ALL SERIES

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

Worldwide Agents

The only professional 5-axis machine center manufacture in Asia

CompactB

LINEAR MOTOR DRIVE

KEN
Focus On High Speed & 5-axis

- Stability
- Precision
- Strength

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KEN ICHI MACHINE CO.,LTD

High Speed 5-axis Machine Center

High-Dynamic

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

Box in Box, Symmetrical Design

Driven with the center of gravity
Minimized crossbeam deformation after long period of usage for reliable and rigidity

Applications For:
Aerospace Aluminum Frame
Automotive Plastic Injection Mold
Mechanical Component

High Rigidity Structure

High-performance structure

Gantry type design, all axial components (X/Y/Z/B/C axis) is moving on top of the column. The work piece is fixed on the table to ensure the weight of work piece does not affect the machine performance.

Optimal structural design for high-speed

Advanced FEM analysis and design to optimize higher rigidity, response and provide stability of high speed cutting.

One-Pieces Structure Design

Improved overall structural rigidity

Ensured the stability of precision and mechanical performance

Box in Box Symmetrical Design

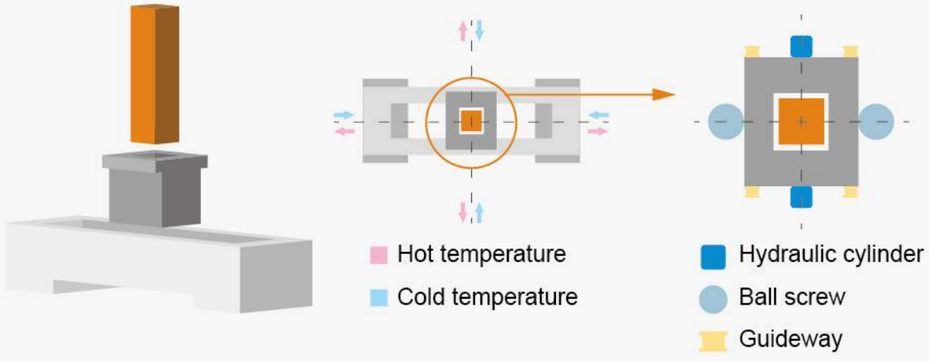
More stability, more precision and more strength

Our System

- Box-in-Box design has spindle locating at the center of Crossbeam and Saddle.
- Symmetrical construction makes 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 during working hours.

Advantages of Box-in-Box Structural Design:

- Y-axis with 4 linear guide ways ensure two tracks on XY plan and YZ plan to support Ram & Saddle. It helps reaching optimized dynamic characteristics.
- Z-axis equipped with 4 linear guide ways on two side of the slider. Each side undertakes the same cutting force, which balances design to enhance the machine lifetime and accuracy.
- Dual ball screw and dual counterbalance system in Z axis. Its stable structure provides accurate high-speed



