

PHENIX

BOX WAYS (w/ Gear Head)

VERTICAL MACHINING CENTER

*THE MOST HIGH VALUE & PERFORMANCE FOR
MOLD MAKING AS WELL AS VERSATILE MACHING,
TOOL ROOM AND DEVELOPMENT.*



CNC Vertical Machining Center

- 8000 r.p.m. spindle speed, BT40 or CAT40 taper.
(optional 10000/12000/15000/24000 r.p.m. available)
- MEEHANITE castings, annealed and stress reliever.
- Hardened & Ground C3 Double-Nut ballscrews are pre-tensioned to minimize backlash, provide high precision movement, and reduce heat deformation on all axes.
- All solid ways are coated with high grade Turcite-B.
Hardened & Ground slide ways give extra 40% wear resistance.
- Telescopic way covers on all axes.



FMC-510 (510x410x460mm)

CNC Vertical Machining Center

- Hardened & Ground C3 Double-Nut ballscrews(\varnothing 40mm) are per-tensioned to minimize backlash, provide high precision movement, and reduce heat deformation on all axes.
- BT40/CAT40/DIN40 8000RPM spindle(\varnothing 150mm). 100% balanced with low vibration performs high precision machining.
- Optional spindle speed : 10000/12000/15000 RPM



FMC-850 (850x510x560mm)

- w/chip conveyer (opt.)

CNC Vertical Machining Center

- Hardened & Ground C3 Double-Nut ballscrews(\varnothing 40mm) are per-tensioned to minimize backlash, provide high precision movement, and reduce heat deformation on all axes.
- BT40/CAT40/DIN40 8000RPM spindle(\varnothing 150mm). 100% balanced with low vibration performs high precision machining.
- All solid ways are coated with high grade Turcite-B. Hardened & Ground slide ways give extra 40% wear resistance.
- 4 solid ways on base provides precise rigidity under heavy cutting conditions. (FMC-1100 ~ 2000G)

