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MANFORD

POWER & DETERMINATION

CNC HORIZONTAL MACHINING CENTER

CNC Horizontal Machining Center

(APC series)

HM-400

- X / Y / Z Travel: 630 / 630 / 630 mm
- Table: 400 x 400 mm
- Spindle: BT40 / 10,000 rpm / Direct drive
- ATC: 40 Tools

HM-500

- X / Y / Z Travel: 800 / 725 / 725 mm
- Table: 500 x 500 mm
- Spindle: BT40 / 10,000 rpm / Direct drive
- Spindle: BT50 / 6,000 rpm / Direct drive
- ATC: 40 Tools

HM-630

- X / Y / Z Travel: 1,000 / 850 / 950 mm
- Table: 630 x 630 mm
- Spindle: BT50 / 6,000 rpm / Direct drive
- ATC: 40 Tools

Features

- The Major structural parts are trapezoidal and box type integrated construction to strengthen column support and fully overcome the cutting vibration issue.
- Three axes are mounted with heavy duty roller type linear guideways, featuring heavy load resistance and rapid traverse.
- The structural parts are symmetrical construction combined with "V" shape rib reinforcement that ensure deformation-free even after a long time operation.
- The structural parts are manufactured from high quality cast iron, tempered for stress relief.
- The advanced finite element analysis software is applied for simulating structural stress. This assures the best possible machine rigidity, stability and dampening capacity.



HM-630

Built With Passion For Hi-Tech Engineering

Engineered for Heavy Duty & Precision Performance

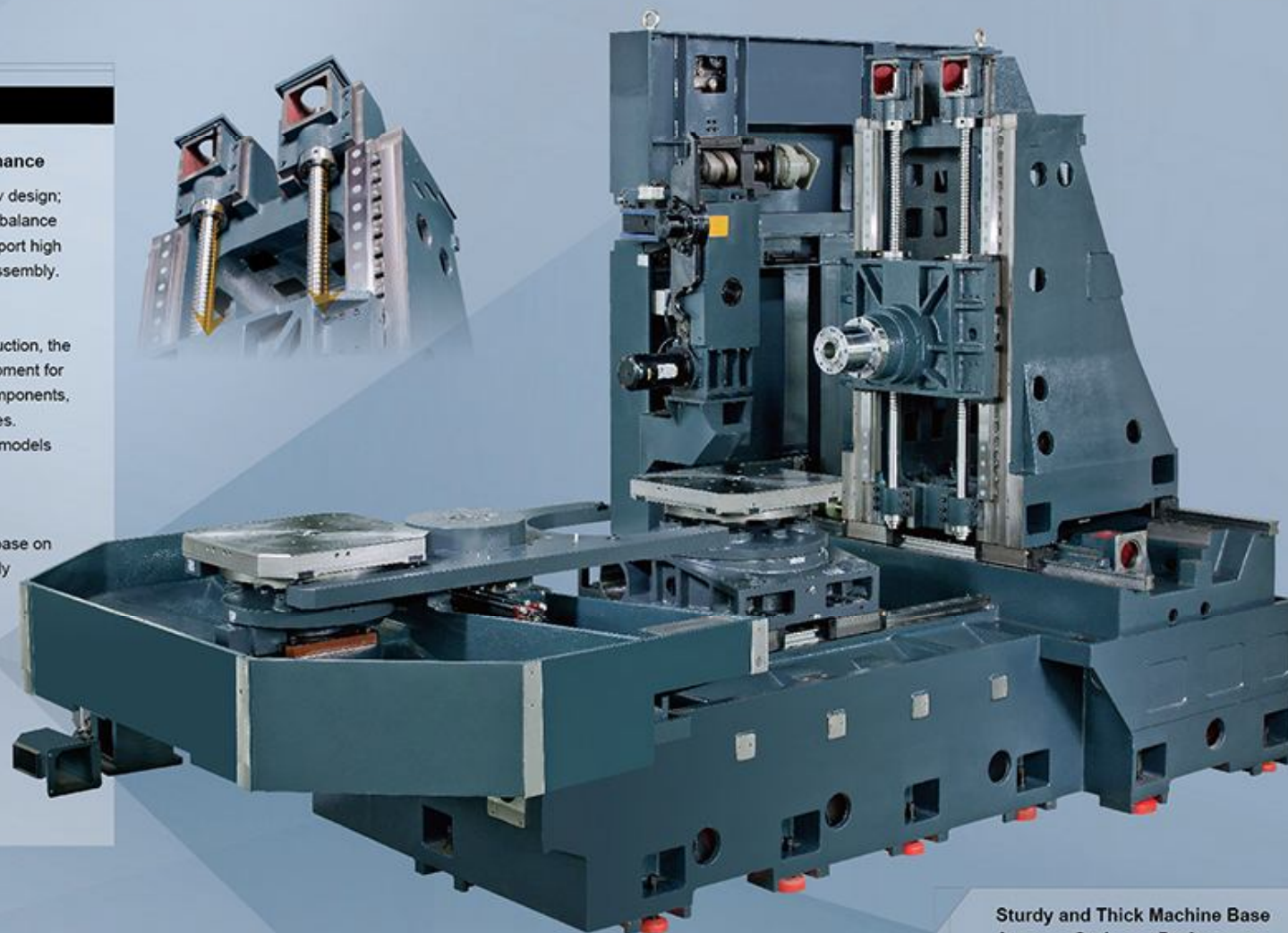
- The vertical Y-axis employs a unique Twin-Ball Screw design; The powerful system replaces the traditional counter-balance mechanism, offering an extraordinary platform to support high speed vertical reciprocating movement of the head assembly.

