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ACW 2025.02.1000E

VERTICAL MACHINING CENTER

HK-LV series

Roller Linear Guideway Series

3 Axis

RUGGED CONSTRUCTION PLUS EXTRAORDINARY DESIGN CONCEPTS

Reducing production costs while increasing productivity is essential to maintaining an enterprise's competitive edge. The HEAKE LV Series vertical machining centers provide the perfect solution, offering a significant advantage in today's market.

Built for durability and high precision, these machining centers incorporate exceptional features which deliver outstanding performance. The T-base design, combined with an oversized base and column, ensures exceptional rigidity and vibration resistance. Roller-type linear guides on all three axes further enhance stability and accuracy, making them ideal for precision manufacturing. Beyond these remarkable attributes, the HEAKE LV Series offers a comprehensive range of advanced capabilities to meet the diverse demands of modern manufacturing.

WIDE RANGE CUTTING CAPACITY

APPLICABLE INDUSTRIES

- Machine parts
- Automotive and motorcycle
- Mold and die
- Aerospace

HK-LV series

VERTICAL MACHINING CENTER
LINEAR GUIDEWAY SERIES

650 / 850 / 960 / 1160 / 1265 / 1377 / 1577 / 1677 / 1688 / 1888 / 2088 / 1610 / 1810 / 2010

YOUR NO. 1 CHOICE FOR HEAVY, EFFICIENT AND HIGH PRECISION MACHINING!

HEAKE Machinery is driven by a team of highly experienced engineers specializing in machine design, manufacturing and service. The core members of the HEAKE team hail from the technical and after-sales departments of large-scale machine tool manufacturers. With years of hands-on interaction with end-users, they possess a profound understanding of machining accuracy issues caused by shortcomings in mechanical structure design.

To address these challenges, HEAKE proactively resolves common design flaws at the earliest stages of mechanical development. Our mission is to create the most reliable precision machines which excel in both performance and machining capabilities.

UNIQUE ONE-PIECE DESIGN T-BASE STRUCTURE

A / EXTRA-LARGE BALL SCREW

- Three axes feeds are transmitted through Ø50 mm large ball screws.
- Ball screws are preloaded to effectively suppress thermal deformation while ensuring high feed accuracy.

B / DUAL CHIP AUGERS DISPOSAL

The twin chip augers are fitted in the channels of the base casting, located at the front and rear side of the base.

C / ULTRA RIGID BASE WITH ARCH SHAPED RIBS

Additional ribs are provided in front of the jointing position between the base and column, which fully eliminates the base deformation problem.
(New type patent No. 504654 in R.O.C)

D / DOUBLE AIR-CYLINDER COUNTER-BALANCE ON Z-AXIS (STANDARD)

- Z-axis movement is counter-balanced with the use of two air cylinders, leading to effortless, smooth and stable movement of Z-axis.
- The pneumatic system is equipped with an accumulator to ensure a consistent supply of air pressure, enabling smoother and more stable air cylinder operation.

E /

The air cylinder is equipped with a universal joint to ensure stability when the air cylinder is moving.

F / REINFORCED COLUMN STRUCTURE

The column is an oversized design in combination with optimal internal rib deployment, which offers the best dampening capability during heavy cutting while keeping the structural deformation to a minimum.

G / PRECISION HAND-SCRAPING WITHOUT PAD ATTACHED

Sliding surfaces are precisely scraped to achieve the best surface mating effect. No pad attached on 3 axes ensures better flatness of mating surfaces.

H / LARGE SIZED ROLLER TYPE LINEAR WAYS ON THREE AXES

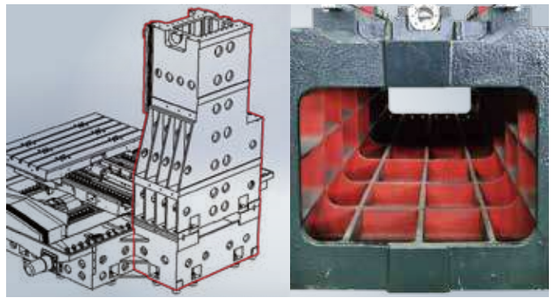
- The roller linear guidways feature high rigidity, high load-resistance, low friction coefficient and low noise.
- Rapid feed rates on three axes.
- Extra long heavy duty blocks on 3 axes.

Direct drive spindle and long nose cast iron one piece structure.

