

## HBM RAM TYPE Series

CNC Horizontal Boring & Milling Center



National Award  
of Outstanding



ISO 9001:2015  
FM 538421



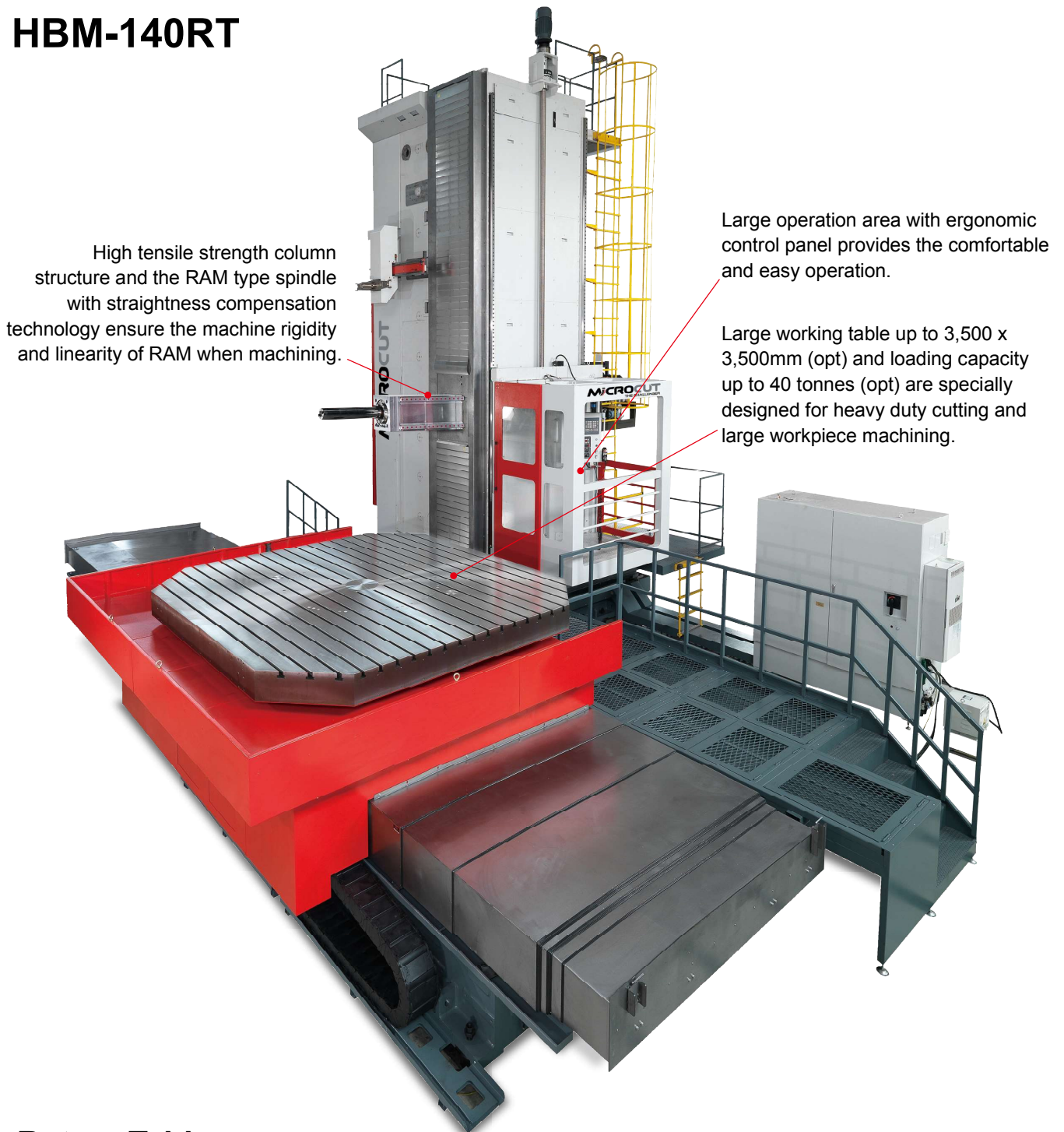
ISO 14001:2015  
EMS 546518



ISO 50001:2011  
ENMS 642457

# RAM Type Horizontal Boring & Milling Center

## HBM-140RT



### Rotary Table

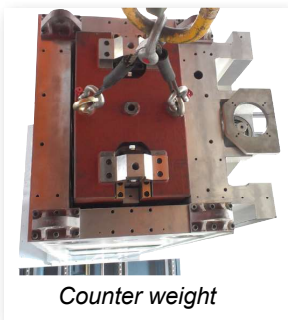
- Table size and loading capacity: Table size: 3200 x 3200mm (std); 3500 x 3500mm (opt)  
Table loading capacity: 20 tonnes (std); 30 / 40 tonnes (opt)
- Dual planetary gear reducer ensures backlash free.
- 0.001 degree variable positioning in any angular position and available for rotary milling.
- Three rings of bearing surface coated and hand-scraping treatment for stability and longevity.
- The rotary table reinforced with integrated hydraulic clamping force and equipped with four points lock pins provides heavy loading capacity and large clamping force.
- Both table slide and clamping plates are made of a robust cross-ribbed casting which is treated by thermal stabilization.
- Centrally integrated rotary encoder guarantees precision positioning and easy maintenance.



- The main frames are made of high grade Meehanite licenced steel to ensure the rigidity of the structure.
- For absolute positioning accuracy, X/Y/Z axis are installed with linear scales to ensure exact axis positioning (accuracy: 0.001mm) under fluctuating temperatures. For B axis, the rotary table is fitted with angle encoder which can significantly increase the accuracy of feed axes.

## X & Z Axes

X/Y axes provide four-roller type linear guideways with 12 pieces blocks for X axis and 16 pieces blocks for Z axis for heavy duty loading requirement and fast movement.



## Y Axis

- Box way design for Y axis.
- The guideway surface has been processed with induction hardened and ground procedure.
- The high tensile strength design can prevent any vibration at the end of the column during machining.