Twin Ball Screws + Step Structure

- Developed for high precision and high reliability production, the Manford horizontal machining center is the best equipment for automobile, small or medium petroleum-chemical components, medical parts, rail road as well as aerospace industries.
*Twin Ball Screw is only available for HM-630. Other models are single ballscrew only.

Step Structure for X-axis Moving Column

- Two linear guideways are equipped on the machine base on different planes. The high-low step structure effectively reduces the machine column's unnecessary mess and increases dynamic rigidity. Compared to the traditional flat base, Manford's sturdy design assures the optimum performance for productivity and accuracy.



**Sturdy and Thick Machine Base
Assures Optimum Performance**

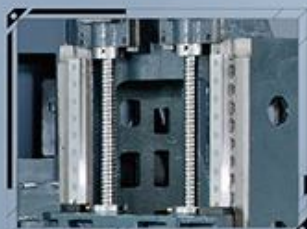
HM-630

Linear Guideways



Rigid Roller Type Linear Guideways

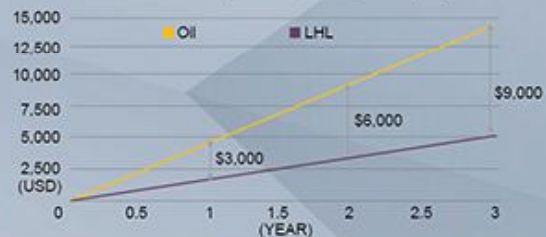
- The Linear Motion Guideways feature low friction and are free from stick-and-slip problems, which are especially suitable for high speed 3D cutting and finishing. The quality of workpiece surface is increased; the need of manual polishing of workpiece surfaces is reduced.