Model photo: HK-LV-1688 (Gear Spindle)

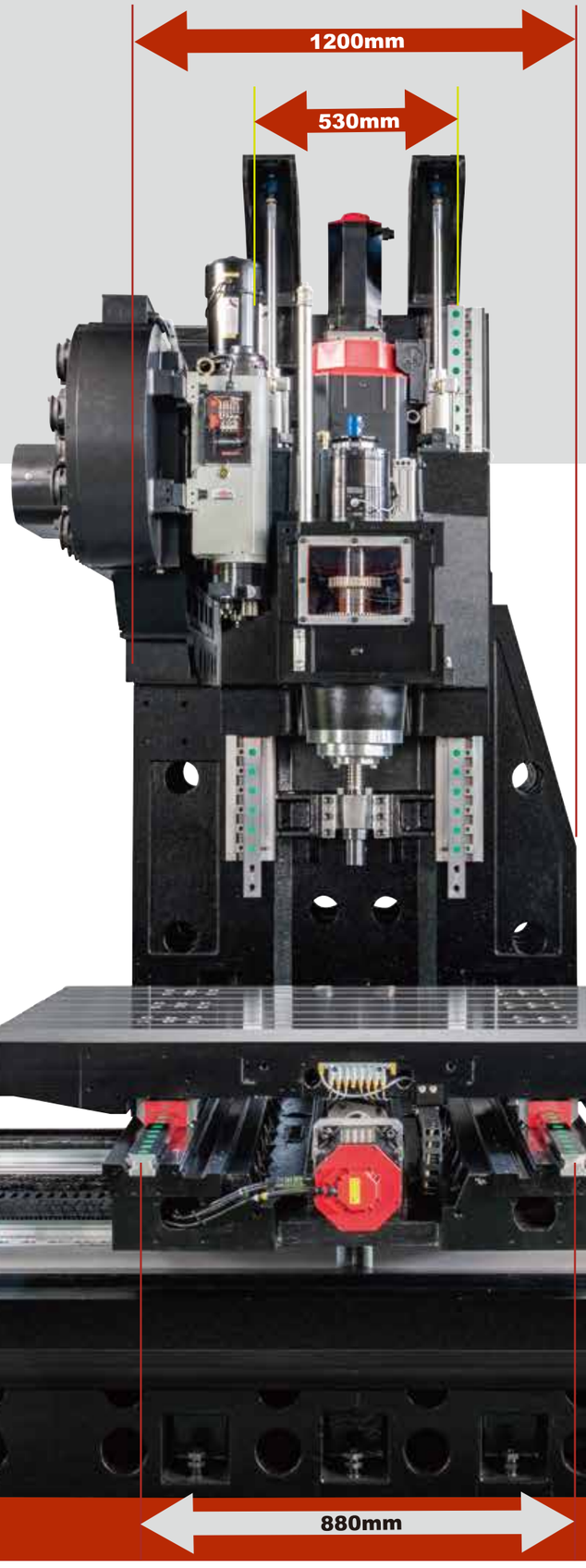
FAR EXCEEDS COMPETING MODELS

HEAKE incorporates the T-base structural design, featuring an extended base and a wider column.
HEAKE's reversed X/Y-axis structure, compared to traditional vertical machining centers, is significantly stronger, more accurate, and durable. This approach minimizes service requirements, boosts productivity, and ensures long-term reliability.



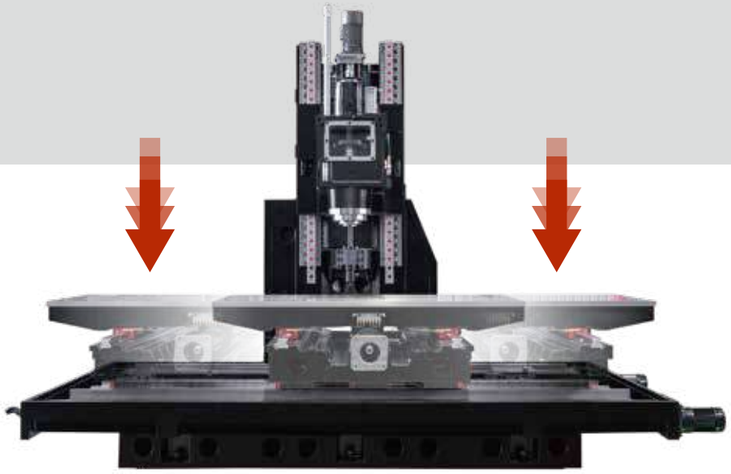
EXTRA LARGE COLUMN

The column is a box type construction, which is specially designed with reinforcement at the column bottom. This is combined with optimal internal ribbing with unique structural strength and rigidity to surpass conventional competitive models.



MASSIVE BASE

The base is an extra large structure, providing solid support for heavy loads. It is optimally rib reinforced, featuring no distortion for heavy loads.



