CNC Horizontal Boring and Milling Machine Model KiMi B-4

Fabrication-no. 650000001

“Show Room Machine” Available stock Germany

GK Werkzeugmaschinen GmbH Hotline: 0049/(0)6158/84772 info@gk-werkzeugmaschinen.de

Content

In consideration of the „General Conditions for the Supply and Erection of Plant and Machinery for Import and Export ORGALIME SI 14" of The European Engineering Industries Association, Brussels January 2014, we take pleasure in quoting without obligation:

1. Technical data

			KIMI B-4	Unit
Spindle unit	Diameter of boring spindle		110	mm
	Spindle taper (7:24)		ISO 50	
	Shank specification		DIN 69871, form AD	
	Pull stud		DIN 69872	
	Power		22	kW
	Spindle speed		10～3,000	rpm
	Max. torque		1,000	Nm
	Max. feed force		15,000	N
Table	Size		1,250×1,400	mm
	Max. load		5,000	kg
Travels	Table cross travel (X)		1,800	mm
	Table longitudinal travel (Z)		1,400	mm
	Spindle unit, vertical travel (Y)		1,400	mm
	Boring spindle, longitudinal travel (W)		600	mm
Speeds	Feed	X-, Y-, Z-axes	2.5 – 3,000	mm/min
		W-axis	2.5 – 2,000	mm/min
		B-axis	1.3	rpm
	Rapid traverse	X-,Y-,Z-axes	5,000	mm/min
		W-axis	3,000	mm/min
		B-axis	1.3	rpm
Positioning accuracy	X-, Y-, Z-axes		0.025/1,000	mm
	W-axis		0.03/600	mm
	B-axis		10	arcsec
Repeatability	X-, Y-, Z-axes		0.015	mm
	W-axis		0.025	mm

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	B-axis	6	arcsec
Total connected load, approx.		50	kVA

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2. Technical description

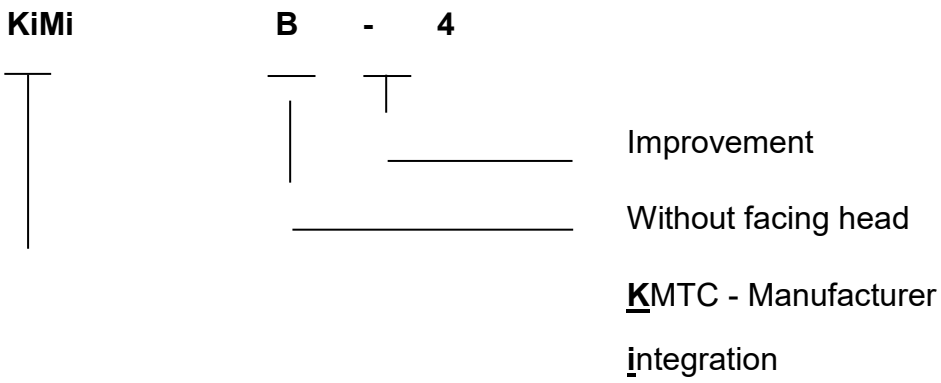
2.1. Description of base machine

KiMi B-4 Brief introduction

KiMi B-4 CNC Horizontal boring and milling machine is an upgraded product from automatic machining center. The X, Y, Z, W and B axis use servo motors for independent feeds. Spindle drive by the AC spindle speed adjusting motor and CNC system adopts SIEMENS 828D. The machine can realize X, Y, Z and B four axis simultaneous machining.

Rigid structure, rapid dynamic respond, superior accuracy and stability are ensured. This machine is applicable for industries of engineering machinery, automobile, mining machinery, large motor, water and steam turbine, ship building and military industries.

