Challenger

Microcut

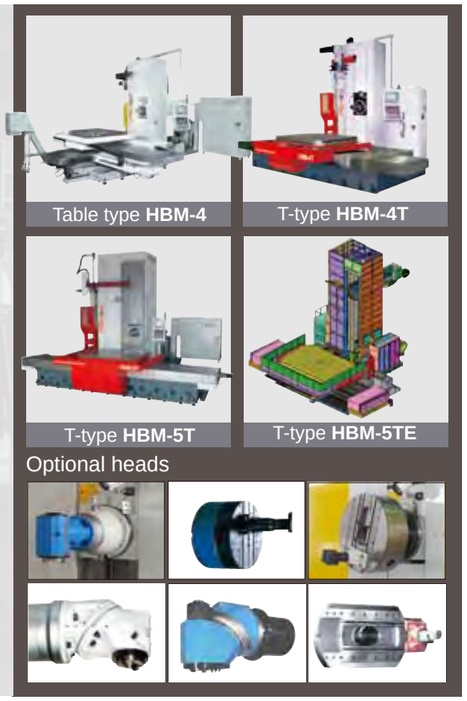
CNC Horizontal Milling and Boring Center

HBM LINE

ISO 14001:2004
EMS 546518

ISO 9001:2008
FM 538421

Nov. 2010



Buffalo machinery has been well known for its brand name –Microcut and Challenger. It has been established in 1978 and began its production since 1997, keeping pace with the modern demands of metal cutting industry. Through its unceasing pursuit of best quality and service, Buffalo Machinery delivers machine tools with innovative and efficient value all over the world. The entire production includes 8 premises and still keeps expanding with the market demand. Microcut/Challenger delivers highest value to customers and achieves 50% of its turnover in Europe. It will be Buffalo Machinery who is your best partner, providing highest quality and service!

High quality production standard and its quick service of Microcut/Challenger were recognized by the certification of ISO9001 and its environmental activities comply with ISO 14001 regulation.

Microcut/Challenger satisfies each customer with the reliable machine. To offer maximum productivity and profit, medium size table type horizontal borer is developed and larger floor type borer is also under development. The HBM line is widely productive in power industry, transportation, mining, oil & gas industry, mold and steel construction. Both quill and ram type are available. There is a wide range of table loading capacity for selection.

HBM-4

Travel: X, Y, Z 2200 x 1600 x 1600mm
W 550mm
Maximum load on table center: 5 tons
Spindle torque: 740NM(std.) / 863NM(opt.)
Spindle diameter: 110mm
Spindle motor: 15/18.5KW(std.) /18.5/22KW(opt.)
Construction of one-piece bed is optional.

HBM-4T

Travel:
X: 2000 (std.) / 3000 mm(opt.)
Y, Z: 2000 x 1400mm
W: 700mm (std.)
Maximum load on table center:
8 tons (std.) / 10 tons (opt.)
Spindle torque: 1976NM
Spindle diameter: 130mm
Spindle motor: 22/30KW

HBM-5T

Travel:
X: 3500mm (std.) / 4500mm (std.) / 5500mm (opt.)
Y: 2600mm (std.) / 3200mm (opt.)
Z: 1400mm (std.) / 2000mm (opt.)
W: 700mm (std.)
Table size:
1800 x 2200mm-10 tons(std.)/15 tons(opt.)/20 tons(opt.)
Spindle torque: 2362NM
Spindle diameter: 130mm
Spindle motor: 37/45KW

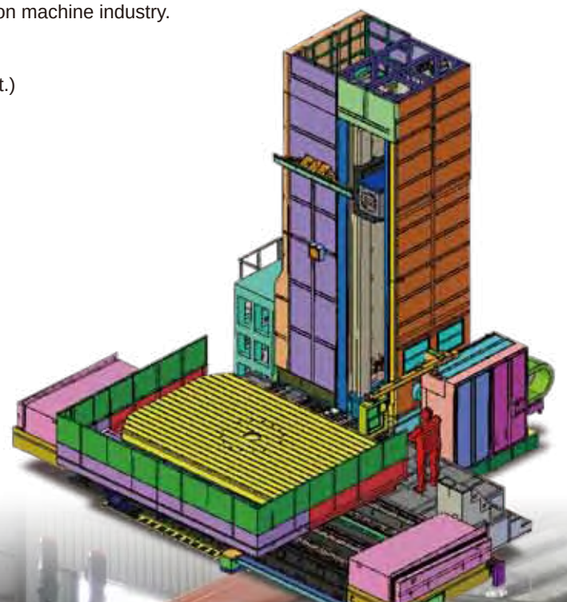
CNC Horizontal Milling and Boring Center

