

ALL SERIES



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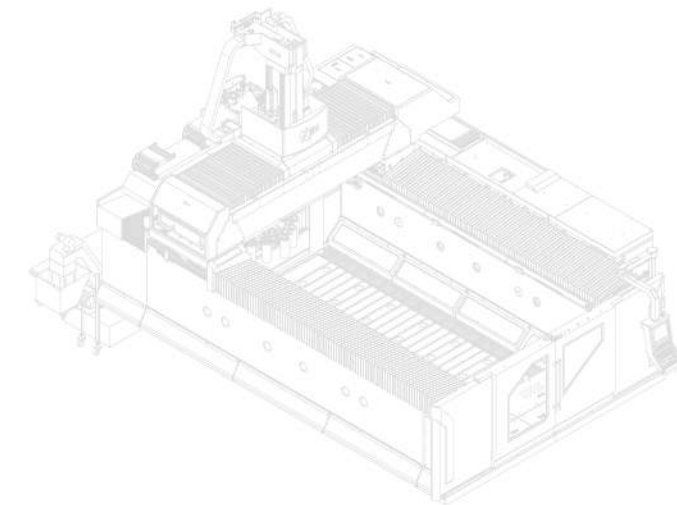
The only professional 5-axis machine center manufacture in Asia

# LinmaxB

LINEAR MOTOR DRIVE



- Stability
- Precision
- Strength



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KEN ICHI MACHINE CO.,LTD

KEN ICHI MACHINE CO., LTD. - 2019-06



## High Speed 5-axis Machine Center

### Highly Dynamic

- Gantry type
- Column one-piece design
- X/Y - Axis linear motor drive
- Feed rate: 60 m/min
- Box in Box symmetrical design
- Direct-drive motor with two-axis milling head

### Box in Box, Symmetrical Design



Driven by the center of gravity  
Minimized crossbeam deformation after long period of  
usage for reliability and rigidity

Applications For:  
Aerospace Aluminum Frame  
Automotive Stamping Die  
Mechanical Component

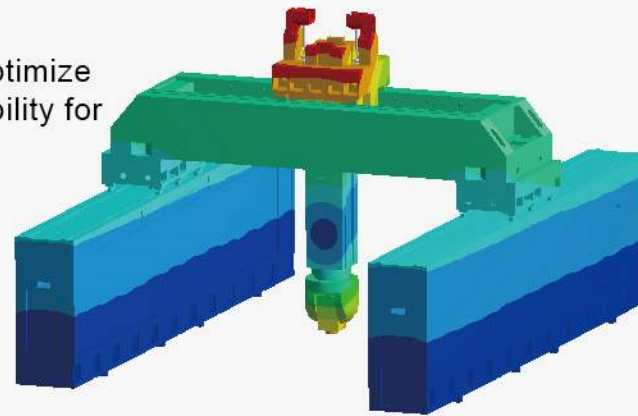




## Optimize Structural Design

### High-Performing Structure

- X/Y axis equipped with linear motor drive
- B/C axis equipped with torque motor drive
- Z axis equipped with dual ball screw
- High rigidity one-piece column design
- Worktable fixed to the foundation
- Advanced FEM analysis and design to optimize higher rigidity, response and provide stability for high-speed cutting



## Box in Box Symmetrical Design

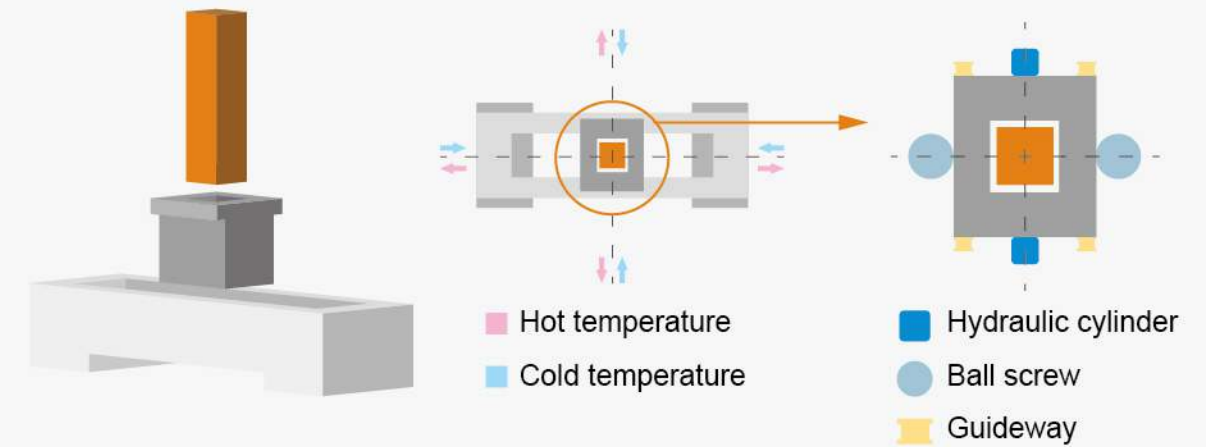
More stability, more precision, and more strength

