

# Heavy Duty Horizontal Machining Center

## HM Series



National Award  
of Outstanding



ISO 14001:2004  
EMS 546518



ISO 9001:2008  
FM 538421

# HM Series

## *Heavy Duty Horizontal Machining Center*

BUFFALO MACHINERY's HM Series features high flexibility, high efficiency, and high precision to satisfy the various metal materials machining demands, to offer great cost performance and to maximize the profitability and productivity. Evolved into a perfect model, HM Series masters the advantages of high-speed machining and heavy-duty cutting; thus, the model satisfies various types of needs in many different industries, such as general engineering, die & mold industry, oil & gas industry, energy industry, shipbuilding industry, automotive and aerospace industry. The concept of optimized handling of thermal growth also provides excellent thermal stabilization and high accuracy; furthermore, the ergonomic and comfort design make the operator being able to simultaneously monitor the controller and machining area and operate the controller with ease.



## Highlights

- The massive structure is made of the high tensile Meehanite cast iron and handled with stress relief treatment, which can ensure the high rigidity and optimum stability while operating heavy-duty cutting.
- The spindle bearing adopts the high rigidity and high precision linear guideway. The spindle scraping out cutter utilizes disk spring to clamp, and applies hydraulic mechanism to release the tool.
- Linear movement feeding mechanism: the feeding movements of X, Y, and Z axes are driven by AC servo motor. Through the connection of coupler and roller ballscrew, oil coolant flows into the hollow ballscrew as the standard configuration, which can guarantee a stable movement of each part from high transmission accuracy performance.
- Three-step gear driven spindle with high power output features the advantages of high speed, high torque, and low noise. To ensure the spindle rotary accuracy, the spindle applies the constant temperature oil circulation to reduce the thermal deformation of spindle system and achieves the best cutting performance.
- The largest machining capacity meets all kinds of applications in most industries.
- Large tool magazine design provides the production with high efficiency and high reliability.
- Excellent chip management
- The optimized design of water channel to separate out the oil and water easily.
- The multi-pallet APC interface is reserved to meet future mass production demand.
- Optional single working table
- Linear scale interface reservation (mechanical part)
- Streamline design—the oil tank, oil cooler and transformer are integrated into the machine to save the floor space.
- Shorten the adjustment time.