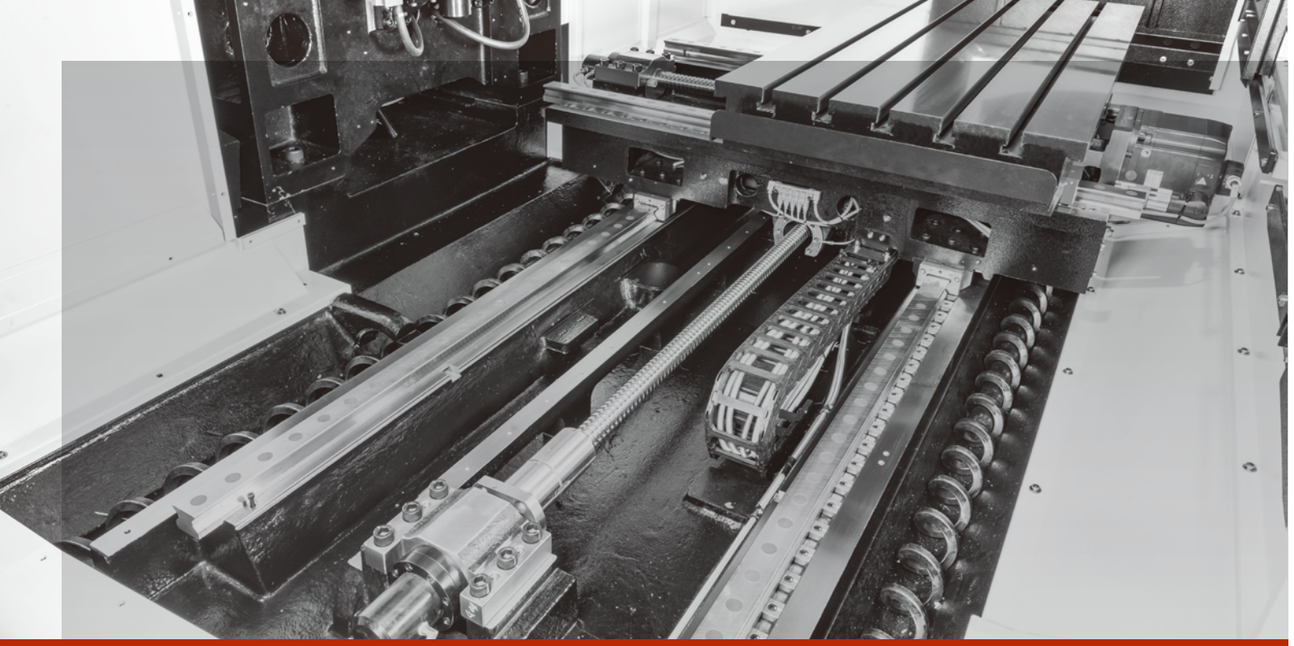
OVERHANG-FREE TABLE

T-base design enables the saddle to achieve full-stroke movement along the X-axis, while the large-spanned saddle carries the Y-axis, ensuring complete support for the worktable's movement. This eliminates the worktable overhang issue and enhances stability and accuracy during operations.

BASE LENGTH 58% GREATER UP

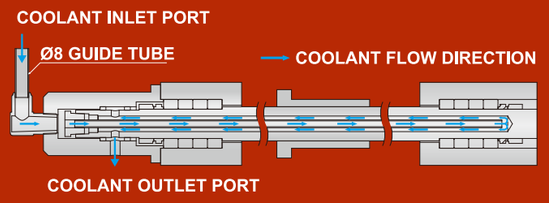
Compared to conventional machines the base length is 58% longer, and is the longest in its class. This leads to a higher level of stability.

Model photo: HK-LV-1677 (Gear Spindle)



COOLING THROUGH BALL SCREWS (OIL/AIR)

By employing cooling through X, Y, Z axis ball screws, the thermal expansion of the ball screws is minimized, helping to maintain high machining accuracy and stability of axial movement. **(NEW TYPE PATENT NO. M502117 IN R.O.C.)**



HIGHLY RIGID THREE AXES PROVIDE FAST FEED

SP CLASS ROLLER TYPE LINEAR GUIDE WAYS ON THREE AXES

- The X, Y, Z-axis are all mounted with heavy duty linear ways together with great span between linear ways, featuring high rigidity, low friction coefficient and outstanding dampening capability.
- Each linear way is equipped with extended extra heavy duty blocks for upgrading loading capacity and dynamic stability.

Model	Linear Ways & Blocks
HK-LV650~HK-LV850	· X-axis 45mm x 4 extended blocks · Y-axis 35mm x 4 extended blocks · Z-axis 45mm x 6 extended blocks
HK-LV960~HK-LV1265	· X, Y-axis 45mm x 4 extended blocks · Z-axis 45mm x 6 extended blocks
HK-LV1377~HK-LV2010	· 3 axes 55mm x 6 extended blocks