### Our System

- Box-in-Box design has spindle located at the center of Crossbeam and Saddle.
- Symmetrical construction allows the machine less susceptible to adverse ambient conditions. Heat deformation will be minimized even after long period of usage.
- Box-in-Box design ensures excellent precision while performing numerous tasks.

#### Advantage of BOX-IN-BOX Structural Design:

- Y-axis with 4 linear guide ways with two tracks on XY plane and YZ plane to support Ram & Saddle for reaching optimized dynamic characteristics.
- Z-axis equipped with 4 linear guide ways on two side of the slider with each side undertaking the same cutting force. Its balanced design will enhance the machine lifetime and accuracy.
- Dual ball screw and dual counterbalance system equipped in Z axis allow stable structure for high speed cutting tasks.

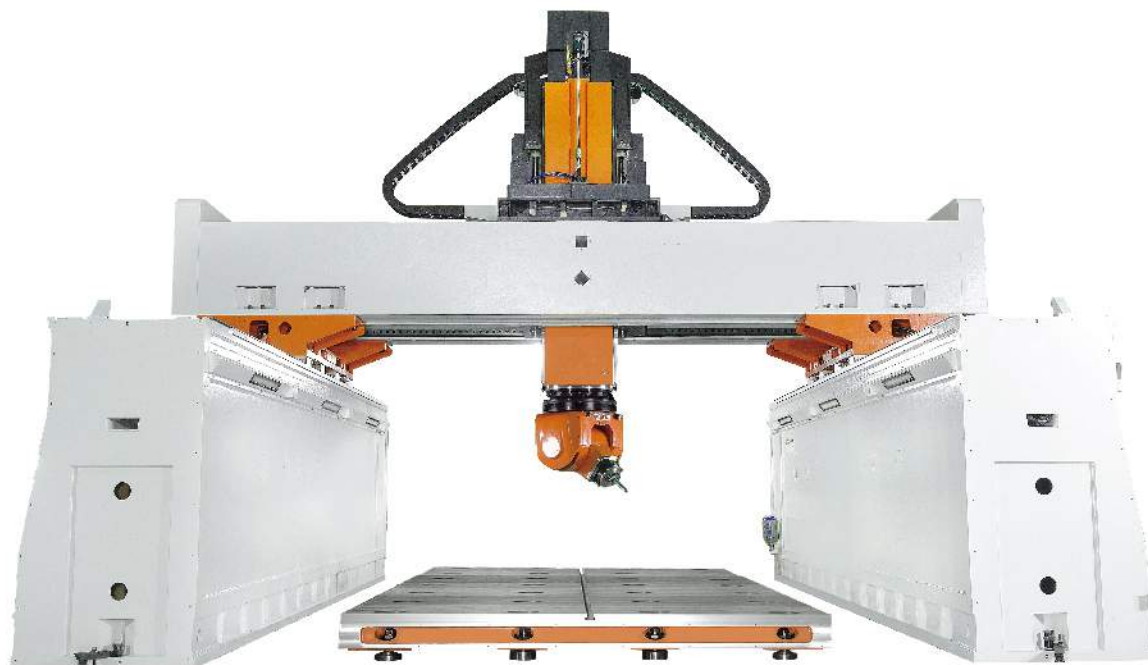


### Other Manufacturers



### Modular Structure to Satisfy Yours Requests

The column is one-piece design, high rigidity, high vibration resistance to ensure that the machine can reach excellent cutting and dynamic performance.





