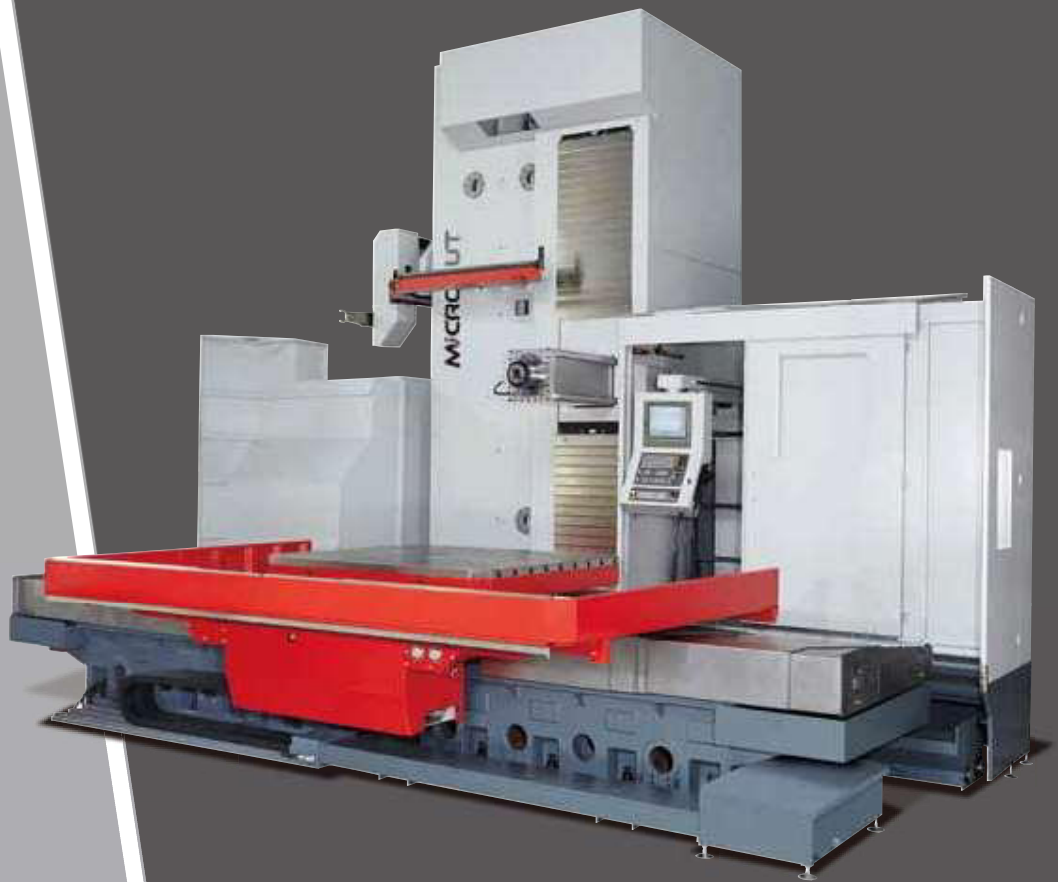


# MICROCUT



## HM-RT/RTL

Universal Horizontal Mill



National Award  
of Outstanding



ISO 9001:2015  
FM 538421



ISO 14001:2015  
EMS 546518



ISO 50001:2011  
ENMS 642457

# HM-RT/RTL

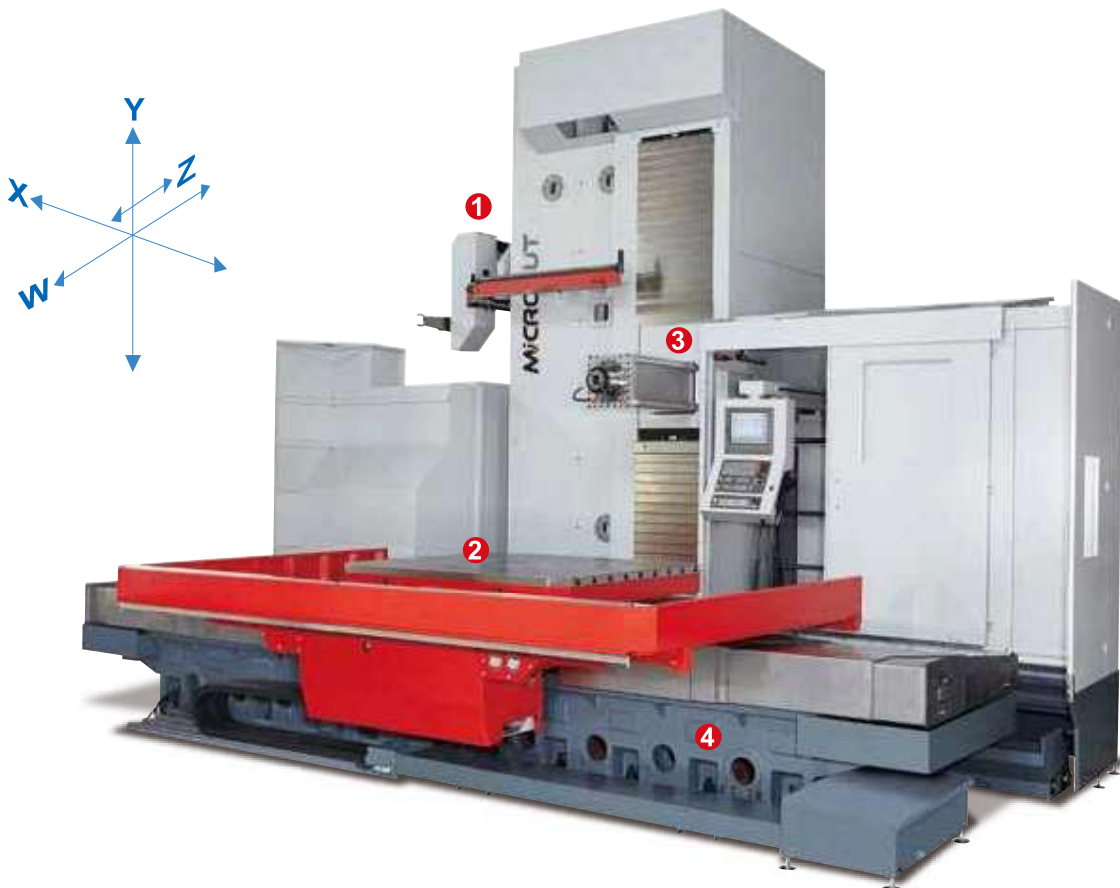
## High Speed Universal Horizontal Mill

MICROCUT high speed universal horizontal mill, HM-RT/RTL provides 12000rpm spindle speed with ISO50 spindle taper. The large working capacity with Ram head and roller type liner guideways on X/Z/W axes. The X-axis travel range is from 2000mm to 3500mm while Y axis is 2000mm and W axis is 1400mm. The availability of table loading is up to 20 tons.

This high precision, great rigidity and excellent accessibility moving column machine with roto-translating and high torque built-in spindle provide better metal removal rate and superior productivity.

HM-RT/RTL can be widely used in the diversification application includes the chemical, paper, plastics, steel, machine tool, automotive, construction, die and mold and aerospace industries.

- 1 ▪ Arm type ATC with 60 tools is available for selection, more tool pockets are available for selection.
- 2 ▪ Large working table and moving column allow big working piece machining
  - Table size: 1600mm x 1800mm (RT) / 2000mm x 2200mm (RTL)