Model introduction



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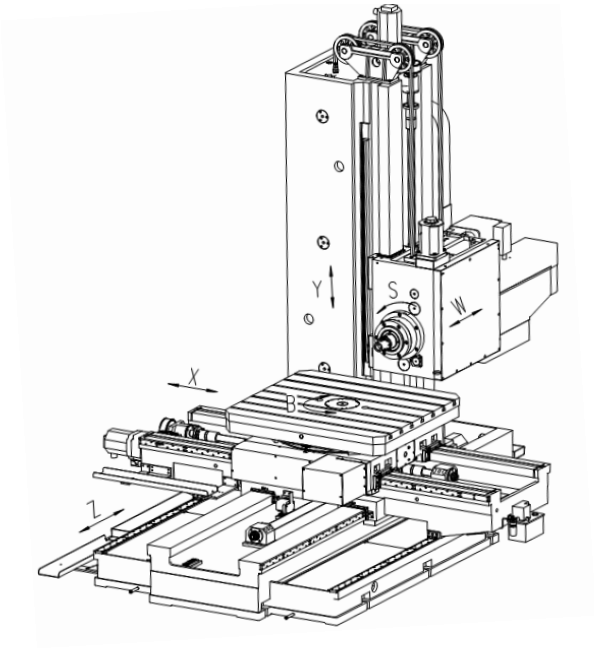

Machine layout

Table cross travel (X)

Table longitude travel (Z)

Spindle head vertical travel (Y)

Boring spindle axial travel (W)

Table rotation (B)

Basic parts

Beds, column, spindle head, table, bed slide, slide support are all made of high quality cast iron. All main components are heat treated. The max. stiffness is based on corresponding FEM calculations. The column bed is a box-shaped design inclusive of reinforcement ribs and multiple support. The column with a large cross section and horizontal and cross reinforcement rips ensures the bending and torsional stiffness.

Bed

is a closed box-shaped design with reinforcement ribs and multi supporting points. The bed is of superior rigid, good bending resistance and good torsion stiffness.

Column

is fixed on the rear end of bed.

Guide ways

Table bed guideway (Z-axis) consist of 4 guideways, among them two rectangular main guideways in the center of table construction are with FLUORTEN paste plastic slide guideway (on the top and inside). The right side guideway has an additional lateral roller guideway. The outside laying auxiliary guideways have roller guides on the top.

The guideways of the X-axis are the same but without the auxiliary guides.

Machine spindle W-axis guideway is high rigid rectangle slide guide way which has the features as low friction and wear resistance also the guideway can ensure the moving parts stability and contact rigid.

Support

The spindle support bearing adopt the high rigid and accuracy tapered roller bearing to ensure the spindle rotation accuracy. Spindle system consists of the boring and milling spindle.

Spindle tool clamp uses disk spring clamping and hydraulic loose device.

Main drive

The boring spindle rotation adopts the SIEMENS AC spindle motor to drive the two shift gearbox through gear pair to transmit the power to hollow spindle and to realize the spindle rotation.

The machine main gearbox uses high and low two shift hydraulic pressure to realize the speed change.

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Linear feed drives

X-, Y-, Z- and W-linear axes are driven by the SIEMENS Servomotors Type 1FK7 and tooth belt to drive the high rigid pre-loaded ball screws to realize the feed motion. Each liner feed motion mechanism has compact structure and high transmission accuracy to guarantee the move stability.

Machine table

is in cross shape slip structure. Table movement is divided into upper and lower carriage, among the upper carriage realizes the X axis travel and lower carriage realizes the Z axis travel. Both carriages ensure the high geometric accuracy. Table surface is in boxy structure design with cross formed steel rods. Therefore the table has a good load capacity.

For safety reasons the table is equipped with semi protection cover.

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Rotation feed drive

B-axis rotation is realized by SIEMENS Servomotor Type 1FK7 through deceleration gear box to drive a further small gear. Then the small gear will drive the big gear ring to realize the table rotation. The table bearing adopts high rigid and accuracy taper roller bearing.

Lubrication

The spindle front bearing adopts grease lubrication. The bearing and transmission gears are lubricated by oil.