- The precise C3 class ballscrews can guarantee the axial and radial cutting strength.
- Mechanical counter weight with holding device ensures a smooth Y-movement and multi-axis simultaneous movement.

# Spindle

- Extremely large working capacity with RAM head is provided; linear guideway and hydrostatic structure are available for selection.
- Equipped with Ø140mm diameter quill with extendable RAM: RAM travel of 800mm, Quill travel of 700mm.
- Two roller bearings fit in front of the spindle and ball/angular contact bearings at the rear, providing oil mist and oil spray device, with suction system in returning oil.
- Spindle is supported by cylindrical roller bearings for heavy duty machining.
- ISO50 spindle taper with 3000rpm spindle speed.
- Automatic two-step speed changer for high torque output.
- Spindle surface is with hardness of HRC52-55.
- Grade GGG iron casting.

## Linear Guideway RAM



## Hydrostatic RAM



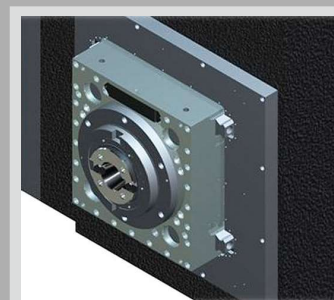
## RAM Structure

- Hydrostatic structure
- Four linear guideway structure
- High rigidity housing structure
- New rear-positioned design motor
- Equipped with H.H. ERM280 rotation encoder

## Accessory Head Interface for RAM type HBM

**Accessory pull force: 2,500 kg x 4 = 10,000 kg**

- Adapting interface is prepared for accessory head as auto head changing system.
- Four pull studs are designed for RAM type HBM, each with 2500 kg pull force, which make the total 10,000 kg force for the integrated head.
- Second counter-weight balance compensation is provided if equipped with accessory head, to guarantee great cutting performance.



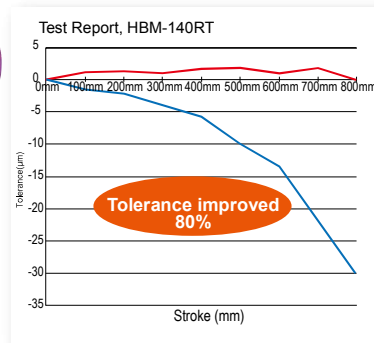
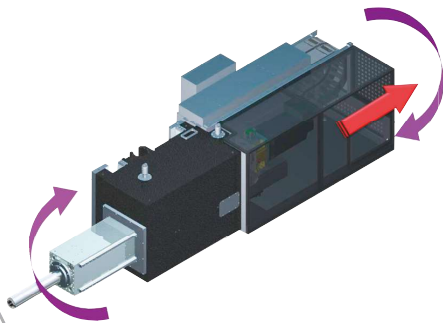


SCT

## Straightness Compensation Technology

A hydraulic compensation mechanism is provided to ensure the linearity of the RAM's spindle and the accuracy of the machine.