# ***Reliable & Stable Cutting Performance***

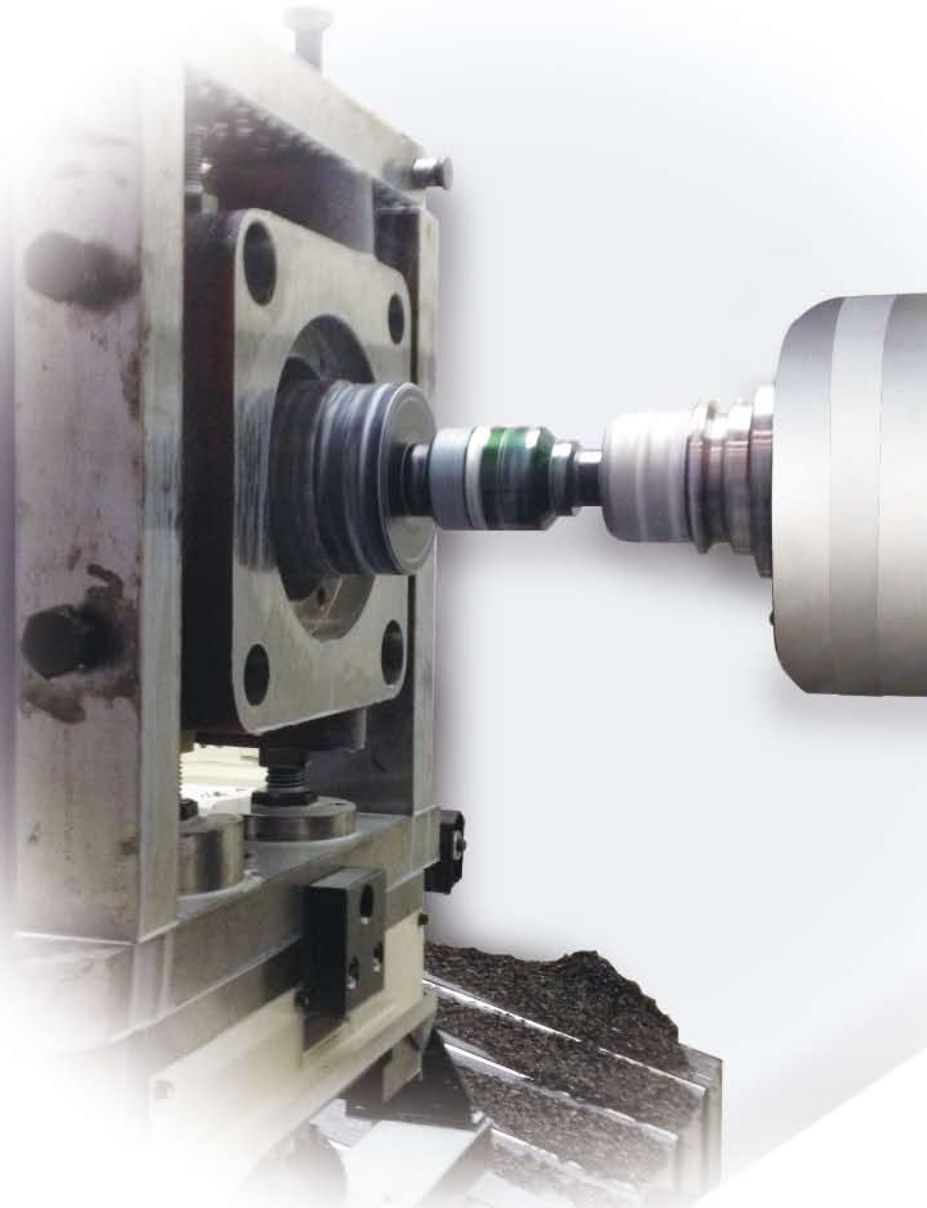
**Precision**

**Efficiency**

**Rigidity**

**Flexibility**

**Productivity**



## **Perfect Cutting**

- With high accuracy and high rigidity bilateral constraint spindle and the spindle taper ISO50, the spindle speed is up to 8,000rpm (optional).
- Three-step gear automatic transmission mechanism can provide the cutting force of various machining demands according to the setting of automatic speed ratio.
- Especially for the heavy-loading machining, the neck design of working table applies large diameter supporting bearing and the high-precision indexing curved tooth clutch.
- On the X axis, both sides are equipped with chip augers. Complete chip management can immediately and automatically remove the chips to make the cutting process well-executed.
- X, Y, and Z axes are equipped with linear scale (optional) to ensure the accuracy.
- The transmission gear of spindle gear box is lubricated by constant temperature oil coolant. The spindle bearing is lubricated by grease, and the lead guideway is lubricated by oil. Lubricating performance is effective and reliable.
- Each guideway is equipped with telescopic cover to prevent the chips, dust, as well as fluids to guarantee the high accuracy and reliable cutting performance.
- The spindle head supporting structure is made of high rigidity cast iron which is suitable for large output and high torque heavy duty cutting.

## Super Rigidity Design

**Powerful spindle and super rigid bed perform perfect heavy-duty cutting.**

### X, Y, & Z Axes

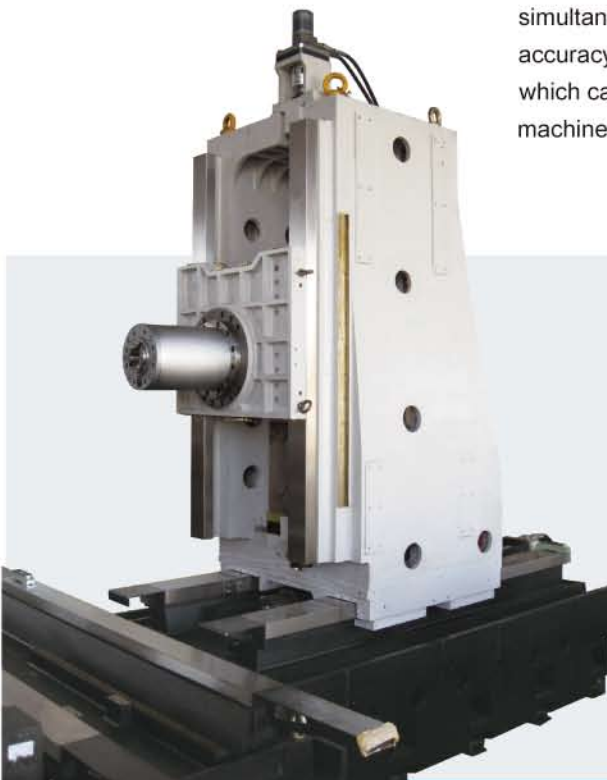
Each axis of HM series provides super thrust force; integrated with high rigidity structure and super shock absorption performance, the machine can achieve the impeccable project for any kind of complex metal machining.

#### HM-6300 / HM-8000eco

- Rigid box way design for X, Y, and Z axes guideways

#### HM-8000 / HM-10000eco / HM-10000 / HM-12500eco

- Y axis column guideway utilizes box way design not only to resist the tremendous resisting force while machining, but also to prevent any vibration at the end of column machining process, especially for tall workpieces.
- X and Z axes provide roller type linear guideways for heavy loading capacity. During machining, the rigid design can transfer vibration with ease and simultaneously endure the force from every directions to perfect the machining accuracy. It is suitable for high-speed machining with long travel distance, which can dramatically decrease the output of horsepower drive that the machine needs.



HM-6300 / 8000eco Y Axis Box Way Guideway



HM-6300 / 8000eco X & Z Axis Box Way Guideway

- The guideway surface is handled by hand-scraping treatment to lower the friction and to optimize shock absorption, which can drastically advance the machining accuracy and prolong the life time of tool.
- X, Y, and Z axes applies high rigidity slide guideway which can offer the great guidance quality and high accuracy. Affixed to special abrasion resistant material on the guideway can optimize accuracy maintenance and execute excellent shock absorption.





## Automatic Pallet Changer

**Standard automatic two-pallet changer and optional single working table are available for selection.**

Automatic Pallet Changer type -

- HM-6300/8000eco: Rotary shuttle type;
- HM-8000/10000eco/10000/12500eco: Parallel shuttle type.

