



PHOENIX



# BED TYPE CNC MILLING MACHINE

*The best assistant for MOLD MAKING as well as versatile machining, tool room, development and maintenance.*



# CNC MILLING MACHINES

FM-160/205/255/300/305/340/395/495/600CNC/MH/ATC



FM-160ATC ▲

- ONE-PIECE rigid bed casting, EXTREMELY WIDE slide ways, FULLY LENGTH saddle supported & STRONG type work head ensured EXCELLENT HEAVY cutting.
- EXTENDABLE quill, more flexible for deeper pocket machining. (standard milling head)
- SWIVELABLE milling head, more flexible for angle machining. (standard milling head)



FM-205CNC ▶

■ w/optional 3-Hand wheel operation panel.

# CNC MILLING MACHINES

FM-160/205/255/300/305/340/395/495/600CNC/MH/ATC



- ONE-PIECE rigid bed casting, EXTREMELY WIDE slide ways, FULLY LENGTH saddle supported & STRONG type work head ensured EXCELLENT HEAVY cutting.
- w/150mm LARGER quill dia. (machining center head)
- EXTENDABLE quill and SWIVELABLE milling head, more flexible for deeper pocket as well as angle machining. (standard milling head)
- Special designed LARGE & RIGID chip tray w/rear splash guards.
- Special designed operation panel cabinet w/base extended support arm, electric cabinet.

FM-255CNC ▲



◀ FM-255MH  
■ w/optional 3-Hand wheel operation panel.

# CNC MILLING MACHINES

FM-160/205/255/300/305/340/395/495/600CNC/MH/ATC



## FM-300ATC ▲

■ w/optional tilting rotary table,3-Hand wheel operation panel.

- ONE-PIECE rigid bed casting, EXTREMELY WIDE slide ways, FULLY LENGTH saddle supported & STRONG type work head ensured EXCELLENT HEAVY cutting.
- w/150mm LARGER quill dia. (machining center head)
- Special designed LARGE & RIGID chip tray w/rear splash guards.



- Tilting rotary table (the 4th & 5th axes control)



## ◀ FM-305ATC

■ w/optional fast feed on 3 axes.

# CNC MILLING MACHINES

FM-160/205/255/300/305/340/395/495/600CNC/MH/ATC



- ONE-PIECE rigid bed casting, EXTREMELY WIDE slide ways, FULLY LENGTH saddle supported & STRONG type work head ensured EXCELLENT HEAVY cutting.
- w/150mm LARGER quill dia. (maching center head)
- Special designed LARGE & RIGID chip tray w/rear splash guards.

