

KH-4100kai Standard Features

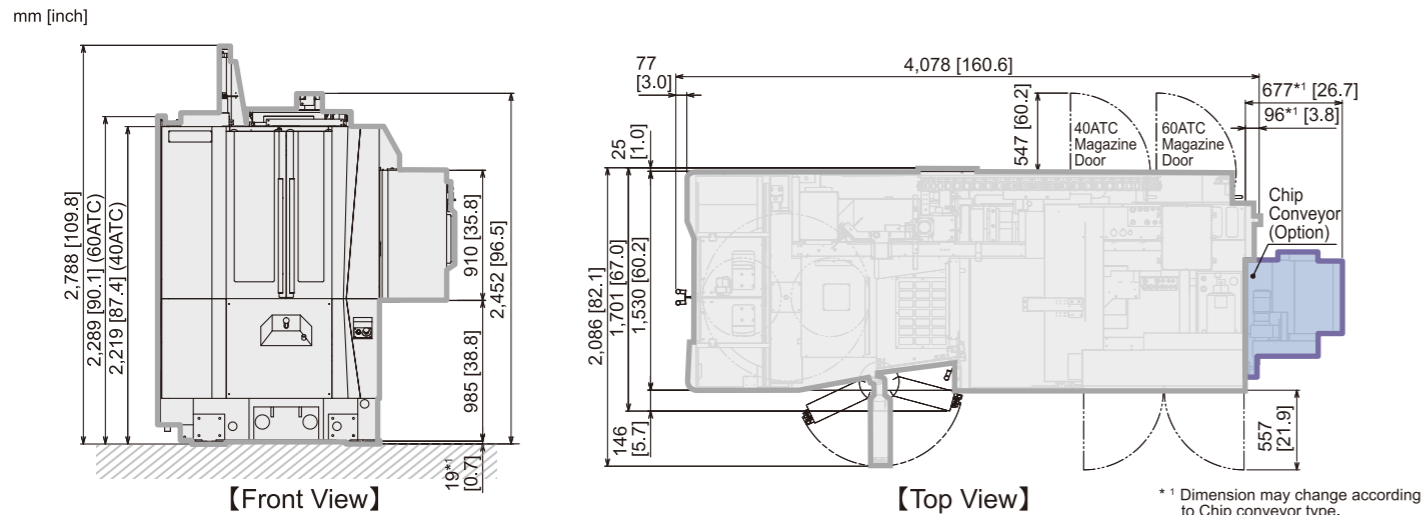
● TRAVEL		● AUTOMATIC TOOL CHANGER			
X, Y, Z axes	mm [inch]	510x510x510 [20.1x20.1x20.1]	Type of tool shank	MAS BT40/CAT40	
Spindle center to pallet surface	mm [inch]	50-560 [2.0-22.0]	Type of pull-stud	JIS	
Spindle nose to pallet center	mm [inch]	100-610 [3.9-24.0]	Number of tools	40 (Opt. 60)	
Pallet top height (from the floor)	mm [inch]	1,069 [42.1]	Max. tool diameter	mm [inch]	Φ 85 [3.3] / Φ 140 [5.5] (Adjacent pots full / empty)
● PALLET		Max. tool length	mm [inch]	400 [15.7]	
Pallet size	mm [inch]	400x400 [15.7x15.7]	Max. tool weight	kg [lbs]	8 [17.6]
Max. work piece size	mm [inch]	Φ 550x850 [Φ 21.7x33.5]	Tool selection system		Random
Max. load	kg [lbs]	500 [1,100]	Tool to tool / Chip to chip	sec.	1.1 / 2.7
Configuration		25-M16 P=80mm [3.1"]	● MOTOR		
Min. indexing degree	degrees	0.001	Spindle motor	kW [HP]	15/7.5 [20/10]
Indexing speed	sec./90 degrees	1.1	Feed axis motor (X/Y/Z/B)	kW [HP]	4.5/4.5/4.5/2.7 [6.0/6.0/6.0/3.6]
Pallet clamping force / system	kN	9.8x4 cones / Mechanical lock	Lubrication pump motor	W [HP]	18 [0.02]
B-axis clamping torque	Nm	2,900	Coolant pumps	W [HP]	600 [0.8] x 3 pcs
● SPINDLE		Hydraulic pump	kW [HP]	2.8 [3.8]	
Spindle speed	min ⁻¹	12,000 Direct drive (Opt. 15,000 Direct drive)	● SUPPLY		
Spindle rated torque	Nm	12,000 min ⁻¹ : 96(2.5min.) / 70(30min.) / 48(cont.)	Electric voltage	v	200 (50 or 60 Hz)
		15,000 min ⁻¹ : 96(10min.) / 70(30min.) / 48(cont.) (Opt. 166)	Electric power supply	KVA	41
Spindle taper		ISO 7/24 Taper NT No. 40	Air pressure	MPa [psi]	0.4 [58]
● FEED		Air volume	liters [gal] / min.	360 [95.1]	
Rapid feed (X/Y/Z)	mm/min [ipm]	80,000 [3,150]	● TANK		
Cutting feed (X/Y/Z)	mm/min [ipm]	30,000 [1,181]	Hydraulic unit tank	liters [gal]	10 [2.6]
Table rotating speed	min ⁻¹	37	Coolant tank	liters [gal]	300 [79.3]
Acceleration (X/Y/Z)	g	1.0 / 1.0 / 1.0	Lubrication unit tank	liters [gal]	1.8 [0.5]
● AUTOMATIC PALLET CHANGER		● SIZE			
Number of pallets		Floor space (w/o chip conveyor)	mm [inch]	1,701x4,078 [67.0x160.6]	
Pallet change system		Machine height	mm [inch]	2,788 [109.8]	
APC time (Unclamp - Clamp)	sec.	Machine weight	kg [lbs]	40ATC : 7,400 [16,280] 60ATC : 7,700 [16,940]	