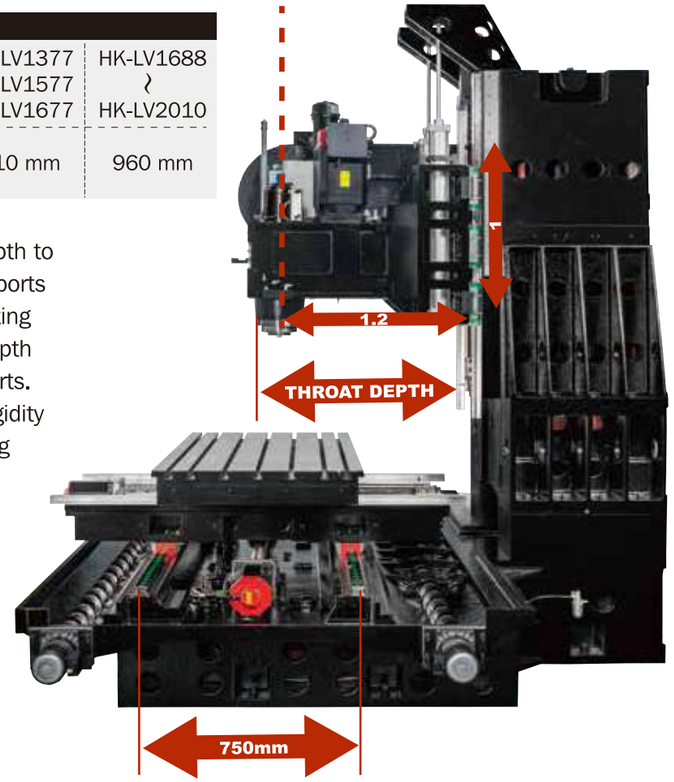
AUTOMATIC TOOL CHANGER

The tool magazine is independently mounted on the machine without without direct contact with the column, which eliminates vibration of the column while ensuring machining accuracy. The twin tool-change arm allows the operator to adjust the tool change speed for various tools. In addition, HEAKE also provides tool life management, big tool managment and tool length measurement functions to ensure accuracy and dependability.

LONG THROAT DEPTH CREATES MORE WORKING SPACE

Throat Depth on Each Model				
Model	HK-LV650 HK-LV850	HK-LV960 HK-LV1160 HK-LV1265	HK-LV1377 HK-LV1577 HK-LV1677	HK-LV1688 ≀ HK-LV2010
Throat Depth	640 mm	700 mm	810 mm	960 mm

The golden ratio 1.2:1 of the throat depth to the height of spindle head strongly supports the spindle for heavy cutting without tilting problems. Moreover, the long throat depth provides ample machining space for parts. HEAKE has strengthened the vertical rigidity of the spindle head to assure machining accuracy.



HIGH SPEED / HIGH RIGIDITY SPINDLE

DIRECT-DRIVE SPINDLE

- With the motor directly driving the spindle, backlash, vibration, and noise are reduced.
- High efficiency of motor power transmission.
- The spindle runs on lightweight ceramic bearings which feature low centrifugal force and low thermal expansion coefficient.
- The spindle oil cooler reduces thermal expansion, improves machining accuracy, and extends spindle bearing life.

HK-LV650 / 850
SPECIFIC USE SPINDLE
(SPECIALLY MADE)

BBT40 (αi I 8/12000)
12,000 rpm is standard.
12,000 / 15,000 rpm with oil mist lubrication(optional)

DIRECT-DRIVE SPINDLE

BBT50 (αi I 15/12000)
8,000 rpm is standard.
10,000 rpm is optional.

DIRECT-DRIVE SPINDLE

BBT40 (αi I 12/12000)
12,000 rpm is standard.
15,000 / 18,000 rpm is optional.

GEAR-DRIVE SPINDLE

- Motor power is transmitted through a two-step gearbox to the spindle, making the machine ideal for heavy cutting.
- The spindle runs on ceramic bearings which minimize spindle deformation and ensure high accuracy of the spindle.
- The spindle at low speed can reach a high torque of 607 Nm (HK-LV960 ~ HK-LV2010).
- The spindle runs on lightweight ceramic bearings which feature low centrifugal force and low thermal expansion coefficient.
- The spindle with 100mm diameter runs in 5 rows of 7020 bearings, ensuring outstanding stability in heavy cutting.
- The use of Japanese made gears features superior rigidity and stability.

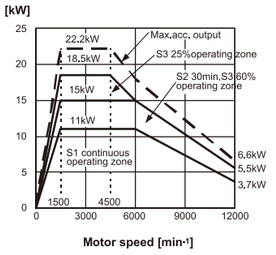
GEAR-DRIVE SPINDLE

BBT50 (αi I 15/8000) for HK-LV960~HK-LV2010
4000 rpm is standard (gear ratio 1: 5.15)
6000/8000 rpm is optional (gear ratio 1:3.02)

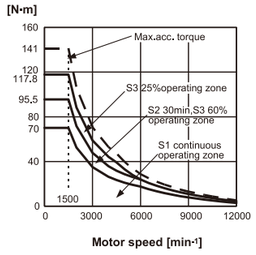
SPINDLE TORQUE DIAGRAM

FANUC αi I 12/12000

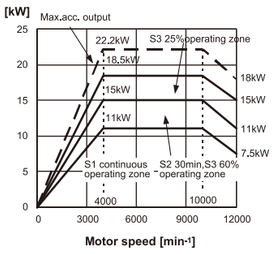
Low-speed winding output (Y connection)



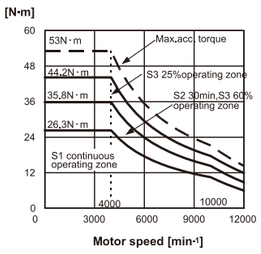
Low-speed winding torque (Y connection)



High-speed winding output (Δ connection)

