

Humanity · Innovation · Technology



Bicycle Pedal



Valve



Artwork

Industry Application

- Aerospace
- Micromachining
- Automotive
- Job shop
- Mold & Die



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ACW 2020.09.1000E



YIDA PRECISION

VERTICAL

MACHINING CENTERS

EV / MV / BMV Series

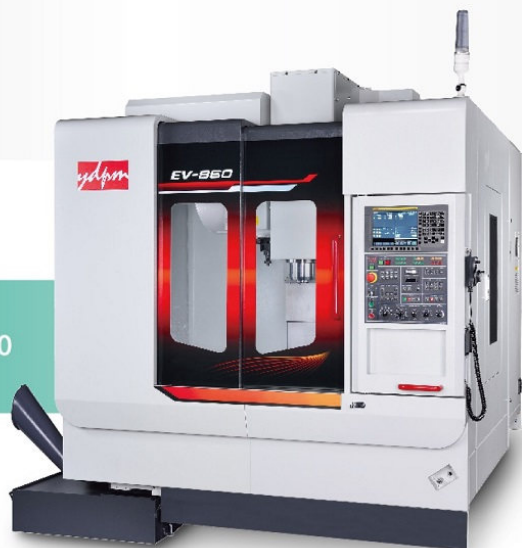
- High rigid and high precision machine structure
- Add 4th & 5th rotary table to increase efficient and productive
- Available to equip with APC and jig for upgrading machine efficiency.



VERTICAL MACHINING CENTERS

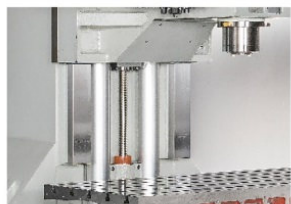
- Stable, rigid machine structure
- Two options: Linear guide way and boxway.

EV-860



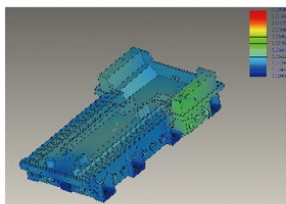
ISO 40 Belt-Driven Spindle

- The spindle is supported by ultra high precision angular contact ball bearings, providing outstanding cutting load resistance in radial and axial directions.
- It features smooth, accurate, and rigid cutting at any speed.



Pneumatic Counter-Balance on Z-Axis

The spindle head movement of the Z-axis is counter-balanced by a pneumatic system, enabling the spindle head to move smoothly, effortlessly, and without vibration. (for (B)MV-1100 / 1300 / 1500)



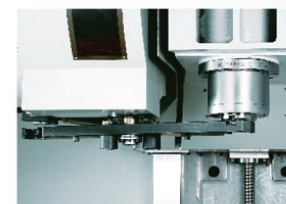
Structural Optimization Design

The machine is optimized by Finite Element Analysis that can simulate various stress/strain conditions. Thus, the maximum rigidity and stability of the structural parts can be achieved.



Pre-Loaded Ballscrew

- The high precision ballscrew is pre-loaded to minimize elongation caused by load and heat.
- The ballscrew is directly coupled to the drive motor to prevent backlash and improve feeding and positioning accuracy.
- Linear guideway design ensures high rigidity, high speed traversal, and precise positioning.



Automatic Tool Changer

- The tool magazine is designed with cylindrical cam transmission, ensuring high positioning accuracy and fast tool selection.
- Bi-directional, random tool selection allows tool change to be quickly accomplished in only 2.1 seconds (tool to tool).
- The reliable twin-arm type ATC system can shorten non-cutting time, which in turn increases productivity.

BMV-1100



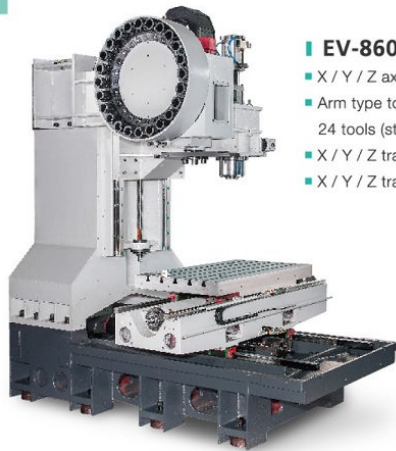
OPTIMIZED STRUCTURE DESIGN

Enhances Machining Accuracy and Efficiency

In order to enable each machining center to reach the highest machining accuracy and productivity, the machine structure design is focused on reducing vibration to a minimum when performing heavy cutting or high speed machining. This allows greater cutting depth and a higher feed rate. As a result, a shortened machining time can be achieved.