**FM-340ATC** ▲  
■ w/optional rotary table.



▶ **FM-395ATC**  
■ w/optional arm type ATC. 4

# CNC MILLING MACHINES

FM-160/205/255/300/305/340/395/495/600CNC/MH/ATC



FM-495MH ▲



FM-600MH ▲

# CNC MILLING MACHINES

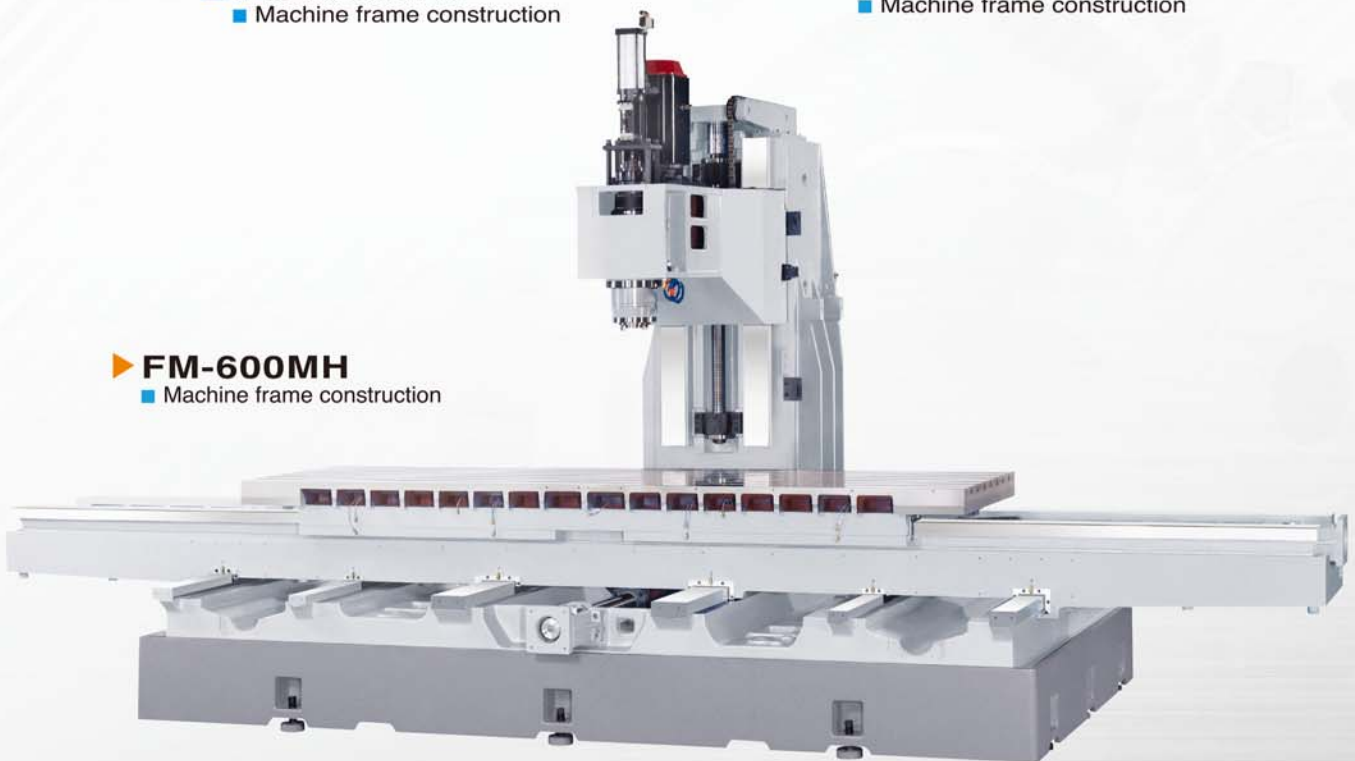
## MACHINE FRAME CONSTRUCTION



▲ **FM-300ATC**  
■ Machine frame construction



▲ **FM-395ATC**  
■ Machine frame construction

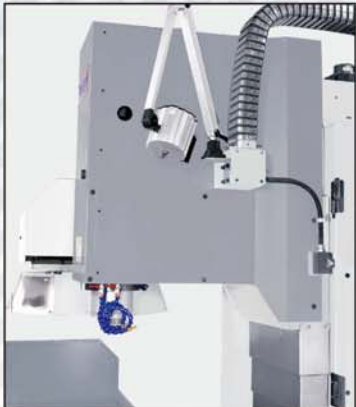


▶ **FM-600MH**  
■ Machine frame construction

- ONE-PIECE HUGE and rigid bed casting w/4-BOX WAYS (340/395/495 series) / 6-BOX WAYS (600 series), EXTREMELY WIDE slide ways, FULLY LENGTH saddle supported & STRONG type work head ensured EXCELLENT HEAVY cutting and accuracy.
- Precision BALL SCREWS w/double nuts on 3 axes.
- Licensed MEEHANITE casting.
- HARDENED & GROUND on X, Y, Z slide ways & top surface of TABLE.
- TURCITE B coated on X, Y, Z slide ways and gibs.

# CNC MILLING MACHINES

## ADVANTAGE / MAJOR FEATURES



- Clear oil level check window for tool clamp/unclamp.



- Special wipers under table guides.
- Sealing gaskets for 3 axes end cover/way cover.



- Strong and rigid support arm construction, special designed clamp fingers and combination type tool magazine construction; ensure the operation accuracy and also reduce the unexpected damage of magazine disk, due to the wrong sequence in action steps of ATC.



- European/ Japanese components, CE norms wiring and arrangement for the electricity control.