RAM compensation uses the hydraulic sector to pull the RAM in time. When the RAM extends, the effect of gravity will cause the RAM drooping and deformation which will affect the tolerance and machining precision. The HBM series uses the hydraulic sector to compensate the tolerance of the RAM, and the hydraulic cylinder will exert and create an opposing pulling force to pull back the RAM by using a lever. When hydraulic pressure has been transferred to the hydraulic cylinder to resist the effect of gravity, the installed pressure feedback device can conserve the transferred pressure. The hydraulic pressure value is used by the pressure feedback device to reach the value of compensation required.



— With Compensation — Without Compensation

The blue curve is RAM deviation without the RAM straightness compensation technology; the max. deformation of RAM is 31um. The red curve shows RAM deviation with the RAM straightness compensation technology, where the tolerance is within +/- 3um. The tolerance is improved by 80%.

## Selection of CNC Controller



Heidenhain iTNC530 HSCI

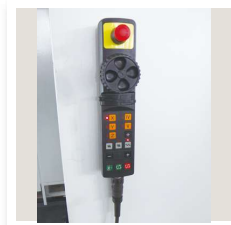


Siemens 840D sl

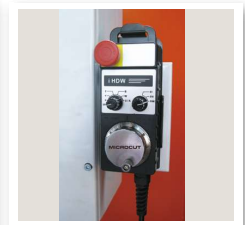


Fanuc 31i/32i

### Portable MPG



Portable control panel  
Heidenhain



Portable control panel  
Fanuc/Siemens

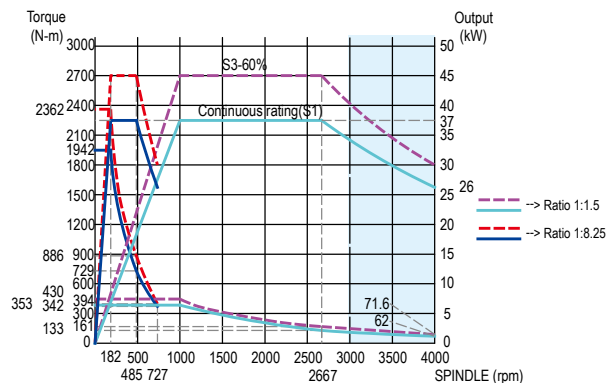
All systems provide full control of 5 axes, especially Heidenhain controller comes with spindle rotation function.

Control system in basic configuration consists of:

- Standard software functions
- 15" color display (Heidenhain) / 10.4" color display (Fanuc/Siemens)
- Operational panel with keyboard
- Auxiliary portable control with electronic hand wheel
- Tool management

## FANUC control

Torque / Horsepower Chart Data	
Spindle Taper	ISO BT50
	CAT50
	DIN 69871
Spindle Speed	4000 RPM
Spindle Motor	FANUC ai40/6000
Motor Output	37 / 45 kW
Gear Ratio	1:1 / 1:5.5
Pulley Ratio	1:1.5





## Machine Features

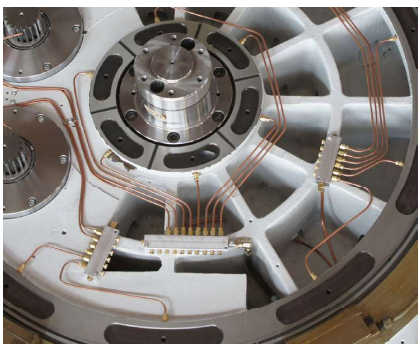
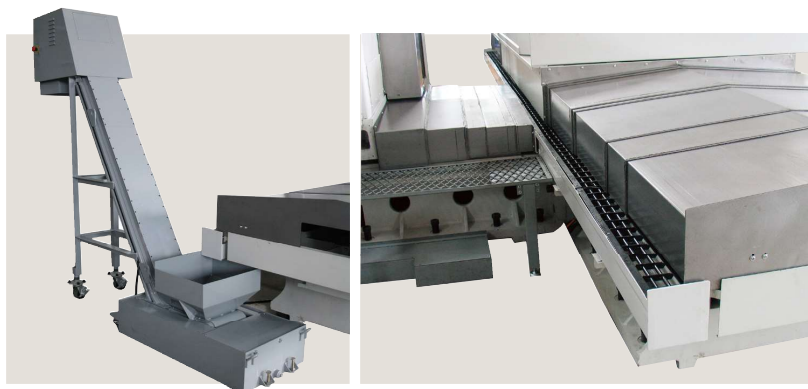


### High Precision Ballscrews

- C3 class ballscrews with double nuts are applied on X/Y/Z/W axes which offer high axis accuracy and less deforming under axial force.
- All the ballscrew nuts are preloaded to ensure less tension deforming, and the ballscrews are with thermal compensation.
- When the axis travel is three meters and above, the ballscrew supporter comes along as standard component to prevent the ballscrew deformation and ensure smooth axis travel.