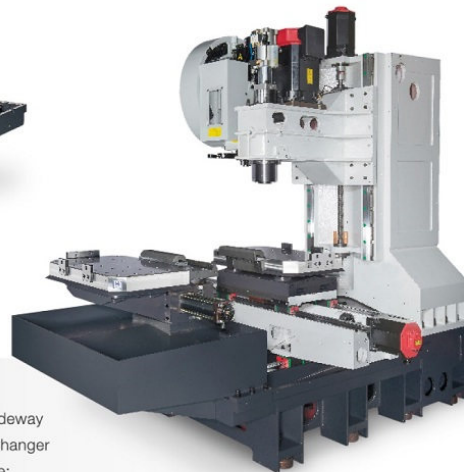
Features of Machine Structure

- The structural parts are manufactured from high quality Meehanite cast iron, stress relieved for lifetime accuracy.
- The box type column is designed with extra wide bottom in combination with internal ribbing to damp vibration and reduce deformation.
- The massive base provides a firm support for the entire machine and heavy loads.



EV-860 / EV-1050

- X / Y / Z axis linear guideway
- Arm type tool magazine:
24 tools (standard) / 30 tools (optional)
- X / Y / Z travel: 860 x 600 x 610 mm (EV-860)
- X / Y / Z travel: 1,050 x 600 x 610 mm (EV-1050)



EV-800 APC

- X / Y / Z axis linear guideway
- With automatic pallet changer
- Arm type tool magazine:
24 tools (standard) / 30 tools (optional)
- X / Y / Z travel: 860 x 500 x 500 mm

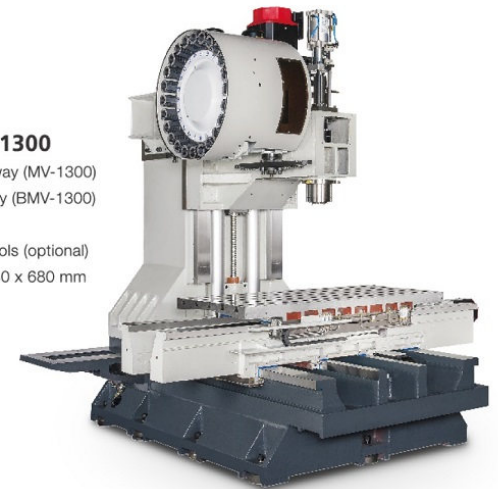


MV-1100 / BMV-1100

- X / Y / Z axis linear guideway (MV-1100)
- X / Y / Z axis box guideway (BMV-1100)
- Arm type tool magazine:
24 tools (standard) / 30 tools (optional)
- X / Y / Z travel: 1,100 x 650 x 620 mm

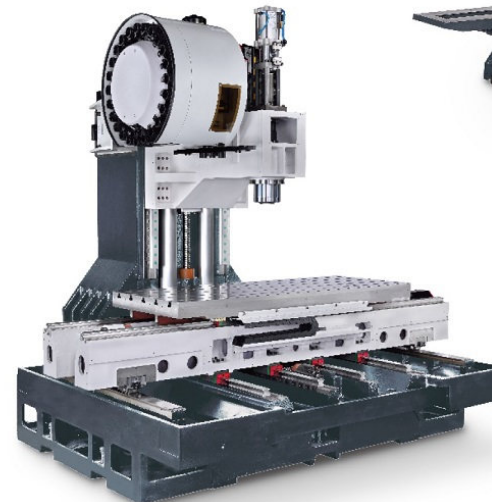
MV-1300 / BMV-1300

- X / Y / Z axis linear guideway (MV-1300)
- X / Y / Z axis box guideway (BMV-1300)
- Arm type tool magazine:
24 tools (standard) / 30 tools (optional)
- X / Y / Z travel: 1,300 x 680 x 680 mm



MV-1500 / BMV-1500

- X / Y / Z axis linear guideway (MV-1500)
- X / Y / Z axis box guideway (BMV-1500)
- Arm type tool magazine:
24 tools (standard) / 30 tools (optional)
- X / Y / Z travel: 1,500 x 680 x 680 mm



AR TECHNOLOGY



Since maintenance has a direct influence on performance, productivity and product quality, we're improving the process through recent developments in Augmented Reality technologies.



Current efforts are focused on developing AR applications for maintenance.