Other Manufacturers

Linear Motor Drive

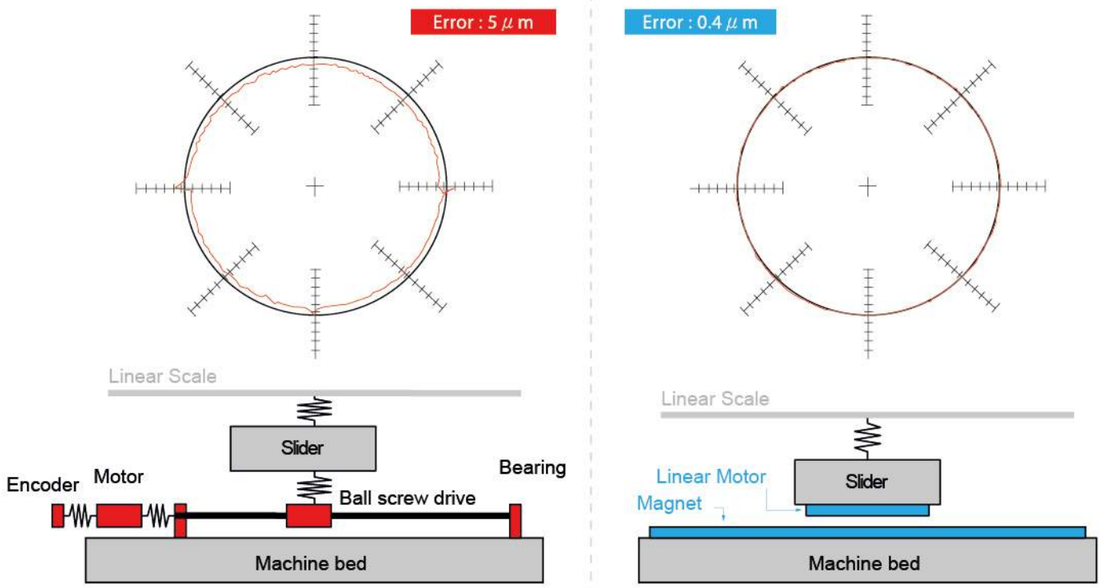
From Germany

The inevitable trend in the future

- Backlash free offers 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

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

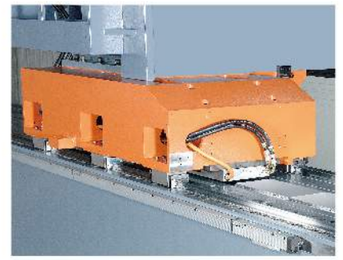
Source by: Siemens laboratory testing

Excellent Design For 5-Axis High Speed Machine

X-Axis

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

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



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

- Compact B-2516/Compact B-2522 use one linear motors on each side and Each side of the guide ways with 3 block to support(Total 12 blocks)
- Compact B-3222 use Two linear motors on each side and Each side of the guide ways with 4 block to support (Total 16 blocks)

Y-Axis

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

Y axis uses linear motor without coupling. It directly transmits the force for saddle movement. 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) can reach higher rigidity.

Z-Axis

Z axis with symmetrical design to remain in the center of gravity. Ensures force to be evenly distributed during cutting and moving.

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

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

Reduced the thermal deformation and minimized the effects of temperature.

TCH-19 (A63)

Fork Type Milling Head

Modular Design For Two-Axis Milling

HSK-A63 High Speed Spindle

Max Spindle speed: 24,000 rpm

- Fork type modular design, B & C axis use rigidity roller bearing support to achieve excellent rigidity and accuracy.
- B & C axis use torque motor direct drive with high speed, high-torque, no backlash, no wear to achieve higher accuracy.
- With hydraulic disc brake system and tightly locked rotation axis, machine can perform milling in any position.
- Spindle type HSK-A63 with max speed 24,000 rpm.

TCH-19 (A100)

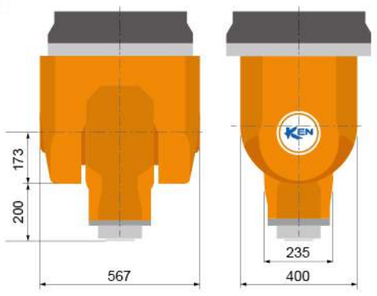
Fork Type Milling Head

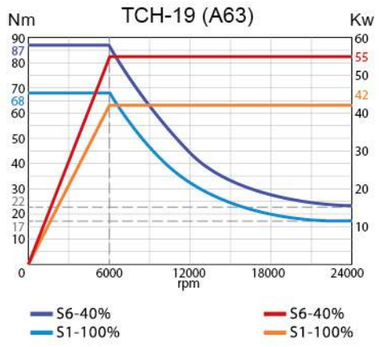
Modular Design For Two-Axis Milling

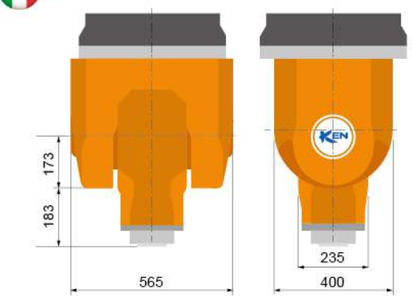
HSK-A100 High Torque Spindle

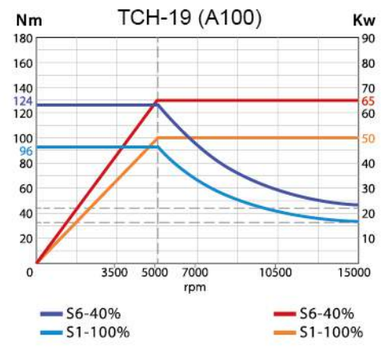
Max Spindle torque :124 Nm

- Fork type modular design, B & C axis use rigidity roller bearing support to achieve excellent rigidity and accuracy.
- B & C axis use torque motor direct drive with high speed, high-torque, no backlash, no wear to achieve higher accuracy.
- With hydraulic disc brake system and tightly locked rotation axis, machine can perform milling in any position.
- Spindle type HSK-A100 with max speed 15,000 rpm.







