

KHB-Series Horizontal Boring Machines

CNC Horizontal Boring & Milling Machine



TECHNOLOGY IS THE FUTURE

Let's go out into the world! Let's make the future with technology!

KiHEUNG endeavours to offer the ultimate to customers throughout the world.

Since founded in 1968 KiHEUNG has become the one of the most advanced and leading machine tool manufactures.

KiHEUNG specialized in manufacturing medium-large size CNC bed type milling machine, Travelling column boring and milling center, Fixed bed travelling column machine, Double column machining center, Conventional Milling Machine and Table Type CNC Milling Machine is determined to enhance the quality by respecting the customer's requirements with the philosophy of "FULL SATISFACTION TO THE CUSTOMER AND ENDLESS SERVICE TO THE CUSTOMER" through the spirit of mutual co-operation, KiHEUNG is able to ensure the continuous distribution with high quality machine tool designed to satisfy customer's requirements all over the world.

Thanking and trusting in your continuous support

기흥기계는 1968년 설립 이래 공작기계의 전문 메이커로 성장한 오늘에 이르기까지 항상 고객의 입장에서 생각하고 고품질의 만족스런 제품을 공급하는데 전력을 기울여 왔습니다. 무한경쟁의 국제화 시대에 지속적인 기술개발과 과감한 설비투자로 명실상부한 공작기계의 선두주자로서 고품질, 고기능의 제품을 공급하는데 최선을 다 할 것입니다. 21세기를 향한 도약과 생존 번영의 길은 고객들로부터 신뢰받는 제품을 생산하는 것이라 믿고 생산에서 애프터서비스에 이르기까지 고객만족의 경영이념아래 보다 완벽한 제품을 공급하기 위해 내실을 다져나가고자 합니다. 앞으로도 고객 여러분의 변함없는 성원과 애호를 부탁 드립니다.



KiHEUNG company video

One of the largest manufacturers of CNC milling machine introduce, we create the future technologies for customers.

History







Major Specification

• CNC Horizontal Boring & Milling Machine

- •X = 2000 / 3000 / 4000 / 5000mm
- •Y = 1500 / 2000 / 2500 / 3000mm
- •Z = 1500 / 2000 / 2500mm
- •W = 700(130Ø) / 800(160Ø)mm

Standard Feature

- Controller : Fanuc-Oi / 31i-B plus
- Linear Scale : X, Y, Z
- Rotary Encoder : W, B
- ZF gear Box. 2 step
- Spindle Orientation for Rigid Tapping
- Hydraulic Balance for vertical Y axis
- Automatic Centralized lubrication sys
- Oil cooler for the head and Gear Box(ZF+Reduction)
- Telescopic Chip cover for X, Z axis and Multi Cover for Y axis
- Flood Nozzle Coolant System
- Spindle Air Blast
- Rear Chip protection cover

Rotary Table

- •1600 x 1800mm(15ton)
- 2000 x 2200mm(20ton)
- •2500 x 3000mm(30ton)

• ATC : ISO#50

- •40 / 60 / 90 Tools
- Opt.
- Controller : Heidenhain, Siemens
- CTS(16bar / 30bar / 50bar)
- Semi Table Cover
- Work piece touch probe
- Tool touch probe
- Attachment(Head)

Characteristics and strengths of the KHB Series

High-rigidity, high-precision structure guarantees the best performance

- The high-rigidity, high-precision structure has improved performance when machining high-load workpieces.
- Strong box guideway and narrow guideway structure.
- Precision has been improved by applying the linear scale to all axes (X, Y and Z-axis) as a standard feature.
- The high-precision encoder has been adopted as a standard feature. The B-axis rotary table structure is backlash-free due to the adoption of a double pinion structure.
- The Turcite surface of all axes (X, Y and Z-axis) is manually scraped by highly skilled workers to guarantee stable precision.