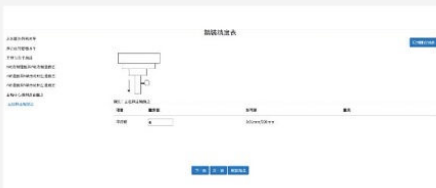


SMART MACHINE ENGINE



- Establish an Industry 4.0 administration console platform
- Communication platforms of various controller for machines, robots and automation equipment
- Master utilization of machine
- Remote program upload / download
- Alarm message analysis
- Machine's data analysis and statistics
- App of for developing smart machinery

PRODUCTION MANUFACTURER / PROCESS RECORDS

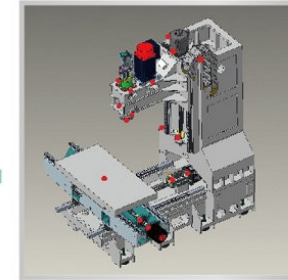


- Upgrade to a smart production system for machine tools
- Management of assembly efficiency
- Visualization of assembly progress
- Analysis of machine assembly accuracy
- Estimate assembly time and control delivery time

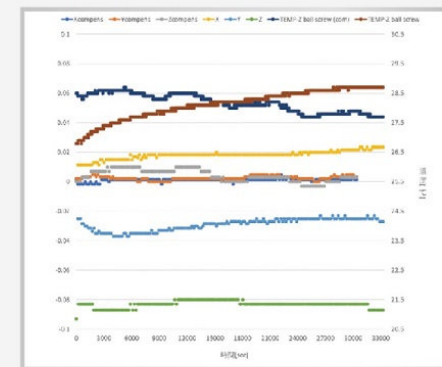
FANUC AI THERMAL DISPLACEMENT COMPENSATION

After the thermal displacement compensation model file is imported into the system, the thermal displacement compensation is performed in real time according to feedback from each temperature sensor during the operation of the machine to improve the machining accuracy of the machine.

Thermal sensor



CNC



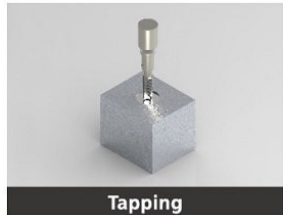
The FANUC AI Thermal Displacement Compensation module was implemented on EV-860. The thermal displacement after applying AI adjustment is within 0.002 mm, compared to 0.08 mm without AI.

ACTUAL MACHINING DATA

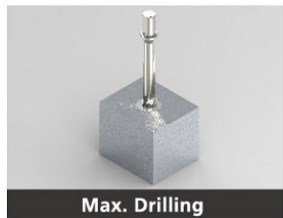
Cutting Material : S45C



Specification	EV-860 / EV-1050	(B)MV-1100 / (B)MV-1300
Tool diameter	Ø80	Ø80
Cutting depth	3 mm	6 mm
Feed rate	1,000 mm/min	1,500 mm/min
Chip removal	240 cc/min	720 cc/min



Description	EV-860 / EV-1050	(B)MV-1100 / (B)MV-1300
Cutting depth	40 mm	40 mm
Feed rate	600 mm/min	1,400 mm/min
Tool spec.	M24 x P1.5	M30 x P3.5



Specification	EV-860 / EV-1050	(B)MV-1100 / (B)MV-1300
Drilling depth	60 mm	60 mm
Feed rate	40 mm/min	25 mm/min
Tool spec.	Ø33 mm	Ø40 mm (twist drill)

QUALITY ASSURANCE

Each machine has been inspected before shipping to ensure optimal operation performance through

Laser Calibration and Ball bar Circularity Inspection



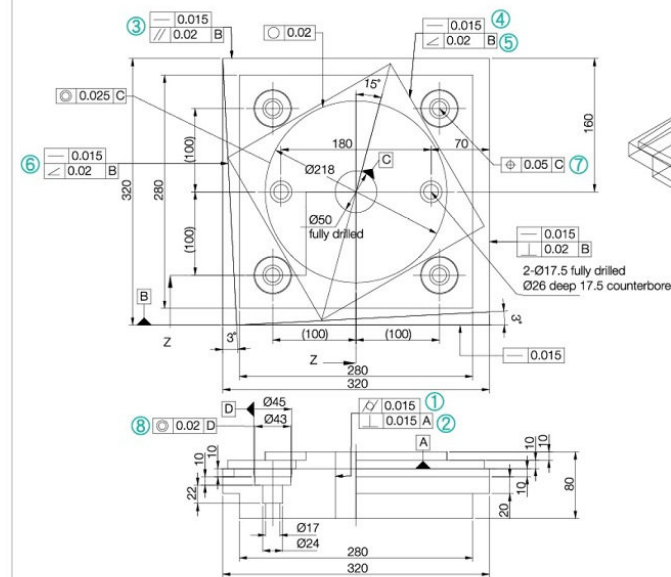
MACHINE SPECIFICATIONS



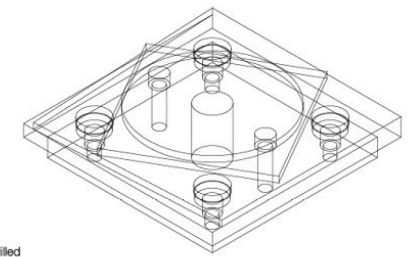
On-line Balancer for Spindle (Optional)

Keeps cutting tool under 0.01 gm unbalance.
Makes (including spindle & cutting tools) accuracy better than 0.05 μ m at the highest speed. Improves the service life of cutting tools and the roughness of working pieces at simultaneously.