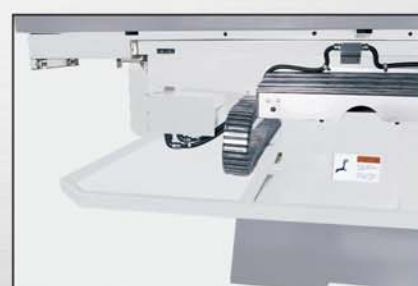
- Standard equipped Floor type power transformer w/cabinet.



- Pressure setting switch included Three-point assembly for safety ATC and Tool clamp/unclamp.
- CNC controlled also Manual adjusting Auto lubrication system.



- All machines are inspected and calibrated by laser test (X, Y, Z axes) and ball bar calibration (not only XY plane, but also on YZ and XZ planes) ; and are executed for at least 72 hours continuous running test before shipment.



- Protect cover/guarding for X and Y servo motors.
- Support brackets for flexible metal conduit.



# CNC MILLING MACHINES

## OPTIONAL ACCESSORIES / EQUIPMENTS



• Rotary table(the 4th axis control)



• 3-Hand wheel operation panel



### ▲ FM-305ATC

■ w/optional full enclosure guard.

- ▲ Full enclosure guard w/auger style chip conveyor, conforming with CE norms.
- Rigid construction features w/simple installation.
- One piece laser cut, protect railed 3-front+2-side windows design; features w/safety, wide field of vision and easy clean up.



• Cool light lamp provides superior lighting.



• Auger style chip conveyor makes chip disposal and collection easy; convenient.



• SYNTEC controller



• FAGOR controller



• FANUC controller

## SPECIFICATIONS

MODEL	FM-160MH	FM-160ATC	FM-205CNC	FM-205MH	FM-205ATC
<b>TABLE</b>					
Working surface	355 x 1270mm (14" x 50")		406 x 1372mm (16" x 54")		
T-slots (size x number x pitch)	16mmx3x64mm (0.630" x 3 x 2.520")		16mm x 3 x 64mm (0.630" x 3 x 2.520")		
Max. table load	500kgs (1100 lbs)		800kgs (1760 lbs)		
<b>TRAVEL</b>					
Longitudinal travel(X axis)	800mm (31-1/2")		1000mm (39-3/8")		
Cross travel(Y axis)	400mm (15-3/4")		500mm (19-11/16")		
Vertical travel(Z axis)	450mm (17-11/16")		600mm (23-5/8")		
Distance from spindle end to table	105 ~ 555mm (4-1/8" ~ 21-13/16")		155 ~ 775mm (6-1/8" ~ 30-1/2")	105 ~ 725mm (4-1/8" ~ 28-9/16")	
Distance from spindle center to column	430mm (16-7/8")		500mm (19-11/16")		
Distance from floor to table surface	780mm (30-11/16")		840mm (33-1/16")		
<b>SPINDLE</b>					
Spindle nose taper	BT40		NT40	BT40	
Spindle speeds	vari 8000 r.p.m. (or 10000 r.p.m., opt.)		vari 4200 r.p.m., 2 ranges	vari 6000 r.p.m. (or 8000/10000 r.p.m., opt.)	
<b>FEED</b>					
Cutting feed rate (X, Y, Z axes)	1~3000 mm/min.(max.) [or 1~5000 mm/min (max.) (F-F), opt.]				
Rapid traverse (X, Y axes)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]				
Rapid traverse (Z axis)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]				
Gear ratio of motor pulley to ballscrew pulley on X, Y, Z axes	1:2/1:1.33 [or direct coupled (F-F), opt.]				
<b>ATC</b>					
Tool storage capacity	—	16pcs (carrousel)	—	—	16pcs (carrousel)
Max. tool weight	—	7 kgs (15.4 lbs)	—	—	7 kgs (15.4 lbs)
Max. tool size(dia. x length)	—	89x250mm(3-1/2"x 9-7/8")	—	—	89x250mm(3-1/2"x 9-7/8")
Tool selection	—	Random	—	—	Random
Tool shank	—	BT40	—	—	BT40
Pull stud bolt	—	MAS-P40T-1	—	—	MAS-P40T-1
Distance from gauge line of tool holder to table	—	450mm (17-5/8")	—	—	555mm (21-3/4")
<b>MOTOR</b>					
Spindle motor (AC servo)	5.5/7.5KW (or 7.5/11 KW, opt.)		7.5/11KW (or 11/15 KW, opt.)		
X, Y, Z axes motor	AC servo, 1KW, 2000 r.p.m. [or 1.5KW, 2000 r.p.m.(F-F), opt.]				
Coolant pump motor	AC 1/6HP / 1/4HP (F.E.G.)				
<b>GENERAL</b>					
Gross weight (Approx.)	2800kgs (6160 lbs)	3000kgs (6600 lbs)	3200kgs (7040 lbs)		3400kgs (7480 lbs)
Packing size (L x W x H)	2080x1800x2450mm (81-7/8"x70-7/8"x96-3/8")		2670x2020x2530mm (105-1/8"x79-1/2"x99-5/8")		