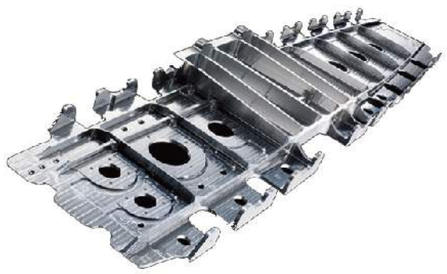


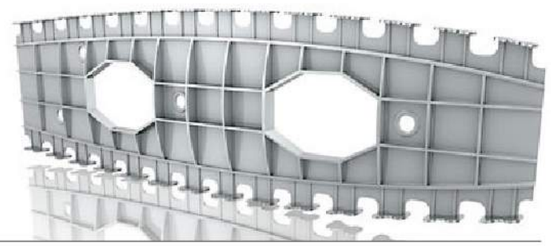
MILLING HEAD B&C-AXIS (TORQUE MOTOR DRIVE)		TCH-19 (A63)
Rotation speed : B &C	rpm (360º/ s)	50 / 50
Max. acceleration : B &C	rad / s²	30 / 30
Max. torque : B &C	Nm	1,100 / 900
Clamping torque : B &C	Nm	4,000 / 4,000
Positioning accuracy: B &C	arc.sec	± 3 / ± 3
Rotation angle : B &C	deg	± 100 º/ ± 240 º
SPINDLE		
Spindle power S1-100% (S6-40%)	kw	42 (55)
Spindle torque S1-100% (S6-40%)	Nm	67 (87)
Max. speed	rpm	24,000
Tool shank	type	HSK-A63

MILLING HEAD B&C-AXIS(TORQUE MOTOR DRIVE)		TCH-19 (A100)
Rotation speed : B &C	rpm (360º/ s)	50 / 50
Max. acceleration : B &C	rad / s²	30 / 30
Max. torque : B &C	Nm	1,100 / 900
Clamping torque : B &C	Nm	4,000 / 4,000
Positioning accuracy: B &C	arc.sec	± 3 / ± 3
Rotation angle : B &C	deg	± 100 º/ ± 240 º
SPINDLE		
Spindle power S1-100% (S6-40%)	kw	50 (65)
Spindle torque S1-100% (S6-40%)	Nm	96 (124)
Max. speed	rpm	15,000
Tool shank	type	HSK-A100

Application

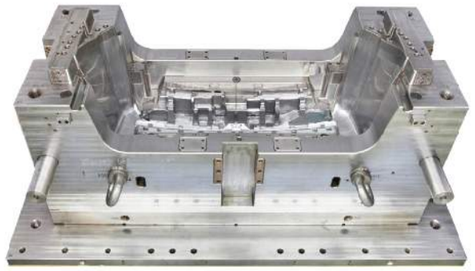
Aircraft (Floor beam, Wing rib structure)



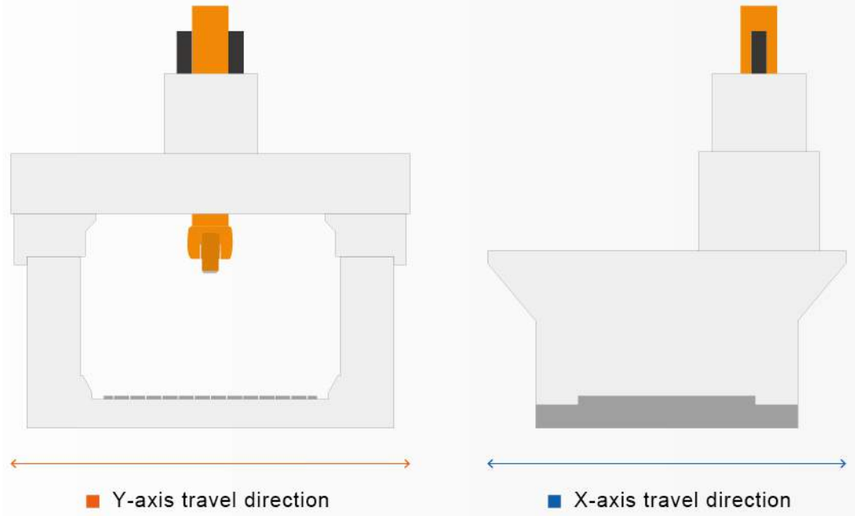



Automotive (Plastic mold, Lamp mold)