ISO10791-7 TEST PIECE



Sectional View: Z - Z



Actual Cutting Test

- ① Boring accuracy (cylinder): 0.0047 mm
- ② Straight angle of hole center line and datum A: 0.002 mm
- ③ Parallelism between datum and the opposite plane: 0.0036 mm
- ④ Straightness in each side: 0.004 mm
- ⑤ Angle accuracy of 75° inclined to B datum: 0.0046 mm
- ⑥ Angle accuracy to B datum: 0.0037 mm
- ⑦ Positioning accuracy of 4 boring holes to center hole C: 0.01 mm
- ⑧ Concentricity of small diameter circle to large diameter circle: 0.0065 mm

MACHINE SPECIFICATIONS

ITEM		UNIT	EV-860	EV-800APC	EV-1050
TABLE	Table dimension	mm	1,000 x 600	800 x 460	1,200 x 600
	Working area	mm	860 x 600	860 x 600	1,050 x 600
	T-slot	mm	CD100 x 18 x 5	Bolt hole 60-M12 x P80	CD100 x 18 x 5
	Number of work table	pcs	1	2	1
	Max. loading capacity	kgs	600	250	800
TRAVEL RANGE	Max. travel range of X / Y / Z-axis	mm	860 / 600 / 610	860 x 500 x 500	1,050 / 600 / 610
	Distance from spindle nose to table surface	mm	120~730	120~620	120~730
	Distance from spindle center to column	mm	700	700	700
SPINDLE	Spindle taper		ISO No.40	ISO No.40	ISO No.40
	Spindle bearing inner dia.	mm	Ø70	Ø70	Ø70
	Spindle speed	rpm	STD: 8,000 belt-driven OPT: 10,000 / 12,000 / 15,000	STD: 8,000 belt-driven OPT: 10,000 / 12,000 / 15,000	STD: 8,000 belt-driven OPT: 10,000 / 12,000 / 15,000
FEEDRATE	Feedrate of X / Y / Z-axis	mm/min	1~10,000	1~10,000	1~10,000
	Slideways of X / Y / Z-axis		Linear guideway	Linear guideway	Linear guideway
	Rapid traverse of X / Y / Z-axis	m/min	36 / 36 / 30	36 / 36 / 30	36 / 36 / 30
TOOL MAGAZINE	Tool capacity	pcs	STD: 24; OPT: 30	STD: 24; OPT: 30	STD: 24; OPT: 30
	Tool selection		Bi-direction	Bi-direction	Bi-direction
	Max. tool dia. x length	mm	Ø80 x 300	Ø80 x 300	Ø80 x 300
	Max. tool weight	kgs	7	7	7
	Tool shank		STD: BT40; OPT: CAT40, SK40, BBT40, HSK63A	STD: BT40; OPT: CAT40, SK40, BBT40, HSK63A	STD: BT40; OPT: CAT40, SK40, BBT40, HSK63A
DRIVE MOTOR	Spindle drive motor	kW	STD: β12 (11/15); OPT: α8 (7.5/11); α12 (11/15)	STD: β12 (11/15); OPT: α8 (7.5/11); α12 (11/15)	STD: β12 (11/15); OPT: α8 (7.5/11); α12 (11/15)
	Servo motors of X / Y / Z-axis	kW	STD: β12/β12/β22 (1.8/1.8/3) OPT: α12/α12/α22 (3/3/4)	STD: β12/β12/β22 (1.8/1.8/3) OPT: α12/α12/α22 (3/3/4)	STD: β12/β12/β22 (1.8/1.8/3) OPT: α12/α12/α22 (3/3/4)
	Coolant motor	W	1,080 (50 Hz) / 1,620 (60 Hz)	1,080 (50 Hz) / 1,620 (60 Hz)	1,080 (50 Hz) / 1,620 (60 Hz)
	Chip conveyor motor	W	200	200	200
	APC motor	kW	-	STD: β22 (2.5); OPT: α12 (3)	-
ACCURACY	Positioning	mm	±0.004	±0.004	±0.004
	Repeatability	mm	±0.003	±0.003	±0.003
MISCELLANEOUS	Power requirement	KVA	380-415 / 220V 21 KVA	380-415 / 220V 21 KVA	380-415 / 220V 21 KVA
	Floor area (L x W x H)	mm	3,105 x 2,611 x 2,838	3,469 x 3,335 x 2,474	3,907 x 2,447 x 2,838
	Packing dimension	mm	3,670 x 2,280 x 2,510	3,530 x 2,280 x 2,550 + 3,500 x 2,280 x 1,850	3,710 x 2,300 x 2,510
	Net weight	kgs	5,980	6,400	6,235
	Gross weight	kgs	6,270	7,100	6,510