# Linear Motor Drive



## The inevitable trend in the future

- Backlash free with high positioning accuracy
- Direct transmission  
Reduced number of ball screw/nut, bearings and couplings
- Free of wear due to friction free drive concept
- Simple structure / long-term accuracy / easy maintenance



# Excellent Design For 5-Axis High Speed Machine

## X-Axis

The Column for the X-axis uses the linear motor without the belt and coupling to increase high accuracy while maintaining high-speed.

X-axis is supported by the left and right box column. Each side has two roller linear guideways and each guideway has three Block to increase rigidity and keep excellent accuracy for a long time.

Brakes will immediately clamp axes in case of an emergency stop or power failure.

Linmax B-22/25 series uses one linear motor on each side and each side of the guide way has 3 blocks to support (Total 12 blocks)

Linmax B-30/35/40 uses Two linear motors on each side and each side of the guide way has 4 blocks to support (Total 16 blocks)



## Y-Axis

Y-axis by symmetrical box-in box design crossbeam will reduce the thermal deformation and minimize the effect from temperature.

Y-axis uses linear motor without coupling to directly transmit force to the saddle. It can produce a high-speed response and high-positioning accuracy.

Y-axis crossbeam equipped with four roller type guide way. Each guide way encloses two slider blocks (Total eight blocks) to reach high-rigidity.



## Z-Axis

Z-axis has symmetrical design to remain in the center of gravity. It ensures force to be evenly distributed while cutting and moving.

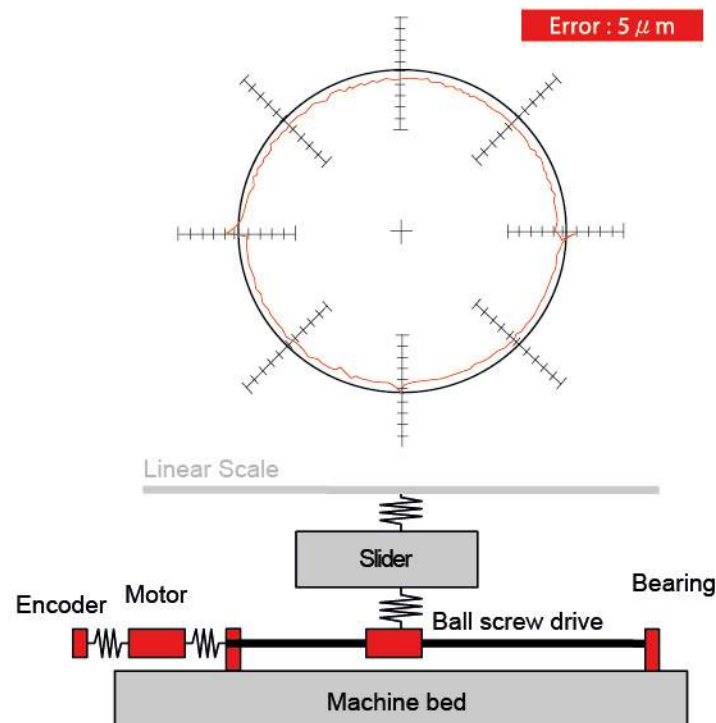
Z-axis equipped with Dual ball screw & dual counterbalance system, features high stability during high speed cutting

Z-axis is equipped with four roller type guide way to provide the best rigidity in cutting.

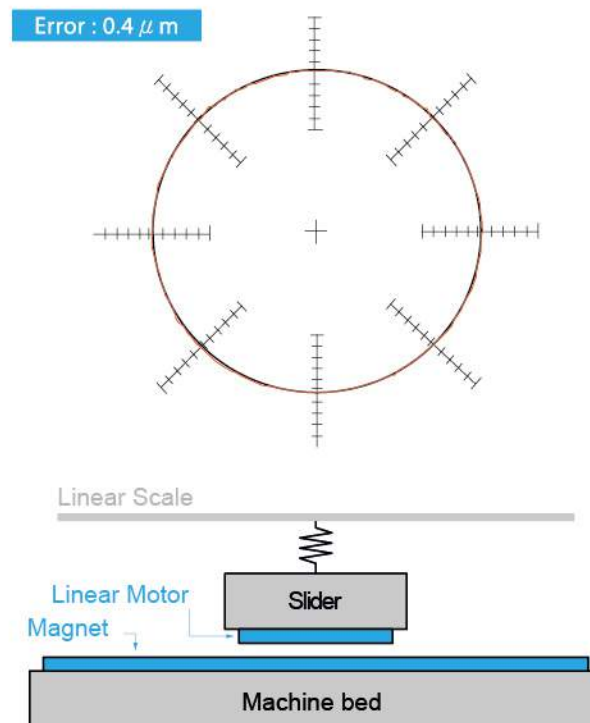
Reduced thermal deformation and minimized the effects of temperature.