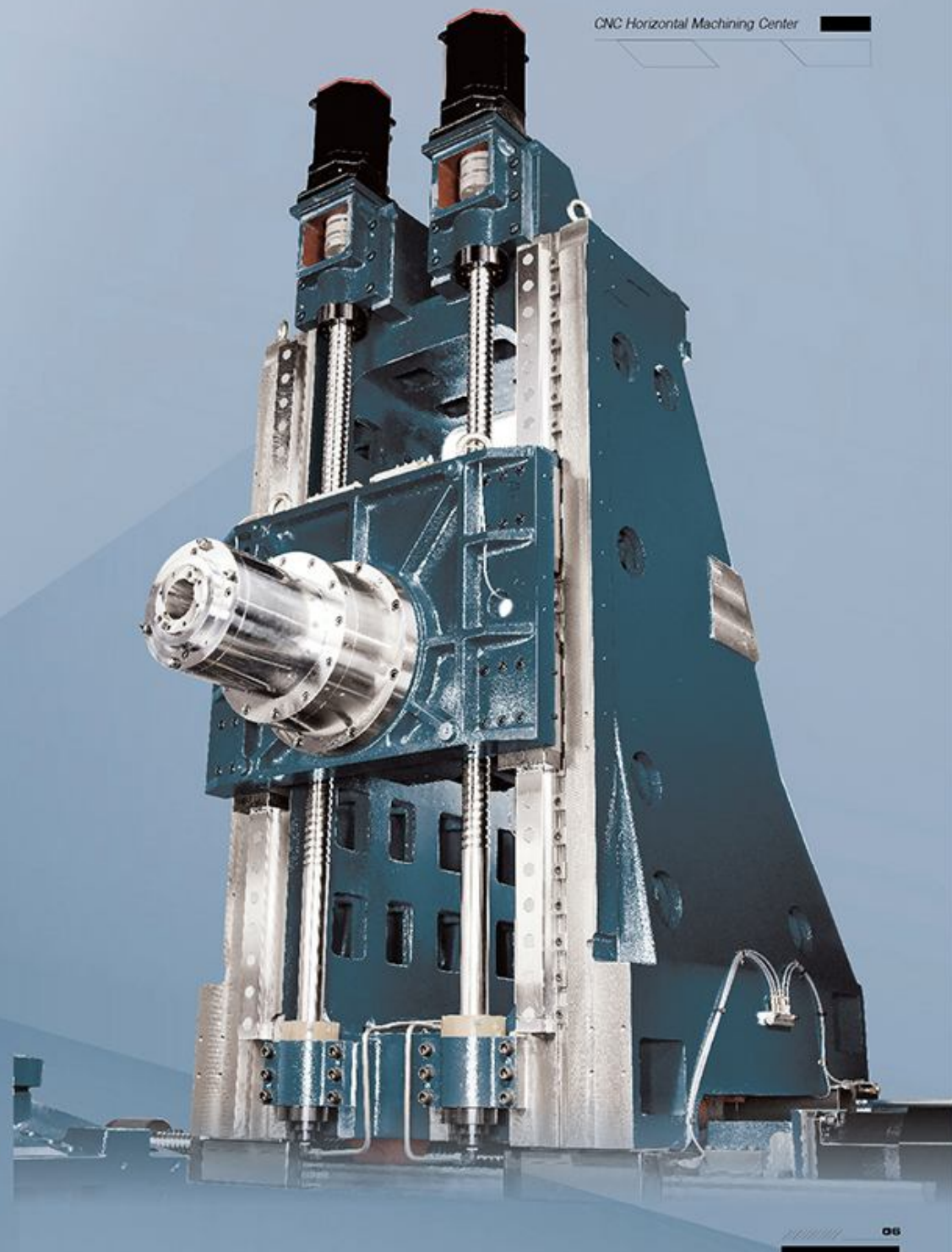
- Roller type linear guideways are used on all linear axes. For added support, each roller shoe is internally preloaded diagonally in a cross configuration.



LHL VS Oil Cost Comparison (Every Year) Opt.



- Compared to high velocity lubrication oil, the LHL central lubrication system uses 90% less oil, and the pump motor consumes 80% less electricity.