  - Table loading: 10 Tons (RT) / 20 Tons (RTL)
  - 0.001 degree high indexing accuracy rotary table
- 3 ▪ Rigid high-speed spindle with 12000rpm, ISO#50
  - Applied with Spindle Vibration Supervision (SVS) function and Straightness Compensation Technology (SCT)
- 4 ▪ Rigid cast iron construction provides excellent mechanical stability



## Highlights

- High speed built-in spindle with 12000rpm, ISO 50 and fitted with automatic 2-step speed changer
- AC servo motor providing extremely high torque, power and axis force.
- Meehanite licensed cast iron construction
- Roller type linear guideways on X/Z/W axes and box way on Y axis
- High precision C3 class ballscrews with double nuts
- High indexing accuracy rotary table with 0.001 degree rotation
- Linear scales for 3 axes & angle encoders on B axis
- Mechanical counter weight
- Chip auger device is provided
- Automatic central lubrication system
- Low voltage circuit control system & EC Conformity
- Spindle Vibration Supervision (SVS)
- Straightness Compensation Technology (SCT)

## Rotary Table

High indexing accuracy rotary table with 0.001 degree rotation

Table size available:

HM-RT: 1600x1800mm table loading 10 tons

HM-RTL: 2000x2200mm table loading 20 tons



The table is designed with dual planetary gear reducer to ensure backlash free.

