Microcut

Challenger

HBM-5T

CNC Boring & Milling Machine

ISO 14001:2004 EMS 546518

ISO 9001:2008 FM 538421

Sept. 2009

Buffalo Machinery has been well known by its brand name – Microcut and Challenger. The company was found in 1978 and started its own factories since 1997. Up to now, growing up as a big engineering company with 7 premises and products are well known around the world since the company has been keeping working on products by innovation, marketing, quality improvement and service support. Its brand Microcut/Challenger in Europe becomes one of the major machine tool suppliers and achieves 50% of the company turn over.

Microcut/Challengr Horizontal Milling and Boring machines, HBM-4 and HBM-5T, are medium size horizontal borers. The demand for these ranges has been rising in recent years. The company is also developing large size products – floor type borer in the future.

Buffalo Machinery is ISO9001 and ISO 14001 certificated. Management department includes ISO committee, quality control, after service, production technology and human resource management. Buffalo devoted to develop CNC machine to fit CE regulation and requirements of the EC (European Community).

Aerocut

AEROCUT

HBM-5T nowadays widely used in the diversification application includes the chemical, paper, plastics, steel, machine tool, power, automotive and aerospace industries.

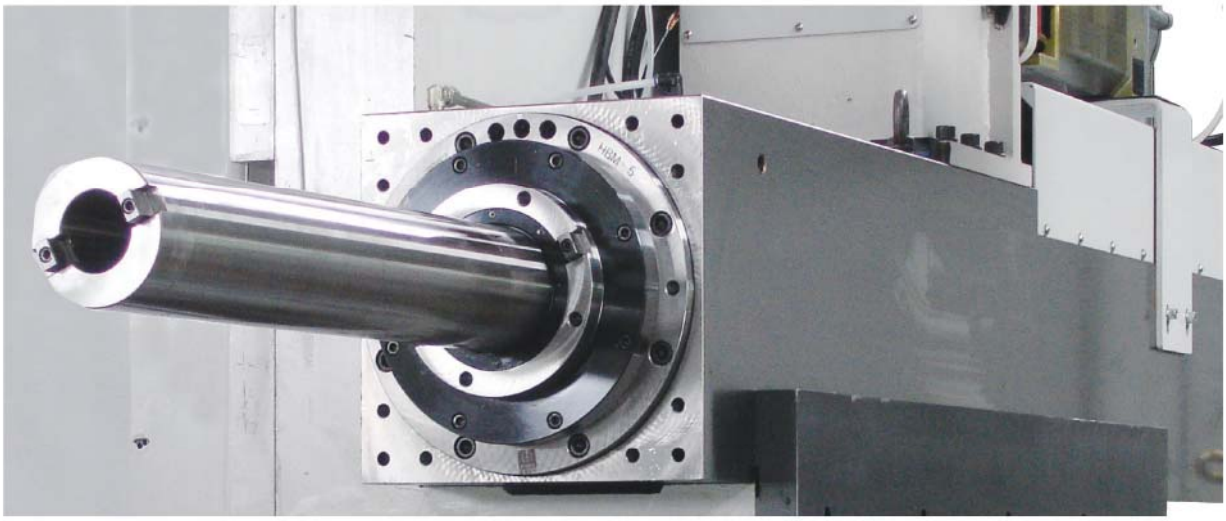
For a die cast work of the automotive, the walls of a die must be straight and accurate and huge amount of casting must be removed, a CNC borer would stand up the deep cuts and optional high pressure coolant through the spindle helps remove the large volume of chips produced. In an oil and gas drilling industry, improvements in hole-making operations can have a major impact on overall productivity. Deep hole with high accuracy is required. A W-axis equipped Horizontal Borer allows operator process the part when the tool really reach out.

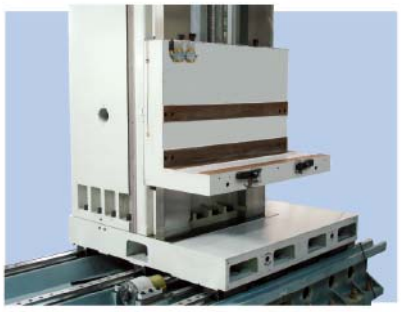
MICROCUT/Challenger Horizontal borer model HBM-5T, is T type Column moving borer. It provides ISO50 spindle taper with 3000rpm spindle speed, auto 2 steps gear box for high torque throughout speed range by CNC control. Machine is 3500mm on X axis, 2200mm on Y axis and 1400mm on Z axis, and 700mm on W axis. An extendable working axis and multiple table applications offer high productivity and efficiency. The high rigidity and stability of its construction maximize customers productivity and profit.