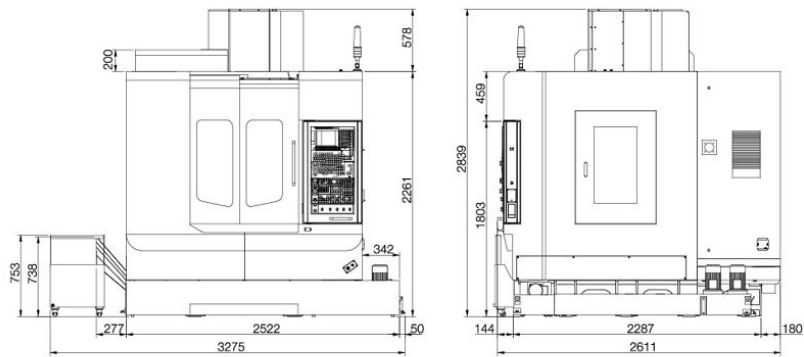
MACHINE SPECIFICATIONS

ITEM	UNIT	MV-1100	BMV-1100	MV-1300	BMV-1300	MV-1500	BMV-1500
TABLE	Table dimension	mm	1,180 x 560	1,500 x 650	1,700 x 650		
	Working area	mm	1,100 x 650	1,300 x 680	1,500 x 680		
	T-slot	mm	CD100 x 18 x 5	CD125 x 18 x 5	CD125 x 18 x 5		
	Number of work table	pcs	1	1	1		
	Max. loading capacity	kgs	1,000	1,200	1,200		
TRAVEL RANGE	Max. travel range of X / Y / Z-axis	mm	1,100 / 650 / 620	1,300 / 680 / 680	1,500 / 680 / 680		
	Distance from spindle nose to table surface	mm	150~770	150~830	150~830		
	Distance from spindle center to column	mm	743	680	765	803	
SPINDLE	Spindle taper		ISO No.40	ISO No.40	ISO No.40		
	Spindle bearing inner dia.	mm	Ø70	Ø70	Ø70		
	Spindle speed	rpm	STD: 10,000 belt-driven OPT: 8,000, 12,000, 15,000	STD: 10,000 belt-driven OPT: 8,000, 12,000	STD: 10,000 belt-driven OPT: 8,000, 12,000		
FEEDRATE	Feedrate of X / Y / Z-axis	m/min	1~10,000	1~12,000	1~12,000		
	Slideways of X / Y / Z-axis		Linear guideway	Box way	Linear guideway	Box way	
	Rapid traverse of X / Y / Z-axis	mm/min	30	18	30	18	
TOOL MAGAZINE	Tool capacity	pcs	STD: 24 ; OPT: 30	STD: 24; OPT: 30	STD: 24; OPT: 30		
	Tool selection		Bi-direction	Bi-direction	Bi-direction		
	Max. tool dia. x length	m/min	Ø80 x 300	Ø80 x 300	Ø80 x 300		
	Max. tool weight	kgs	7	7	7		
	Tool shank		STD: BT40; OPT: CAT40, SK40, BT40, HSK63A	STD: BT40; OPT: CAT40, SK40, BBT40, HSK63A, BT50	STD: BT40; OPT: CAT40, SK40, BBT40, HSK63A, BT50		
DRIVE MOTOR	Spindle drive motor	kW	STD: α12 (11/15); OPT: α15 (15/18.5)	α15 (15/18.5)	α15 (15/18.5)		
	Servo motors of X / Y / Z-axis	kW	α12 (2.7)	α22 (4)	α22 (4)		
	Coolant motor	W	1,080 (50 Hz) / 1,620 (60 Hz)	1,080 (50 Hz) / 1,620 (60 Hz)	1,080 (50 Hz) / 1,620 (60 Hz)		
	Chip conveyor motor	W	200	200	200		
	APC motor	kW	-	-	-		
ACCURACY	Positioning	mm	±0.004	±0.005	±0.005		
	Repeatability	mm	±0.003	±0.004	±0.003	±0.004	
MISCELLANEOUS	Power requirement	KVA	380-415 / 220V 21 KVA	380-415 / 220V 30 KVA	380-415 / 220V 30 KVA		
	Floor area (L x W x H)	mm	4,299 x 2,453 x 2,814	4,045 x 2,599 x 2,878	4,855 x 2,600 x 2,878		
	Packing dimension	mm	3,730 x 2,280 x 2,530 + 1,050 x 800 x 920	4,420 x 2,300 x 2,530 + 1,050 x 800 x 920	4,780 x 2,300 x 2,450 + 1,050 x 800 x 920		
	Net weight	kgs	Machine: 7,000; Accessory: 270	Machine: 7,980; Accessory: 1,500	Machine: 9,900; Accessory: 1,800		
	Gross weight	kgs	Machine: 7,670; Accessory: 390	Machine: 9,000; Accessory: 1,650	Machine: 10,300; Accessory: 2,100		