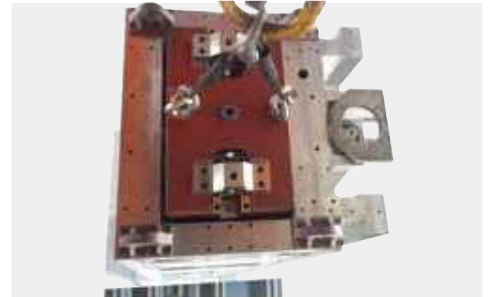


The angle encoder is equipped to enable the automatic positioning of the table at increments of 0.001 degree

# Guideways



- The box way construction of Y axis provides rigid moving of headstock.
- Fabricated from robust cast, the machine column and slide are jointed in one unit which provides maximum rigidity and strength of the slide/column structure.
- Y axis is driven by a braking motor and N.C. electromagnetic braking system is adopted at the end of ballscrew as security mechanism.



The mechanical counter weight with holding device is equipped to ensure a smooth Y-movement and multi-axis simultaneous movement. It is ideal to enhance headstock stability and to produce better finish.

- Roller type linear guideways on X/Z/W axes for rigid structure and high speed movement.
- **HM-RT**: 2 linear guideways for X axis and 3 linear guideways for W axis.
- **HM-RTL**: 3 linear guideways for X and W axis

**HM-RT**



2 linear guideways for X axis

**HM-RTL**



3 linear guideways for X and W axis



Linear scales are fitted on X, W and Y axes for absolute positioning accuracy.



High precision C3 class ballscrews with double nuts are applied on all axes.

# Spindle

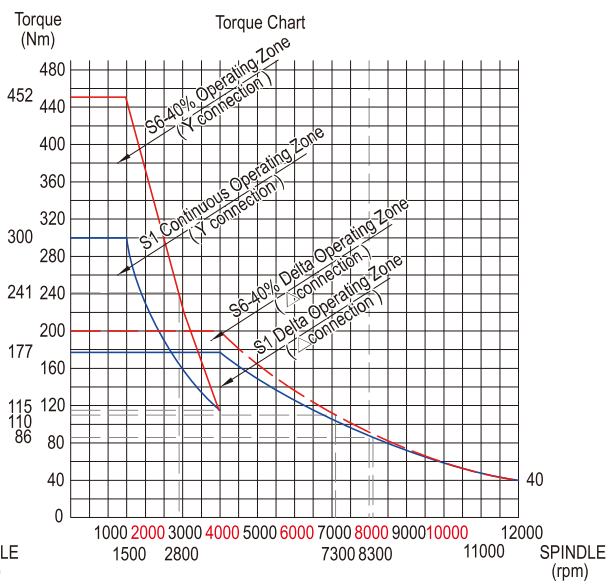
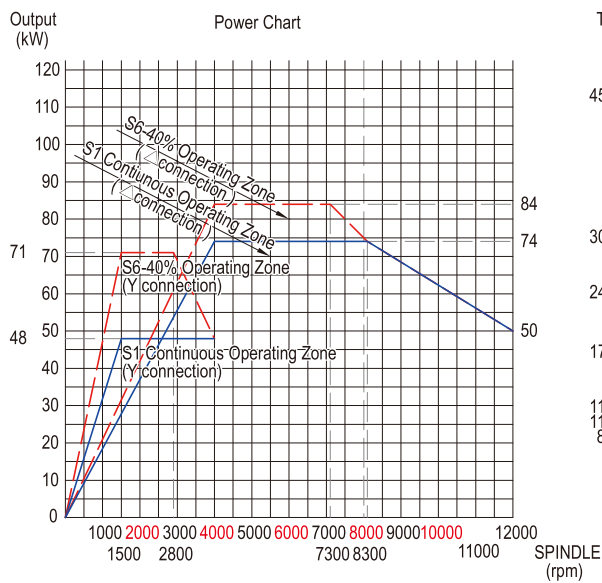
Built in spindle with 12000rpm spindle speed and ISO 50 spindle taper



HM-RT/RTL is equipped with the rigid spindle with 4 linear guideways structure RAM and fitted with automatic 2-step speed changer to provide high torque output. The spindle motor is Y-Δ motor and can prepare machine with high torque output during low spindle speed for heavy duty cutting. The spindle speed is available up to 12000 rpm for fast cutting.