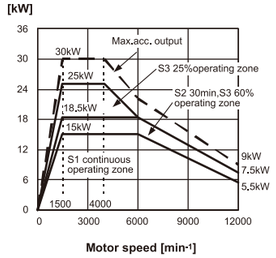


High-speed winding torque (Δ connection)

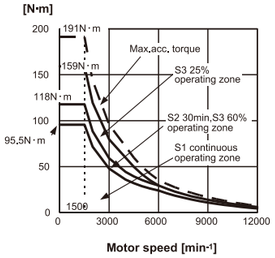


FANUC αi I 15/12000

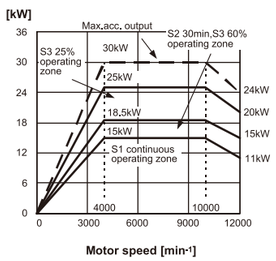
Low-speed winding output (Y connection)



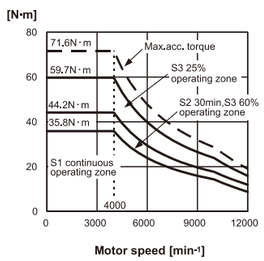
Low-speed winding torque (Y connection)



High-speed winding output (Δ connection)

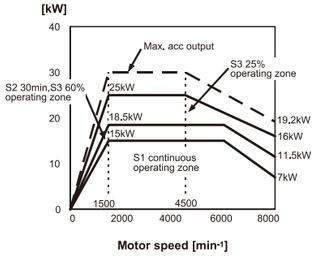


High-speed winding torque (Δ connection)

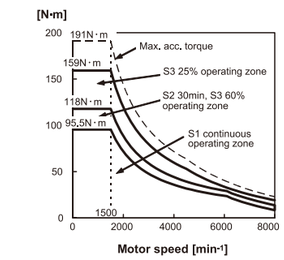


FANUC αi I 15/8000

Output

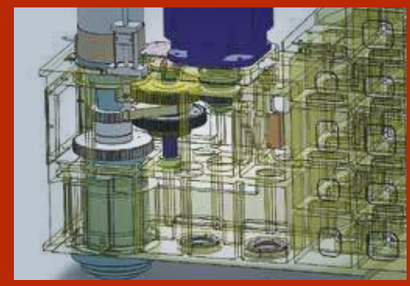


Torque

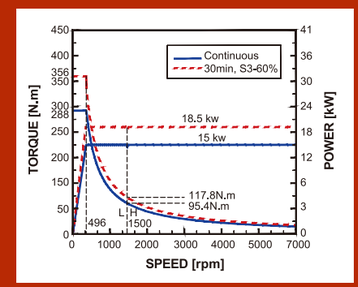


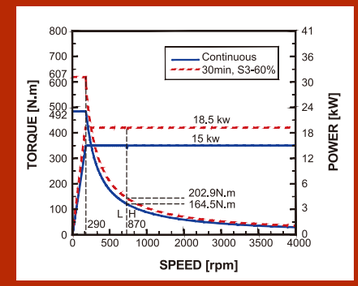
GEAR-DRIVE SPINDLE HEAD

- The gear-drive spindle head features high / low two-step speed ranges. The low speed range provides high torque output for heavy cutting. The high speed range is ideal for fine machining and creates fine finish on machining surfaces.
- The gearbox is oil bath lubricated.
- Available to be equipped with a spindle oil cooler, allowing the gearbox to maintain a constant temperature to prevent the spindle from thermal deformation.