The bed guideways and ball screws are lubricated time dependent by constant variable displacement pump.

Guideways protection

The X and Z-axes have steel telescopic covers. The Y-axis has steel slats on the spindle side.

Compensation device

The compensation for the spindle is performed by a balance weight for the stability of the vertical movement of the Y-axis.

Hydraulic

With a central hydraulic unit the machine functions are ensured, mainly the release of the tool in the spindle. The hydraulic table is clamped via a separate hydraulic unit. The connection dimensions of hydraulic elements are designed in accordance with applicable international standards.

Protection devices

No.	Function
1	Temperature control and pressure loss in hydraulic system
2	Failure of spindle drive
3	Overload of spindle system
4	Interlock of spindle, automatic tool unloading and spindle start
5	Overload of system protection

6	Failure of feed drives
7	Soft limits
8	Travel limits

Measuring systems

- X-, Y- and Z linear axes adopt liner scales of FAGOR (Spain).
- W axis adopts rotary encoder of OMRON (Japan).
- Table rotation adopts encoder of FAGOR for 360 degree control.
- Spindle adopts OMRON encoder for spindle orientation.

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2.2. Electrical equipment

The machine is designed with electrical equipment in consideration with the IEC-Rules 204.1 (acc. to VDE 0113).

The electrical equipment of the machine includes the electrical cabinet with air-conditioning unit and all required components and cables between control cabinet and machine as well as the installation at the machine. The wiring is marked in the principle source-target.

As feed motors SIEMENS AC servomotors are used. In case of overload of the motors an automatic switch off is ensured. Inside the electric cabinet the controller units are located.

As CNC control system, the SINUMERIK 828D is used. The CNC is equipped with all required options for the function of machine.

Additional NC functions, which are not quoted and described in our offer, have to be discussed and offered separately.

• Voltage, AC, 3 Phase	400	V	+/-10%
• Frequency	50	Hz	+/- 2 Hz
• Control voltage DC	24	V	
• Total connected load	50	kVA	
• Net type	TN-C		

2.3. CNC Control System SINUMERIK 828D

Functionality of CNC System in basic design

The scope of control is on the requirements for standardized drilling and milling machines - of the single, tuned to mass production.

- Digital drive control
- Modular design for controllers and power units
- Up to 6 axes / spindles for milling
- Intelligent control functions for the highest requirements of machining

The controller has extensive CNC functions, such as kinematic transformations and a powerful tool management.

Especially for drilling and milling machines, the SINUMERIK 828D offers extensive drilling and milling operations, in any swiveled work piece planes and cylindrical work pieces. The performance of the control and the new motion control allow for mold making applications mirror-smooth surfaces with a minimum of processing time.

Hardware components

- The control panel consists of highly durable magnesium die-cast with horizontal or vertical mounting
- 10.4 " TFT color display
- Built-in QWERTY full CNC keyboard with soft keys
- USB, CF card and Ethernet interface on the operator panel front

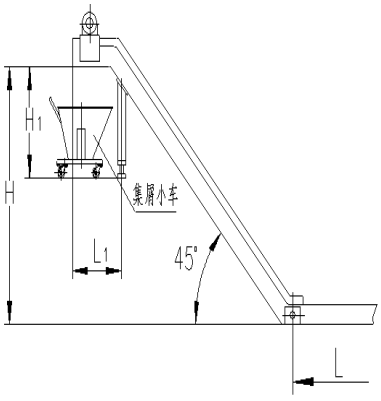
3. General

Installation conditions	Remark
Temperature requirement:	
Operation temperature: 5°～45 °C	Air conditioner available
During transportation： -30 ℃ ～ 50 ℃	
Humidity:	
Operation conditions: ≤90%	
Workshop requirement :	
Avoid the vibration influence	Vibration acceleration ≤0.5 g
Avoid the influence of contaminate and corruptive gas or liquid	
Avoid the direct sunlight	
Avoid the direct heat, hot or cold wind	
Avoid the dust as far as possible (metal dust, sand, soil etc.)	
Avoid the water leaking and soaking	