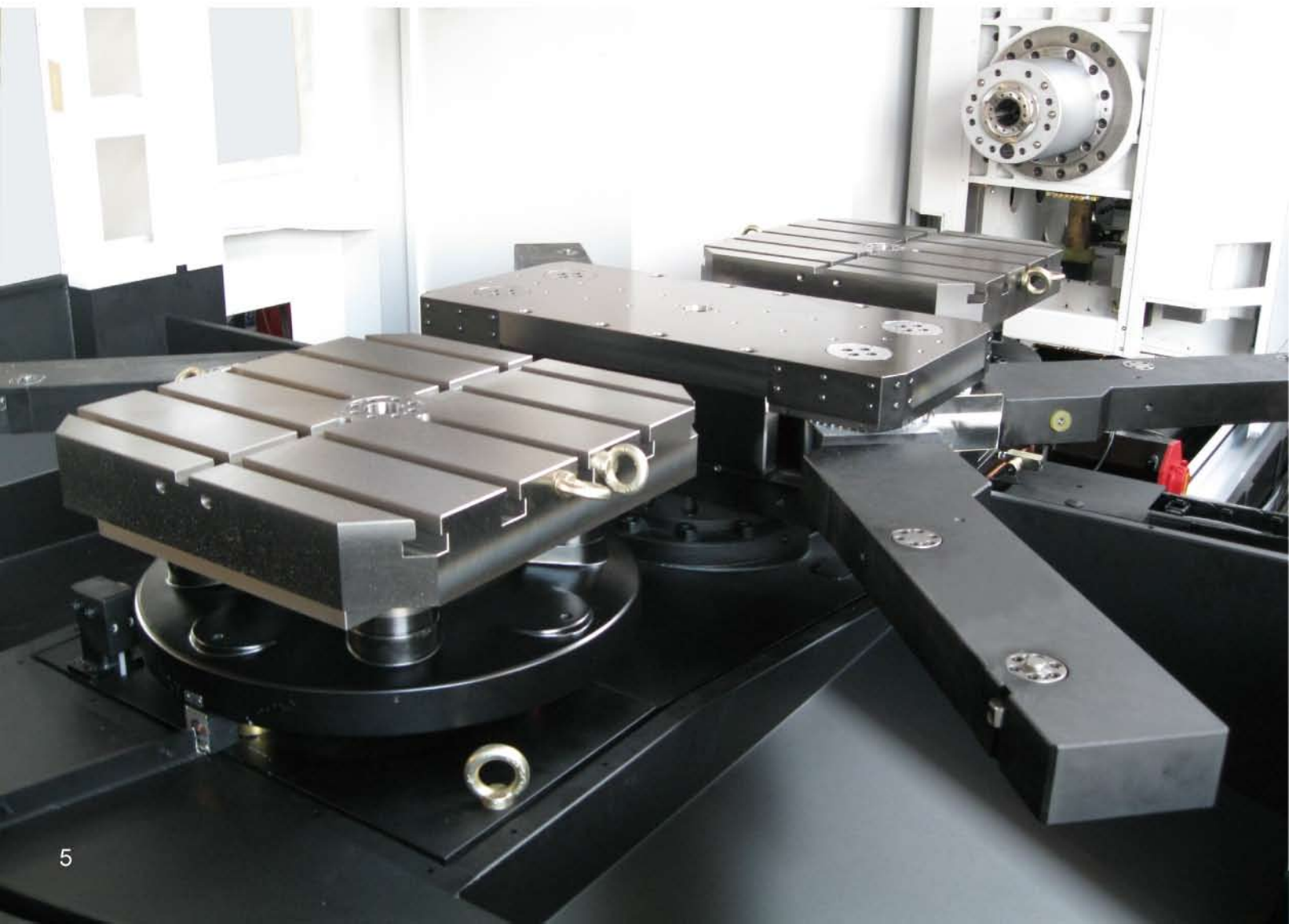
Equipped with control station at the side of machine front door, the operator can control easily for the workpiece clamp / unclamp.



Control station at the side of machine front door



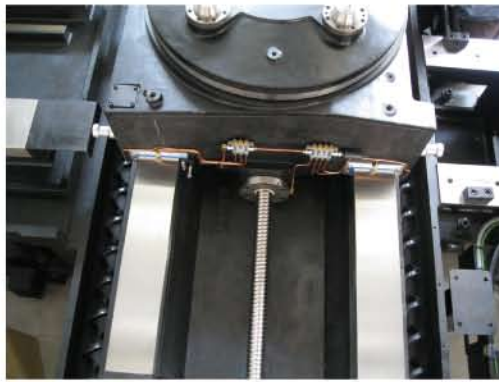
Automatic Two-Pallet Changer



## Chip Management

### Excellent chip removal arrangement provides easy cleaning and maintenance.

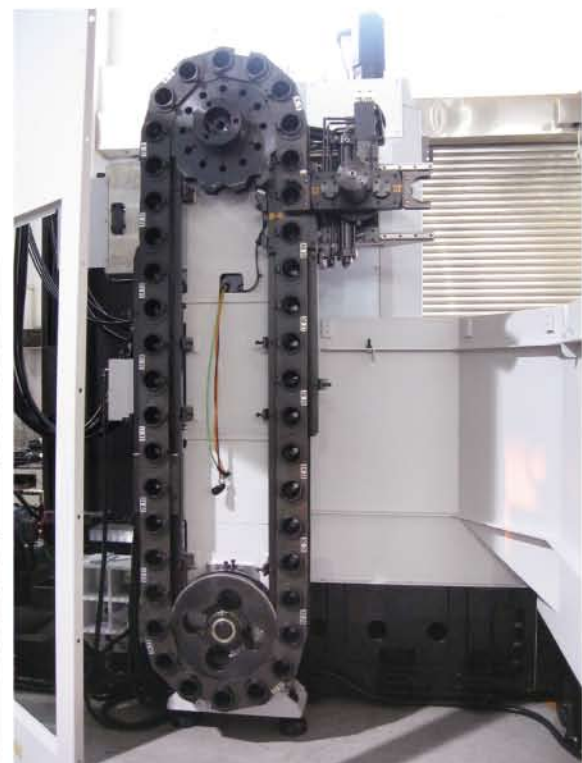
- Equipped with mass flow cutting fluid cooling system, built-in chip auger and chip collector unit, and fully enclosed cover. The chip filter device can separate the chips and waste oil coolant before the chips moving to the chip conveyor.
- The chip auger installed on both sides of X axis, which is an optimum chip arrangement to remove the chips out of the machine quickly.
- Chip collecting unit and coolant recycling unit are divided into inner and outer parts. The inner part is equipped with dual chip augers and the outer part is supplied with chain conveyor. Coolant tank, chip filter device, and chain conveyor are an integral whole design.