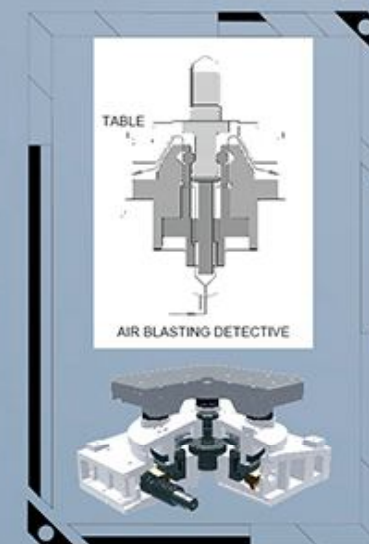
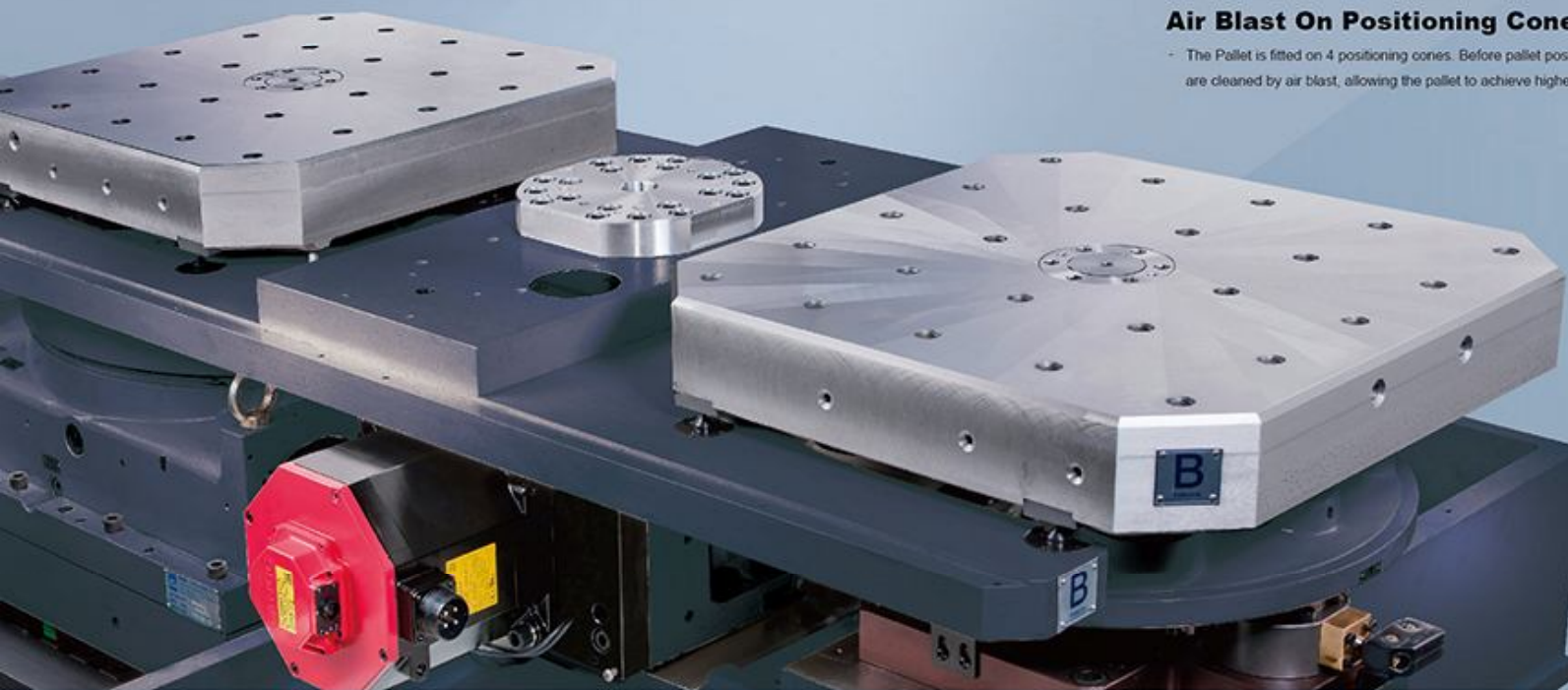
The Combination Of Flexibility, High Productivity And Profitability

Rotary Type - APC

- The entire Automatic Pallet Changing (APC) system is installed on the machine base. The 1° index table employs a high precision curve clutch for accurate positioning, presenting excellent positioning as well as repeatability accuracy. It is easy to re-calibrate the pallet position in clockwise or counter-clockwise in case there is unexpected crash or system malfunction occurs. The continuous 0.001° index, or B axis is optional.