## Power and Torque Chart

12000rpm




Torque / Power Chart Data	
Spindle Taper	BT50
	ISO HSK A100
	SK50
Spindle Speed	12000 RPM
Motor Output	74 / 84 kW

# Smart Machining Technology

The patented functions of Straight Compensation Technology (SCT) and Spindle Vibration Supervision (SVS) of Smart Machining Technology have been applied on the HM series for better spindle performance and to ensure the machining accuracy.

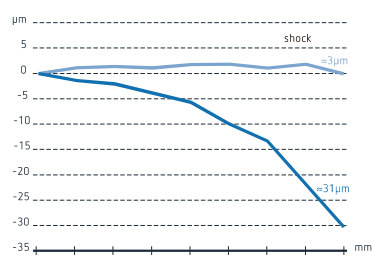
**SCT**



Hydraulic compensation mechanism is constructed based on AutoCAD ANSYS simulation to ensure the linearity of ram movement and keep high accurac

- > **DEFORMATION RESISTANCE CAPACITY**  
Structural designing for manageable deformation control
- > **INTEGRATED COMPENSATION MECHANISM**  
Monitored and feedback by hydraulic pressure numerical control

**EXPERIMENT**




Max dev. without compensation 31µm.  
With compensation, the tolerance is within +/- 3µm.

- Without compensation
- With compensation

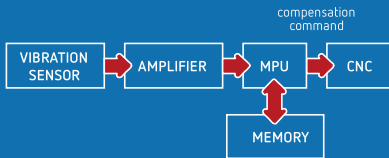
**TOLERANCE IMPROVED**  
**80%**

**SVS**

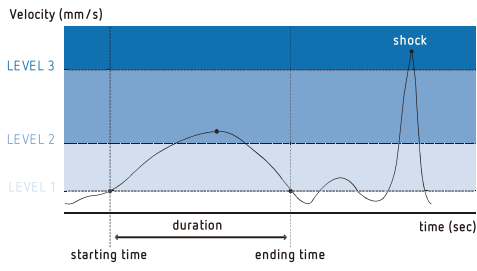


How to real-time monitor the spindle vibration to remain the machining accuracy under long time operation?

- > **HIGH FINISH QUALITY**  
Spindle Life Time
- > **LONGER LIFE TIME**  
Wear reduction on spindle
- > **EASY FOR MAINTENANCE**  
Abnormal vibration data recording



**THREE LEVELS FOR SPINDLE VIBRATION MONITORING**



**LEVEL 1**  
shows the warning message to notify operator

**LEVEL 2**  
shows the error message and reduces spindle speed and feed rate

**LEVEL 3**  
machine shut down immediately to prevent crash

# Features

## Chip management



- Chip auger is stalled in the front side of table to collect chips which will save user's time on floor cleaning and keep the working environment clean.
- Floor chip conveyor is available on request.

## Automatic central lubrication system



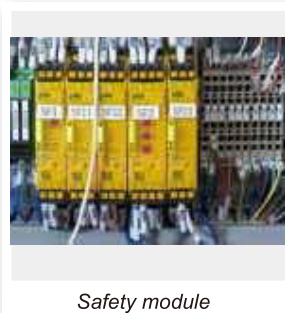
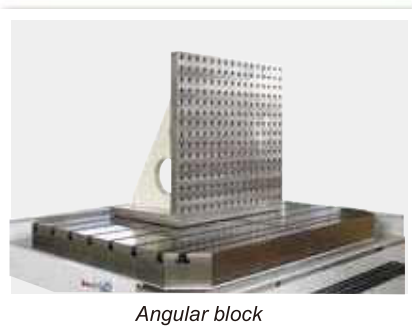
Pressure-relief type of lubrication system is used to assure sufficient lubricating oil in pipes. The lubrication points of distributor supply a fixed flow of oil. A float switch can detect the volume of oil to each terminal. When the oil is lower than the level, abnormal signal is sent and system will make alarm automatically. The pumping time and break time is adjustable by PLC.

## Coolant system



Coolant pump for spindle nozzle is equipped with checked valve.