Machine Options Overhead hydraulic arm 3-color program end signal light Weekly timer Automatic power off Interface for danger prevention

FANUC 0i-MF Plus (Type 0) ● Standard Features Options

- Max. controlled axis: 5 axes
- Max. simultaneously controlled axis: 4 axes
- Spindle override 50-150% (each 10%)
- Cutting feed override 0-200% (each 10%)
- Rapid traverse override 1,2,4,8,15,25,50,100%
- Rapid traverse bell-shaped acceleration/deceleration
- Manual handle feed 1 unit
- Thread cutting, synchronous cutting
- Workpiece coordinate system
- Addition of workpiece coordinate system 48 sets
- Programmable data input G10
- Custom macro
- Canned cycles for drilling
- Scaling
- Rigid tapping
- Tool offset: 400 pcs
- Tool radius / Tool nose radius compensation
- Stored pitch error compensation
- Part program storage: 512 Kbyte
- Number of registrable programs: 1,000 pcs
- Background editing
- Run hour and parts count display
- Single direction positioning
- Cylindrical interpolation
- Helical interpolation
- 200 look-ahead blocks (AI contour control II)
- Optional chamfering / corner R
- Automatic corner override
- Programmable mirror image
- Coordinate system rotation
- Tool offset memory C
- Tool life management
- 400 look-ahead blocks
- Optional block skip

MACHINE SIZE



Shipment of this machine requires the Japanese government's approval.

Specifications and dimensions are subject to change without notice.

KIWA Japan

KH-4100kai

Horizontal Machining Center



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2020.11E

KIWA MACHINERY CO., LTD.

KIWA Japan
KH-4100kai
Horizontal Machining Center



Just 1,530 mm [60.2"] Wide,^(*)
Full-Spec. "KH" Machine

The high-performance Horizontal Machining Center with full rotary B-axis can be installed in a space for a Vertical Machining Center.



Space Saving Design

Side-Mounted ATC Magazine

Center Trough Design

Full Rotary B-axis

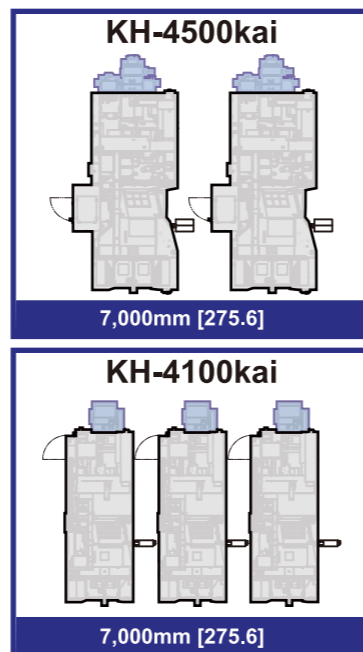
510 mm [20.1"] Stroke (X/Y/Z)

* Control Box is not included in the width of 1,530 mm.
3-color program end signal light is optional.