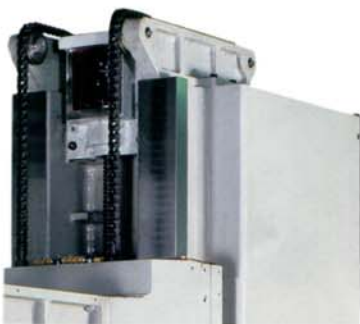


FMC-1300

Machine frame construction

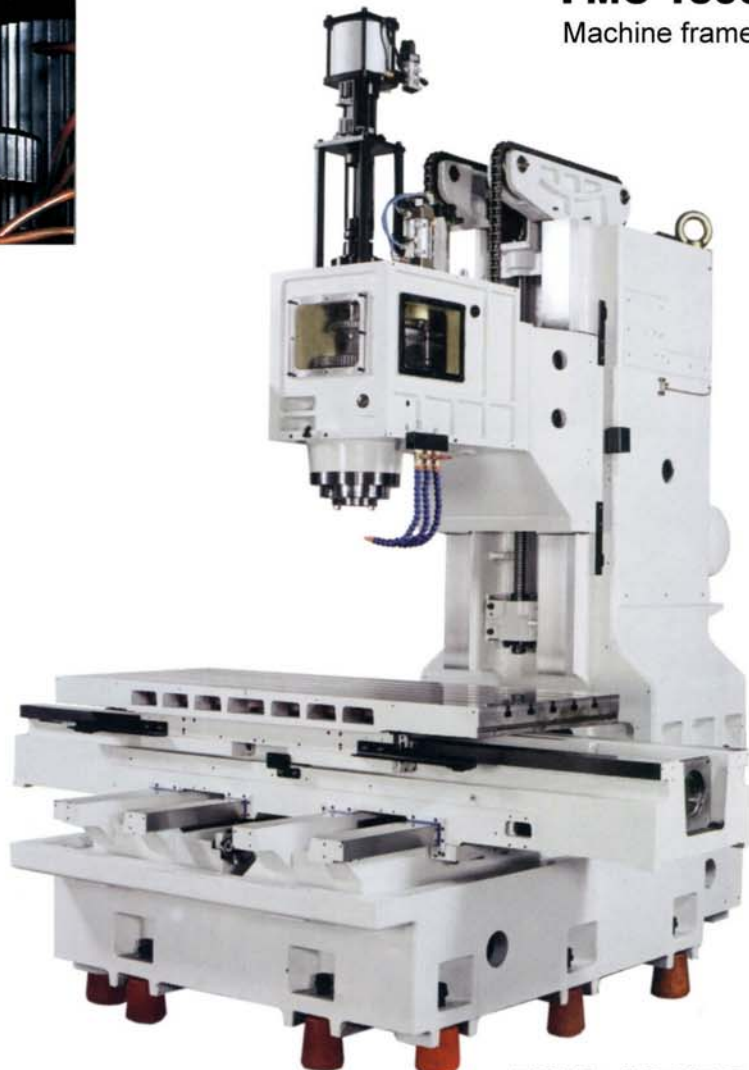


Japan Hamada gears "0" grade



COUNTER BALANCE

The maintenance-free counter balance block glides through a guiding bar. The smooth reciprocating motion increases workpiece surface finish especially during high speed cutting.



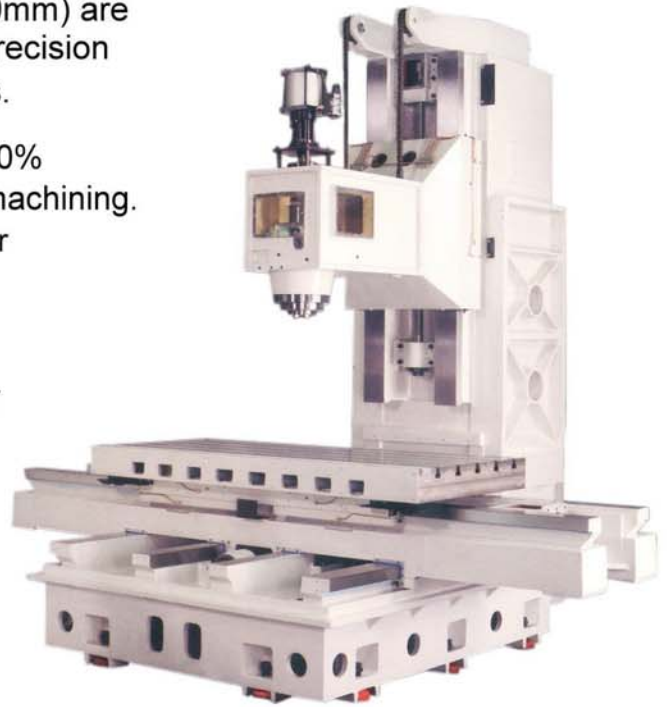
FMC-1305G

Machine frame construction

- w/ BT50 Gear Head

CNC Vertical Machining Center

- Hardened & Ground C3 Double-Nut ballscrews(\varnothing 50mm) are per-tensioned to minimize backlash, provide high precision movement, and reduce heat deformation on all axes.
- BT40/CAT40/DIN40 8000RPM spindle(\varnothing 150mm). 100% balanced with low vibration performs high precision machining. (BT50/CAT50/DIN50 6000RPM gear drive spindle for #50 Gear Head models)
- All solid ways are coated with high grade Turcite-B. Hardened & Ground slide ways give extra 40% wear resistance.
- 4 solid slide ways on base provides precise rigidity under heavy cutting conditions. (FMC-1100 ~ 2000G)



FMC-1600G

Machine frame construction

- w/ BT50 Gear Head



FMC-1600 (1600x800x800)

CNC Vertical Machining Center



The lubrication oil pipe is made of copper instead of plastic or aluminum, featuring long term chemical stability that prevents the oil pipes being clogged resulting in severe damage caused by slideways' lubrication failure.



Refrigerated oil is circulated around the spindle to remove heat from the cartridge. It keeps the spindle unit in a stable and constant temperature range. Eventually the cutting accuracy and tool life time is improved.

- 6 Solid slide ways on base and Total Supported saddle ensured excellent heavy cutting and accuracy.



FMC-2200G

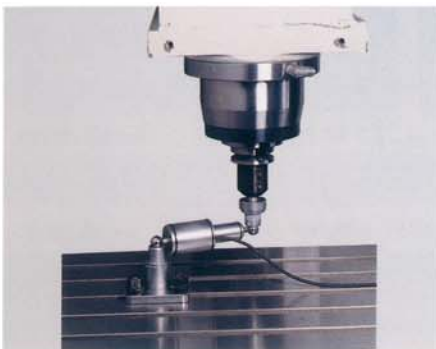
Machine frame construction

- w/ BT50 Gear Head

Precision, Accuracy, Rigidity

PRECISION HAND SCRAPING

Every contact sliding surface is applied with Turcite-B that maximizes the durability of slideways and features optimum damping coefficient. The mating surface is precision hand scraped to increase the flatness and improve geometric accuracy of the whole assembly.