Diverse product lineup

- The product lineup, ranging from compact to extra-large models, can be customized according to the customer's request.
- Various head attachments are provided as optional features for various kinds of heavy-duty cutting, precision-boring and milling work.
- Various options designed to improve the user's convenience are available.
 - Automatic tool changer(40, 60, 90 Tool)
 - Various tool penetration coolants(CTS 16/30/50 bar)
 - · Customized coolant treatment and splash guard(Chip conveyor & Table cover)

Certified parts guarantee the durability and reliability of each machine

- CNC : Fanuc-Oi/31i-B plus, Heidenhain T640(Opt.), Siemens 840 Dsl(Opt.)
- Servo Motor : Fanuc, Heidenhain, Siemens(Opt.)
- Spindle bearing : NSK, Japan, SKF, Sweden
- Linear Scale : Fagor, Spain, Heidenhain, Germany
- Ballscrew : Shuton, Korta, Spain
- Roller Shoes Linear Guideway : INA, Germany
- Lubrication Pump : Dropsa, Italy
- Oil Mist(Spindle bearing lubrication) : TACO, Japan, SKF, Germany
- Hydraulic Unit : Hawe, Germany, Limsco, Italy
- Electric Component : Siemens, Igus, Germany
- Accumulator : Parker, USA

Guideway shape







$_1$ Stable mechanical structure $_$

The X-bed, Z-bed, and column are designed with a high-rigidity casting structure to secure a high-rigidity and stable mechanical structure, and the guideway is ground precisely after heat treatment to ensure high stiffness and high precision. The counter surface was hand scraped with Turcite attached, and a linear scale was installed as standard to ensure high precision, realizing the optimal conditions for improving processing quality.



• Hydraulic balance structure of the Y-axis

- The hydraulic balance structure features an accumulator charged with high-pressure nitrogen gas, thereby guaranteeing smooth operation and high precision of the Y-axis.
- Noise has been eliminated and energy can be saved as the machine is not equipped with a hydraulic pump.



Hand Scrapping



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\neg Spindle structure and W-axis feed system r°



High-rigidity spindle with excellent machining capability

Cutting work can be carried out in conditions of prefect stability as access to the workpiece has been facilitated with the adoption of a nose-type head structure, and the protrusion distance of the boring spindle has been minimized. High-rigidity bearings have been applied to the milling spindle to support the spindle unit. The milling spindle is designed and manufactured to withstand large loads during axial direction machining. In addition, the spindle is equipped with a large-capacity cooling device to maintain stable thermal displacement even during long-term operation, and that cools the gearbox (ZF + reduction gear) and spindle cartridge.

The oil mist method is adopted to lubricate spindle bearings, can maintain the stability of bearing heating generation state.

Stable W-axis drive

The boring spindle is applied a W-axis ball screw and 2-way LMG method. It is driven by a servo motor and a reduction pulley, and equipped with a high-precision encoder to guarantee the degree of feedback.

• Spindle Power-Torque Diagram





🖵 High-load, high-precision rotary table structure 🖵 🗢

- To ensure smooth operation of the rotary table under heavy loads, the center shaft is equipped with double roller bearings and thrust ball bearings. Also, the rotary table features a thrust roller bearing structure and a strong bi-directional clamping structure that ensure stable processing conditions.
- The drive of the table has a structure in which a gear box and double pinion rotate a large high-precision ring gear. A high-precision encoder is installed at the center of the table as a standard feature, allowing precise control of the index.
- Tables of various forms are available to meet diverse customer requirements.



Picture of table structure



Drawing of table structure

• Table shape



Table 1800 x 1600(standard)

Table 2200 x 2000(standard)

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Reliable Automatic Tool Changer(ATC)

• The tool changer consists of a tool magazine and carriage driven by a servo motor to increase reliability. The adoption of a hydraulic cylindrical structure allows it to function stably even when using heavy tools.



Changer part



* Advance consultation is essential for special tool options.

$_{ m T}$ Smooth chip disposal and coolant system $_{ m T}$

• Easy chip collection using the chip conveyor: Coolant and chips that fall on the left and right sides of the table are collected by the machine's chip pan.

🚹 Fire Safety

The use of a water-insoluble coolant or failure to use a coolant while machining inflammables may result in a fire. Unauthorized modification of the machine may also result in a risk of fire.

Make sure to read and comply with the safety instructions before using the machine.

Nozzle Coolant System

The system is composed of a coolant tank and a chip conveyor. A coolant is sent to the coolant tank via the chip conveyor in the middle by the chip fan.