DIMENSIONAL DRAWINGS

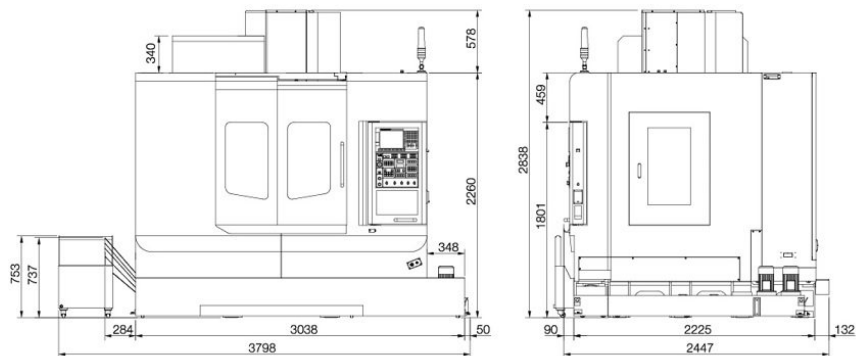
EV-860

unit: mm



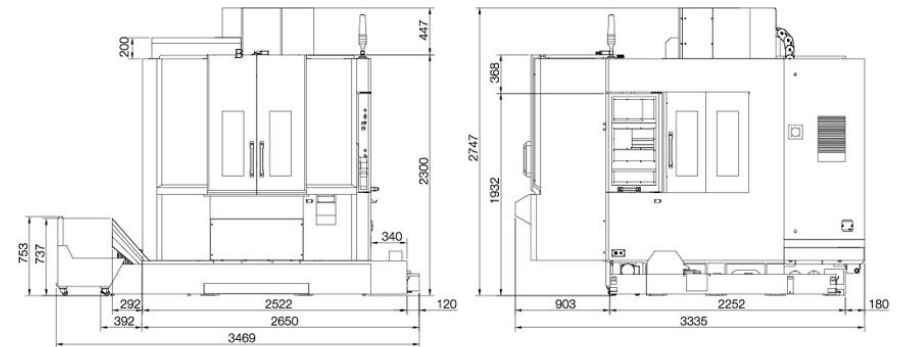
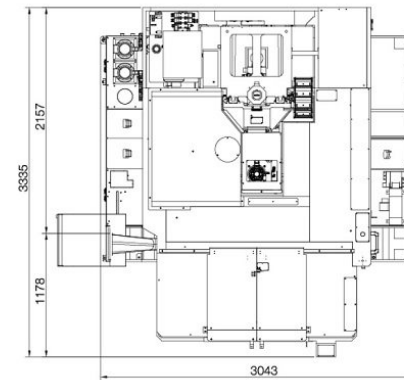
EV-1050