## Automatic Tool Changer

### A fast and reliable automatic tool changing system provides tool changing smoothness and machining efficiency.

- Adopts standard BBT50 tool shank. The standard 40 tool capacity or optional 60/90/128/156/228 tool capacity is available for selection. The fixed selecting tool changing is automatically done by running the preset program.
- The ATC is driven by servo motor to make the tool changing procedure much more stable and accurate.

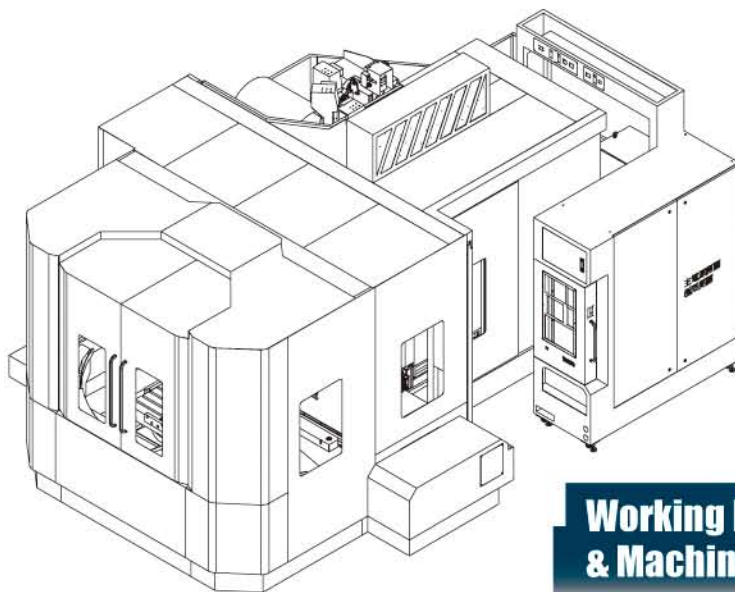




## Fully Enclosed Guard

**Protects the operator from splashes of chips and cutting fluid while operating the machine.**

The guard protection unit comprises the guideways cover, ballscrew cover, and outer enclosed guard which also realizes feasibility, safety, and ergonomic features.



## Working Environment Safety & Machine Reliability

- Operator Protection—Conformity with ISO safety standard
- Machine Protection--The machine and spindle immediately stop while feeding ceased which is caused by the conditions below:
  - Spindle tool clamp failure
  - Spindle gear box lubricant and oil temperature control unit failure
  - Spindle or feeding motor overloading
  - Hydraulic pressure (oil volume or oil pressure) failure







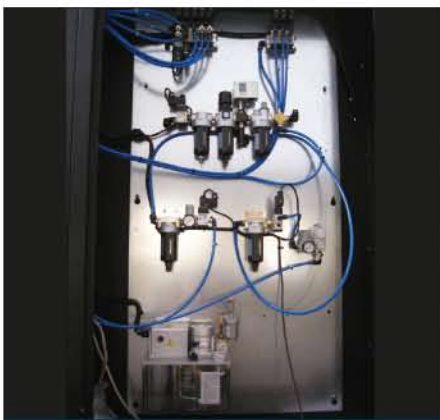
Oil Tank



Hollow Ballscrew w/ Oil Cooling System  
for 3 axes



CTS



Lubrication System & Air Regulator



Lubrication System



Oil Cooler

## Lubrication System

- Automatic pressure-released lubrication
- Oil is quantitatively supplied according to the required lubrication for the sliding surface and the ballscrew.
- Oil level detector unit is provided.
- Oil shortage alarm message will be shown on the screen .

## Hydraulic Unit

The hydraulic unit supplies oil to the machine. Hydraulic oil and constant temperature oil are separately delivered by each pump. The oil cooler controls oil temperature which extends the hydraulic component life time and working efficiency. The hydraulic unit configuration is in conformity with international standards to provide stability and reliability.

## Hollow Ballscrew with Oil Cooling System for 3 Axes

X/Y/Z axis is driven by servo motor. The cooling system through the connection of coupler and roller ballscrew, oil coolant flows into the hollow ballscrew to minimize the thermal growth caused by the high-speed movement. Each transmission mechanism design is compact and great transmission accuracy can guarantee a stable movement .

## Electric System & Controller

Japanese FANUC 31iMB/32iMB or Germany SIEMENS 840D sl/828D sl is available for selection. Each component is configured independently such as the spindle and driver for each axis. Simultaneously controlled axes are X, Y, Z, and B coordinates axes and the spindle; coupled axes are X, Y, and Z axes (table indexing angle  $0.001^\circ$  is selectable for four axes simultaneously controlled).