Model: HK-LV960~HK-LV2010

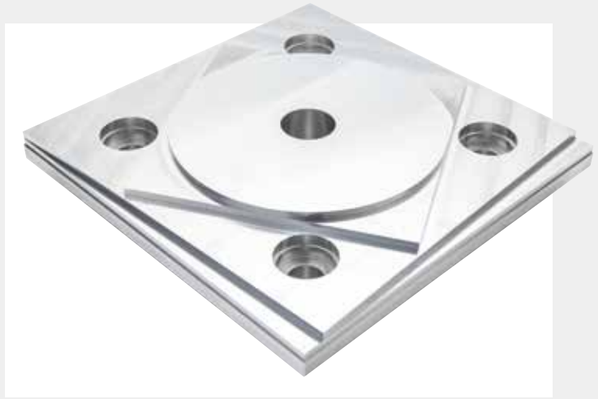


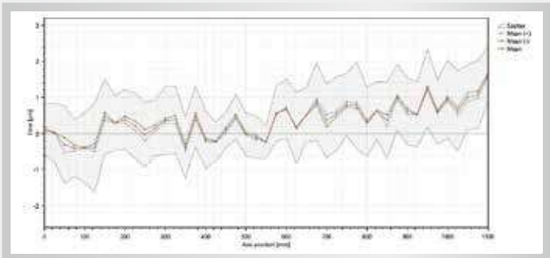


MACHINING CAPACITY

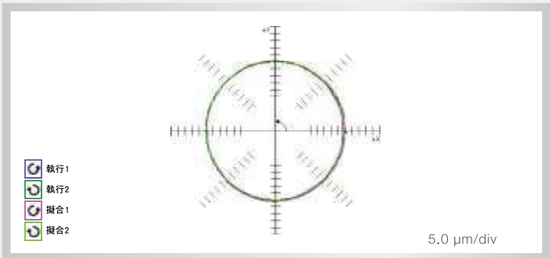
	BBT 40 Direct-drive Spindle (αil 12/12000)	BBT 50 Gear-drive Spindle (αil 15/8000)
	**MATERIAL REMOVAL:** **375 cc/min** ■ Tool : ***63 mm*** ■ Material: S45C Steel ■ Cut: 50 mm x 4 mm ■ Feed Rate: 1875 mm/min ■ Spindle Speed: 1500 rpm	**MATERIAL REMOVAL:** **684 cc/min** ■ Tool : ***100 mm*** ■ Material: S45C Steel ■ Cut: 80 mm x 4.8 mm ■ Feed Rate: 1780 mm/min ■ Spindle Speed: 1460 rpm
	**MATERIAL REMOVAL:** **189 cc/min** ■ Tool : ***63 mm*** ■ Material: S45C Steel ■ Cut: 25 mm x 4 mm ■ Feed Rate: 1890 mm/min ■ Spindle Speed: 1800 rpm	**MATERIAL REMOVAL:** **338 cc/min** ■ Tool : ***63 mm*** ■ Material: S45C Steel ■ Cut: 45 mm x 4 mm ■ Feed Rate: 1880 mm/min ■ Spindle Speed: 1710 rpm
	■ Tool : ***40 mm*** ■ Material: S45C Steel ■ Diameter Cut: 40 mm ■ Feed Rate: 225 mm/min ■ Spindle Speed: 1500 rpm	■ Tool : ***60 mm*** ■ Material: S45C Steel ■ Diameter Cut: 60 mm ■ Feed Rate: 190 mm/min ■ Spindle Speed: 1180 rpm
	■ Tool : ***M30 x 3.5 P*** ■ Material: S45C Steel ■ Width Cut: 30 mm ■ Feed Rate: 448 mm/min ■ Spindle Speed: 128 rpm	■ Tool : ***M42 x 4.5 P*** ■ Material: S45C Steel ■ Width Cut: 42 mm ■ Feed Rate: 855 mm/min ■ Spindle Speed: 190 rpm

ACCURACY





E.g. X Axis Laser Compensation under 5 microns.



E.g. XY Double Ball Bar Test Results under 5 microns.

HEAKE performs cutting tests in circle, square and diamond shapes to ensure a maximum tolerance under 0.005 mm.

Linear X - Analysis features	**VDI 3441**
Name	**Value (μm)**
Maximum reversal (U max)	0.4
Maximum scatter (Ps max)	2.3
Positional uncertainty (P)	4
Positional deviation (Pa)	2
Mean reversal	0.1
Mean scatter (Ps mean)	1.6

Ball Bar - Diagnostics (XY 360 degree 15 mm)	
20% Reversal spike Y	↑ 1.2 μm ↓ 1.2 μm
17% Reversal spike X	↑ 0.1 μm ↓ -1.1 μm
12% Backlash Y	↑ 0.1 μm ↓ -0.7 μm
8% Straightness	1 μm
Circularity	3.9 μm

LASER INSPECTION

In addition to being subjected to rigorous rigorous tests, HEAKE machines are also inspected by using a sophisticated laser instrument. This allows us to inspect and calibrate pitch error of ball screw, backlash, positioning accuracy and repeatability accuracy on X, Y, Z-axis.