Machine Specifications



Specifications / Mold		Model: Compact B		
		2516	2522	3222
Travel	Unit			
■ Y-axis travel	mm	2500	2500	3200
■ X-axis travel	mm	1600	2200	2200
Z-axis travel	mm	1250	1250	1250
Distance between column	mm	3225	3225	3925
Distance between spindle nose to table surface	mm	250/1500	250/1500	250/1500
Table width	mm	2500	2500	3200
Table length	mm	1600	2200	2200
T-slot size (Width)	mm	22	22	22
Table load	kg/m^2	5000	5000	5000
X/Y/Z-axis rapid feed rate	m/min	60/60/50	60/60/50	60/60/50

Milling Head Type	Unit	TCH-19 (A63)	TCH-19 (A100)
Tools Shank	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 dimenzions	∅mm	75	125

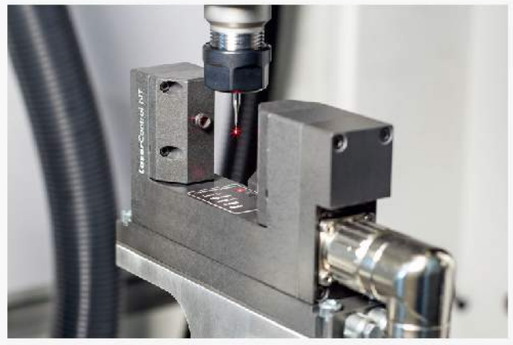
Auto Tool Changer

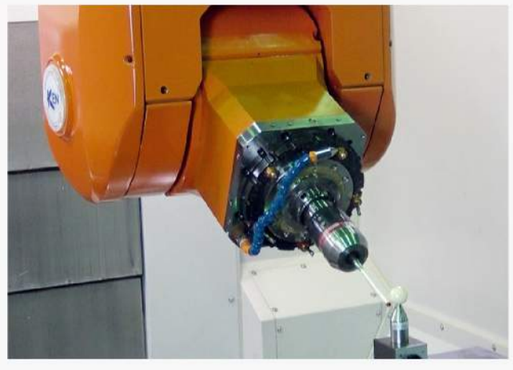
Standard

- HEIDENHAIN TNC-640 controllers
  (X, Y, Z, B, C-five axis continuously)
- HEIDENHAIN handwheel-HR520
- Europe 2-axis milling head TCH-19 (A63)
- European system of vertical spindle HSK-A63 24,000 rpm
- HSK A63 30 tools magazine
- X/Y axis linear motor coolant system
- 12 Roller linear guideways (4 sets for X/Y/Z axis)
- 4 HEIDENHAIN linear scale (2 sets for X-axis, 2 sets for Y/Z axis)
- The spindle and milling head coolant system
- Spindle oil mist lubrication system
- Cutting oil mist device
- Front-type chip conveyor containing iron filings cars each 1 style
- Front and rear working door safety interlock (each type)
- Waterproof work light
- Can be used in all meta international system of units (SI) standards
- Protection devices are complete and reliable to ensure safety in work area following ISO 12100-1&-2 1992
- Electrical cabinet with air-conditioning system, filtration, ventilation installations and variety of electrical protection
- Machine standard color