4. Chip conveyor and coolant attachment

Chip conveyor	
Capacity	20 kg/min
Motor power	0.3 kW
Discharge height	1,200 mm

Coolant attachment	
Tank capacity	400 l



For reference only

Pump pressure for internal supply	20 bar
Pump pressure for external supply	6 bar

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Documentation

The documentation will be provided in English language as follows:

No.	Name	Qty.	Remark
1	Electrical diagrams Schematic diagram of hydraulic system Structure chart for maintaining Drawings of wear parts	1	
2	Layout and foundation drawing	1	
3	Operation and alarming information	1	Included in the mechanical and electrical operation manual
4	SINUMERIK 828D hand book	1	Including operation manual, programming manual and diagnosis guide
5	Machine data and PLC program backup	1	
6	Test chart	1	
7	Packing list	1	Along with the machine

Main purchase parts of base machine

Name	Specification	Manufacturer
Spindle front bearing	71936ACD/P4 ATBTB	FAG / SKF
Spindle rear bearing	71940ACD/P4 ADBA	FAG / SKF
Ball screws	severals	China
Main spindle motor		SIEMENS
Feed motors, all axes	1FK7	SIEMENS
Plastic cable chain	severals	IGUS
Oil cooler		China
Hydraulic components	AMO-IV-150S	China
Limit switch	LXZ	China

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	XCMN2102L1	SCHNEIDER
Approaching switch	E21-S08KS02-WP-B1	OMRON
MPG	XER-Q-A6-P1/L6,KE2-3	LUOKE ELECTRIC
X/Y/Z Linear scales	GP	FAGOR
Spindle encoder	E6C2-CWZ1X(2000P/R)	OMRON
Rotary encoder	SP-D90(18000P/R)	SIEMENS

5. Services

5.1. Packaging and transport

- Packaging for trucking
- Delivery EXW Aschersleben

5.2. Training

In customer`s works

upon request

5.3. Installation and commissioning

upon request

6. Prices

The machine price includes the above described attachments and services as follows:

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		Options	
		EURO	**EURO**
	Base machine		
	CNC Horizontal Boring and Milling Machine Model KiMi B-4 inclusive of: - Base machine as described above - Documentation - Packaging and delivery EXW Aschersleben		

7. Delivery conditions

7.1. Validity of offer

If not stipulated differently, the prices stated are valid for a period of 30 days as of date of quotation.

We keep the right in insignificant changing of technical features in order to improve our products. Excluded are changes of the subject of contract with disadvantage for the customer. In case of extensive changes we will ask for a confirmation by customer.

An order becomes validity after our written confirmation.

Because the offered machine is a stock machine, we reserve the right to sell the machine to others.

7.2. Prices

All prices stated in this offer are to be understood net in EURO without V.A.T / taxes EXW Germany according to Our General Terms and Conditions.

7.3. Payment conditions

30% down payment (within 10 days, direct after sales confirmation)

70% rest payment by T/T before shipment or L/C at sight.

Payable within 14 days when due and invoice each.

The machine keeps in manufacturer`s ownership until full payment.

7.4. Delivery time

The machine can be delivered ex works Aschersleben approx. 3 weeks after placement of order, clarification of all technical and commercial details as well as 1st down payment.

The precise date of delivery will be defined upon signing of contract.

7.5. Warranty, General Terms and Conditions

The machines has a warranty with a period of 12 months from the bill of landing date (B/L). Any defect in question was not caused wilfully or by operating errors will be repaired with spare parts from the supplier. The warranty includes exclusively spare parts EXW Frankfurt Germany.

Subject to being unsold.

Validity of quotation is 30 days after date of sending. All prices are net prices without VAT. Our General Terms and Conditions apply, they are included with this quotation.

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