## Ball Screw VS Linear motor



- Transmission chain length, the error is larger
- The path is less accurate
- Backlash exists



- Direct transmission
- System with higher KV value
- Path of high precision
- No backlash

Source by: Siemens laboratory testing

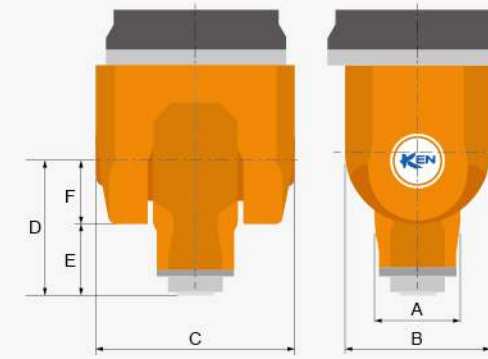


# Two-axis Milling Heads Modular Design From Italy



Direct-Drive Motor

- Italian modular design with 2-axis milling head; suitable for plastic injection mold
- Innovative symmetric "open frame" design made in GGG40 modular cast iron for head
- Dedicated "Direct-Drive" torque motor with integrated water-cooling system for B/C axis
- Double row crossed roller bearing support to achieve excellent rigidity and accuracy for B/C axis
- High-resolution, high-precision encoder for B/C axis

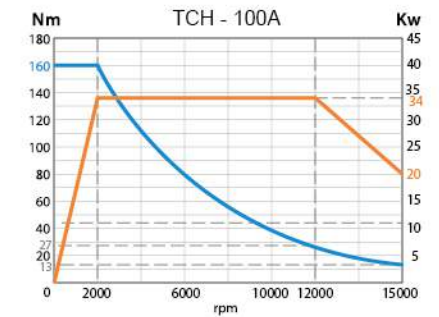


TCH-19		
	A63	A100
A	235	235
B	400	400
C	567	565
D	373	356
E	200	183
F	173	173

TCH-25		
	A	B
A	303	471
B	471	698
C	698	375
D	375	185
E	185	190
F	190	

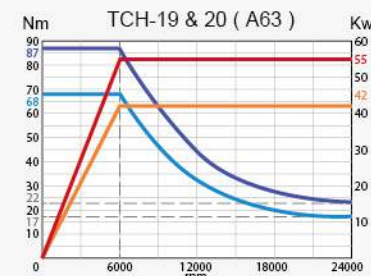
TCH-20		
	A63	A100
A	233	233
B	420	420
C	648	648
D	310	345
E	127	162
F	183	183

## TCH-100A Vertical spindle for 3-axis

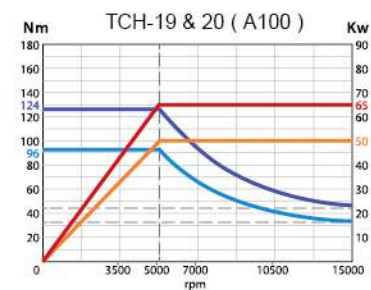


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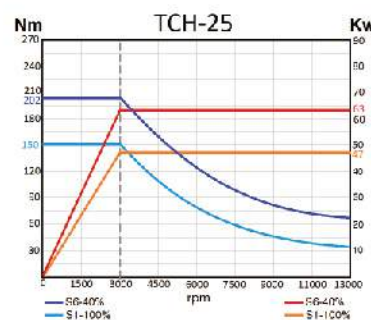
### TCH-19