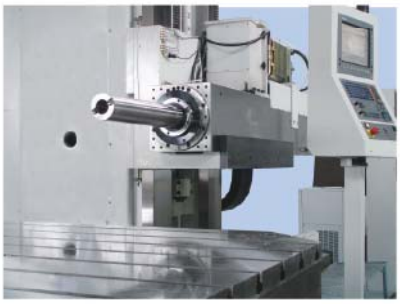
HIGH-PERFORMANCE SPINDLE

Spindle construction 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. The ideal design enables spindle speeds up to 3000rpm. Moreover, spindle is prepared for coolant through spindle with high pressure pump system.



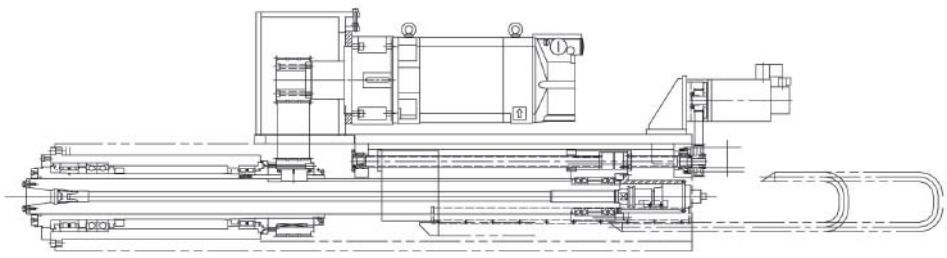




The spindle and sleeve are made of chrome steel and under hardened and ground treatment. The hardness is around HRC55-58. The box type spindle housing provides strong rigidity and ISO 50 taper spindle will be able to work extremely high removable rate.

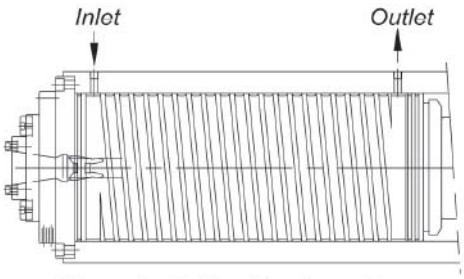
Lubrication

Seal-up type bearing in spindle and lubricated by grease. It's maintenance free and ensures long spindle life.



Thermo control

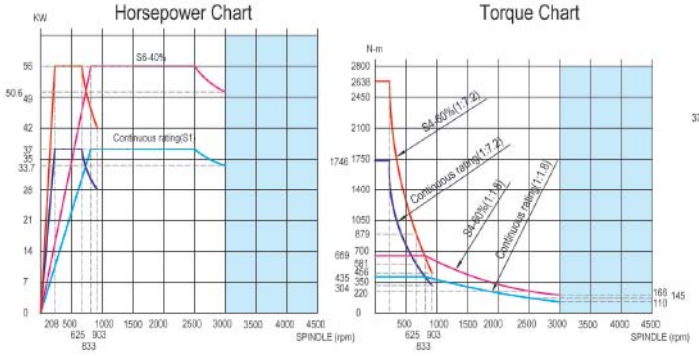
The oil cooler is for spindle and gear box cooling. It can cool down the heat induced on spindle and gear box during machining, which can control the thermo stability



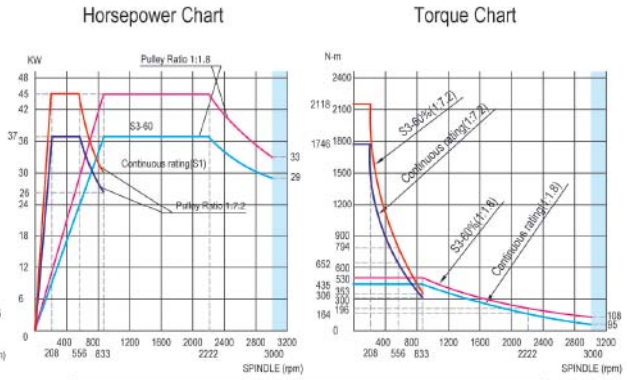
The path of oil cooler channel

Torque power diagram

Through 2-speed Gear box, the spindle generates high torque output for boring and tapping work. The cutting power is constant and remains available across a wide speed range. It is achieved high torque output by cooperating with a gear box. It is capable for mould working at high speed .



Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	SIEMENS 1PH7167-2NF
		CAT50	Motor Output	37 / 55 kw
	DIN	DIN 69871	Gear Ratio	1:1.8 / 1:7.2
Spindle Speed	3000 RPM		Pulley Ratio	-



Torque / Horsepower Chart Data				
Spindle Taper	ISO	BT50	Spindle Motor	FANUC a40/6000i
		CAT50	Motor Output	37/45 kw
		DIN 69871	Gear Ratio	1:1.8 / 1:7.2
Spindle Speed	3000 RPM		Pulley Ratio	-

Powerful & Speedy machining

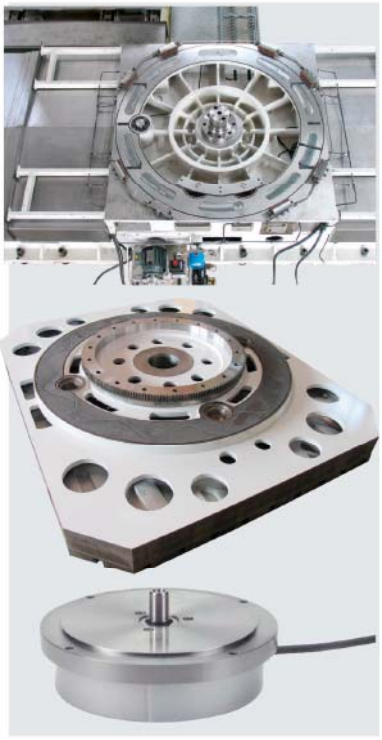
Material: S50C

	Tool diameter (mm)	Cutting Speed (M/min.)	Feed rate (mm/min.)	Depth of cut (mm)	Volume of cutting (cm^3/min.)
Face milling	160	200	1041	0.26	749
Drilling	50	162	186	0.18	364

•Various cutting data is decided by factors of machine model, work piece fixture, machine location, tooling and tool holder used.

PRECISION ROTARY TABLE

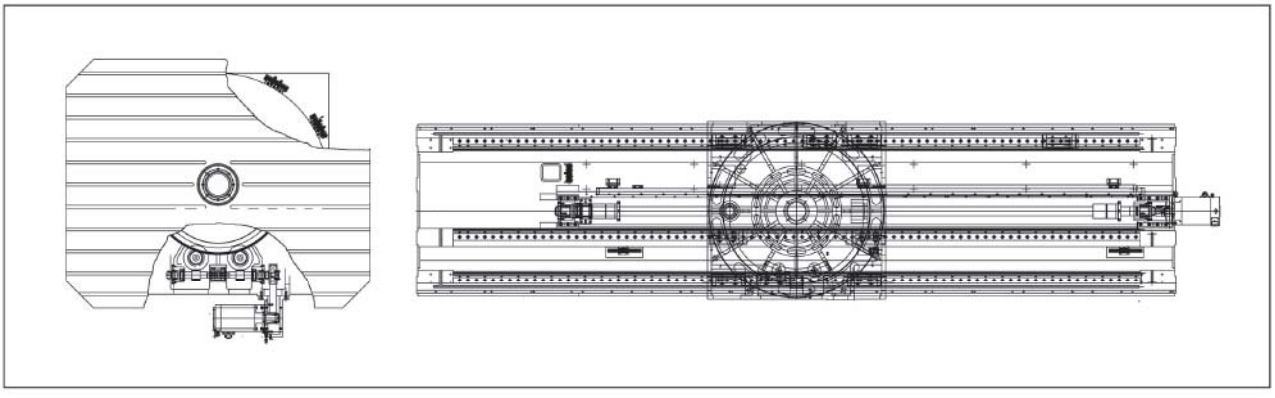
The continuous rotary table is equipped with a high resolution HEIDENHAIN encoder. The direct measuring and feed back to CNC provide high precision. The encoder is protected by cover and sealed on top table, easy for maintenance and trouble free.
The automatic positioning of the table at increments of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



Heidenhain ±5° rotary encoder

Highlights

- Table rotation speed: 1.5 rpm.
- Positioning accuracy: 15 sec.(360°)
- Repeatability: 4 sec.
- Feed driven by AC servo-drives & two worm gear systems
- 10 Tons (std.) / 15 Tons (opt.) / 20 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. Standard with 10 tons loading, 15 tons and 20 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 two worm gear driving system ensure backlash free after using for span.

