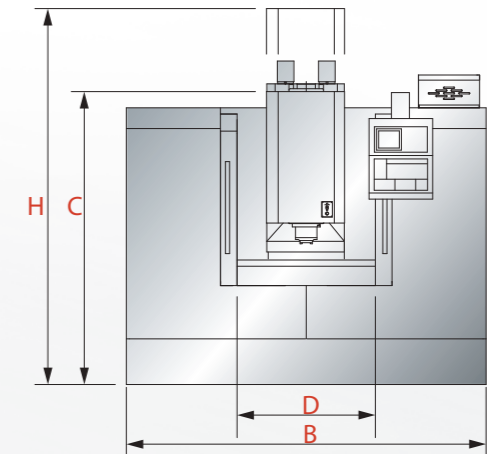
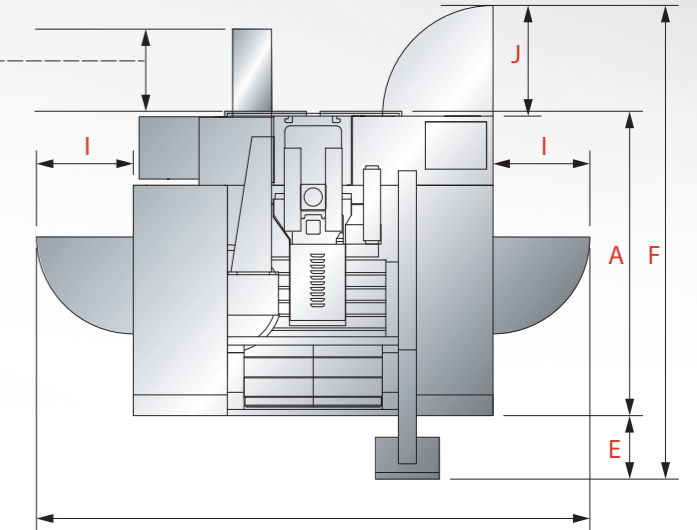
Tool Shank and Pull Stud Dimensions



(Unit : inch)

Machine Dimensions

BM-850 ~ 1460	40 Taper 40 Tool ATC : 170 mm (6.7") 50 Taper 30 Tool ATC : 510 mm (20.1") 50 Taper 40 Tool ATC : 1,140 mm (44.9")
BM-1400	50 Taper 30 Tool ATC : 265 mm (10.4") 50 Taper 40 Tool ATC : 900 mm (35.4")
BM-1600	50 Taper 30 Tool ATC : 245 mm (9.6") 50 Taper 40 Tool ATC : 880 mm (34.6")
BM-1800	50 Taper 30 Tool ATC : 245 mm (9.6") 50 Taper 40 Tool ATC : 880 mm (34.6")
BM-2100	50 Taper 40 Tool ATC : 520 mm (20.4")
BM-2500	50 Taper 40 Tool ATC : 520 mm (20.4")
BM850-APC	40 Taper 40 Tool ATC : 170 mm (6.7") 50 Taper 30 Tool ATC : 510 mm (20.1") 50 Taper 40 Tool ATC : 1,140 mm (44.9")



Unit	
mm	inch

Models	A	B	C	D	E	F	G	H	I	J
BM-850	2,200	86.6	2,600	102.3						
BM-1020			3,000	118.1						
BM-1200			3,400	133.9	2,117	83.8	1,000	39.3	580	22.8
BM-1460	2,185	86.0	3,850	151.6						
BM-1400										
BM-1600	2,935	115.5	3,950	155.5	2,320	91.3	1,500	59.1	655	25.7
BM-1800	2,995	117.9	4,400	173.2	2,585	101.7	1,800	70.9	605	23.8
BM-2100	2,965	116.7	4,880	192.1			2,070	81.4	720	28.3
BM-2500	3,545	139.7	6,500	255.9			2,950	116.1		
BM850-APC	3,000	118.1	2,600	102.4	2,417	95.2	850	33.5	790	31.1

Specifications are subject to change without notice.