## Optional accessories



# Control



Heidenhain iTNC530 HSCI  
TNC 640



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.**

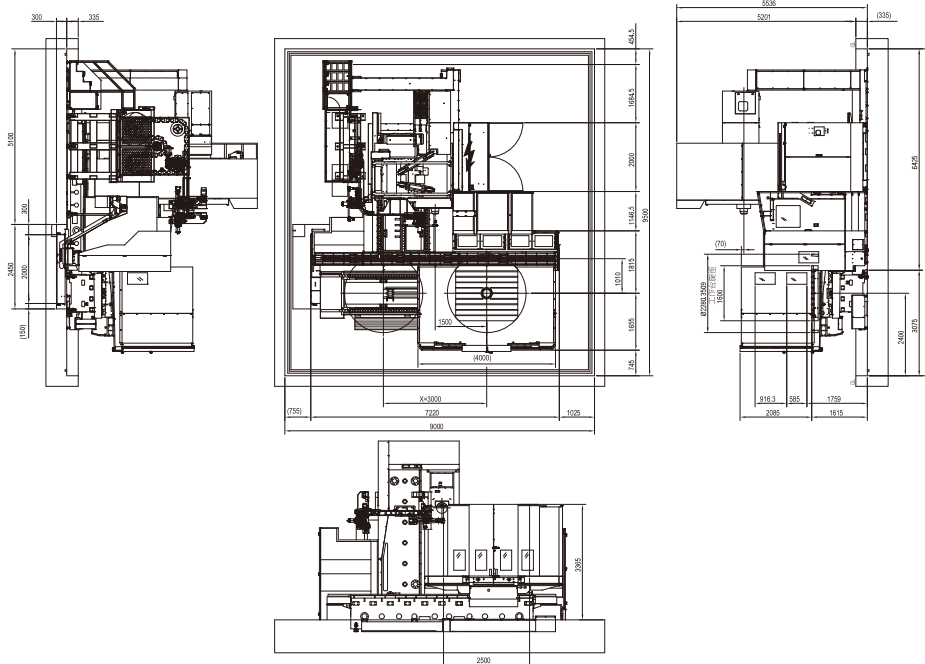
Control system in basic configuration consists of:

- 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

# Layout

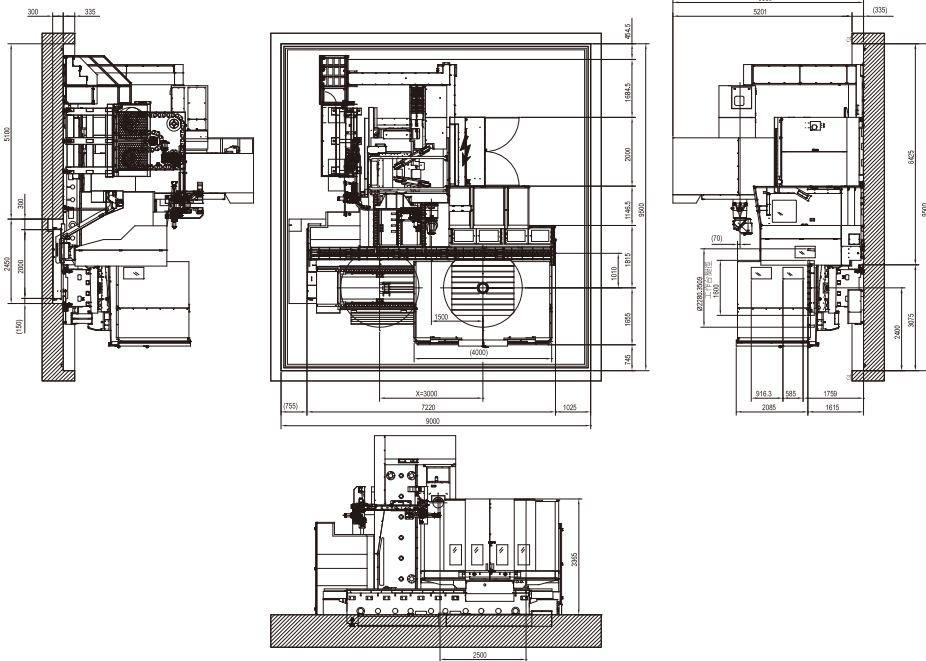
## HM-RT

Table 1600 x 1800 (mm) Travel X/Y/W 3000/2000/1400 (mm)