HBM-5TE

HBM-5TE is a horizontal boring and milling machine with T-type construction equipped with extremely large Y- travel. A powerful CNC unit provides a multiple axis controll continuously. It provides powerful function, high technology and high cutting capacity for large and heavy workpiece. HBM-5TE is especially suitable for LCD industry, mold, injection mold, power generating equipment and construction machine industry.

Travel:
- X: 4500mm (std.) / 5500mm (opt.) / 6500mm (opt.)
- Y: 4300mm
- Z: 1450mm / 2000mm(opt.)
- W1: 700mm
- W2: 1000mm

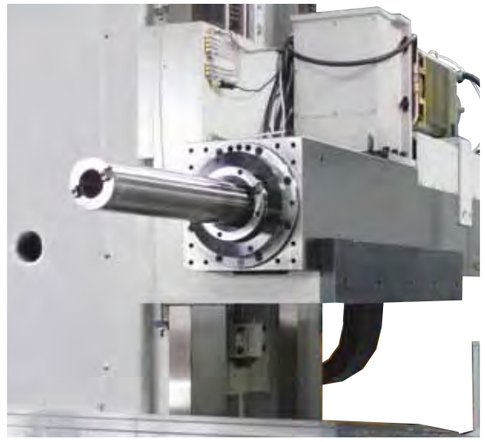
Table size:
4500 x 3000mm - 15 tons (std.) 20 tons (opt.)
3200 x 3200mm - 40 tons (option)
Spindle torque: 2362NM
Spindle diameter: 130mm
Spindle motor: 37/45KW

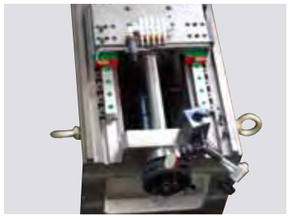


High-performance spindle

Designed for deep hole boring

Spindle designed with cylindrical roller bearing (double roller) is capable for heavy duty machining. Ground spindle and sleeve provides high precise accuracy. Spindle speed up to 3000rpm enables high speed machining. Moreover, spindle is prepared for coolant through spindle with high pressure pump system and anti-vibration control.

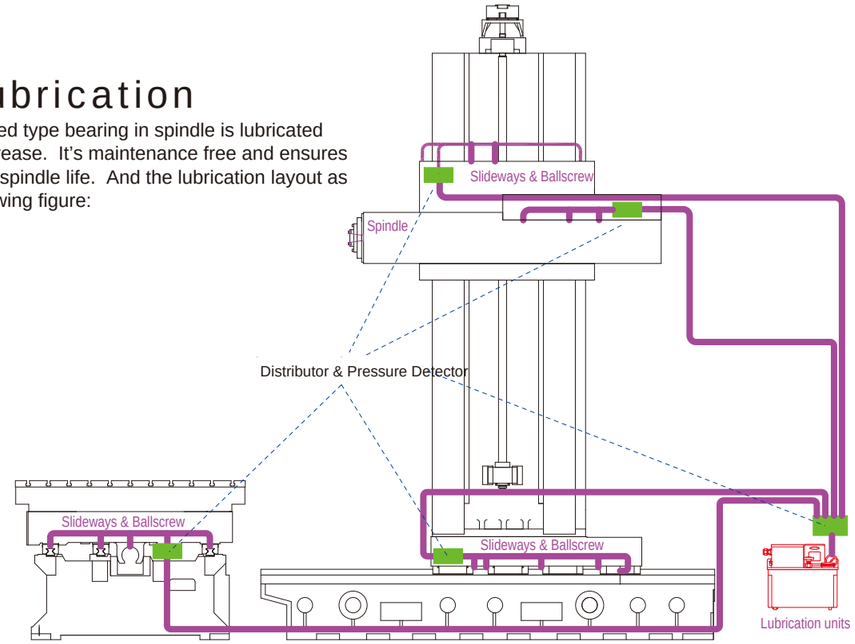




The spindle and sleeve are made of chrome alloy steel under hardened and ground treatment. The hardness is around HRC52-55. The box type spindle housing provides strong rigidity and ISO 50 taper spindle can work with extremely high removable rate.