unit: mm



EV-800 APC

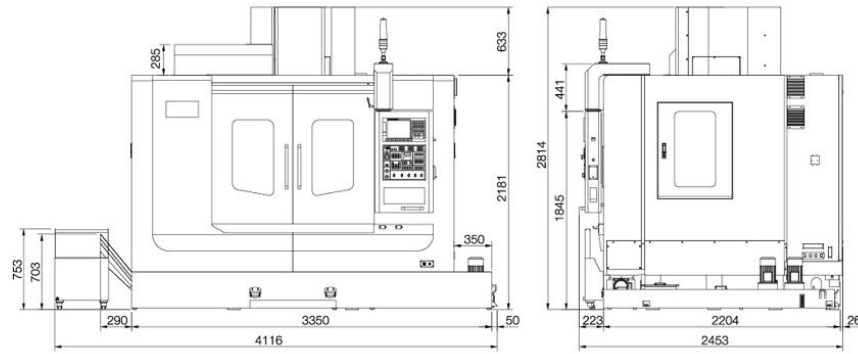
unit: mm



DIMENSIONAL DRAWINGS

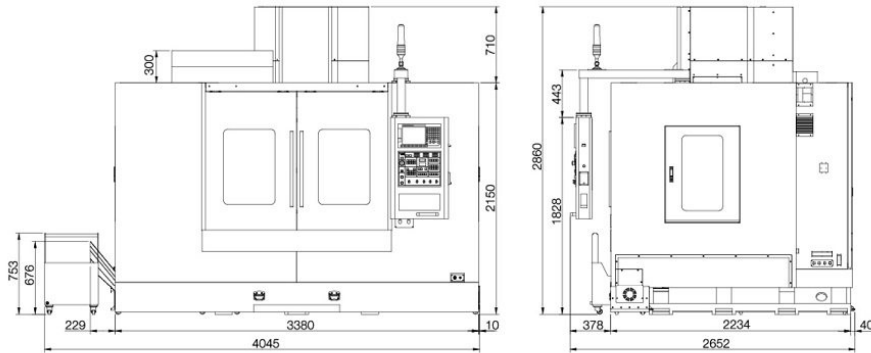
MV-1100 / BMV-1100

unit: mm



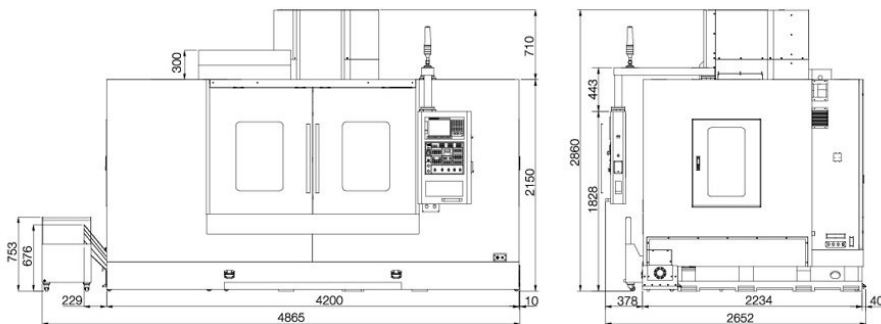
MV-1300 / BMV-1300

unit: mm



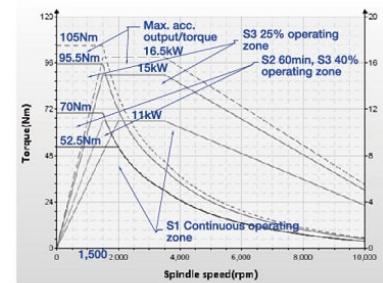
MV-1500 / BMV-1500

unit: mm

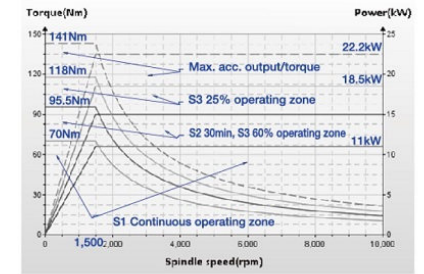


SPINDLE POWER & TORQUE DIAGRAM

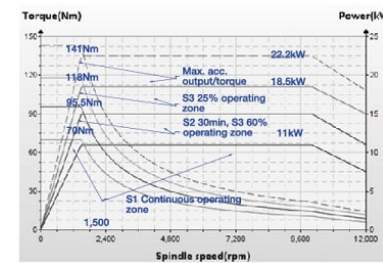
Fanuc β 12i/10000



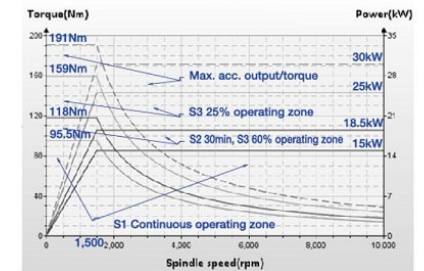
Fanuc α 12/10,000rpm



Fanuc α 12/12,000rpm

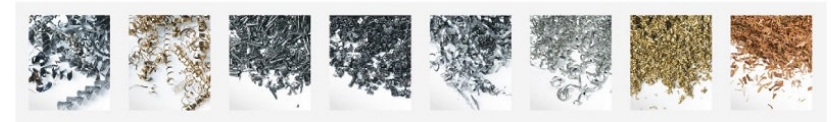


Fanuc α 15/10,000rpm



CHIP CONVEYOR (OPTIONAL)

Select a Suitable Conveyor by Different Chip Types



	Curly Iron	Metallic	Non-Curly	Foundry	Curly Aluminum	Aluminum	Brass	Non-Metallic
Screw type	●	●	---	---	●	●	---	---
Chain type	●	●	---	---	●	---	---	●
Scraper type	---	---	●	●	---	●	●	---