MODEL	FM-255CNC	FM-255MH	FM-255ATC	FM-300CNC	FM-300MH	FM-300ATC
<b>TABLE</b>						
Working surface	420 x 1600mm (16-9/16" x 63")			450 x 1800mm (17-11/16" x 70-7/8")		
T-slots (size x number x pitch)	16mm x 5 x 60mm (0.630" x 5 x 2.362")					
Max. table load	1000kgs (2200 lbs)					
<b>TRAVEL</b>						
Longitudinal travel(X axis)	1300mm (51-3/16")			1500mm (59")		
Cross travel(Y axis)	635mm (25") [or 610mm(24") direct coupled (F-F), opt.]			650mm (25-9/16") [or 610mm(24") direct coupled (F-F), opt.]		
Vertical travel(Z axis)	620mm (24-3/8")					
Distance from spindle end to table	155~775mm (6-1/8"~ 30-1/2")	105 ~ 725mm (4-1/8" ~ 28-9/16")		155~775mm (6-1/8"~ 30-1/2")	105 ~ 725mm (4-1/8" ~ 28-9/16")	
Distance from spindle center to column	630mm (24-13/16")					
Distance from floor to table surface	895mm (35-1/4")					
<b>SPINDLE</b>						
Spindle nose taper	NT40		BT40		BT40	
Spindle speeds	vari 4200 r.p.m., 2 ranges	vari 6000 r.p.m. (or 8000/10000 r.p.m., opt.)		vari 4200 r.p.m., 2 ranges	vari 6000 r.p.m. (or 8000/10000 r.p.m., opt.)	
<b>FEED</b>						
Cutting feed rate (X, Y, Z axes)	1~3000 mm/min.(max.) [or 1~5000 mm/min (max.) (F-F), opt.]					
Rapid traverse (X, Y axes)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]					
Rapid traverse (Z axis)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]					
Gear ratio of motor pulley to ballscrew pulley on X, Y, Z axes	1:2/1:1.33 [or direct coupled (F-F), opt.]					
<b>ATC</b>						
Tool storage capacity	—	—	16pcs(carrousel)	—	—	16pcs(carrousel)
Max. tool weight	—	—	7 kgs (15.4 lbs)	—	—	7 kgs (15.4 lbs)
Max. tool size(dia. x length)	—	—	89x250mm(3-1/2"x 9-7/8")	—	—	89x250mm(3-1/2"x 9-7/8")
Tool selection	—	—	Random	—	—	Random
Tool shank	—	—	BT40	—	—	BT40
Pull stud bolt	—	—	MAS-P40T-1	—	—	MAS-P40T-1
Distance from gauge line of tool holder to table	—	—	555mm (21-3/4")	—	—	555mm (21-3/4")
<b>MOTOR</b>						
Spindle motor (AC servo)	7.5/11KW (or 11/15 KW, opt.)					
X, Y, Z axes motor	AC servo, 1KW, 2000 r.p.m. [or 2KW, 2000 r.p.m.(F-F), opt.]					
Coolant pump motor	AC 1/6HP / 1/4HP (F.E.G.)					
<b>GENERAL</b>						
Gross weight (Approx.)	3900kgs (8580 lbs)			4100kgs (9020 lbs)		4300kgs (9460 lbs)
Packing size (L x W x H)	2700x2020x2530 mm (106-5/16"x79-1/2"x99-5/8")					