Lubrication

Sealed type bearing in spindle is lubricated by grease. It's maintenance free and ensures long spindle life. And the lubrication layout as following figure:



SVS

Spindle Vibration Supervision

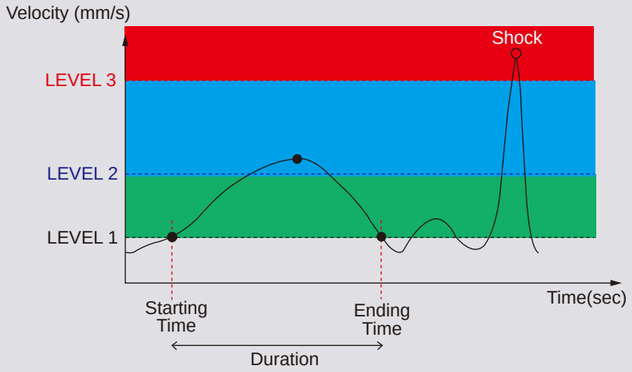
High finish quality
•Spindle vibration suppression

Longer life time
•Wear reduction on spindle bearings and tools

Information recorder
•Abnormal vibration data recorded for maintenance

Spindle Vibration implies lots of important information such as unusual spindle conditions (e.g.lubrication shortage, worn bearings, out-of-balance or even crash). Also, the vibration information can be used as the index of chatter-free control to eliminate the undesired chattering during machining. A motion sensor is integrated into the spindle to gather the vibration data. According to the recorded vibration data, the status of the spindle and machine can be identified.

If the vibration is over the setting level, three data will be recorded.



Three levels for spindle vibration monitoring:

- First level: shows the warning message when the vibration occurs and notifies the operator.
- Second level: shows the error message and reduces spindle speed and feed rate.
- Third level: when vibration reaches level 3 the machine will be shut down immediately to prevent crash.

Fig.1 Vibration report before compensation

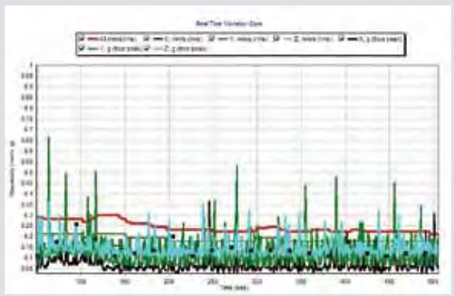


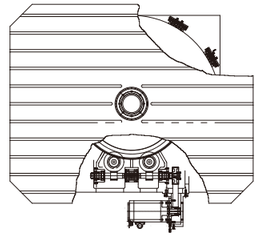
Fig.2 Vibration report after compensation

Precision rotary table

The continuous rotary table is equipped with a high resolution HEIDENHAIN encoder. The direct measuring and feed back to CNC provide high precision. The encoder is well-protected and sealed on top of table, easy for maintenance and trouble shooting. The automatic positioning of the table is at increments of 0.001˚

Heidenhain ±5″ rotary encoder

Highlights
•Table rotation speed: 1.5 rpm.
•Positioning accuracy: 15 sec.
•Repeatability: 4 sec.
•Feed driven by AC servo-drives & two worm gear systems
•10 Tons (std.) / 15 Tons (opt.) / 20 Tons(opt.) / 30 Tons(opt.) load capacity

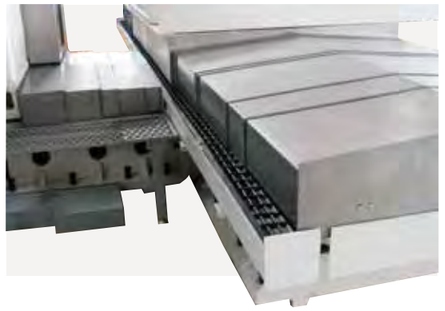


Strongly ribbed and stable casting construction. The upper table is available optionally in high quality grey casting. For maintenance work, the table can easily be taken off without disassembly of the saddle unit.