STANDARD / OPTIONAL SPECIFICATIONS

● Standard ○ Optional

No.	Description	EV-860 EV-1050	EV-800APC	MV-1100	MV-1300	MV-1500	BMV-1100	BMV-1300	BMV-1500
1	Fanuc 0i-MF(3) Plus controller, 10.4" LCD, AICC II	○	●	●	●	●	●	●	●
2	Fanuc 0i-MF(1) Plus controller, 10.4" LCD, AICC II	○	●	●	●	●	●	●	●
3	Fanuc manual guide 0i function	○	○	○	○	○	○	○	○
4	Fanuc manual guide I function	○	○	○	○	○	○	○	○
5	Mitsubishi E80	○	○	○	○	○	○	○	○
6	Mitsubishi M80	○	○	○	○	○	○	○	○
7	Siemens controller	○	○	○	○	○	○	○	○
8	Heidenhain controller	○	○	○	○	○	○	○	○
9	Spindle speed 8,000 rpm belt driven	●	●	○	○	○	○	○	○
10	Spindle speed 10,000 rpm belt driven	○	○	○	○	○	○	○	○
11	Spindle speed 12,000 rpm direct driven	○	○	○	○	○	○	○	○
12	Spindle speed 15,000 rpm direct driven	○	○	○	○	○	○	○	○
13	Spindle taper BT40	●	●	●	●	●	●	●	●
14	Spindle taper BT50	○	○	○	○	○	○	○	○
15	Spindle taper BBT40 / DIN40 / HSK63A	○	○	○	○	○	○	○	○
16	Spindle taper BBT50 / DIN50 / HSK100A	○	○	○	○	○	○	○	○
17	Spindle motor 7.5/11 kw	○	○	○	○	○	○	○	○
18	Spindle motor 11/15 kw	○	○	○	○	○	○	○	○
19	Spindle motor 15/18.5 kw	○	○	○	○	○	○	○	○
20	2 step speed gear box	○	○	○	○	○	○	○	○
21	Spindle oil chiller	○	○	○	○	○	○	○	○
22	Tool magazine capacity - 24 tools	○	○	○	○	○	○	○	○
23	Tool magazine capacity - 30 tools	○	○	○	○	○	○	○	○
24	Ball type linear guide way	○	○	○	○	○	○	○	○
25	Roller type linear guide way	○	○	○	○	○	○	○	○
26	Box way	○	○	○	○	○	○	○	○
27	Coolant and chip flush system	○	○	○	○	○	○	○	○
28	Spindle taper cleaner	○	○	○	○	○	○	○	○
29	MPG	○	○	○	○	○	○	○	○
30	Heat exchanger for electrical cabinet	○	○	○	○	○	○	○	○
31	Air conditioner	○	○	○	○	○	○	○	○
32	Automatic lubrication system	○	○	○	○	○	○	○	○
33	Fully enclosed splash guard	○	○	○	○	○	○	○	○
34	Work lamp	○	○	○	○	○	○	○	○
35	End of program light (three colors)	○	○	○	○	○	○	○	○
36	Rigid tapping	○	○	○	○	○	○	○	○
37	M80 auto power off	○	○	○	○	○	○	○	○
38	Level bolts and pads	○	○	○	○	○	○	○	○
39	Screw type chip conveyor and chip cart	○	○	○	○	○	○	○	○
40	Chain type chip conveyor and chip cart	○	○	○	○	○	○	○	○
41	Coolant gun	○	○	○	○	○	○	○	○
42	Coolant through spindle	○	○	○	○	○	○	○	○
43	Oil skimmer	○	○	○	○	○	○	○	○
44	Oil mist collector	○	○	○	○	○	○	○	○
45	Automatic tool length measurement	○	○	○	○	○	○	○	○
46	Automatic workpiece measurement	○	○	○	○	○	○	○	○
47	Linear scale	○	○	○	○	○	○	○	○
48	CNC rotary index table	○	○	○	○	○	○	○	○
49	Auto door	○	○	○	○	○	○	○	○
50	Stabilizer	○	○	○	○	○	○	○	○
51	Transformer	○	○	○	○	○	○	○	○
52	CE approval	○	○	○	○	○	○	○	○

OPTIONAL ACCESSORIES



High Pressure Coolant Spindle with Centrifugal Separator (20~70 bars)



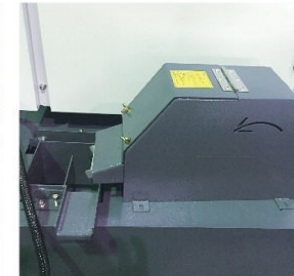
Workpiece Measuring System



Tool Measuring System



Linear Scale



Oil Skimmer



Oil Mist Collector



Robot Automation



GTP or ZF gear box



CNC Rotary Table