## SPECIFICATIONS

MODEL	FM-305MH	FM-305ATC	FM-305MH-L	FM-305ATC-L	FM-340MH	FM-340ATC	FM-395MH	FM-395ATC
<b>TABLE</b>								
Working surface	610x1854mm (24" x 73")		800 x 1854mm (31-1/2" x 73")		762 x 1830mm (30" x 72")		813 x 2185mm (32" x 86")	
T-slots (size x number x pitch)	18mmx5x70mm (0.709" x 5 x 2.756")		18mmx5x70mm (0.709" x 5 x 2.756")		18mm x 5 x 100mm (0.709" x 5 x 3.9")			
Max. table load	1500kgs (3300 lbs)		1500kgs (3300 lbs)		1800kgs (3960 lbs)			
<b>TRAVEL</b>								
Longitudinal travel(X axis)	1500mm (59")		1500mm (59")		1700mm (66-7/8")		2000mm (78-3/4")	
Cross travel(Y axis)	850mm (33-7/16")		1020mm (40-1/8")		850mm (33-7/16")			
Vertical travel(Z axis)	710mm (28")		710mm (28")		710mm (28")			
Distance from spindle end to table	95 ~ 805mm (3-3/4" ~ 31-11/16")		95 ~ 805mm (3-3/4" ~ 31-11/16")		95 ~ 805mm (3-3/4" ~ 31-11/16")			
Distance from spindle center to column	869mm (34-3/16")		1050mm (41-5/16")		870mm (34-1/4")			
Distance from floor to table surface	895mm (35-1/4")		785mm (30-7/8")		885mm (34-13/16")			
<b>SPINDLE</b>								
Spindle nose taper	BT40 (or BT50, opt.)		BT40 (or BT50, opt.)		BT40 (or BT50, opt.)			
Spindle speeds	vari 6000 r.p.m.(BT40) (or 8000/10000 r.p.m., opt.) (BT40)		vari 6000 r.p.m.(BT40) (or 8000/10000 r.p.m., opt.) (BT40)		vari 6000 r.p.m. (BT40) (or 8000/10000 r.p.m., opt.) (BT40)			
<b>FEED</b>								
Cutting feed rate (X, Y, Z axes)	1 ~ 3000 mm/min. (max.) [or 1 ~ 5000 mm/min. (max.)(F-F), opt.]		1 ~ 5000 mm/min. (max.)		1 ~ 5000 mm/min. (max.)			
Rapid traverse (X, Y axes)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]		10.0 m/min (max.)		10.0 m/min (max.)			
Rapid traverse (Z axis)	5.0 m/min. (max.) [or 10.0 m/min. (max.)(F-F), opt.]		10.0 m/min (max.)		10.0 m/min (max.)			
Gear ratio of motor pulley to ballscrew pulley on X, Y, Z axes	1:2/1:1.33 [or direct coupled (F-F), opt.]		Direct coupled		Direct coupled			