CHIP REMOVAL

Machine standard 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 cleaning.

DIFFERENT GUARDING TO MEET CUSTOMERS' DEMAND

HBM-5T is available to have full guarding design, table guarding design and elevator device for user operation on request. Customers have the most applicable guarding with HBM-5T borer.

Full enclosure guarding (option)

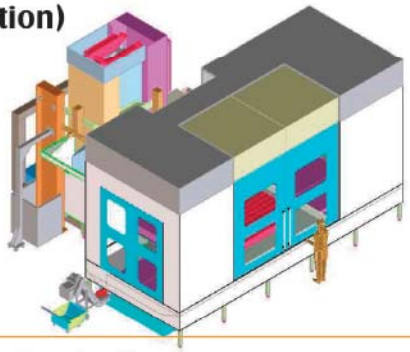
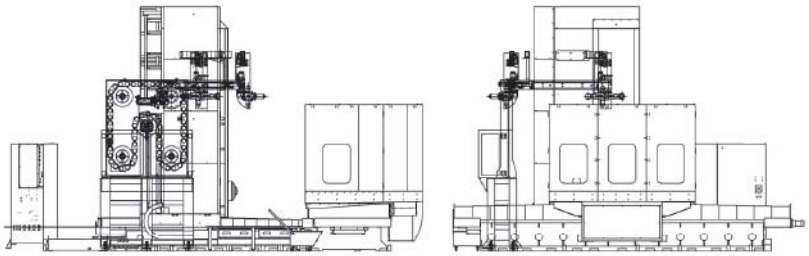
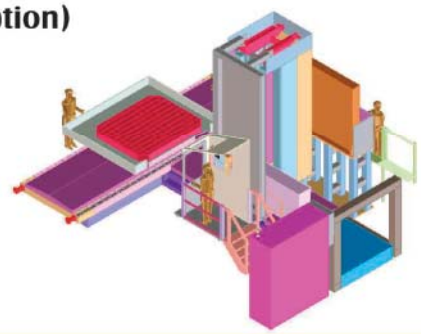


Table guard for CTS function (option)



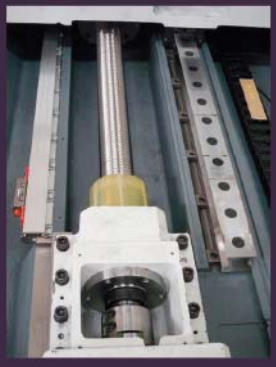
User operation station(option)



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 and stable movement. Even after using for years, this will also be easy for maintenance. The Y axis is with box way for rigid moving of headstock. It is hardened & ground at hardness HRC52-55. 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.



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.