		BM-850	BM-1020	BM-1200	BM-1460	BM-1400	BM-1600	BM-1800	BM-2100	BM-2500
Specifications										
X-axis travel	mm (inch)	850 (33.5)	1,020 (40.2)	1,200 (47.2)	1,400 (55.1)	1,400 (55.1)	1,600 (63.0)	1,800 (70.8)	2,100 (82.6)	2,500 (98.4)
Y-axis travel	mm (inch)	600 (23.6)				800 (31.5)			1,000 (39.3)	
Z-axis travel	mm (inch)	600 (23.6)				700 (27.5)	800 (31.5)		1,000 (39.3)	
Distance from spindle center to column	mm (inch)	680 (26.8)				900 (35.4)			1,100 (43.3)	
Distance from spindle nose to table center	mm (inch)	125 ~ 725 (4.92 ~ 28.5)				200 ~ 900 (7.87 ~ 35.4)	200 ~ 1,000 (7.87 ~ 39.3)		200 ~ 1,200 (7.87 ~ 47.2)	
Working Table										
Table size (X direction)	mm (inch)	1,050 (41.3)	1,120 (44.1)	1,300 (51.2)	1,500 (59.1)	1,500 (59.1)	1,700 (66.9)	2,000 (78.7)	2,300 (90.5)	2,700 (106.2)
Table size (Y direction)	mm (inch)	600 (23.6)	600 (23.6)	600 (23.6)	650 (25.6)	800 (31.5)	800 (31.5)	800 (31.5)	1,000 (39.3)	1,000 (39.3)
Table load capacity	kg (lbs)	850 (1,870)	1,000 (2,210)	1,200 (2,650)	1,400 (3,085)	1,800 (3,968)	2,000 (4,409)	2,200 (4,850)	3,000 (6,613)	4,000 (8,818)
Spindle										
Spindle taper		40-Taper : CAT 40 ^{*1}			50-Taper : CAT 50 ^{*1}		40-Taper : CAT 40 ^{*1}		50-Taper : CAT 50 ^{*1}	
Spindle configuration		40-Taper : 2-speed Gear Box Belt Drive (Opt.)			50-Taper : 2-speed Gear Box		40-Taper : Direct Drive		50-Taper : 2-speed Gear Box Direct Drive (Opt.)	
Spindle motor (cont. / 30 min.)	kW (HP)	40-Taper : 7.5 / 11 (10 / 15) ^{*5}			50-Taper : 11 / 15 (15 / 20) ^{*5}		40-Taper : 7.5 / 11 (10 / 15)		50-Taper : 11 / 15 (15 / 20) ^{*5}	
Spindle speed ranges	rpm	40-Taper : L : 65~1,500 / H : 1,500~8,000 Belt Drive 10~10,000 (Opt.)			50-Taper : L : 65~1,500 / H : 1,500~6,000		40-Taper : 65~12,000 65~15,000 (Opt.)		50-Taper : L : 65~1,500 / H : 1,500~6,000 Direct Drive 10,000	
Feed Rate										
X / Y axes rapid feed rate	m/min. (IPM)	24 (945)				20 (788)			15 (591)	
Z-axis rapids feed rate	m/min. (IPM)	20 (788)				18 (709)			12 (473)	
Cutting feed rate	m/min. (IPM)	1-10 (39.4 ~ 393.7)				1-8 (39.4 ~ 314)				
Tool Magazine										
Tool magazine capacity	T	40-Taper : 20T drum ATC ^{*2}			50-Taper : 24 / 30T swing arm ATC		40-Taper ^{*2}		50-Taper : 16T drum ATC ^{*2}	
Max. tool diameter / adj. pocket empty	mm (inch)	40-Taper : 90 / 150 (3.5" / 5.9")			50-Taper : 110 / 200 (4.3" / 7.8") ^{*3}		40-Taper : 127 / 228 (5" / 8.97")		50-Taper : 160 / 300 (6.3" / 11.8")	
Max. tool length	mm (inch)	40-Taper : 250 (9.84")			50-Taper : 300 (11.8")		40-Taper : 250 (9.84")		50-Taper : 400 (15.7")	
Max. tool weight	kg (lbs)	40-Taper : 8 (18)			50-Taper : 15 (33)		40-Taper : 8 (18)		50-Taper : 15 (33)	
Accuracy										
Positioning accuracy (JIS B 6338)	mm (inch)	± 0.01 / Full Travel (± 0.00039 / Full Travel)				± 0.01 / Full Travel (± 0.00039 / Full Travel)				
Positioning accuracy (VDI 3441)	mm (inch)	P = 0.012 (P = 0.00047)				P = 0.02 (P = 0.00079)				
Repeatability (JIS B 6338)	mm (inch)	± 0.003 (± 0.000118)				± 0.003 (± 0.000118)				
Repeatability (VDI 3441)	mm (inch)	Ps = 0.008 (Ps = 0.00031)				Ps = 0.008 (Ps = 0.00031)				
General										
Control system		FANUC Oi- MF / 31i- MB MITSUBISHI M70 / M730				FANUC Oi- MF / 31i- MB MITSUBISHI M70 / M730				
Pneumatic pressure requirement	kg/cm ² (PSI)	6 (85)				6 (85)				
Power requirement	V	220 ± 10%								
Coolant tank capacity	liter (gal)	310 (82)	350 (93)	365 (97)	415 (110)	600 (159)	600 (159)	630 (167)	1,000 (265)	1,060 (281)
Machine weight	kg (lbs)	6,500 (14,330)	6,800 (14,991)	7,300 (16,093)	7,500 (16,534)	13,000 (28,660)	15,000 (33,069)	17,000 (37,478)	20,000 (44,092)	22,000 (48,501)

*1 : Optional BT, DIN.

*3 : 24-tool swing arm ATC.

*5 : Different spindle motor maybe optional available, please consult with your sales representative.

*2 : Optional 24 / 30 / 40 tools swing arm ATC.

*4 : Individual models may vary, please contact YAMA SEIKI.

Specifications are subject to change without notice.

Standard Accessories

- 3 axes auto lubrication system
- 3 axes ball screw pretension
- Spindle air curtain
- Coolant nozzle around spindle
- Air blow system
- Front side chip auger
- Two sides chip auger
BM-1400 ~ 2500
- Fully enclosed splash guard
- Rigid tapping
- Lubricating oil recovering system
- Heat exchanger for electrical cabinet
- RS-232 interface
- Tool box
- Air gun
- Water gun
- Alarm light
- Foundation bolt kit
- Automatic power-off system

Optional Accessories

- Roof enclosed splash guard
- Coolant through spindle (Form A)
- Spindle thermal compensation
- X / Y / Z axes optical linear scale
- CNC rotary table
- Transformer
- Coolant through the tool adapter
- Chips flush coolant system
- Scraper type chip conveyor
- Caterpillar type chip conveyor & bucket
- Automatic tool length measurement
- Oil skimmer
- Data server