MACHINE SPECIFICATIONS

MODEL	UNIT	HK-LV650	HK-LV850	HK-LV960	HK-LV1160	HK-LV1265	HK-LV1377	HK-LV1577	HK-LV1677	HK-LV1688	HK-LV1888	HK-LV2088	HK-LV1610	HK-LV1810	HK-LV2010
FANUC Oi-MF PLUS Controller															
TABLE															
Table Size	mm	700 x 500	900 x 550	1000 x 600	1200 x 600	1300 x 600	1400 x 780	1600 x 780	1700 x 780	1700 x 930	1900 x 950	2000 x 950	1700 x 930	1900 x 950	2000 x 1000
T-Slot (No. x Width x Pitch)	mm	5 x 18 x 100		5 x 18 x 100			5 x 18(22) x 125			7 x 22 x 150		7 x 22 x 150	7 x 22 x 150		7 x 22 x 150
Max. Table Load	kg	400	500	600	1000	1200	1500	2000	2300	2500	3300	3600	2500	3300	3600
TRAVEL															
X Axis	mm	610	800	950	1100	1200	1350	1500	1600	1650	1800	2000	1650	1800	2000
Y Axis	mm	500	530	600		650	710 (750) (※2)			880			1000		
Z Axis	mm	510	560 (710)	610 (810)		610 (810)	720 (920) (※2)			820	850	840	820	850	840
Spindle Nose to Table Surface	mm	100-610	120-680 (830)	130~740 (940)		130~740 (940)	150~870 (150~1070)			150~970	250~1100	250~1090	250~1090		
Spindle Center to Column Cover	mm	577		655			795			935			1035		
SPINDLE															
Spindle Taper		BBT (Taper Dual Contact)		BBT (Taper Dual Contact)			BBT (Taper Dual Contact)			BBT (Taper Dual Contact)			BBT (Taper Dual Contact)		
Spindle Speed & Transmission	rpm	#40: 12000 direct drive (5.5/7.5 kw)	#40: 12000 direct drive (7.5/11 kw)	#40: 12000 direct drive (11/15 kw) #50: 10000 direct drive (15/18.5 kw) #50: 6000 gear drive (15/18.5 kw)			#40: 12000 direct drive (11/15 kw) #50: 10000 direct drive (15/18.5 kw) #50: 6000 gear drive (15/18.5 kw)			#50: 10000 direct drive (15/18.5 kw) #50: 4000 gear drive (15/18.5 kw) #50: 6000 gear drive (15/18.5 kw)			#50: 10000 direct drive (15/18.5 kw) #50: 4000 gear drive (15/18.5 kw) #50: 6000 gear drive (15/18.5 kw)		
FEED															
Rapid Feed Rate - X/Y/Z axis	m/mim	40 / 40 / 40		#40: 36 / 36 / 36 #50: 24 / 24 / 24	#40: 32 / 32 / 30 #50: 24 / 24 / 24	#40: 30 / 30 / 24 #50: 24 / 24 / 24	#40: 24 / 24 / 20 (16) #50: 20 / 20 / 20 (16)			#50: 18 / 18 / 18 (direct drive) #50: 15 / 15 / 15 (gear drive)			#50: 18 / 18 / 18 (direct drive) #50: 15 / 15 / 15 (gear drive)		
Cutting Feed Rate - X/Y/Z axis	m/mim	15 / 15 / 15		15 / 15 / 15			15 / 15 / 15			15 / 15 / 15			15 / 15 / 15		
ATC															
Tool Storage Capacity		#40: 24T		#40: 24, 30 / 32 /40 / 60 (Opt.) #50: 24, 30 / 40 / 60 (Opt.)			#40: 24, 30 / 32 / 40 / 60 (Opt.) #50: 24, 30 / 40 / 60 (Opt.)			#50: 24, 30/40/60 (Opt.)			#50: 24, 30/40/60 (Opt.)		
Tool Shank Type		BBT40		BBT40			BBT40 / BT50			BT50			BT50		
Max. Tool Diameter x Length	mm	#40: Ø75 x 250		#40: Ø75 x 250 #50: Ø125 x 300			#40: Ø75 x 250 #50: Ø125 x 350			#40: Ø75 x 250 #50: Ø125 x 400			#50: Ø125 x 400		
Without Adjacent Tool (diameter)	mm	Ø125		#40: Ø125 #50: Ø250			#40: Ø125 #50: Ø250			Ø250			Ø250		
Max. Tool Weight	kg	7		7/15			7/15			15			15		
ACCURACY															
ISO 230-2		A: 0.006 ; R: 0.005		A: 0.006 ; R: 0.005			A: 0.008 ; R: 0.006			A: 0.01 ; R: 0.006	A: 0.012 ; R: 0.007		A: 0.01 ; R: 0.006	A: 0.012 ; R: 0.007	
ISO 10791-2		A: 0.006 ; R: 0.005		A: 0.006 ; R: 0.005			A: 0.008 ; R: 0.006			A: 0.01 ; R: 0.006	A: 0.012 ; R: 0.007		A: 0.01 ; R: 0.006	A: 0.012 ; R: 0.007	
VDI 3441 (※1)		P: 0.008 / PS: 0.005		P: 0.008 / PS: 0.005			P: 0.009 / PS: 0.006			P: 0.012 / PS: 0.007	P: 0.014 / PS: 0.008		P: 0.012 / PS: 0.007	P: 0.014 / PS: 0.008	
PERIPHERALS															
Power Requirement	KVA	30		#40: 30, #50: 35			35			40	45		40	45	
Pneumatic Supply	Mpa,1/min	0.6		0.6			0.6			0.6			0.6		
Coolant Tank Capacity	L	365		390			480			540		600	540		600
Footprint Size (W x D)	mm	2890 x 3160		3650 x 3335			4200 x 3715			4590 x 3975			4870 x 4225		
Machine Net Weight	kg	5350	6250	9050	10800	11500	13950	15800	16280	16850	18600	18800	17350	19100	19600

NOTE 1: The VDI 3441 employs a statistical method method by using 5 standard deviations, which can achieve a quality assurance level of 99.5%.

* As the machine manufacturer constantly conducts machine research and improvement, the machine specifications are subject to change without prior notice.

NOTE 2: HK-LV1377/1577/1677, if Y/Z-axis travel is changed to 700/680 mm, it can be packed into 40" HQ container.