Higher Performance in Less Space

Space Saving

The KH-4100kai is designed as slim as possible, just 1,530 mm [60.2"] wide (excluding Control Box). Compared to Kiwa HMC KH-4500kai, the new KH-4100kai saves floor space by 45 %. This means less space, for more spindles. In spite of the compact design, the KH-4100kai is equipped with full specs. for a variety of workpieces and factory automation equipment.



Side-Mounted ATC Magazine



40/60 tools

The operator can easily check tool conditions due to the side mounted ATC design.

Center Trough

The KH-4100kai is equipped with a wide center trough in the machining area and strong bed coolant wash. Chips will go directly down the center trough to be disposed of at the back of the machine.

Sheet metal covers on both sides are steeply slanted and chips will not accumulated in the machine.



Full Rotary B-axis

A full rotary table is a standard feature.

Chip Disposal

Rear Side Disposal

An optional outside chip conveyor will be placed at the back of the machine. If a chip conveyor is not mounted, a pull-out chip basket is available as an option to remove chips manually.



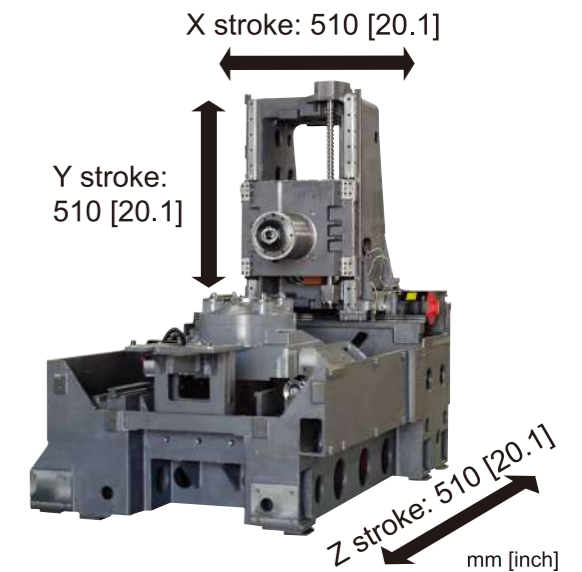
Workpiece Solution

Max. Workpiece

Size $\phi 550 \times 850 \text{ mm}$ [$\phi 21.7" \times 33.5"$]

Weight **500 kgs** [1,100 lbs]

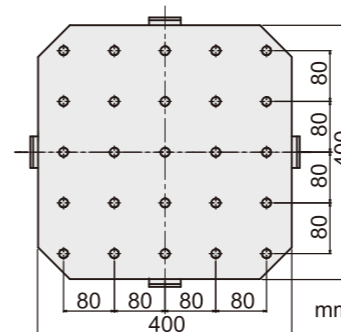
The KH-4100kai can accommodate a large workpiece for its compact design. This enables large sophisticated fixtures, if required.



2 pallets

APC

For the most suitable system to meet your requirements, the 400 x 400 mm pallet 2APC.



Pallet Clamping System

The pallet is securely clamped by four taper cones with a clamping force of 9.8 kN x 4 cones.



Fixture Preparation

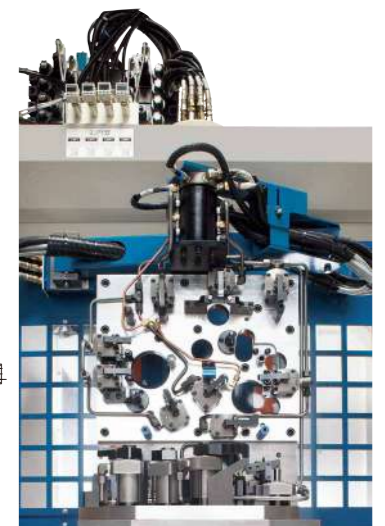
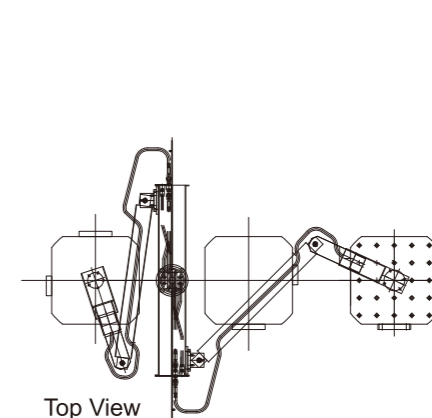
OPTION

For clamping / unclamping of pneumatic / hydraulic fixtures, Kiwa can provide an auto-coupler system and a flexible guide arm using a rotary joint. These systems allow free movement of the rotary table and protect hoses and cables inside.