<b>ATC</b>								
Tool storage capacity	—	16pcs (or 20pcs, opt.)(BT40) (carrousel)	—	16pcs (or 20pcs, opt.)(BT40) (carrousel)	—	16pcs (or 20pcs, opt.)(BT40) (carrousel)	—	16pcs (or 20pcs, opt.)(BT40) (carrousel)
Max. tool weight	—	7 kgs (15.4 lbs) / 15 kgs (33.1 lbs) (BT50)	—	7 kgs (15.4 lbs) / 15 kgs (33.1 lbs) (BT50)	—	7 kgs (15.4 lbs) / 15 kgs (33.1 lbs) (BT50)	—	7 kgs (15.4 lbs) / 15 kgs (33.1 lbs) (BT50)
Max. tool size(dia. x length)	—	89x250mm(3-1/2"x 9-7/8")/ 125x300mm(4-7/8"x 11-3/4") (BT50)	—	89x250mm(3-1/2"x 9-7/8")/ 125x300mm(4-7/8"x 11-3/4") (BT50)	—	89x250mm(3-1/2"x 9-7/8")/ 125x300mm(4-7/8"x 11-3/4") (BT50)	—	89x250mm(3-1/2"x 9-7/8")/ 125x300mm(4-7/8"x 11-3/4") (BT50)
Tool selection	—	Random	—	Random	—	Random	—	Random
Tool shank	—	BT40 (or BT50, opt.)	—	BT40 (or BT50, opt.)	—	BT40 (or BT50, opt.)	—	BT40 (or BT50, opt.)
Pull stud bolt	—	MAS-P40T-1 / MAS-P50T-1 (BT50)	—	MAS-P40T-1 / MAS-P50T-1 (BT50)	—	MAS-P40T-1 / MAS-P50T-1 (BT50)	—	MAS-P40T-1 / MAS-P50T-1 (BT50)
Distance from gauge line of tool holder to table	—	645mm (25-3/8")	—	645mm (25-3/8")	—	645mm (25-3/8")	—	645mm (25-3/8")
<b>MOTOR</b>								
Spindle motor (AC servo)	11/15KW (or 15/18.5 KW, opt.)		11/15KW (or 15/18.5 KW, opt.)		11/15KW (or 15/18.5 KW, opt.)			
X, Y, Z axes motor	AC servo, 1KW, 2000 r.p.m. [or 2KW, 2000 r.p.m.(F-F), opt.]		AC servo, 3.5KW, 2000 r.p.m.		AC servo, 3.5KW, 2000 r.p.m.			
Coolant pump motor	AC 1/6HP / 1/4HP(F.E.G.)		AC 1/4HP		AC 1/4HP			
<b>GENERAL</b>								
Gross weight (Approx.)	6000kgs (13200 lbs)	6200kgs (13640 lbs)	6300kgs (13860 lbs)	6500kgs (14300 lbs)	6700kgs (14740 lbs)	6900kgs (15180 lbs)	7000kgs (15470 lbs)	7200kgs (15912 lbs)
Packing size (L x W x H)	3200x2260x2550 mm (126"x89"x100-3/8")		3600x2260x2550 mm (142"x89"x100-3/8")		3000x2300x2545 mm (118-1/8"x90-9/16"x100-3/16") + 3030x2300x1060 mm (119-5/16"x90-9/16"x41-3/4")			