### TCH-20



### TCH-25



MILLING HEAD B&C-AXIS(TORQUE MOTOR DRIVE)	TCH-19 (A63)	TCH-19 (A100)	TCH-20 (A63)	TCH-20 (A100)	TCH-25	TCH 100A	
Rotation speed : B&C	rpm (360°/s)		50/50	50/50	50/50	/	
Max. acceleration : B&C	rad / s <sup>2</sup>		30/30	30/30	30/30	/	
Max. torque : B&C	Nm		1,100/900	1,100/900	1,400/1300	1,400/1300	/
Clamping torque : B&C	Nm		4,000/4,000	4,000/4,000	4,000/4,000	4,000/4,000	/
Positioning accuracy : B&C	arc.sec		± 3 / ± 3	± 3 / ± 3	± 3 / ± 3	± 3 / ± 3	/
Rotation angle : B&C	deg		± 100° / ± 240°	± 100° / ± 240°	± 100° / ± 240°	± 100° / ± 240°	± 115° / ± 360°
<b>SPINDLE</b>							
Spindle power S1-100% (S6-40%)	kw	42 (55)	50 (65)	42 (55)	50 (65)	47 (63)	34
Spindle torque S1-100% (S6-40%)	Nm	67 (87)	96 (124)	67 (87)	96 (124)	150 (202)	160
Max. speed	rpm	24,000	15,000	24,000	15,000	13,000	15,000
Tool shank	type	HSK-A63	HSK-A100	HSK-A63	HSK-A100	HSK-A100	HSK-A100