Auto-Coupler



Flexible Guide Arm



High Speed & High Productivity

ATC ATC Time (T-T/C-C)
1.1/2.7 sec.

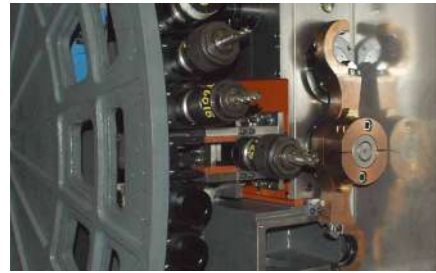


Table Indexing Speed
37 min⁻¹



Rapid Traverse

X/Y/Z **80 m/min.**
[3,150 ipm]

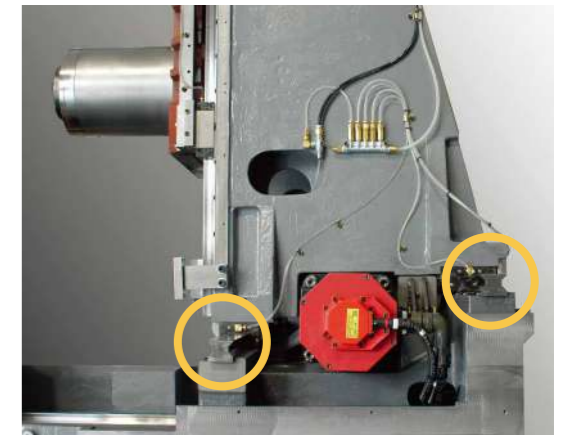
X/Y/Z **1.0/1.0/1.0 G**

Rigidity & Accessibility

Roller Guide Ways

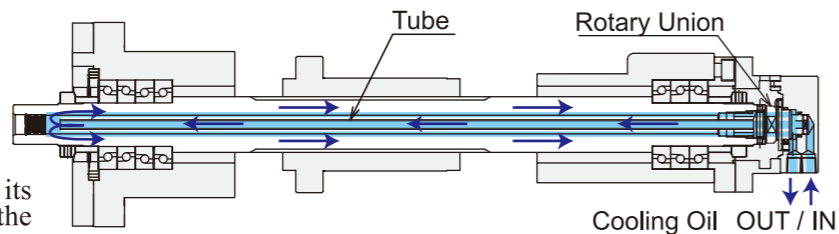
Stepped Layout of X-axis

The KH-4100kai uses roller guide ways that have higher load capacity than the same size ball guide ways and almost double the rigidity. X-axis roller guide ways are set on stepped bed and this further increases rigidity.



Ballscrew Cooling

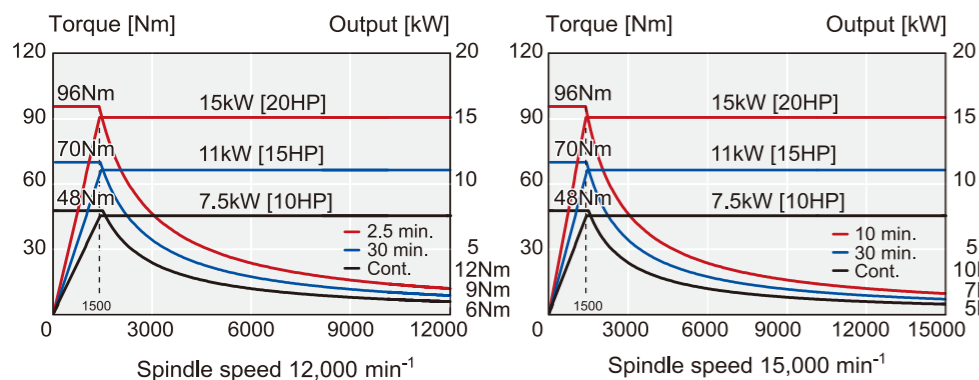
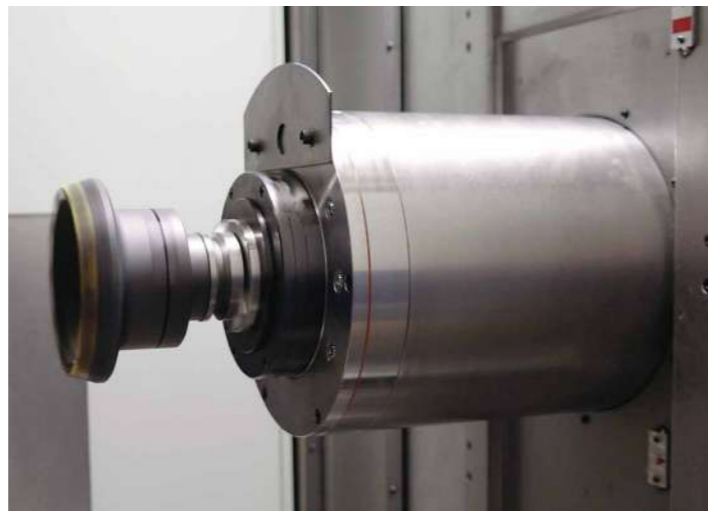
Oil circulates inside the ballscrew and controls its temperature according to the temperature of the machine body, minimizing its thermal expansion.