BALLBAR TEST

Every machine is inspected by a Ballbar test to ensure machining accuracy.



LASER INSPECTION SYSTEM

All 3 axes are checked by a Laser test to ensure positioning and repeating accuracy.



SPINDLE NOISE & VIBRATION CHECK

SPECIFICATIONS

MODEL	FMC-510	FMC-610	FMC-850 / FMC-850G	FMC-1000 / FMC-1000G
TABLE				
Working surface	600 x 370mm (23-5/8"x14-9/16")	800 x 450mm (31-1/2"x17-11/16")	1000 x 500mm (39-3/8"x19-11/16")	1200 x 500mm (47-3/16"x19-11/16")
T-slots (size x number x pitch)	14mmx3x100mm (0.551" x 3 x 3.937")	18mmx3x100mm (0.708" x 3 x 3.937")	18mmx5x100mm (0.708" x 5 x 3.937")	
Max. table load	300 kgs (661 lbs)	400 kgs (882 lbs)	750 kgs (1653 lbs)	
TRAVEL				
Longitudinal travel (X axis)	510mm (20")	610mm (24")	850mm (33-7/16")	1020mm (40-1/8")
Cross travel (Y axis)	410mm(16-1/8")	460mm(18-1/8")	510mm(20")	
Vertical travel (Z axis)	460mm(18-1/8")	510mm(20")	560mm(22")	
Guide ways (X / Y / Z axes)	2 / 2 / 2 ways	2 / 2 / 2 ways	2 / 2 / 2 ways	
Distance from spindle end to table	130~590mm (5-1/8"~23-3/16")	130~640mm (5-1/8"~25-3/16")	140~700mm (5-1/2"~27-9/16")	
Distance from spindle center to column	470mm (18-1/2")	535mm (21")	575mm (22-5/8")	
SPINDLE				
Spindle nose taper	BT40 (or CAT40 / DIN40, opt.)			
Spindle speeds	8000 r.p.m. (or 10000 ~ 24000 r.p.m.,opt.)		8000 r.p.m. (or 10000 ~ 15000 r.p.m.,opt.) (for FMC-850 / 1000)	
Transmission	belt	belt	belt / H / L gear	belt / H / L gear
FEED				
Cutting feed rate (X, Y, Z axes)	1~10000 mm/min. (max.)			
Rapid traverse (X, Y axes)	24 m/min. (max.)			
Rapid traverse (Z axis)	16 m/min. (max.)			
ATC				
Tool storage capacity	12 pcs (carrousel) (or 20pcs (carrousel / arm), opt.)	16 pcs(carrousel) (or 20pcs(carrousel) / 24 pcs(arm),opt.)		
Max. tool weight	6 kgs (13.23 lbs)			
Max. tool size (dia. x length)	100mm x 300mm (3-15/16" x 11-13/16")			
Tool selection	Random			
Tool shank	BT-40			
Pull stud bolt	MAS-P40T-1			
MOTOR				
Spindle motor (AC servo)	3.7 / 5.5KW	5.5 / 7.5KW	5.5 / 7.5KW(for FMC-850 / 1000) / 7.5 / 11KW(for FMC-850G / 1000G)	
X, Y, Z axes motor (AC servo)	1.5KW	2 KW		
Coolant pump motor	3/4HP			
DIMENSION				
Machine size	2000x2305x2460mm (78 ³ / ₄ "x90 ³ / ₄ "x96 ⁷ / ₈ ")	2160x2435x2550mm (85"x95-7/8"x100 ³ / ₈ ")	2900x2420x2850mm (114 ³ / ₁₆ "x95 ¹ / ₄ "x112 ³ / ₁₆ "	2900x2420x2850mm (114 ³ / ₁₆ "x95 ¹ / ₄ "x112 ³ / ₁₆ "
Machine weight	2800 kgs (6173 lbs)	3800 kgs (8377 lbs)	5000kgs(11023 lbs) / 5300kgs(11684 lbs)	5200kgs(11463 lbs) / 5500kgs(12125 lbs)

- The manufacturer reserves the right to modify the design, specifications, mechanisms...etc. to improve the performance of the machine without prior notice. All the specifications shown above are just for reference.