FANUC Controller & Portable MPG



Heat Exchanger

## Heat Exchanger

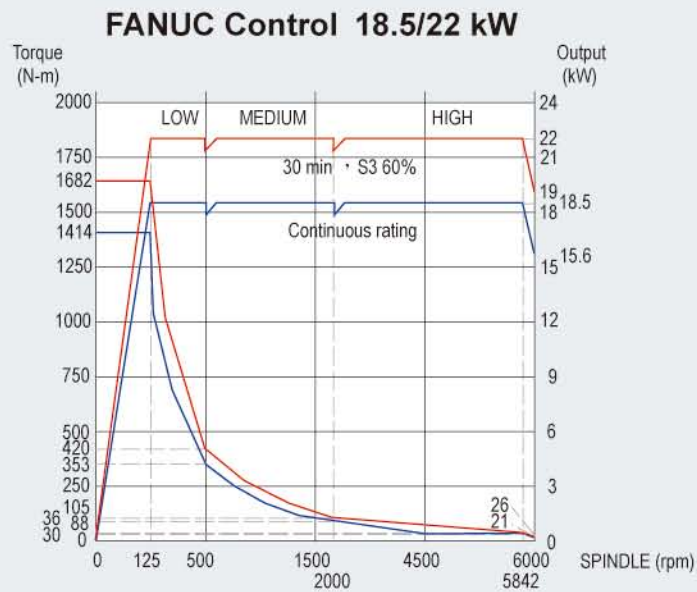
The heat exchanger is integrated within the electric cabinet and located at the rear side, making efficient heat dissipation and saving the floor space.



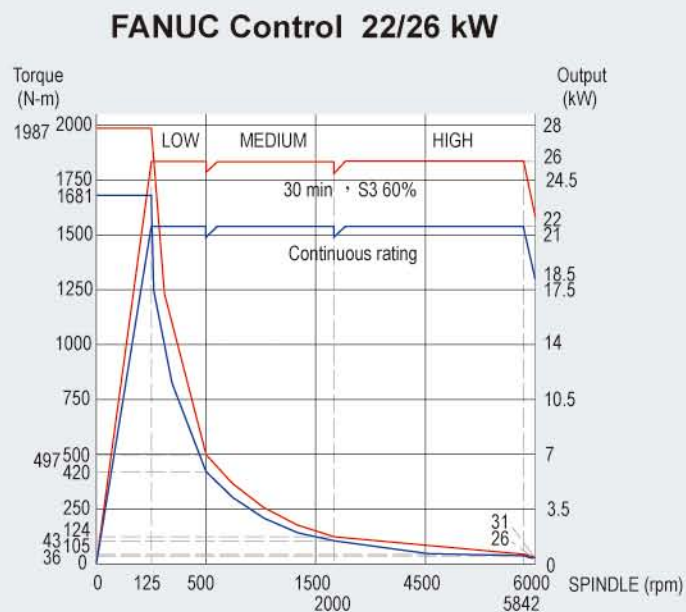


# HM Series

## Spindle Power-Torque Diagram



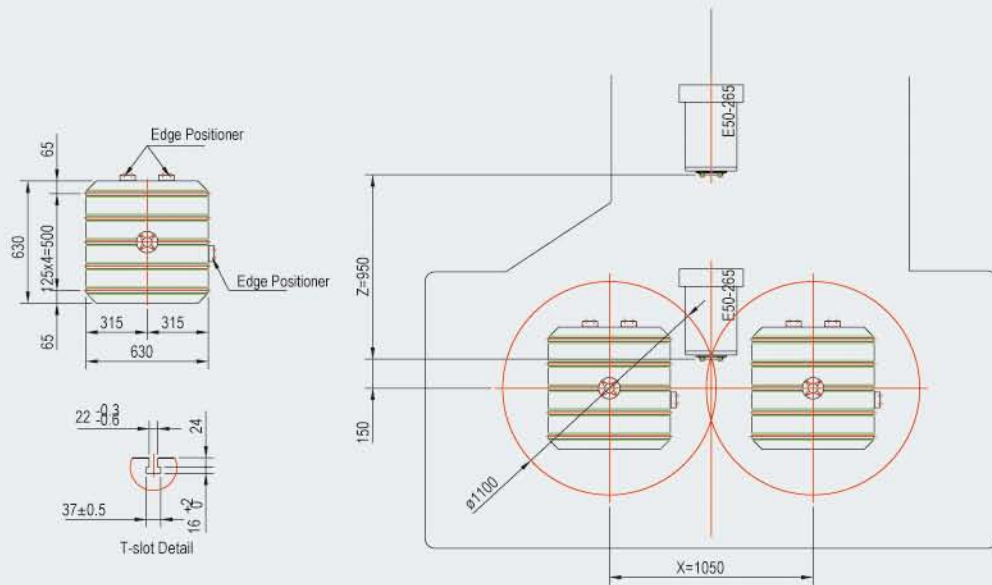
Torque / Power Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC a18/7000i
		CAT50	Motor Output	18.5/22kW
		DIN 69871	Gear Ratio	1:12.005 / 1:3 / 1:1.027
Spindle Speed	6000 rpm	Pulley Ratio	-	



Torque / Power Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC a22/7000i
		CAT50	Motor Output	22/26kW
		DIN 69871	Gear Ratio	1:12.005 / 1:3 / 1:1.027
Spindle Speed	6000 rpm	Pulley Ratio	-	