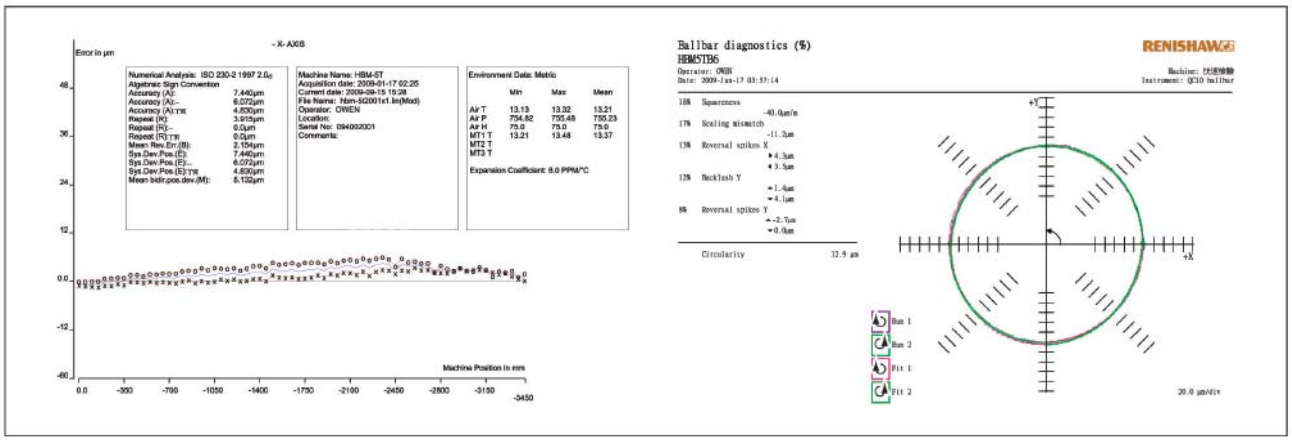
Column with box guide way

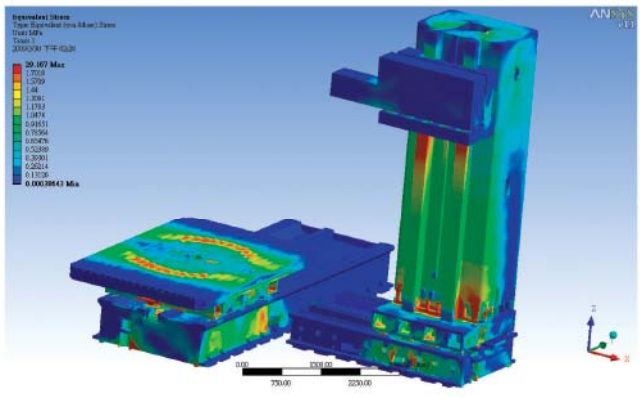
Extra wide box guide ways withstands the cutting force of powerful machining. Hydraulic counter weight is ideal for headstock stability and thus furthermore offers perfect products finishing.

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. All machines are checked by laser equipment and must be approved to match repeatability accuracy. Moreover, all machines roundness is approved by Ball bar measurement and with roundness within 12μm.

A 24-hours free run is done before all the geometrical testing is finished. Furthermore, a cutting test is conducted on machine and the full testing programs are saved in the CNC.





Through strain and stress analyze ensure the structure of design and rigidity is ideal for machine application.

Various heads for selection

The design of MICROCUT borer is based on the most advanced technology and a well-researched concept of modules. Supplied with various heads for different applications.

Universal milling head

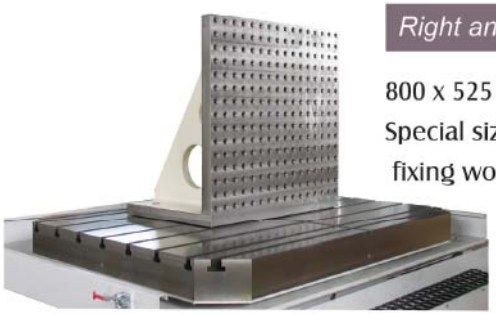
Extension sleeve

Angle milling head

Facing head (A W-axis extendable with servo driven will be introduced soon.)

Automatic tool changers - 60 pockets

A servo type 60 tools ATC. It offers stable and rapid tool changing action. A ladder is equipped with ATC for user's easy tool loading purpose. An interlocked ATC door and an emergency stop button next to the tool loading spot for safety protection