OPTIONAL ACCESSORIES / EQUIPMENTS

- Spindle cooling device
- 10000~24000 r.p.m. spindle speed w/ spindle cooling device
- Bigger horse power spindle motor
- Carrousel type 20 tools ATC
- Arm type 24 tools ATC
- Chain type 32 tools ATC
- Auger style chip conveyer
- Steel belt chip conveyer
- High pressure water scour for chip removal
- Coolant through spindle
- Air conditioner for electrical cabinet
- CNC Rotary table (the 4th axis control)
- CNC Tilting rotary table (the 4th / 5th axis control)

*The machines could be supplied without controller and servo motor/drives as OEM FRAME.

SPECIFICATIONS

MODEL	FMC-1100 / FMC-1104G	FMC-1105G	FMC-1300 / FMC-1304G	FMC-1305G
TABLE				
Working surface	1300 x 650mm (51-3/16" x 25-9/16 ")		1500 x 650mm (59" x 25-9/16 ")	
T-slots (size x number x pitch)	18mm x 5 x 100mm (0.708" x 5 x 3.937")			
Max. table load	1000kgs (2205 lbs)			
TRAVEL				
Longitudinal travel (X axis)	1100mm (43-3/8")		1300mm (51-3/16")	
Cross travel (Y axis)	700mm (27-9/16")			
Vertical travel (Z axis)	610mm (24")		710mm (27-15/16")	
Guide ways (X / Y / Z axes)	2 / 4 / 2 ways		2 / 4 / 2 ways	
Distance from spindle end to table	130 ~ 740mm (5-1/8"~29-1/8")		130 ~ 840mm (5-1/8"~33")	
Distance from spindle center to column	730mm (28-3/4")			
SPINDLE				
Spindle nose taper	BT40 (or CAT40 / DIN40, opt.)	BT50 (or CAT50 / DIN50, opt.)	BT40 (or CAT40 / DIN40, opt.)	BT50 (or CAT50 / DIN50, opt.)
Spindle speeds	8000 r.p.m. (or 10000 ~ 15000 r.p.m., opt.) (for FMC-1100)	6000 r.p.m.	8000 r.p.m. (or 10000 ~ 15000 r.p.m., opt.) (for FMC-1300)	6000 r.p.m.
Transmission	belt / H / L gear	H / L gear	belt / H / L gear	H / L gear
FEED				
Cutting feed rate (X, Y, Z axes)	1~10000 mm/min. (max.)			
Rapid traverse (X, Y axes)	24 m/min. (max.)			
Rapid traverse (Z axis)	15 m/min. (max.)			
ATC				
Tool storage capacity	20 pcs (carrousel) (or 24pcs (arm) , opt.)	24pcs (arm)	20 pcs (carrousel) (or 24pcs (arm) , opt.)	24pcs (arm)
Max. tool weight	6 kgs (13.23 lbs)	15 kgs (33.07 lbs)	6 kgs (13.23 lbs)	15 kgs (33.07 lbs)
Max. tool size(dia. x length)	100mm x 300mm (3- 15/16" x 11 13/16")	125mm x 300mm (4- 15/16" x 11 13/16")	100mm x 300mm (3- 15/16" x 11 13/16")	125mm x 300mm (4- 15/16" x 11 13/16")
Tool selection	Random			
Tool shank	BT-40	BT-50	BT-40	BT-50
Pull stud bolt	MAS-P40T-1	MAS-P50T-1	MAS-P40T-1	MAS-P50T-1
MOTOR				
Spindle motor (AC servo)	7.5 / 11 KW	11 / 15 KW	7.5 / 11 KW	11 / 15 KW
X, Y, Z axes motor (AC servo)	3.5 KW			
Coolant pump motor	3/4HP			
DIMENSION				
Machine size	3200x2825x3080 mm (126" x 111 ³ / ₁₆ " x 121 ¹ / ₄ ")		3200x2825x3080 mm (126" x 111 ³ / ₁₆ " x 121 ¹ / ₄ ")	
Machine weight	9000kgs(19841 lbs)/ 9400kgs (20723 lbs)	9500kgs (20943 lbs)	9200kgs(20281 lbs)/ 9600kgs (21163 lbs)	9700kgs (21384 lbs)

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STANDARD ACCESSORIES / EQUIPMENTS

- Tool box w/ tools
- Leveling screws w/ blocks
- Coolant spraying device
- Centralized auto lubrication device
- Automatic tool changer equipment
- Full enclosed guarding w/ safety power off front door
- Work lamp
- Heat exchanger for electrical box
- Telescopic sheet metal way covers on 3 axes
- Hardened and ground on X, Y, Z slides and top surface of table
- Turcite B on X, Y and Z slides
- C3 Double nut precision ball screws
- Net work interface
- Auto power off circuit
- End of program light