• Coolant through Spindle

- 1. Dual cartridge filter
 - 16bar(20l/min) coolant through spindle(Adjustable 5~6bar)
 - 9bar coolant through nozzle(Adjustable 0~9bar)
 - 2tank(500l+700l)
 - Dual cartridge filter(20 $\mu\text{m})$ to switch over when one filter is dirty.
- 2. Paper filter
 - 16, 30, 50bar(20l, 25l, /min) coolant through spindle(Adjust-able 5~16, 30, 50bar)
 - 9bar coolant through nozzle(Adjustable 0~9bar)
 - 2tank(500l+700l, 1000l)
 - Paper band filtering(20 μm) system with drive and paper transport unit

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Optional Equipment -0

Semi Table Cover



Spindle support ø130/ø160



Compact Angle head

ø130/ø160

614 951

KHB-160C

Right angular head ø130/ø160



Special Option Head(Discussion)

- 1. Compact Angle Head
- 2. Right Angular Head
- 3. Universal Head(Manual)
- 4. Spindle Support
- 5. Face Plate(Manual)
- 6. Facing Head(D'ANDREA) UTC-500
- 7. Angle Plate

Measuring Touch Probe

- 1. Work Piece Touch probe : Renishaw RMP60, Heidenhain
- 2. Tool Touch Probe : Renishaw TS-27R, Heidenhain

Face plate (Manual) S/T 160 ø600 000 242.2



Work piece touch probe **RENISHAW RMP 60** with radio signal transmission



Heidenhain probes HEIDENHAIN TT160

165 85

Tool touch probe Signal transmission : Cable



HEIDENHAIN SE 660 / TT460 / TS 460

TT460 : Tool touch probe TS460 : Work piece touch probe SE660 : Receiver Signal transmission : Radio / Infrared



Universal head (Manual) ø130/ø160



Facing head (Auto) (D'ANDREA)



o¬ Model Line-up _┌∘

					(*:STD)
Machine Specification		Unit	KHB-130A	KHB-130B	KHB-160C
TABLE	X-Axis(Table)	mm	2000* / 3000	3000* / 4000	4000* /5000
	Y-Axis(Head)	mm	1500	2000	2500
	Z-Axis(Column)	mm	1500	2000	2000
	W-Axis(Quill)	mm	700	700	800
Distance between spindle center to Table surface		mm	0~1500	0~2000	0~2500
Distance between spindle nose to Table Center		mm	100~800~2300	100~800~2800	100~900~2900
FEED	Rapid	m/min	16(X,Y,Z) 10(W)	\leftarrow	\leftarrow
	Cutting feed	mm/min	8000(X,Y,Z) 5000(W)	\leftarrow	\leftarrow
Table	Table Size	mm	1600 x 1800	1600 x 1800	2000 x 2200
	Allowable load	tons	15	15	20
Spindle	Max. spindle speed	rpm	2500	2500	2000
	Boring Spindle	mm	Ø130	Ø130	Ø160
	Motor Power	kw	30 / 37	30 / 37	37 / 45
	No. of Tools	еа	40 / 60 / 90	40 / 60 / 90	40 / 60 / 90
	Tool Holder/Pull stud	ISO 50	BT50+MAS-P50T(45°) / or DIN69872	\leftarrow	←
ATC	Max. tool dia	mm	Ø125 / Ø250	\leftarrow	←
	Max. tool length	mm	500	\leftarrow	<i>←</i>
	Max. tool weight	kg	25* / 30	\leftarrow	\leftarrow
	Max. tool moment	Nm	34	\leftarrow	←
Power	Reguired power capacity / KVA		120	120	160
Machine size	Height	mm	4,487	4,987	5,607
	Floor Space	mm	8,720 x 7,942*	8,722 x 8,942*	9,240 x 10,400*
	Machine Weight	tons	Ca. 40 / 45	45 / 50	55 / 60