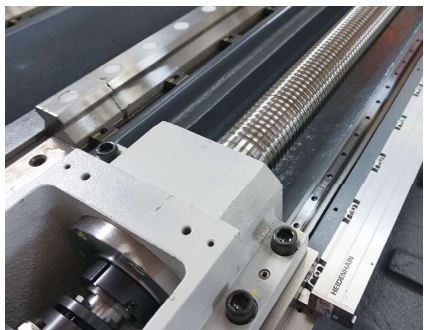
### Chip Arrangement

- Machine is equipped with chip auger for easy chip collection.
- Floor chip conveyor is available for request.



### Lubrication System

- Automatic lubrication system uses pressure-released type lubricator; oil volume is controlled according to distribution values metered.
- Oil is supplied according to the lubrication oil demand of the sliding surface and the ballscrew.
- Oil level detector unit is provided.
- Alarm will be shown on the screen when an oil shortage occurs. Sealed type spindle bearings are lubricated by grease.



### Measuring System

#### X/Y/Z axes -

All three axes are equipped with absolute linear scale.

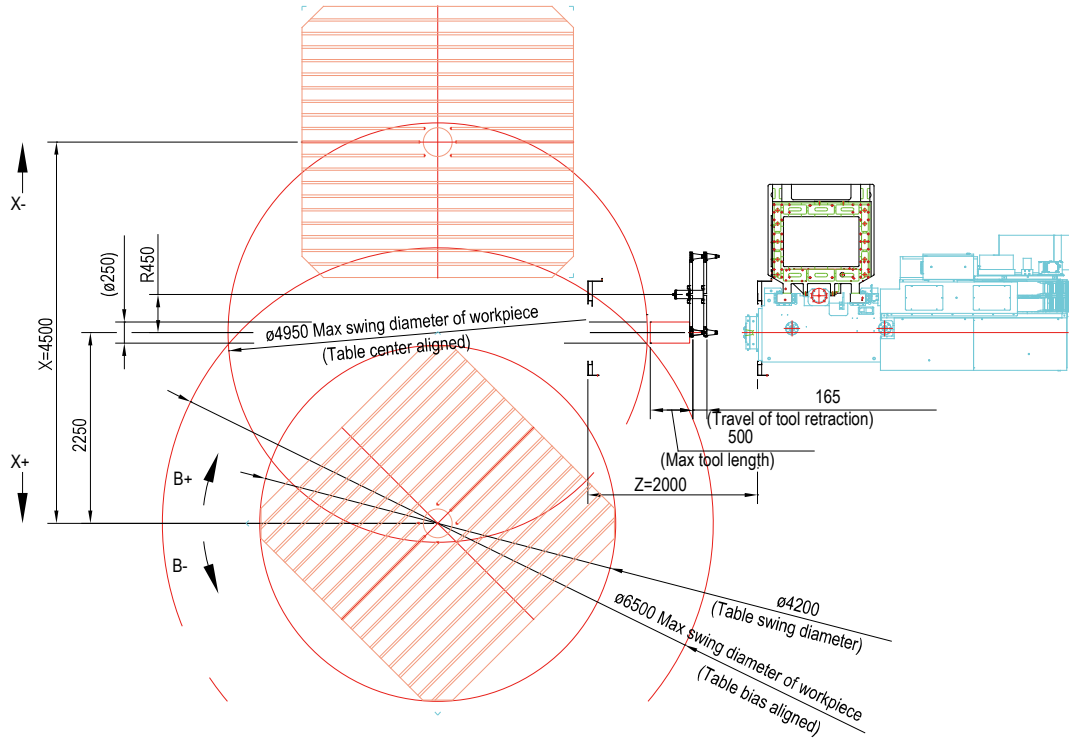
#### W axis -

The W axis is measured by the axis servo motor.