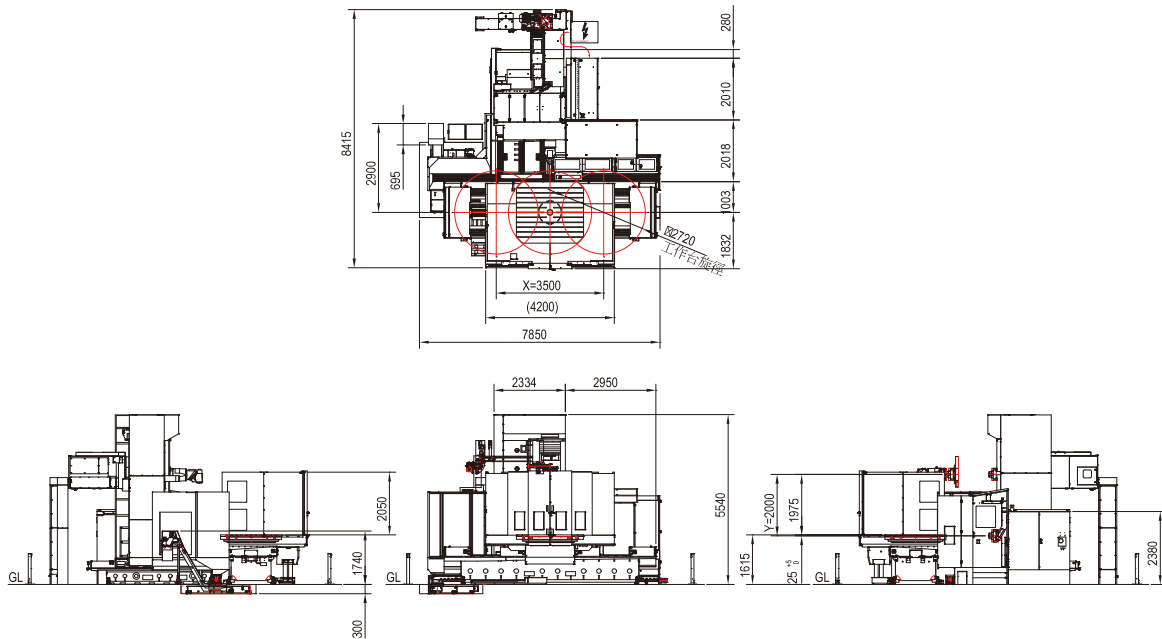


**Table 1600mm x 1800 (mm) Travel X/Y/W 3000/2000/1400 (mm) With universal head (option)**



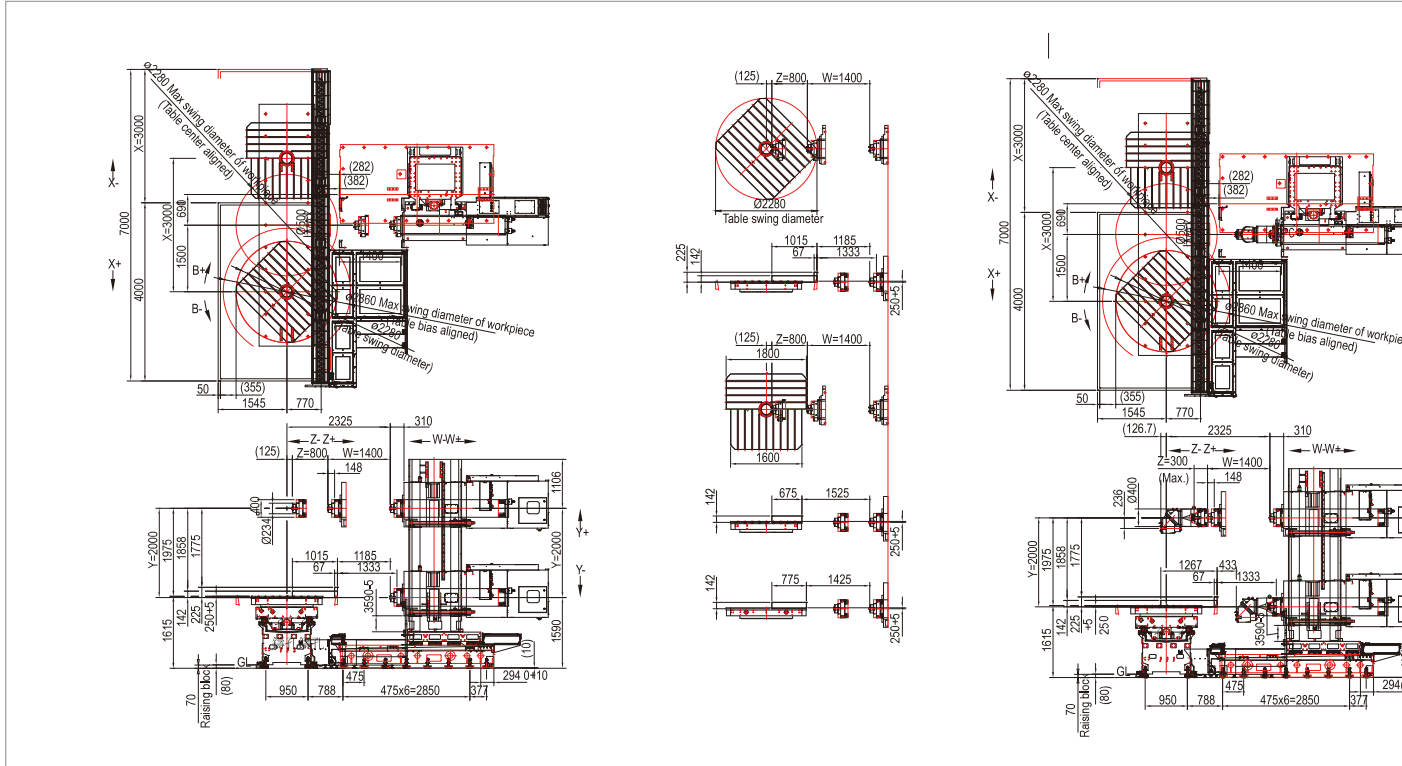
## HM-RTL

**Table 2200 x 2200 (mm) Travel X/Y/W 3500/2000/1400 (mm) With universal head (option)**

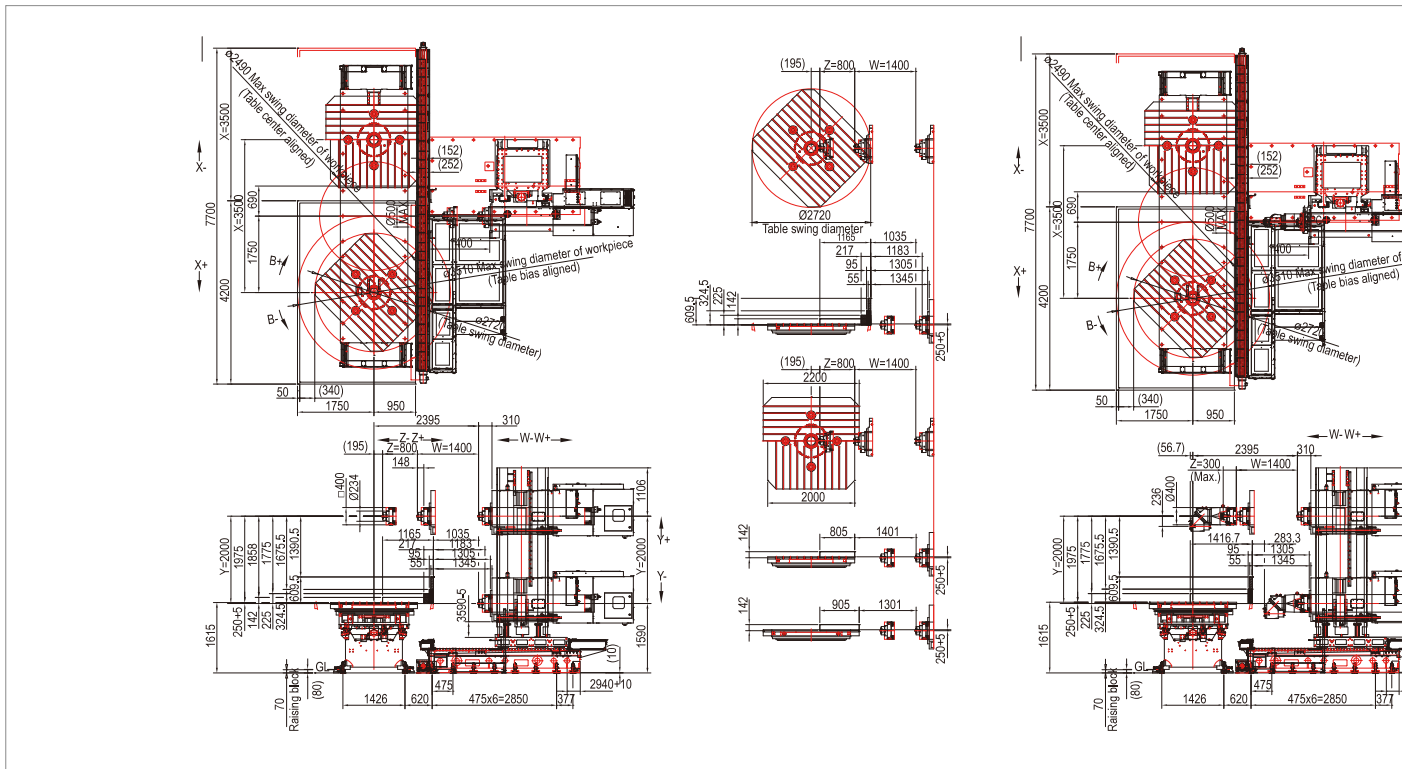


# Interference drawing

**HM-RT** Table 1600 x 1800 (mm)  
Travel X/Y/W/Z: 3000/2000/1400/800 (mm)



**HM-RTL** Table 2000 x 2200 (mm)  
Travel X/Y/W/Z: 3500/2000/1400/800 (mm)





# Technical Data

Item	Unit	HM-RT-20	HM-RT-30	HM-RTL-35
<b>TABLE</b>				
Table size	mm	1600 x 1800		2000 x 2200
Table height		1280		1280
T-slots (width x P x No.)	mm	24H8 x 160 x 9		24H8 x 160 x 9
Max. table load	Ton	10		20
Table index	degree	0.001°		0.001°