A massive size of high accuracy rotary table carries large loading capacity. It is made by Meehanite licensed casting with hardness HB180-220. 10 tons loading capacity as standard, 15 tons 20 tons, and 30 tons are available on request. Two circles of lubrication on rotary table contact and supported by 3 rings makes table rotates smoothly. Digitally controlled AC servo-drives and double worm gear driving system ensure backlash free after using for span.

Chip removal

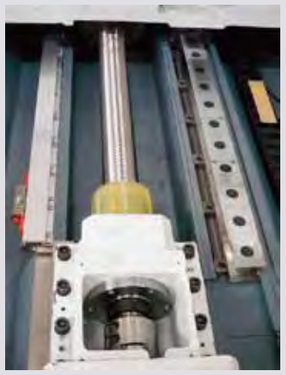
Machine is equipped with chip auger carries out most of chips produced from machining area to chip trolley.
Floor chip conveyor is available on request for automatic chip collecting from chip augor.



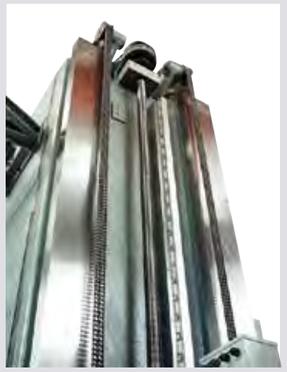
Precise and reliable movement

All major structural components are Meehanite licensed casting with stress released, ensuring maximum stability and rigidity.

The extra-wide roller type linear guide ways for X/Z axes offer high speed, stable movement and rigidity. This will be easy for maintenance. It is hardened & ground at hardness HRC 52-55. The bearing surface of headstock bracket is applied with Turcite B. The X/Y/Z axes are standard with 1μm linear scale, and B axis with angle scale provides the best accuracies.



ballscrews



Box guide way

C3 double nut, high class precision ballscrews

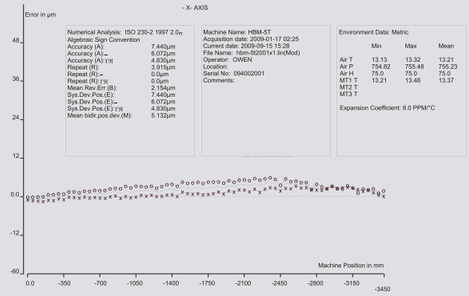
C3 class ballscrews with double nuts are applied on X/Y/Z/W axes which offer high axis accuracy and less deforming under axial force.
All the ballscrew nuts are preloaded to ensure less tension deforming. Moreover, ballscrews are pre-tensioned for thermal compenstation. The large diameter and high precision (C3) ballscrews with supporter drives axes in most smooth motion.

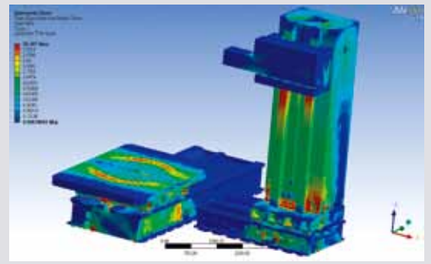
Column with box guide way

Extra wide box guide ways withstands the cutting force of powerful machining. Hydraulic counter weight is ideal for headstock stability and thus furthermore offers perfect surface finishing.

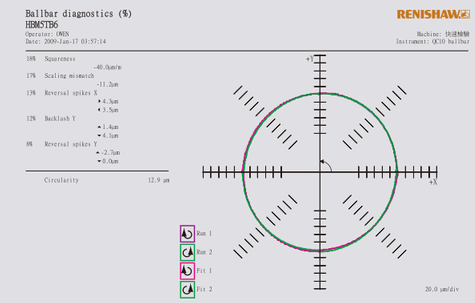
Geometrical test for high accuracy

The geometrical accuracy is tested according to ISO 3070-2 standard and the repeatability and positioning accuracy is tested according to the ISO230-1. And it is approved by laser equipment. Moreover, all machines roundness is approved by Ball bar measurement and with roundness within 12μm.
All the geometrical testing is finished after 24 hours full function runing then a cutting test is conducted on machine and the full testing programs are saved in the CNC.