***The machines could be supplied without controller and servo motor/drives as OEM FRAME.**

SPECIFICATIONS

MODEL	FMC-1600 / FMC-1600G	FMC-2000 / FMC-2000G	FMC-2200 / FMC-2200G
TABLE			
Working surface	1800 x 840mm (70-7/8" x 33-1/16 ")	2200 x 850mm (86-5/8" x 33-7/16 ")	2400 x 1000mm (94-1/2" x 39-3/8 ")
T-slots (size x number x pitch)	22mm x 5 x 150mm (0.866" x 5 x 5.906")		22mm x 5 x 150mm (0.866" x 5 x 5.906")
Max. table load	2200kgs (4850 lbs)	2500kgs (5511 lbs)	3000kgs (6614 lbs)
TRAVEL			
Longitudinal travel (X axis)	1600mm (63")	2000mm (78-3/4")	2200mm (86-5/8")
Cross travel (Y axis)	800mm (31-1/2")	900mm (35-7/16")	1000mm (39-3/8")
Vertical travel (Z axis)	800mm (31-1/2")	800mm (31-1/2")	800mm (31-1/2")
Guide ways (X / Y / Z axes)	2 / 4 / 2 ways	2 / 4 / 2 ways	2 / 6 / 2 ways
Distance from spindle end to table	200 ~ 1000mm (7-7/8" ~ 39-3/8")	200 ~ 1000mm (7-7/8" ~ 39-3/8")	250 ~ 1050mm (9-13/16" ~ 41-5/16")
Distance from spindle center to column	870mm (34-1/4")	975mm (38-3/8")	1050mm (41-5/16")
SPINDLE			
Spindle nose taper	BT40 (or CAT40/DIN40, opt.) (for FMC-1600 / 2000 / 2200) / BT50 (or CAT50/DIN50, opt.) (for FMC-1600G / 2000G / 2200G)		
Spindle speeds	8000 r.p.m. (for FMC-1600 / 2000 / 2200) / 6000 r.p.m. (for FMC-1600G / 2000G / 2200G)		
Transmission	belt / H / L gear	belt / H / L gear	belt / H / L gear
FEED			
Cutting feed rate (X, Y, Z axes)	1~10000 mm/min. (max.)		
Rapid traverse (X, Y axes)	15 m/min. (max.)		
Rapid traverse (Z axis)	12 m/min. (max.)		
ATC			
Tool storage capacity	24pcs (arm) (or 32pcs (chain), opt.)		
Max. tool weight	6 kgs (13.23 lbs) for BT40 / 15 kgs (33.07 lbs) for BT50		
Max. tool size (dia. x length)	100mmx300mm (3- ¹⁵ / ₁₆ " x 11 ¹³ / ₁₆ ") for BT40 / 125mmx300mm (4- ¹⁵ / ₁₆ " x 11 ¹³ / ₁₆ ") for BT50		
Tool selection	Random		
Tool shank	BT40 (for FMC-1600 / 2000 / 2200) / BT50 (for FMC-1600G / 2000G / 2200G)		
Pull stud bolt	MAS-P40T-1 (for FMC-1600 / 2000 / 2200) / MAS-P50T-1 (for FMC-1600G / 2000G / 2200G)		
MOTOR			
Spindle motor (AC servo)	11/15 KW (for FMC-1600 / 2000 / 2200) / 15/18.5 KW (for FMC-1600G / 2000G / 2200G)		
X, Y, Z axes motor (AC servo)	4.5 / 7.0 / 4.5 KW		7.0 / 9.0 / 4.5 KW
Coolant pump motor	3/4HP		
DIMENSION			
Machine size	4400x3300x3300 mm (173 ¹ / ₄ " x 129 ¹⁵ / ₁₆ " x 129 ¹⁵ / ₁₆ ")	5500x3435x3310 mm (216 ¹ / ₂ " x 135 ¹ / ₄ " x 130 ⁵ / ₁₆ ")	6130x4200x3661 mm (241 ¹⁵ / ₁₆ " x 165 ³ / ₈ " x 144 ¹ / ₈ ")
Machine weight	14500kgs (31965 lbs) / 15000kgs (33068 lbs)	16000kgs (35272 lbs) / 16500kgs (36374 lbs)	24000kgs (52908 lbs) / 24500kgs (54010 lbs)

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