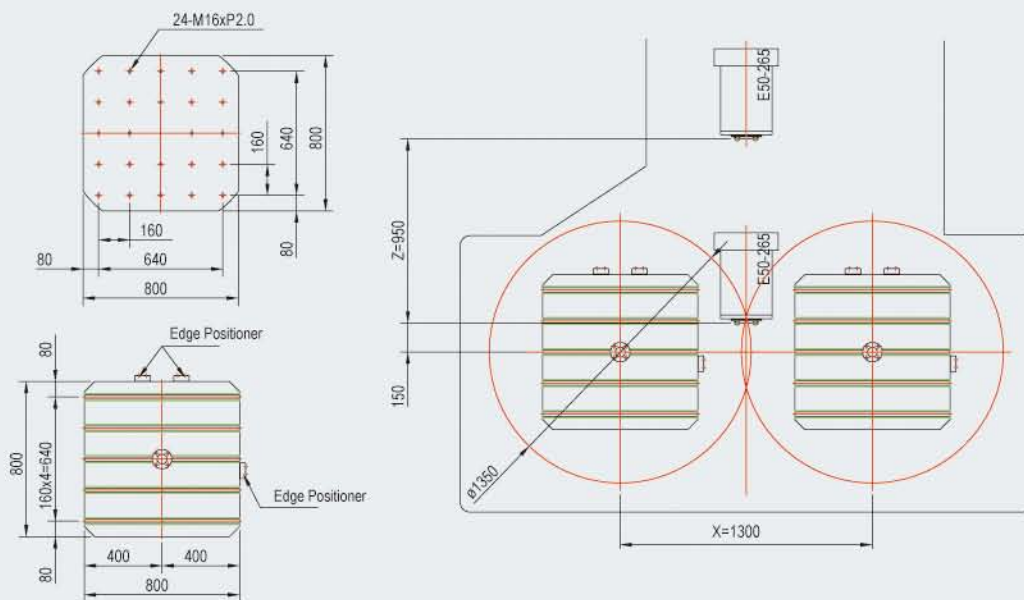
# HM-6300

## Working Table Specification / Interference Drawing



# HM-8000eco

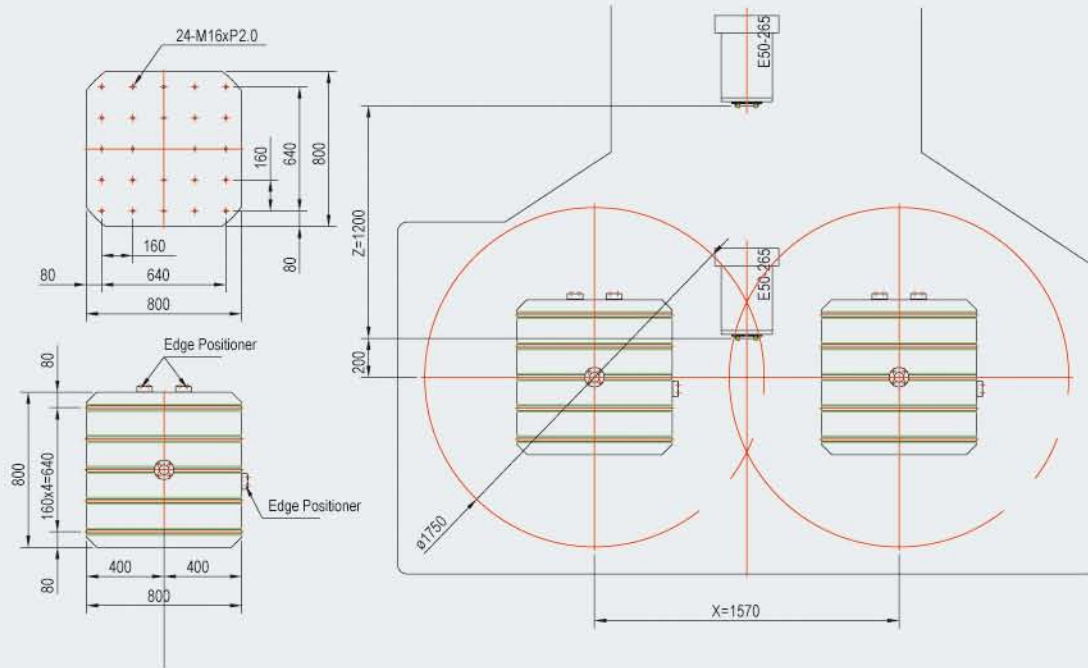
## Working Table Specification / Interference Drawing