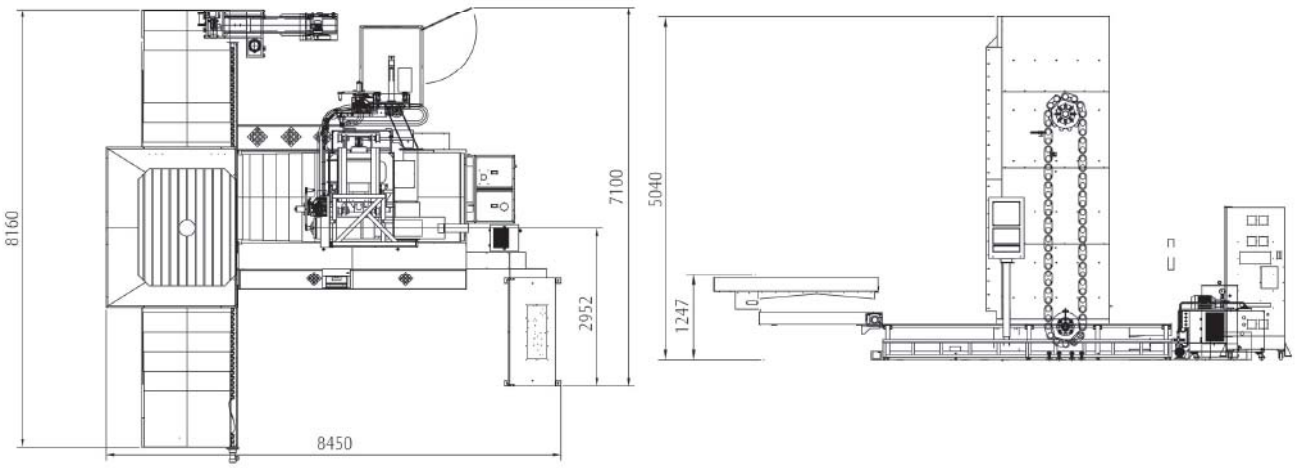


Right angle block device

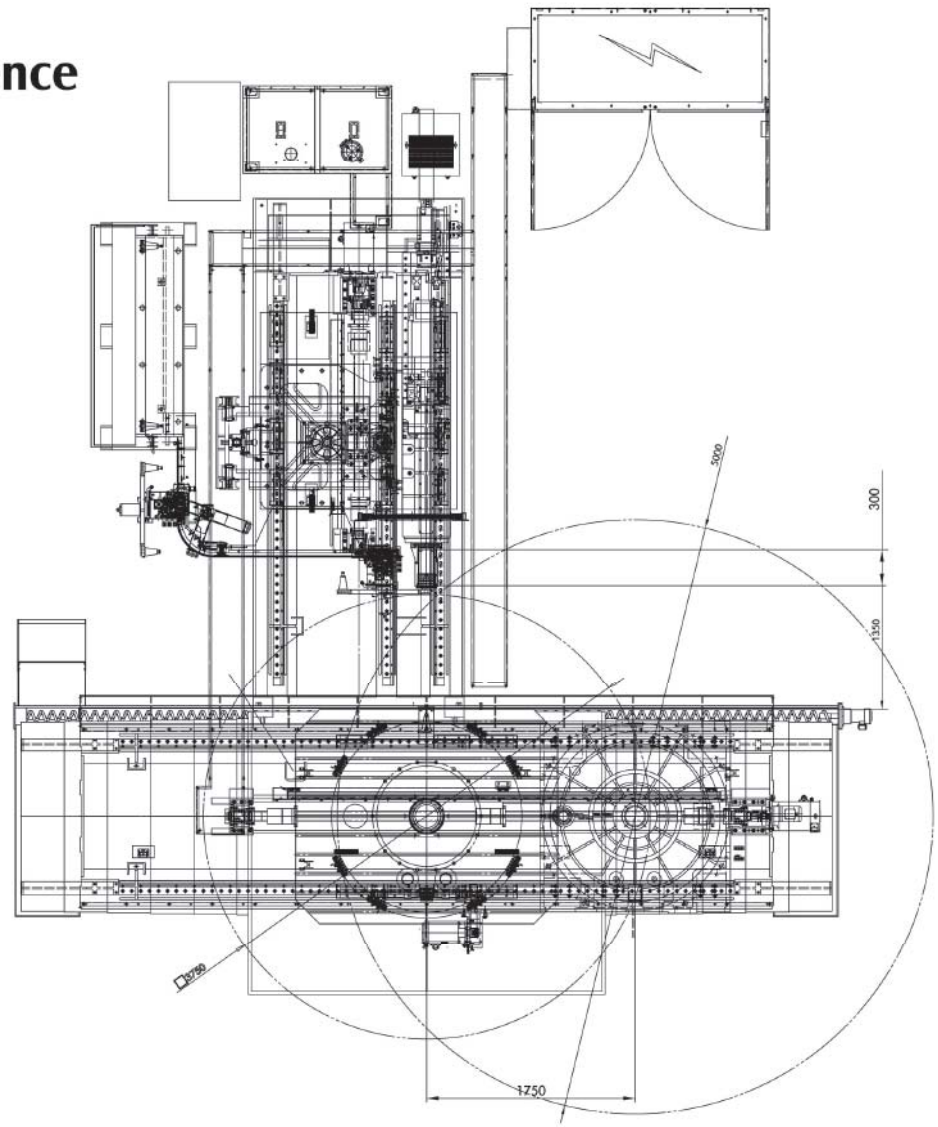
800 x 525 x 800mm or 1000 x 550 x 1000mm

Special size is available on request; both round hole or T-slot for fixing work piece are available.