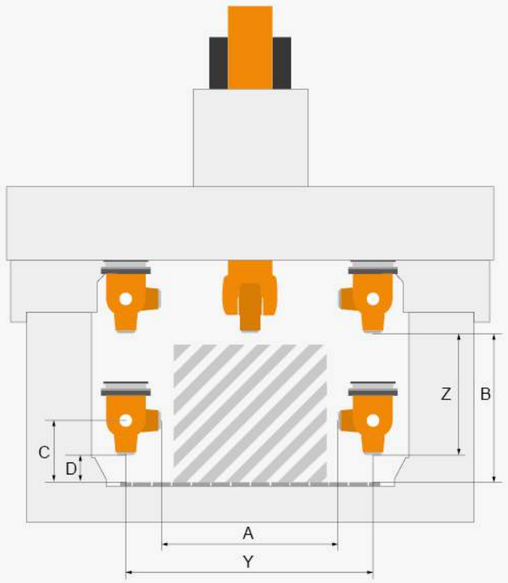
Option

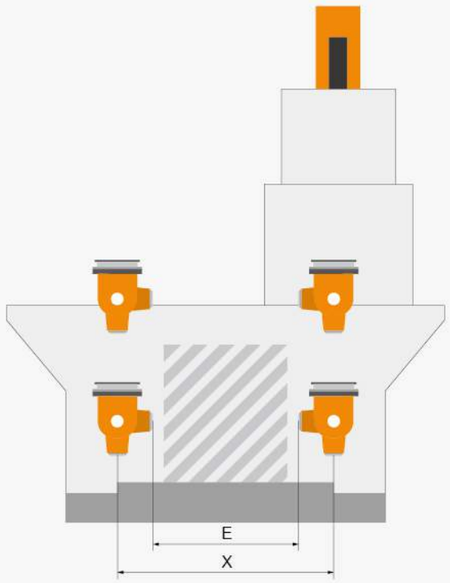
- TCH-19 (A100) modular 2-axis milling head+15,000 rpm spindle
- ATC system magazine capacity (optional)
  (HSK-A100)-60 tools
  (HSK-A63)-60 tools
- Siemens-840D CNC controllers
- Laser tool measuring system
- Touch probe for work piece measurement
- Coolant through spindle 20/30/40 bar
- Transformer
- Voltage stabilizer
- Spiral-type chip conveyor on both side of worktable area
- GPS (Global Program Settings) Hand wheel function
- Blum form control comparison software
- Automatic kinematics 5-axis compensation function
- Enclosed rooftop
- Oil mist recovery system

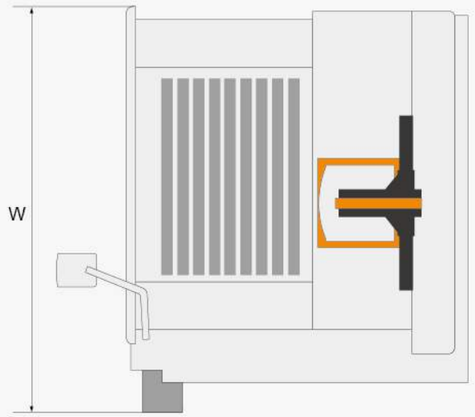


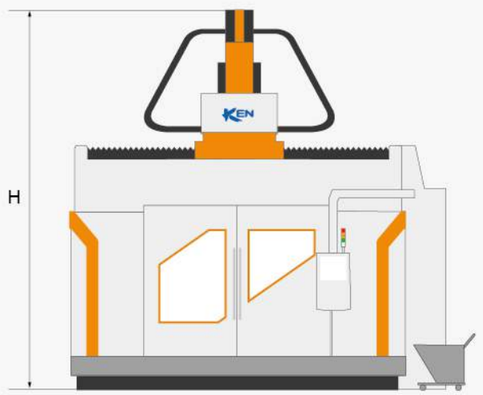


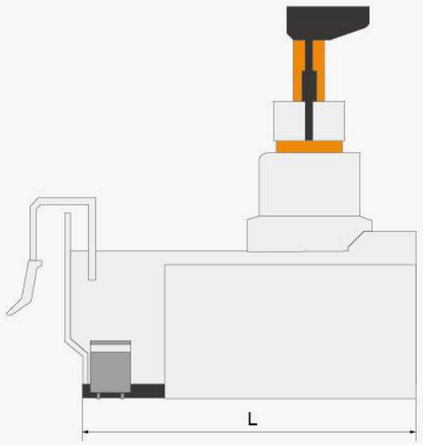
Working Area and Layout











	Regional (mm)	Milling heads	Model - Compact B 2516	2522	3222
A	Distance between spindle nose to spindle nose (Y-Direction)	TCH-19 (A63)	1754	1754	2454
		TCH-19 (A100)	1784	1784	2484
B	Z-axis opening height			1500	
C	(Swing axis 90 °) Z-Direction	TCH-19 (A63)		623	
		TCH-19 (A100)		608	
D	Distance between spindle nose to table surface	TCH-19 (A63)		250	
		TCH-19 (A100)			
E	Distance between spindle nose to spindle nose (X-Direction)	TCH-19 (A63)	854	1454	1454
		TCH-19 (A100)	884	1484	1484
X	X-axis travel		1600	2200	2200
Y	Y-axis travel		2500	2500	3200
Z	Z-axis travel			1250	

Axis	Model - Compact B 2516	2522	3222
L (Length)	5300	5900	6120
W (Width)	6139	6139	6838
H (Height)	5980	5980	5980

Unit: mm