Strain and stress analysis ensures ideal structure of design and rigidity.



Controller

Fanuc 18i, 31i, Heidenhain iTNC 530, Siemens 840DSL / Standard CNC accessories

- Digital control display
- Controllable axes: spindle 5 axes
- Spindle orientation function:
  automatic tool change rigid tapping and ballbar diagnostics
- Optional axes
  U axis – NC facing head
  AC axis - universal milling head
- 10.4” or 15”(opt.) LCD controller screen
- MPG
- Interface RS 232 / High-speed network RS 422
- Ethernet

Option accessories

Automatic Multi-angular Head

Universal milling head

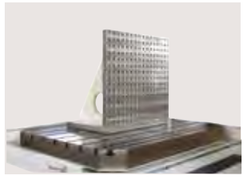
Angle milling head

Facing head (A)

Facing Head (B)

Extension sleeve

NC facing head



Angle plate

ATC 60T

ATC 28T(for HBM-4 only)

NC facing head

NC contour facing head

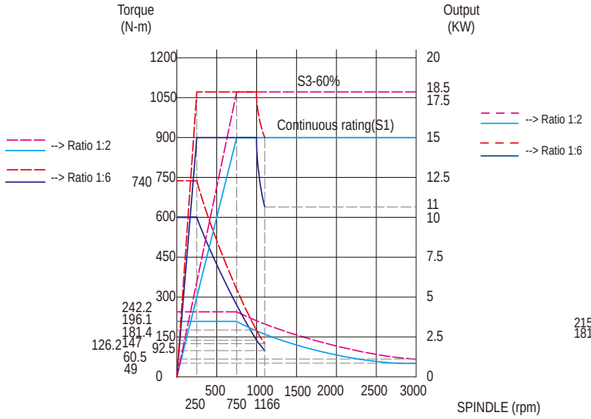
NC Facing head with spindle through(opt.)