CHAIN TYPE CHIP CONVEYOR (OPTIONAL)

The chip conveyor and coolant tank are integrated and mounted on the left side of the machine for saving space.

TWIN CHIP AUGERS

- There is one set each of chip augers mounted on the front and rear side of the base, which delivers chips generated during cutting to the chip conveyor at the back side of the machine.
- The chip augers may prevent thermal effects due to the deposited chips and keep the machine interior clean at all times.

COOLANT THROUGH SPINDLE DEVICE (OPTIONAL)

- The coolant through spindle device employs a high pressure and high flow rate pump which discharges cutting fluid to the cutting position.
- Especially when performing high speed machining, deep drilling and deep milling, the coolant through spindle device helps to remove chips quickly, so as to upgrade machining accuracy and save machining time.

INTELLIGENT FUNCTIONS

Tool Management

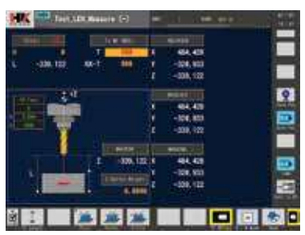
PLC Alarm List

Utilization Rate

Spindle Load Monitor

Peripheral Devices

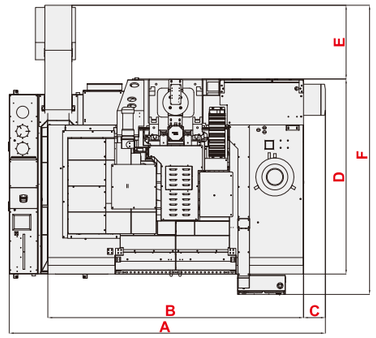
Workpiece Management

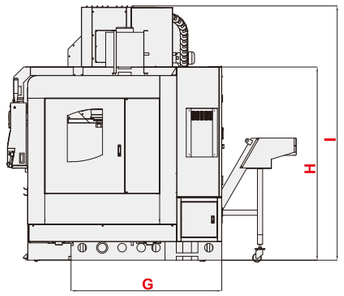


Tool Management

Lube Information

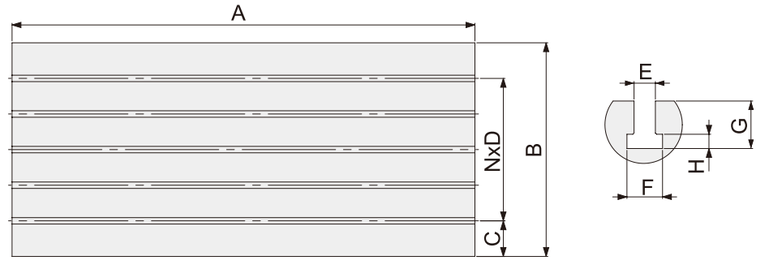
MACHINE DIMENSIONS





Unit: mm

MODEL	A	B	C	D	E	F	G	H	I
HK-LV2010	4870	4540	-	3310	610	4225	2413	2700	3785
HK-LV1888	4590	4260	-	3060	610	3975	2413	2700	3785
HK-LV1688	4590	4260	-	3060	610	3975	2413	2700	3785
HK-LV1677	4200	3610	125	2754	655	3715	2138	2430	3075
HK-LV1577	4200	3610	125	2754	655	3715	2138	2430	3075
HK-LV1377	4200	3610	125	2754	655	3715	2138	2430	3075
HK-LV1265	3650	2950	255	2250	855	3335	1750	2230	2935
HK-LV1160	3650	2950	255	2250	855	3335	1750	2230	2935
HK-LV960	3650	2950	255	2250	855	3335	1750	2230	2935
HK-LV850	2850	2280	-	2630	480	3150	1610	2180	2850
HK-LV650	2850	2080	-	2630	480	3150	1610	2180	2850



Unit: mm

MODEL	A	B	C	N	T-SLOT	D	E	F	G	H
HK-LV2010	2000	1000	200	4	5+2(NOTE: 1)	150	22	37	40	16
HK-LV1888	1900	950	175	4	5+2(NOTE: 1)	150	22	37	40	16
HK-LV1688	1700	930	165	4	5+2(NOTE: 1)	150	22	37	40	16
HK-LV1677	1700	780	140	4	5	125	18	30	40	12
HK-LV1577	1600	780	140	4	5	125	18	30	40	12
HK-LV1377	1400	780	140	4	5	125	18	30	40	12
HK-LV1265	1300	600	100	4	5	100	18	30	40	12
HK-LV1160	1200	600	100	4	5	100	18	30	40	12
HK-LV960	1000	600	100	4	5	100	18	30	40	12
HK-LV850	900	550	100	4	5	100	18	30	40	12
HK-LV650	700	500	100	4	5	100	18	30	40	12

NOTE: 1. One each of T-slot is added to the right and left side.
Side distance 200 / 175 / 165 for model HK-LV2010 / HK-LV1888 / HK-LV1688.
2. T-slot specifications can be specified by customers.