Layout Drawing



Interference Drawing



SPECIFICATION

Specification	Unit	HBM-5T
SPINDLE		
Spindle quill diameter	mm	130
Spindle taper	ISO	#50
Spindle speed range	rpm	3000
Main motor power rated	KW	37/56 (Siemens)
Spindle step		2 steps (auto)
Spindle gear box		ZF-2K300
Gear ratio		1:1 ; 1:4
Spindle bearing I/D	mm	170/260
AXIS TRAVEL		
Rotary table travel, X	mm	3500 (std.) / 4500 (opt.)
Headstock vertical travel, Y	mm	2600
Column longitudinal travel Z	mm	1400 (std.) / 2000 (opt.)
Spindle stroke W	mm	700
Feed range X, Y, Z, W	M/min	5
Distance between spindle centre to table centre	mm	0-2600
Distance between spindle nose to table centre	mm	887-2287
TABLE		
Table clamping surface dimensions	mm	1800 x 2200
Table index	degree	0.001
Rotary table positioning accuracy	sec.	15
Rotary table repeatability accuracy	sec.	4
Rotary table encoder accuracy	sec.	+/-5
Minimum distance of the spindle axis,	mm	-25
above the rotary table surface		
Maximum workpiece weight	tons	10 (std.) / 15 (opt.) / 20 (opt.)
T-slots on the table (Dim x P x No.)	mm	22HB x 160 x 11
AXES & FEED		
X & Z axes ballscrew dimension	mm	80xP10/C3, double nut
X & Z axes Linear scale	RA65	RA65
Y-axis ballscrew dimension	mm	63XP10/C3 double nut
Y-axis guide way distance (inside/outside)	mm	620/1120
W-axis ballscrew dimension		40xP5/C3 double nut
Max. Rapid feed rate X, Y, Z, W	M/min	10
Max. Cutting feed rate X, Y, Z, W	M/min	5
B axis cutting speed	rpm	1.5
AUTOMATIC TOOL CHANGE (option)		
Tool capacity		60
Pitch of pockets in magazine	mm	130
Max. tool dia. With fully planted magazine	mm	125

Specification	Unit	HBM-5T
Max. tool dia. With adjacent pockets free	mm	250
Max. tool length (Drills)	mm	300 (500)
Max. tool weight	kgs	25
Total weight of tools in magazine	kgs	900
Imbalance of tools in magazine, max.	kgs	120
Total tool change time	sec.	9
PNEUMATIC		
Air pressure	bar	5 ~ 7.5
Air consumption	L/min.	250
LUBRICATION		
Pump motor	w	25
Pump pressure	kg/cm^2	20
Pump capacity	c.c./min.	250
COOLANT		
Pump motor	Kw	1.7
Tank capacity	L	120
CONNECTION TO THE MAINS		
Main voltage / frequency	V/Hz	220 or 400 / 50 or 60
Total power consumption	KVA	95
MACHINE WEIGHT		
Net weight	kgs	49000

**Specifications are subject to changer without notice.*

STANDARD ACCESSORIES

- CNC controller (Heidenhain iTNC530, Fanuc 18iMB, 31iA, or Siemens 840D)
- Spindle and servo motor package
- CTS preparation on spindle (without wiring)
- Large fully ground work table with 11 T-slots
- High precision ground ball screw
- Heavily ribbed Meehanite licensed casting components
- ISO 50 spindle taper
- Automatic lubrication with low lubrication alarm
- Coolant system
- Chip drawers and chip auger & trolley
- Telescopic way covers
- 3000rpm spindle
- Low voltage controlcircuit system
- CE declaration of confirmity

OPTION ACCESSORIES

- Universal head
- Right angle milling head
- Spindle extension sleeve
- Coolant through spindle system with high pressure coolant pump
- Table guard for CTS function
- Full enclosure guarding
- User operation station
- ATC-60 pockets
- Oil skimmer device
- Right angle block device
- Heat exchanger
- Chip conveyor
- EMC
- Air conditioner for electric cabinet
- Safety module
- Lifting device

ОФИЦИАЛЬНЫЙ ДИЛЕР В РОССИИ

БАЛТИЙСКАЯ ПРОМЫШЛЕННАЯ КОМПАНИЯ

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