Specifications

	Unit	HBM-4	HBM-4T	HBM-5T	HBM-5TE
Table					
Table size	mm	1200 x 1500(1") 1250 x 1500(0.001")	1400 x 1600(std.) 1600 x 1800(opt.)	1800x2200	4500 x 3000(std.) 3200 x 3200(opt.)
Table height	mm	1100	1250	1250	1985
T-slot(w/pitch/no)	mm	22H8x150x7	22H8x160x9	22H8x160x11	M22x160x19
Max. table load	tons	5	8(std.)/10(opt.)	10(std.)/15(opt.)/20(opt.)	15(std.)/20(opt.) 40(opt.-for 3200mm table only)
Table index	degree	1˚(std.)/0.001°(opt.)	0.001°	0.001°	0.001°
Rotary table positioning accuracy	sec.	15	15	15	15
Rotary table repeatability accuracy	sec.	4	4	4	4
Rotary table encoder accuracy	sec.	±5	±5	±5	±5
Travel					
X axis - standard	mm	2200	2000	3500	4500
X axis - option	mm	x	3000	4500 / 5500	5500 / 6500
Y axis	mm	1600	2000	2600	4300
Z axis - standard	mm	1600	1400	1400	1450
Z axis - option	mm	x	2000	2000	2000
W1 axis	mm	550	700	700	700
W2 axis	mm	x	800(opt.)	800(opt.)	1000
Distance between spindle nose to table surface	mm	0-1600	-25~1975	0~2600	-25~4275
Distance between spindle nose to table center	mm	105-2255	-65~2090	-100~2000	-100~3030
Spindle					
Spindle taper		ISO 50	ISO 50	ISO 50	ISO 50
transmission		Gear	Gear	Gear	Gear
Spindle speed	rpm.	35-3000	35-3000	35-3000	35-3000
Spindle output (Fanuc)	kw	15/18.5	22/30	37/45	37/45
Spindle torque	Nm	740 / 863	1976	2362	2362
Spindle step	sec.	2 step	2 step	2 step	2 step
Quill diameter (W axis)	mm	110	130	130	130
Spindle bearing I/D	mm	150	170	170	170
Axes Transmission					
X axis ballscrew	mm	ø55xP12xC3	ø80xP10xC3	ø80xP10xC3	ø80xP20xC3
Y axis ballscrew	mm	ø55xP12xC3	ø63xP10xC3	ø63xP10xC3	ø63xP20xC3
Z axis ballscrew	mm	ø55xP12xC3	ø80xP10xC3	ø80xP10xC3	ø80xP20xC3
W axis ballscrew	mm	ø40xP5xC3	ø40xP5xC3	ø40xP5xC3	W_1/W_2 ø40xP5xC3
Motor output					
Axes motor (X/Y/Z/B/W)	Nm	22/38/22/22/12	75/38/38/38/22	75/38/38/38/22	95/95x2/75/75/22x2
hydraulic motor	kW	3.75	7.5	7.5	7.5
Coolant motor	kW	1.7	1.7	1.7	1.7
Lubrication pump motor	W	25	25	25	25
Guide way					
X axis guide way type		Box way	Linear way	3 Linear way	4 Linear way
X axis guide distance	mm	700	1010	1250	2150
Y axis guide way type		Box way	Box way	Box way	Box way
Y axis guide distance	mm	540	1120	1120	1764
Z axis guide way type		Box way	Linear way	Linear way	Linear way
Z axis guide distance	mm	1000	954	1374	2600
Axes feed rate					
X/Y/Z/W rapid feed	m/min.	12/12/12/6	10/10/10/8	10/10/10/8	10/10/10/10
X/Y/Z cutting feed	m/min.	10/10/10/6	10/10/10/5	10/10/10/5	10/10/10/5
B axis cutting feed	rpm	5.5(1˚) / 2(0.001˚)	1.5	1.5	1.5
ATC system					
ATC type		Arm	Arm		
No. of tool		28/60	60		
Tool shank type		BT/CAT/DIN#50	BT/CAT/DIN #50		
Tool changing time(T-T)	sec.	9	16		
Max. tool diameter	mm	125	125		
Max. tool diameter with next tool empty	mm	250	250		
Max. tool length	mm	300/500	300/500		
Max. tool weight	kgs	25	25		
Max. loading weight	kgs	900	900		
Dimension					
Length	mm	7750	7800	8450(z1400)/9050(z2000)	10200
Width	mm	4715	7050/7800	6980/8420/9720	10200/11200/12200
Height	mm	3706	4600	5040	8115
Weight	kgs	22500	40000	49000	95000

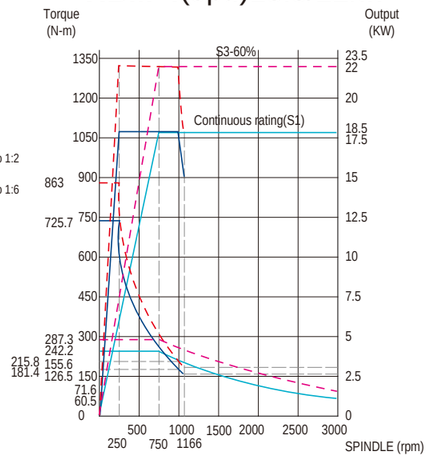
Torque & horse power chart

HBM-4(std.)15/18.5kw



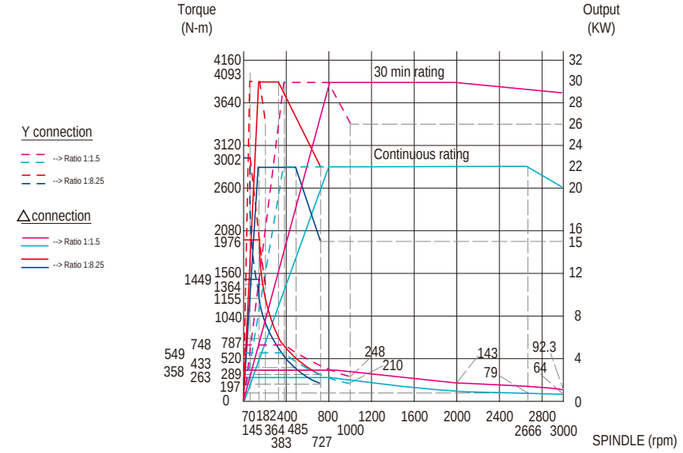
Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC α15/7000i
		CAT50	Motor Output	15 / 18.5 kw
	DIN	DIN 69871	Gear Ratio	1:2 / 1:6
Spindle Speed	3000 RPM		Pulley Ratio	-