Direct Coupling Spindle

Spindle Speed **12,000 / 15,000 min⁻¹**
Tool Shank **BT40 / CAT40**
Bearing Size **φ 70 mm [φ 2.8"]**
Clamping Force **12,000 N**

The spindle is lubricated by a pressurized oil and air system. Fresh oil is constantly supplied to the spindle bearings, and this extends the bearing life and reduces heat. The inside of the spindle is pressurized so no coolant or chips can enter the spindle bearings.



Double Contact

The spindle is designed to accept Double contact type tool holders.

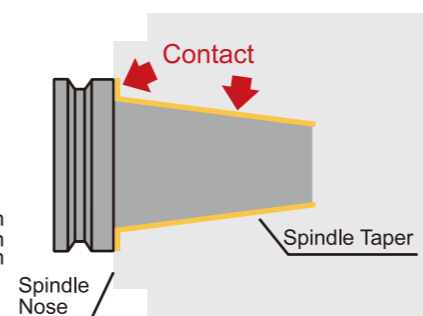
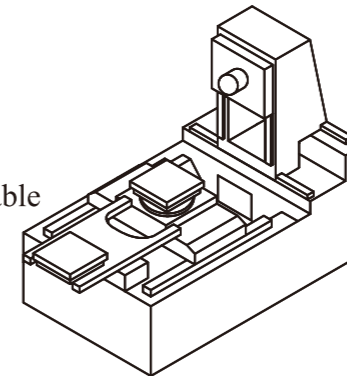


Table Traverse Z-axis

In spite of the small width of the machine, the KH-4100kai has a table traverse type Z-axis. This provides more rigidity and stability than a quill type spindle.



Box Type Bed

The enough height of the rear bed (stepped design) minimizes distortion when moving the column in the X-axis direction. The bed has a box type structure and provides enough rigidity for the maximum pallet loading capacity of 500 kgs [1,100 lbs].

Excellent Access

Operator Door & Set-up Doors

The Operator door and set-up doors provide excellent access to the pallet and fixture. The set-up doors have no rails on the upper side. Loading/Unloading from above is easy using a hoist or over head crane.

Long Nose Spindle

A long nose spindle improves accessibility to workpieces.

Swivel Type Control Box

The control box is located at the operator's left hand side and swings to the position most comfortable for the operator.



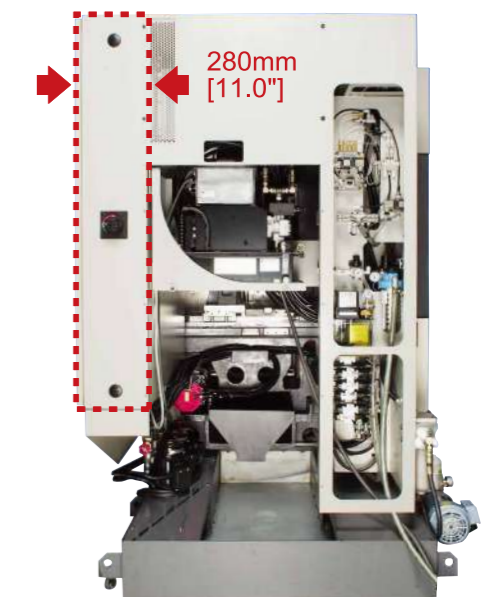
Operator Door



Front Set-up Doors

Easy Maintenance

The electrical box including its doors is 280 mm [11.0"] in depth and easily accessible for maintenance.



Lubrication unit, Hydraulic unit and Air system are grouped together in one location at the rear of the machine for easy maintenance.