Air Blast On Positioning Cones

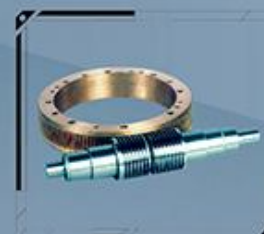
- The Pallet is fitted on 4 positioning cones. Before pallet positioning, the surfaces of 4 positioning cones are cleaned by air blast, allowing the pallet to achieve higher stability and positioning accuracy.



Rotary Type - APC 1° Indexing Table Hirth Coupling

MODEL	HM-500	HM-630
Pallet size	500 x 500 mm	630 x 630 mm
Accuracy	± 5 sec	± 5 sec
Repeatability	± 1.5 sec	± 1.5 sec
Tilting moment	7,800 Nm	15,000 Nm
High clamping force	5,500 Nm	8,000 Nm

- HM-500/630 four cones clamping system clamping force at 35,000Nm
- Dual-lead 0.001° worm gear set. (high positioning & repeatability accuracy)



0.001° NC Rotary Table Opt.

MODEL	HM-400 (Std.)	HM-500	HM-630
Pallet size	400 x 400 mm	500 x 500 mm	630 x 630 mm
Indexing accuracy	± 7.5 sec	± 7.5 sec	± 7.5 sec
Repeatability	± 3 sec	± 3 sec	± 3 sec
Tilting moment	4,000 Nm	4,000 Nm	9,000 Nm
High clamping force	2,500 Nm (Std.)	3,000 Nm (Opt.)	5,000 Nm (Opt.)

Direct Drive Spindle

- High power and high torque motor is coupled directly with the spindle. The design features no belt or gear transmission that generate heat affecting the entire head stock's metallic thermal stability and accuracy. Together with the oil cooling system, the direct drive spindle displays outstanding power and accuracy with low noise, low vibration, low temperature rising performance to meet all different kinds of cutting conditions.



Automatic Tool Changer

- The automatic tool magazine facilitates the versatility of the machine's applications. Various magazine capacities of 40, 60, 80, 90 or 120 tools are available to choose from. The tool magazine is installed in parallel direction to the spindle; adopting larger magazine occupies limited space only.
- Fast and stable tool change motions save non-cutting time and increases efficiency. The spindle features floating tool retracting to extend the service life of the spindle bearings.

HM-630

Tool Storage Capacity: #50 x 40 Tools



Coolant Through Spindle

- The coolant through spindle function is available via a rotary joint between the motor and spindle. The high pressure coolant boosts especially deep hole drilling performance for multiple times, and also extends the life time of cutting tools.



BT50 Gear Head Spindle (HM-500/630 Opt.)

- The spindle is directly transmitted by gears, featuring extraordinary rigidity that provides high torque during low speed range, suitable for heavy duty cutting. Low noise and low vibration.





Coolant Shower

- Large flow coolant shower nozzles are deployed on the top lid of the cutting area. It is capable of removing metal chips as well as heat from the cutting area, maintaining stable and accurate machining conditions.



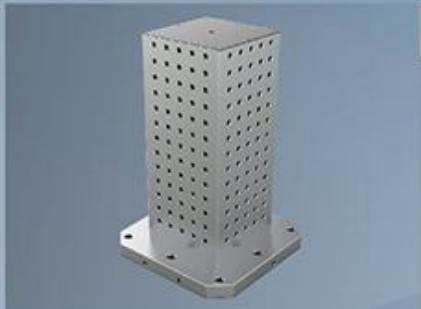
Highly Efficient Chip Removal

- The standard twin chip augers are installed on the machine base.



CTS Coolant Through Spindle Device (CTS 30 Bar Opt.)

- 30 bar coolant through spindle with filtration unit features mighty performance that the cutting efficiency is increased, and the tool life time is extended.



Square Tooling Column (Opt.)

- Alignment busing & thread insert at every hole location, easily adapts to standardized jig components.



The chip flushing system has 3 flushing areas with 30 nozzles to provide extra powerful flushing effect. With this specially designed chip flushing system, the thermal deformation on workpiece is minimal.