HBM-4(opt.)18.5/22kw



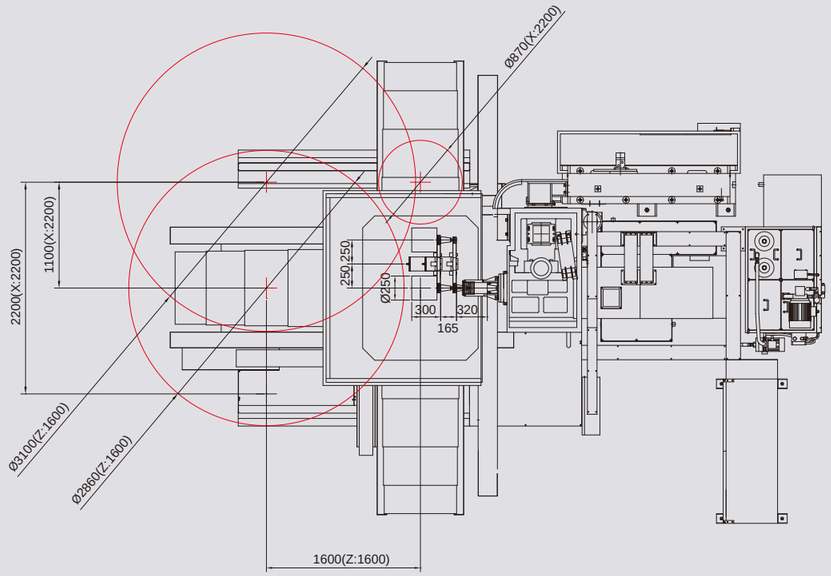
Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC £\18/7000i
		CAT50	Motor Output	18.5 / 22 kw
	DIN	DIN 69871	Gear Ratio	1:2 / 1:6
Spindle Speed	3000 RPM		Pulley Ratio	-

HBM-4T 22/30kw

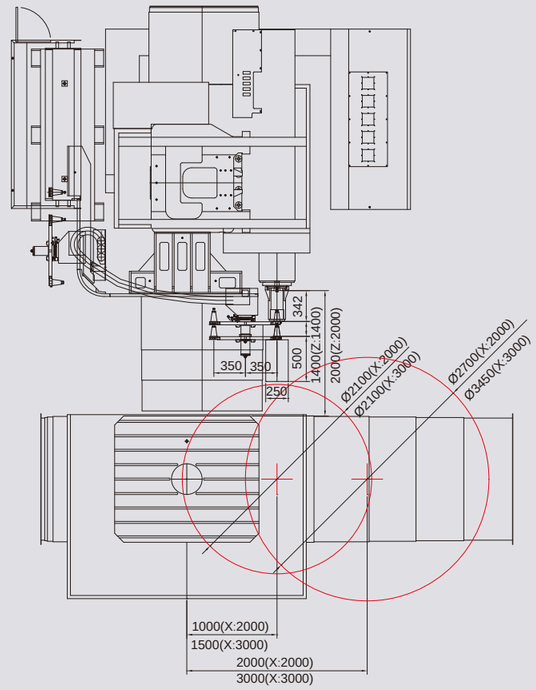


Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC aP50/6000i
		CAT50	Motor Output	22/30 kw
		DIN 69871	Gear Ratio	1:1 / 1:5.5
Spindle Speed	3000 RPM		Pulley Ratio	1:1.5