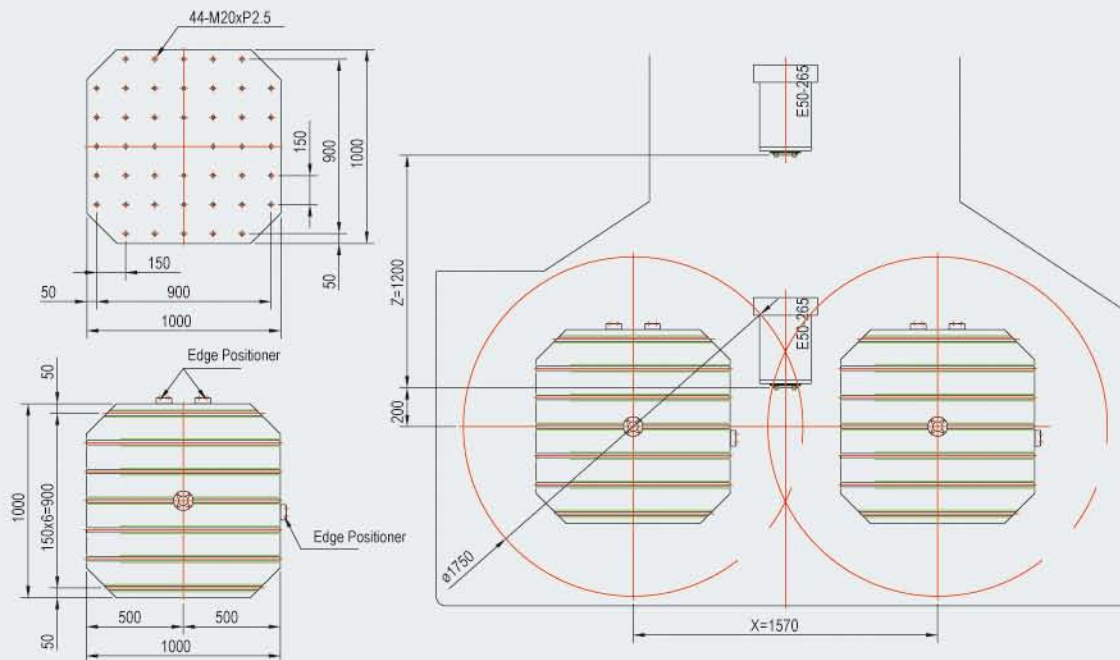
## HM-8000

### Working Table Specification / Interference Drawing



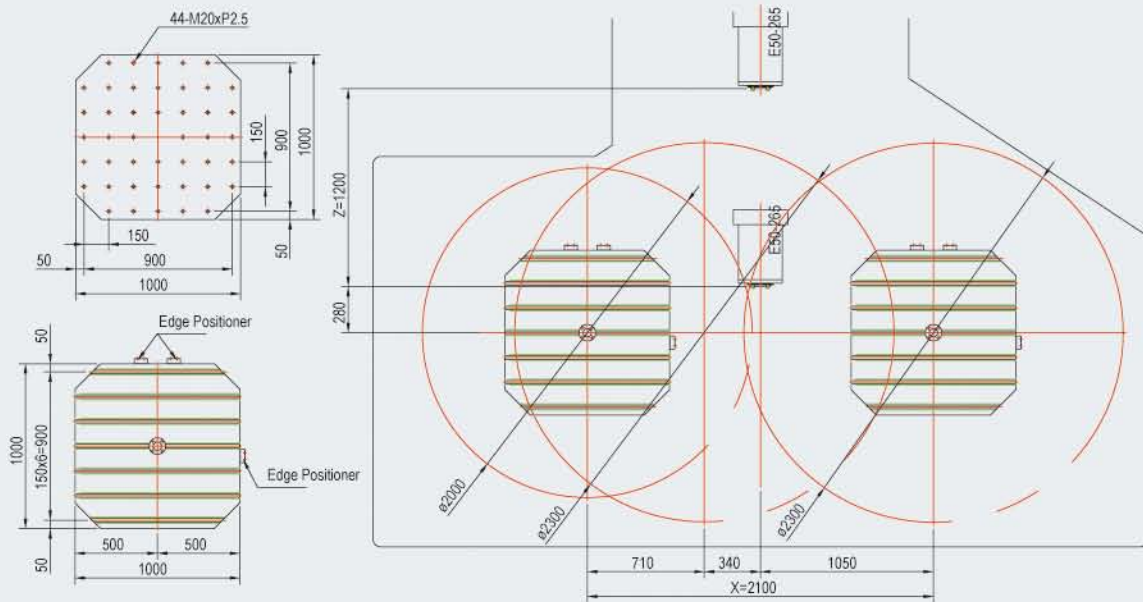
## HM-10000eco

### Working Table Specification / Interference Drawing



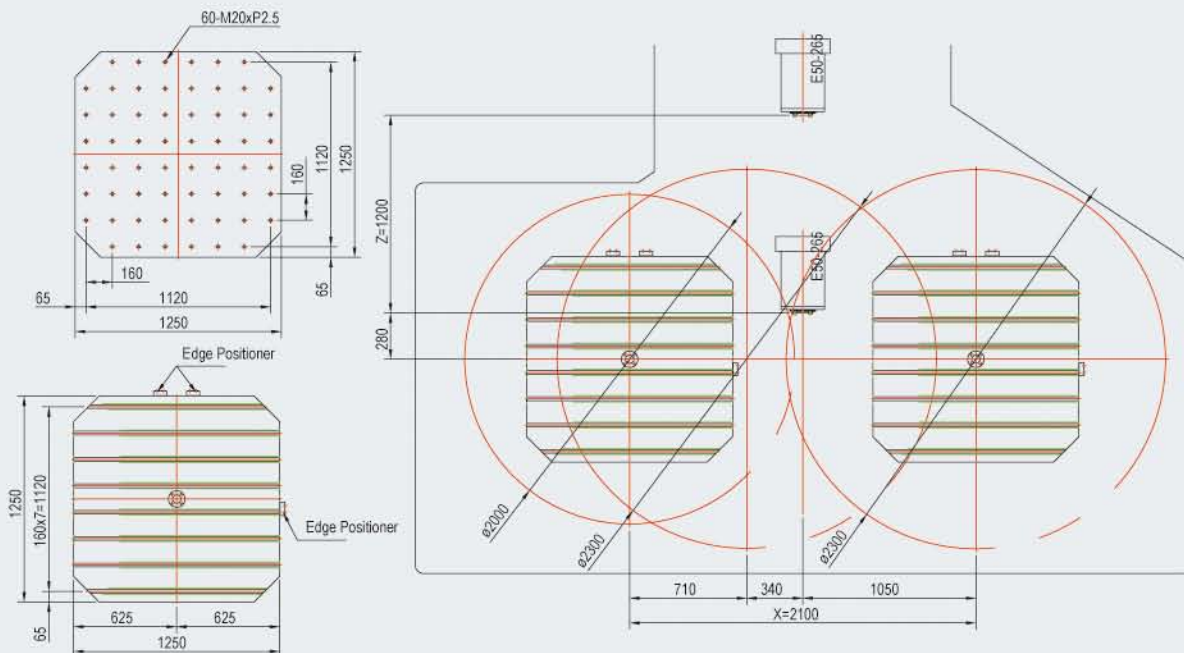
# HM-10000

## Working Table Specification / Interference Drawing



# HM-12500eco

## Working Table Specification / Interference Drawing





## Specification

Item	Unit	HM-6300	HM-8000eco	HM-8000	HM-10000eco	HM-10000	HM-12500eco
<b>Table</b>							
Table size	mm	630x630	800x800	800x800	1,000x1,000	1,000x1,000	1,250x1,250
Table height	mm	1,235	1,250	1,300	1,300	1,300	1,320
T slot (dim/pitch/no)	mm	22x125x5	22x160x5	22x160x5	22x150x7	22x150x7	22x160x7
Max. table load	kg	1,200x2	1,600x2	2,500x2	2,500x2	3,500x2	3,500x2
Table index	degree	1(std); 0.001° (opt)	1(std); 0.001° (opt)	1(std); 0.001° (opt)	1(std); 0.001° (opt)	0.001°	0.001°
<b>Travel</b>							
X axis	mm	1,050	1,300	1,570	1,570	2,100	2,100
Y axis	mm	950	1,050	1,300	1,300	1,650	1,650
Z axis	mm	950	950	1,200	1,200	1,200	1,200
<b>Spindle</b>							
Spindle taper		ISO50	ISO50	ISO50	ISO50	ISO50	ISO50
Transmission		Gear (3-step)					
Spindle speed	rpm	6,000 (Std)/8,000 (Opt)					
Spindle output	kW	18.5/22; 22/26	18.5/22; 22/26	18.5/22; 22/26	18.5/22; 22/26	18.5/22; 22/26	18.5/22; 22/26
Spindle torque	Nm	1,680/1,989	1,680/1,989	1,680/1,989	1,680/1,989	1,680/1,989	1,680/1,989
<b>Axes Transmission</b>							
X axis ballscrew	mm	Ø50xP12	Ø50xP12	Ø55xP12	Ø55xP12	Ø55xP12	Ø55xP12
Y axis ballscrew	mm	Ø50xP12	Ø50xP12	Ø55xP12	Ø55xP12	Ø55xP12	Ø55xP12
Z axis ballscrew	mm	Ø50xP12	Ø50xP12	Ø55xP12	Ø55xP12	Ø55xP12	Ø55xP12
X/Y/Z axis transmission		Direct (Hollow ballscrew w/ oil cooling system for 3 axes)					
<b>Axes Feed Rate</b>							
X/Y/Z rapid feed	m/min	32/32/32	32/32/32	32/32/32	32/32/32	20/20/20	20/20/20
<b>Cutting Feed Rate</b>							
X/Y/Z axis cutting feed rate	m/min	12/12/12	12/12/12	12/12/12	12/12/12	10/10/10	10/10/10
<b>Guide Way</b>							
X guide way type		Box way	Box way	Linear way	Linear way	Linear way	Linear way
Y guide way type		Box way	Box way	Box way	Box way	Box way	Box way