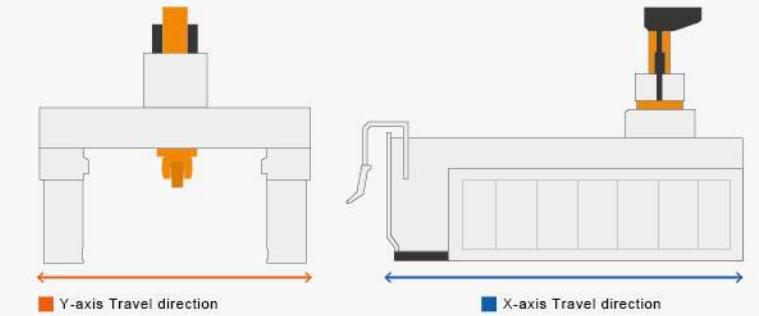


# Application

*Aerospace - Automotive - Mechanical Component*



# Machine Specifications

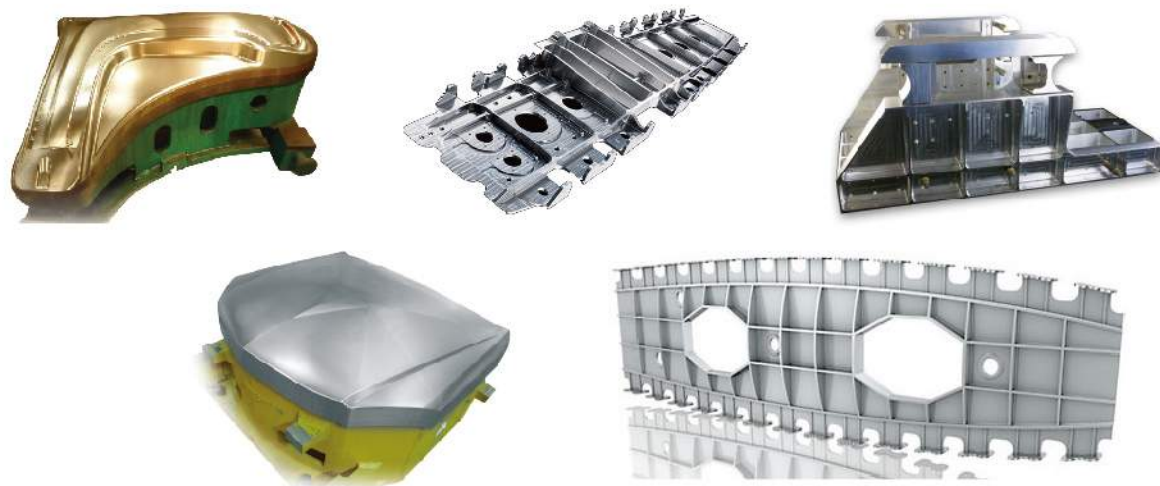


		Model: Linmax B				
Specifications		2232	2540	3050	3550	4050
Travel	Unit	22 <sup>∞</sup>	25 <sup>∞</sup>	30 <sup>∞</sup>	35 <sup>∞</sup>	40 <sup>∞</sup>
■ Y-axis travel	mm	2,200	2,500	3,000	3,500	4,000
■ X-axis travel	mm	3,200 / 4,000 / ∞ 4,000 / 5,000 / ∞ 5,000 / 6,000 / ∞ 5,000 / 6,000 / ∞ 6,000 / 8,000 / ∞				
Z-axis travel	mm	1,250	1,250	1,250	1,250	1,250
Distance between column	mm	3,290	3,590	4,090	4,590	5,090
Distance between spindle nose to table surface	mm	200~1,450	200~1,450	200~1,450	200~1,450	200~1,450
Table width	mm	2,000	2,200	2,700	3,200	3,700
Table length	mm	3,200 / 4,000 / ∞ 4,000 / 5,000 / ∞ 5,000 / 6,000 / ∞ 5,000 / 6,000 / ∞ 6,000 / 8,000 / ∞				
T-slot size (Width)	mm	28	28	28	28	28
Table load	kg/m <sup>2</sup>	5,000	5,000	5,000	5,000	5,000
X/Y/Z-axis drive mode	X/Y/Z	Linear Motor / Linear Motor / Twin Ball-Screw				
X/Y/Z-axis rapid feed rate	m/min	60/60/50				

∞ = or more

Milling head type	Unit	TCH-19 (A63)	TCH-20 (A63)	TCH-19 (A100)	TCH-20 (A100)	TCH 25 (A100)	TCH-100A
Tool changer							
Tool type	type	HSK A63		HSK A100			
Tool magazine capacity	pcs	30		30			
Max. tool weight	Kgs	8		15			
Max. tool length	mm	350		350			
Max. tool dimensions	mm	Ø75		Ø125			