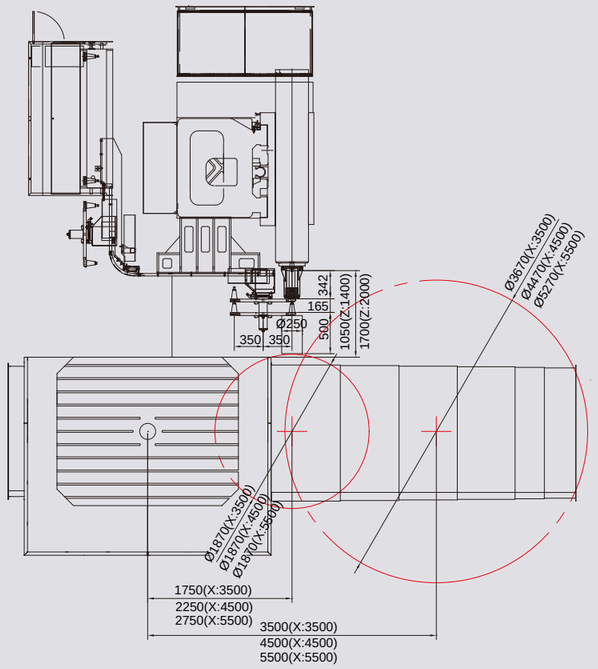
Interference drawing



HBM-4

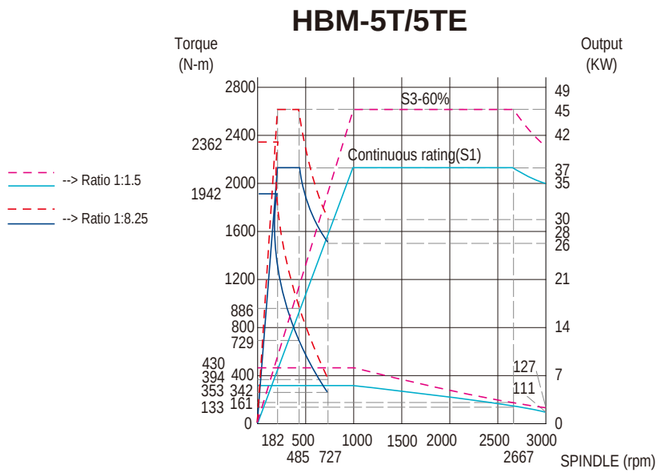


HBM-4T



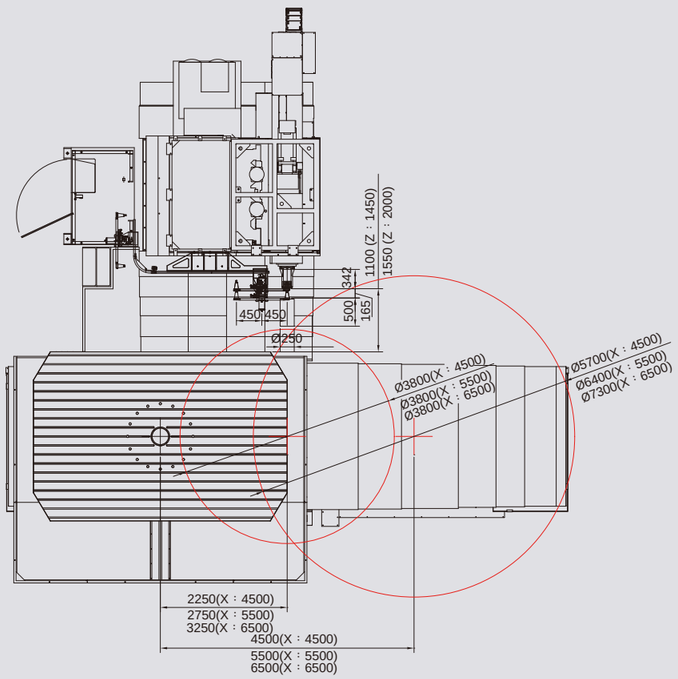
HBM-5T

Torque & horse power chart



Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC a40/6000i
		CAT50	Motor Output	37/45 kw
		DIN 69871	Gear Ratio	1:1 / 1:5.5
Spindle Speed	3000 RPM		Pulley Ratio	1:1.5

Interference drawing



HBM-5TE

Parts for Aerospace

Parts for Bulldozer

Motor Parts

Oil Tube

Parts for Ship

Parts of Bulldozer

Center machining

Machine Parts