Extra Powerful Chip
Flushing Effect **33% UP**

Specifications

Model		Unit	HM-400	HM-500	HM-500	HM-630
Travel	X axis travel	mm	630	800	800	1,000
	Y axis travel	mm	630	725	725	850
	Z axis travel	mm	630	725	725	950
	Spindle center to work table surface	mm	50 ~ 680	50 ~ 775	50 ~ 775	100 ~ 950
	Spindle nose to work table center	mm	130 ~ 760	150 ~ 875	200 ~ 925	150 ~ 1,100
Table	Table surface to floor	mm	1,100	1,100	1,100	1,300
	Table size	mm	400 x 400	500 x 500	500 x 500	630 x 630
	T-slot / Bolt spec.	mm	24-M10 x P1.5 x 20	24-M16 x P2.0	24-M16 x P2.0	24-M16 x P2.0
	Max table load	kg	400	500	500	1,200
	Index precision	deg	0.001°	1° (Opt. 0.001°)	1° (Opt. 0.001°)	1° (Opt. 0.001°)
Spindle	Spindle taper	type	BT40	BT40	BT50	BT50
	Transmission	type	Direct drive	Direct drive	Direct drive	Direct drive
	Spindle speed	rpm	10,000	10,000	6,000	6,000
Feedrate	Spindle motor (cont. / 30 min)	kW	15 / 18.5	15 / 18.5	15 / 18.5	22 / 26
	3 axes cutting feedrate	mm / min	1 ~ 10,000	1 ~ 10,000	1 ~ 10,000	1 ~ 10,000
	3 axes rapid feedrate	m / min	36	30	30	36
	3 axes min. setting unit	mm	0.001	0.001	0.001	0.001
	Repeatability accuracy	mm	0.006	0.006	0.006	0.006
	Position accuracy	mm	0.01	0.01	0.01	0.01
ATC	Tool capacity	pcs	24	24	24	40
	Max. tool diameter x length	mm	Ø80 x 300	Ø85 x 300	Ø125 x 400	Ø125 x 400
	Max. tool weight	kg	10	10	20	20
	Tool change time (tool-tool)	sec	1.6	1.6	2.9	2.9
APC	Number of pallets	pcs	2	2	2	2
	Method of pallet change	type	Rotary	Rotary	Rotary	Rotary
	Pallet change time	sec	8	8	8	16
Others	Floor space (L x W x H)	mm	4,713 x 3,056 x 2,735	4,835 x 3,227 x 2,957	4,835 x 3,227 x 2,957	7,150 x 5,200 x 3,510
	Machine weight (N.W / G.W)	kg	11,500 / 13,500	13,500 / 16,500	16,000 / 19,000	22,000 / 25,000
	Power capacity requirement	KVA	40	40	40	50

* NOTE

* Twin Ball Screw only standard for HM-630. Other models are single ballscrew only.

* Specifications are subject to change without notice.

Standard Accessories

- Rotary type automatic pallet changer
- 1° indexing rotary table (HM-400 Std. 0.001°)
- Chain type chip conveyor with cart
- Rigid roller type linear guideways system
- Spindle curtain coolant
- Spindle oil cooler
- Heat exchanger for electrical cabinet
- 3 areas powerful chip flushing system
- Automatic lubrication system
- Fully enclosed splash guard
- Leveling bolts and pads
- Tool box with tools
- Operation and maintenance manual

Optional Accessories

- 0.001° indexing rotary table (HM-400, 0.001° Std.)
- 60, 90, 120 tools chain type magazine
- BT40, 10,000 ~ 24,000 rpm direct drive (HM-400 / 500)
- BT50, 8,000 ~ 10,000 rpm direct drive (HM-500)
- Coolant through spindle (CTS30 / 70 bars)
- 3 axes linear scales
- Oil skimmer
- Air conditioner for electrical cabinet
- Automatic tool length measurement system
- Automatic workpiece measurement system
- CE
- SIEMENS, HEIDENHAIN controller
- Pallet automation system
- High torque gear box