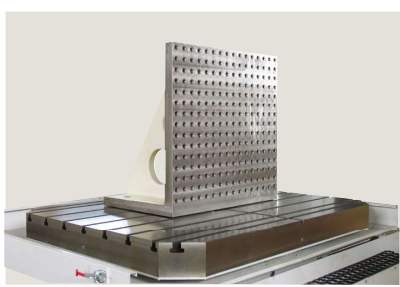
#### Rotary table -

The rotary table is integrated with rotary encoder, providing accuracy of 0.001mm.

# Interference drawing



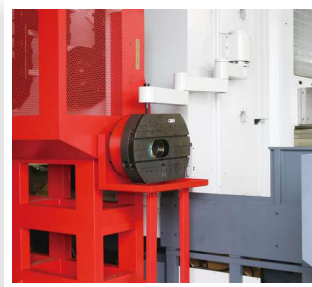
## Optional Accessories



Angular block



Table guard with folding door



Support stand and rotary arm  
(Only available on HBM-4)



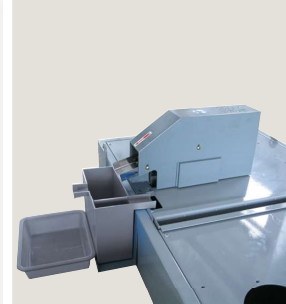
Safety module



Air conditioner



CTS unit



Oil skimmer

# Technical Data

Item	Model	HBM-140RT	Item	Model	HBM-140RT
<b>Table</b>			<b>Motor Output</b>		
Table size		3200mmx3200mm (std); 3500mmx3500mm (opt)	Axes motor (X/Y/Z/V/W /B1/B2)		65/65/38/65/30/22/22 Nm
Table height		2015mm	Hydraulic motor		Main hydraulic unit 7.5kW; Tbman hydraulic unit 4kW
T-slot (Dim/pitch/No.)		28mmH8/160mm/19 (std); 28mmH8/160mm/21 (opt)	Coolant motor		1.5 kW
Max. table load		20,000kg(std)/40,000kg(opt)	Lubrication pump motor		25W
Table index		0.001°	<b>Guideway</b>		
Rotary table positioning accuracy		15 seconds	X axis guideway type		Linear/ 65mm(Roller)
Rotary table repeatability accuracy		4 seconds	X axis guideway distance		2150mm
Rotary table encoder accuracy		±5 seconds	Y axis guideway type		Box way
<b>Travel</b>			Y axis guideway distance		1050mm
X axis		4500mm(std) 5500mm/6500mm(opt)	Z axis guideway type		Linear/ 65mm(Roller)
Y axis		3200mm(std) / 4500mm(opt)	Z axis guideway distance		2600mm
Z axis (RAM)		800mm	<b>Axes Feed Rate</b>		
V axis (Column)		2000mm	X/Y/V rapid feed		10/10/10 m/min
W axis (Quill)		700mm	B axis cutting feed		1rpm
Spindle nose to table center		80~3580mm	<b>ATC System (Opt)</b>		
<b>Spindle</b>			ATC type		Arm
Spindle taper		ISO 50	No. of tool		60
Transmission		Gear	Tool shank type		BT/CAT/DIN #50
Spindle speed		35~3000rpm	Tool changing time (T-T)		19 seconds
Spindle output		37/45kW (std)	Max. tool diameter		ø125mm
Spindle torque		1942Nm/2362Nm (std)	Max. tool dia. w/ next tool empty		ø250mm
Spindle step		2 steps	Max. tool length		500mm
Quill diameter (W axis)		ø140mm	Max. tool weight		25kg
Spindle bearing I/D		ø180/250mm	Max. loading weight		900kg
<b>Axes Transmission</b>			<b>Dimension</b>		
X axis ballscrew		ø80mm x P20 x C3	Length		10000mm
Y axis ballscrew		ø100mm x P20 x C3	Width		(X travel 4500) 9800mm (X travel 5500) 11050mm (X travel 6500) 11850mm
Z axis ballscrew		ø63mm x P25 x C3	Height		7800/9000mm
W axis ballscrew		ø80mm x P20 x C3	Weight		125000kg

\*Specifications are subject to change without notice.

## Standard Accessories

- CTS preparation
- Spindle oil cooling system
- Chip conveyor(incl. water tank and oil skimmer )
- Linear scale for three axes
- Heat exchanger
- Operation station
- Hoist ring set

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