# Working pieces



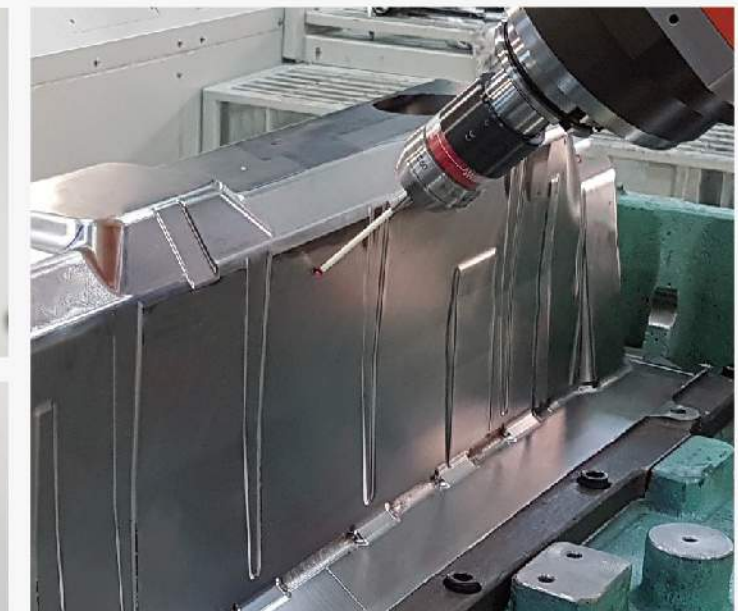


## Standard

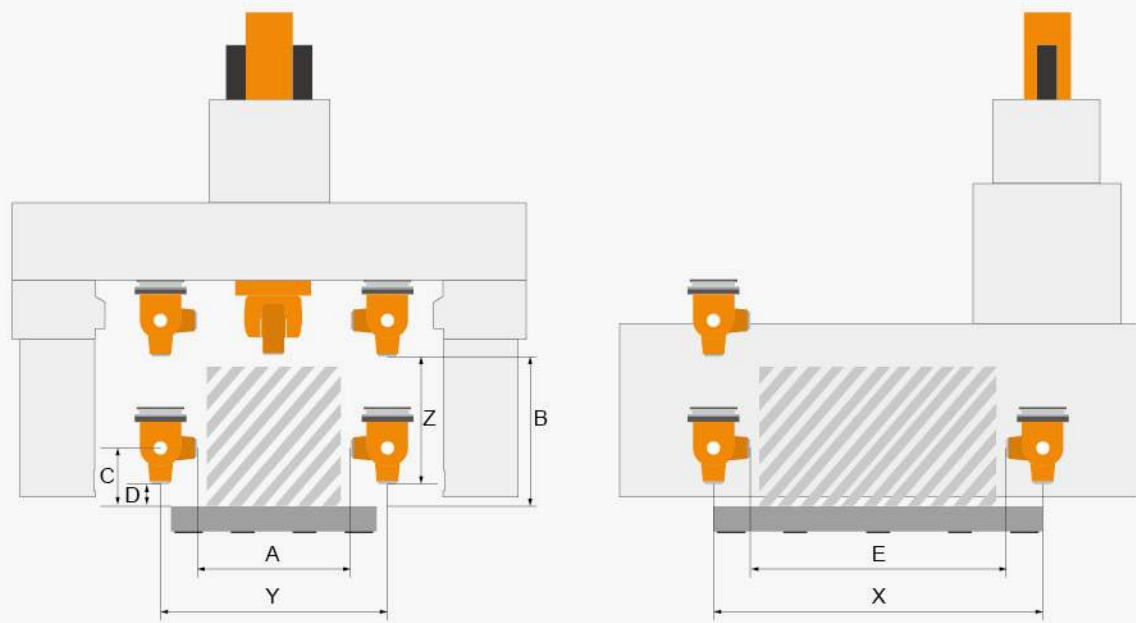
- The HEIDENHAIN TNC-640 controller, X, Y, Z, B, C, continuous five-axis
- HEIDENHAIN handwheel-HR520
- European modular 2-axis milling head TCH-19 (A63)
- The European system of vertical spindle HSK A63 with 24,000 rpm
- HSK A63 30 tool magazine
- X/Y direct drive linear motor
- 12 roller with linear guideways (each 4 sets for X/Y/Z axis)
- 4 HEIDENHAIN linear scale (2 sets for X axis 2 sets for Y/Z axis)
- Electrical cabinet temperature control device
- X/Y linear motor with spindle cooling system
- Spindle oil-mist device
- Spiral-type chip conveyor and rear-type chip conveyor containing iron filing cars
- Front and rear door with safety interlock system (each type)
- Waterproof work light
- Machine all parts and a variety of instruments unit of measurement
- Used in all meta international system of units (IS) standards
- Guards the cabinet with variety of electrical protection, filtration, ventilation and air-conditioning system
- Machine standard color

## Option

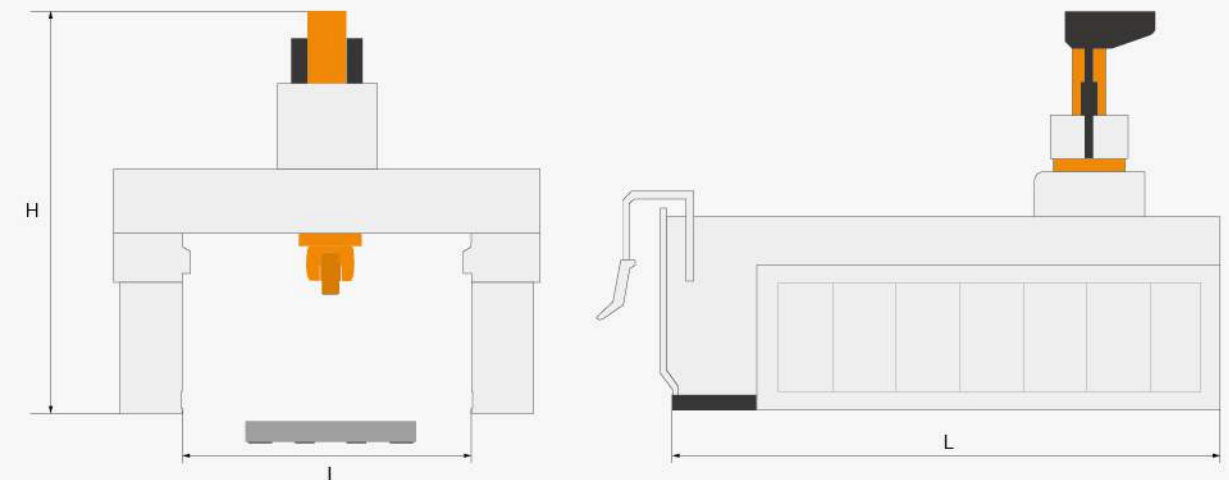
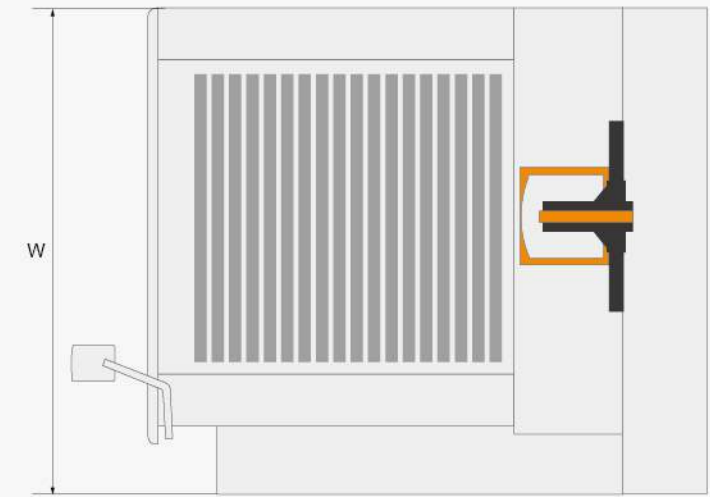
- TCH-19 (A100) Modular 2-axis Milling Head +15,000 rpm Spindle
- TCH-20 (A63) Modular 2-axis Milling Head +24,000 rpm Spindle
- TCH-20 (A100) Modular 2-axis Milling Head +15,000 rpm Spindle
- TCH-25 Modular 2-axis Milling Head +13,000 rpm Spindle
- Siemens 840D CNC control
- ATC system magazine capacity; (option)  
(HSK-A100)-60 tools  
(HSK-A63)-60 tools
- Laser tool measuring System
- Touch probe to measure workpiece
- Coolant through spindle with (CTS) 20/30/40 bar
- Transformer
- Voltage stabilizer
- GPS (Global Program Setting) hand wheel function
- Blum form control comparison software
- Automatic kinematic 5-axis compensation function
- HEIDENHAIN wireless handwheel-HR 550
- Enclosed rooftop
- Oil mist recovery system
- Chain-type chip conveyor on both side of worktable area  
(Suitable for aircraft industry application)