- 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

- Air power draw bar (for NT40 spindle nose, CNC models)
- Protection guard for work table
- Spindle cooling device (for 6000/8000 r.p.m., MH/ATC)
- 8000/10000 r.p.m. M/C head w/spindle cooling device (for MH/ATC)
- Fast feed on 3 axes (10 m/min. rapid, 5 m/min. cutting ; F-F)
- Bigger horse power spindle motor
- Bigger horse power 3 axes servo motor
- Coolant thru spindle (CTS)
- Arm type ATC (auto tool changer)
- Full enclosure guard w/ auger style chip conveyer
- High pressure water scour for chip removal
- 3-Hand wheel operation panel  
(not available for machine w/full enclosure guard)
- Rotary table (the 4th axis control)
- Tilting rotary table (the 4th & 5th axes control)
- ZF gear box
- Gear head (for 600MH/ATC)

\* FM-205/255/300 CNC: **CNC** means the machine w/standard milling head.

\* FM-205/255/300/305/340/395/495/600MH/305MH-L: **MH** means the machine w/machining center head.

\* FM-205/255/300/305/340/395/495/600ATC/305ATC-L: **ATC** means the machine w/Auto Tool Changer as well as machining center head.

## SPECIFICATIONS

MODEL	FM-495MH	FM-495ATC	FM-600MH	FM-600ATC
<b>TABLE</b>				
Working surface	813 x 2750mm (32" x 108-1/4")		813 x 3200mm (32" x 126")	
T-slots (size x number x pitch)	18mm x 5 x 125mm (0.709" x 5 x 4.921")		18mm x 7 x 100mm (0.709" x 7 x 3.937")	
Max. table load	2000kgs (4400 lbs)		2200kgs (4840 lbs)	
<b>TRAVEL</b>				
Longitudinal travel(X axis)	2500mm (98-1/2")		3000mm (118-1/8")	
Cross travel(Y axis)	850mm (33-1/2")		900mm (35-7/16")	
Vertical travel(Z axis)	710mm (28")		750mm (29-1/2")	
Distance from spindle end to table	100 ~ 810mm (3-7/8" ~ 31-7/8")		100 ~ 850mm (3-7/8" ~ 33-7/16")	
Distance from spindle center to column	870mm (34-1/4")		930mm (36-5/8")	
Distance from floor to table surface	880mm (34-5/8")		955mm (37-9/16")	
<b>SPINDLE</b>				
Spindle nose taper	BT40 (or BT50, opt.)		BT50	
Spindle speeds	vari 6000 r.p.m. (BT40) ( or 8000/10000 r.p.m., opt.) (BT40)		vari 4500 r.p.m. ( or 6000 r.p.m., opt.)	
<b>FEED</b>				
Cutting feed rate (X, Y, Z axes)	1 ~ 5000 mm/min. (max.)		1 ~ 5000 mm/min. (max.)	
Rapid traverse (X, Y axes)	10.0 m/min (max.)		10.0 m/min (max.)	
Rapid traverse (Z axis)	10.0 m/min (max.)		10.0 m/min (max.)	
Gear ratio of motor pulley to ballscrew pulley on X, Y, Z axes	Direct coupled			
<b>ATC</b>				
Tool storage capacity	—	20pcs (BT40) (carrousel) (or 24pcs, arm type, opt.)	—	20pcs (BT50) (carrousel) (or 24pcs, arm type, opt.)
Max. tool weight	—	7 kgs (15.4 lbs) / 15 kgs (33.1 lbs) (BT50)	—	15 kgs (33.1 lbs)
Max. tool size(dia. x length)	—	89x250mm(3-1/2"x 9-7/8") / 125x300mm(4-7/8"x 11-3/4") (BT50)	—	125x300mm (4-7/8"x 11-3/4")
Tool selection	—	Random	—	Random
Tool shank	—	BT40 (or BT50, opt.)	—	BT50
Pull stud bolt	—	MAS-P40T-1 / MAS-P50T-1 (BT50)	—	MAS-P50T-1
Distance from gauge line of tool holder to table	—	645mm (25-3/8")	—	704mm (27-11/16")
<b>MOTOR</b>				
Spindle motor (AC servo)	15/18.5KW (or 18.5/22 KW, opt.)		18.5/22KW (or 22/26 KW, opt.)	
X, Y, Z axes motor	5KW, MHMA, 2000 r.p.m.		5KW, MHMA, 2000 r.p.m. + i3 Speed Reducer	
Coolant pump motor	AC 1/4HP		AC 1/2HP	
<b>GENERAL</b>				
Gross weight (Approx.)	10200kgs (22542 lbs)	10400kgs (22984 lbs)	21000kgs (46200 lbs)	21500kgs (47300 lbs)
Packing size (L x W x H)	3230x2300x2545mm(127-3/16"x90-9/16"x100-3/16") + 3030x2300x10600mm(119-5/16"x90-9/16"x41-11/16")		6000x2300x2550mm(236-3/16"x90-9/16"x100-3/8") + 6250x2300x1060mm(246"x90-9/16"x 41-11/16")	

- 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.

## STANDARD ACCESSORIES / EQUIPMENTS

- Draw bar (for CNC)
- Air tool clamp / unclamp device (for MH/ATC)
- Tools
- Tool box
- Chip tray
- Rear splash guard
- Telescopic sheet metal way covers on 3 axes
- Leveling screws w/blocks
- Precision ball screws w/double nuts on 3 axes
- Hardened and ground on X, Y, Z slide ways and top surface of table
- Turcite B coated on X, Y, Z slide ways and gibs
- Centralized auto lubrication device
- Coolant spraying device
- Halogen work lamp
- Power transformer w/cabinet (except OEM)

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



**TOP PHOENIX  
INTERNATIONAL CORP.**  
Machinery Exporter & Importer

No. 48-3, Wayao Rd., Dali Dist.,  
Taichung City 412, Taiwan  
E-Mail: sales@topphoenix.com.tw; topphoenix24@gmail.com;  
top.phoenix@msa.hinet.net  
http://www.topphoenix.com.tw  
Tel: 886-4-2406-5028 (Rep.) Fax:886-4-2406-5019