<b>AXIS TRAVEL</b>				
X axis	mm	2000	3000	3500
Y axis	mm	2000		2000
Z axis		800		800
W axis	mm	1400		1400
<b>SPINDLE</b>				
Spindle taper	ISO	ISO 50		ISO 50
Spindle transmission		Built-in		Built-in
Spindle speed	rpm	12000		12000
Spindle output	kW	74/84		74/84
Distance between spindle nose to table center	mm	70~2170		70~2170
<b>AXES TRANSMISSION</b>				
X axis ballscrew	mm	Ø80 x P10 x C3		Ø80 x P10 x C3
Y axis ballscrew	mm	Ø100 x P20 x C3		Ø100 x P20 x C3
Z axis ballscrew	mm	Ø63 x P25 x C3		Ø63 x P25 x C3
W axis ballscrew	mm	Ø80 x P10 x C3		Ø80 x P10 x C3
<b>AXES FEED RATE</b>				
X/Y/Z/W axis	m/min	10/10/10/10		10/10/10/10
B axis	rpm	4.2		3.4
<b>GUIDEWAY</b>				
X axis guideway type		2 Linear Guideway / 65mm (Roller)		3 Linear Guideway / 65mm (Roller)
X axis guideway distance	mm	1010		1010
Y axis guideway type		Box way		Box way
Y axis guideway distance	mm	1050		1050
W axis guideway type		3 Linear Guideway / 65mm (Roller)		3 Linear Guideway / 65mm (Roller)
W axis guideway distance	mm	2600		2600
<b>ATC SYSTEM</b>				
ATC type		Arm type		Arm type
No. of tools	T	60		60
Tool shank type		BT / CAT / DIN 50		BT / CAT / DIN 50
Tool Changing Time (T-T)	sec	16		16
Max. tool diameter	mm	Ø125		Ø125
Max. tool diameter w/ next tool empty	mm	Ø250		Ø250
Max. tool length	mm	300 / 500		300 / 500
Max. tool weight	kg	25		25
Max. loading weight	kg	900		900
<b>DIMENSION</b>				
Length	mm	8400		8650
Width	mm	7250	7750	7600
Height	mm	5550		5550
Floor space	mm	9000x9500	9000x9500	9000x9500

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