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Controller Fanuc-31i-B plus

Control Axis	
Controlled axes	5 (X, Y, Z, W, B)
Simultaneously controllable axes	
Positioning(G00)	/Linear interpolation(G01): 3axes
Circula Real-lash companyation	ar interpolation(G02, G03) : 2axes
Emergency stop / overtravel	
Follow up	
Least command increment	0.001mm / 0.0001 (inch)
Least input increment	0.001mm (0.0001 (inch)
Machine lock	
Mirror image	Reverse axis movement
	(setting screen and M-function)
Stored pitch error compensation	
Pitch error	offset compensation for each axis
Stored stroke check 1	Overtravel controlled by software
Compensation and Feed Funcion	
2nd reference point return	G30
Al Contour Control II	200 block preview
Automatic corner deceleration	000.000
Circular Interpolation	G02, G03
Dual position feedback	
Dwell	G04
Exact stop check	G09, G61(mode)
Feed per minute	mm / min
Feedrate clamp by circular radius	0.000%
Helical interpolation	0-200%
	0~5000mm / min
Linear ACC/DEC after interpolation	
Linear ACC/DEC before interpolation	
Linear interpolation	G01
Manual handle feed(1unit)	0.1.1.0.01.1.0.001
Manual handle teedrate	0.1/0.01/0.001mm
Positioning	G00
Program restart	
Rapid traverse bell-shaped acceleration	/ deceleration
Rapid traverse override	F0 (fine feed), 25 / 50 / 100%
Reference point return	<u> </u>
Smooth backlash compensation	031
Thread cutting, synchronous cutting	
Handle interruption	
High speed skip function	
Spindle and M Code Eurotian	
M-code function	M3 diaits
Polar coordinate interpolation	G12.1 / G13.1
Retraction for rigid tapping	
Rigid tapping	G84, G74
Scaling	G50, G51
Spindle outout switching	
Spindle serial output	
Spindle speed command	S5 digits
Spindle speed override (10% increments) 10-150%
TOOL Funcion	
Tool offset B	G43, G44, G49
Geometry / Wear and	Length / Radius offset memory
Tool number command	T3 digits
Tool offset memory C	
Tool offset pairs	200 ea
Tool offset	G45-G48
Absolute / Incremental programming	600 / 001
Addition of custom macro common variable	<u> </u>
Additional work coordinate system(48 Pair)	- G54.1 P1-48 pairs
Auto.Coordinate system setting	· · · · ·
Background editing	220 074 070 000 000 000
Canned cycle (<u>a73, G74, G76, G80-G89, G99</u>
Coordinate system rotation	662 830
Custom macro	
Increment system 1/10	
Decimal point input	

Extended part program editing	
I / O interface	USB / Ethernet
Inch / metric conversion	G20 / G21
Label skip	
Local / Machine coordinate sys	stem G52 / G53
Macro executor	
Maximum commandable Demer	nsion
±	±99999.999mm(±9999.9999 inch)
No. of Registered programs	1000 ea
Optional angle chamfering / col	rner R
Optional block skip	
Optional stop	M01
Part program storage size	4Mbyte(10,240 m)
Program number	O4-digits
Program protect	
Program stop / end	M00 / M02, M30
Programmable data input	
Tool offset an	nd work offset are entered by G10, G11
Sub program	Up to 4 nesting
Tape code	ISO / EIA Automatic discrimination
Work coordinate system	G54-G59
OTHERS FUNCTIONS (Operation,	Setting & Display, etc)
Alarm display	

Alarm display	
Alarm history display	
Clock function	
Cycle start / Feed hold	
Display of PMC alarm message	
Message	display when PMC alarm occurred
Dry run	
Ethernet function (Embedded)	
External data input	
Graphic display	Tool path drawing
Help function	
MDI / DISPLAY unit	
10.4 " color LCD, Ke	eyboard for data input, soft-keys
Memory card interface	
Multi language display	
Operation functions	Tape / Memory / MDI / Manual
Operation history display	
Program restart	
Run hour and part number display	
Search function	Sequence NO. / Program NO.
Self-diagnostic function	
Servo setting screen	
Single block	

Optional Function

3-dimensional coordinate conversion	
3-dimensional tool compensation	
Addition of tool pairs for tool life management	nt 1024 pairs
Additional controlled axes	max. 6 axes in total
Additional work coordinate system	G54.1 P1-300 (300 pairs)
Al Contour Control II	600 block preview
Automatic corner override	G62
Chopping function	G81.1
Cylindrical interpolation	G07.1
Data server	
Dynamic graphic display	Machining profile drawing
Exponential interpolation	
MDI/DISPLAY unit	
	15" Color LCD, Touchscreen
Figure copying	G72.1, G72.2
Interpolation type pitch error compensati	on
Involute interpolation	G02.2, G03.2
Machining time stamp function	
Manual handle feed 2/3 unit	
No. of Registered programs	4000 ea
Number of tool offsets	499 / 999 / 2000 ea
Part program storage size	8Mb (20480m)
Polar coordinate command	G15 / G16
Programmable mirror image	G50.1 / G51.1
Single direction positioning	G60

* The contents of the catalogue are subjected to change without prior notice

• Exterior view of machine • КНВ-130 А/В





Front view



Side view



• Exterior view of machine ro KNB-160C

Top view





Front view



Side view







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