Z guide way type		Box way	Box way	Linear way	Linear way	Linear way	Linear way
<b>Accuracy (ISO 230-2,2006)</b>							
Positioning accuracy	mm	0.012	0.012	0.015	0.015	0.015	0.015
Repeatability	mm	0.008	0.008	0.01	0.01	0.01	0.01
<b>ATC System (Option)</b>							
Tool Storage Capacity		40(std); 60/90/128/156/228(opt)	40(std); 60/90/128/156/228(opt)	ATC System (Option) 40(std); 60/90/128/156/228(opt)	40(std); 60/90/128/156/228(opt)	40(std); 60/90/128/156/228(opt)	40(std); 60/90/128/156/228(opt)
ATC type		Arm					
Tool shank type		BBT 50	BBT 50	BBT 50	BBT 50	BBT 50	BBT 50
Max. tool diameter	mm	135/250	135/250	135/250	135/250	135/250	135/250
Max. tool length	mm	610	610	610	610	610	610
Max. tool weight	kg	25	25	30	30	30	30
Tool changing time (T-T)	sec	6	6	6	6	6	6
<b>APC System (Option)</b>							
No. of pallets in APC system	set	2	2	2	2	2	2
APC type		Rotary Shuttle Type			Parallel Shuttle Type		
<b>Dimension &amp; Weight</b>							
Length	mm	6,550	6,550	7,200	7,200	9,800	9,800
Width	mm	4,980	4,980	4,400	4,400	5,500	5,500
Height	mm	3,041	3,041	3,500	3,500	4,800	4,800
Weight	kg	20,000	20,500	22,000	22,500	30,500	31,500
<b>Controller</b>							
Controller		FANUC 31iMB / 32iMB; SIEMENS 840D sl / 828D sl					

\*Specifications are subject to change without notice.

## Standard Accessories

- Oil Cooler
- Automatic Lubrication System
- Heat Exchanger
- Oil Tank
- Fully Enclosed Guard w/ Working Light
- Automatic Tool Changer (40 tool)
- Chip Auger
- Hollow Ballscrew w/ Oil Cooling System for X/Y/Z axis
- Portable MPG
- Machine Operation Manual & Controller Operation Manual (FANUC or SIEMENS)
- Reservation for Coolant Through Spindle System
- Automatic Power Off Device
- Alarm Beacon
- Tool Box
- Automatic Two-Pallet Changer
- Controller FANUC 32iMB

## Optional Accessories

- Automatic Tool Changer (ATC) 60/90/128/156/228 Tool
- Single Working Table
- Coolant Through Spindle System (20 bar/70 bar)
- Workpiece Probe
- Tool Probe
- Oil Mist Collector
- Linear Scale for X/Y/Z Axis
- Shower Coolant
- Chip Conveyor
- Coolant Gun



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