## Working Area and Layout



Regional (mm)		Milling heads	Model				
			Linmax B 22	Linmax B 25	Linmax B 30	Linmax B 35	Linmax B 40
A	Distance between spindle nose to spindle nose (Y-Direction)	TCH-19 (A63)	1454	1754	2254	2754	3254
		TCH-19 (A100)	1484	1784	2284	2784	3284
		TCH-20 (A63)	1580	1880	2380	2880	3380
		TCH-20 (A100)	1510	1810	2310	2810	3310
		TCH-25	1584	1884	2884	2884	3384
B	Z-axis opening height	TCH-19			1450		
		TCH-20			1370		
		TCH-25			1360		
C	(Swing axis 90 °) Z-Direction	TCH-19 (A63)			573		
		TCH-19 (A100)			558		
		TCH-20 (A63)			430		
		TCH-20 (A100)			465		
		TCH-25			418		
D	Distance between spindle nose to table surface	TCH-19 (A63)			200		
		TCH-19 (A100)			200		
		TCH-20 (A63)			120		
		TCH-20 (A100)			120		
		TCH-25			110		
E	Distance between spindle nose to spindle nose (X-Direction)	TCH-19 (A63)			X axis -746		
		TCH-19 (A100)			X axis -716		
		TCH-20 (A63)			X axis -620		
		TCH-20 (A100)			X axis -690		
		TCH-25			X axis -616		
X	X-axis travel		X axis travel (according to customer's choice)				
Y	Y-axis travel		2200	2500	3000	3500	4000
Z	Z-axis travel						1250



Axis	Model				
	Linmax B 22	Linmax B 25	Linmax B 30	Linmax B 35	Linmax B 40
L	Linmax B 2232: 8370	Linmax B 2540: 9380	Linmax B 3050: 10670	Linmax B 3550: 10670	Linmax B 4060: 10670
		Linmax B 2550: 10380	Linmax B 3060: 11670	Linmax B 3560: 11670	Linmax B 4080: 11670
			Linmax B 3080: 13670	Linmax B 3580: 13670	Linmax B 40100: 13670
W	6485	6580	7200	7700	8200
H	5450	5450	5450	5450	5450
I	3290	3590	4090	4590	5090

Unit: mm