Focus5

Linear Motor Drive

High Speed 5-Axis Machine Center

KEN

Focus On High Speed & 5-Axis

- Stability
- Precision
- Strength

KEN ICHI MACHINE CO., LTD.

WWW.KENCNC.COM

Focus5

Linear Motor Drive

High Speed 5-Axis Machine Center

Machine Feature

- High rigidity one-piece column and crossbeam structure
- X / Y-axis Linear motor drive
- Feed rate: 60 m/min
- Direct-drive
  Torque motor 2-axis milling head

Application For

- Automotive Plastic Injection Mold Core, Lamp Mold
- Aircraft Aluminum Structure, Wing Rib, Floor Beam
- Mechanical Component and Electronic Component Mold

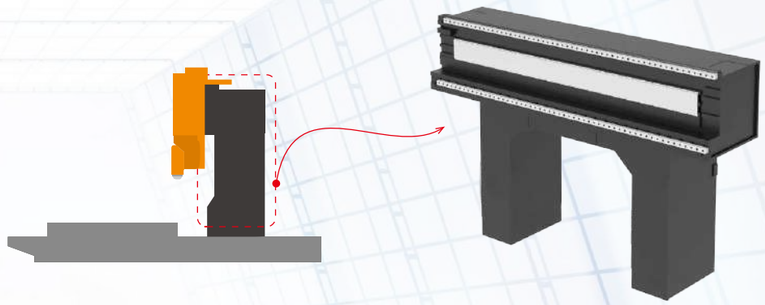
Linear Motor Drive
The inevitable trend in the future

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

High speed feedrate 60 m/min

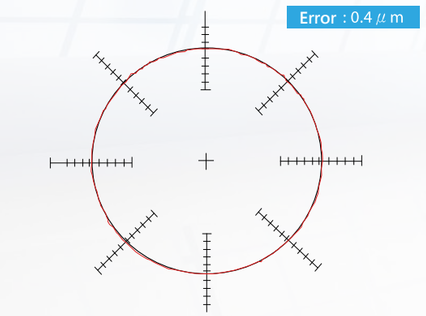
Optimize Structural Design
High-Rigidity Structure

- One-piece base and column with high rigidity to ensure the best structural rigidity and stability of high-speed cutting.
- X/Y/Z-axis use high-speed and heavy-duty roller linear guideway. Machine can achieve excellent high-speed cutting dynamic and long-lasting accuracy.
- Standard with high resolution optical scales on X/Y/Z-axis.

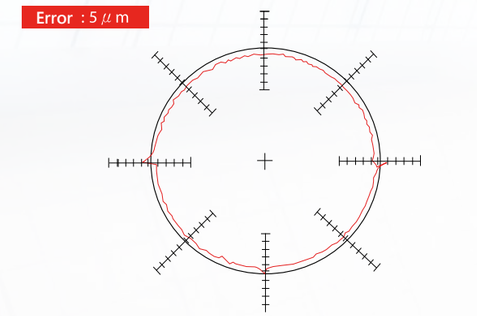


One- Piece Column & Crossbeam

Linear Motor VS Ball Screw



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

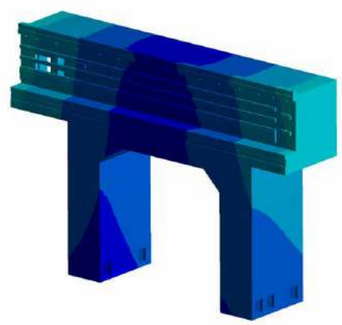


- Transmission chain length, the error is larger
- The path is less accurate
- Backlash exists

Source : Siemens laboratory testing

Structural Analysis Software with
Numerical Technique FEM

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

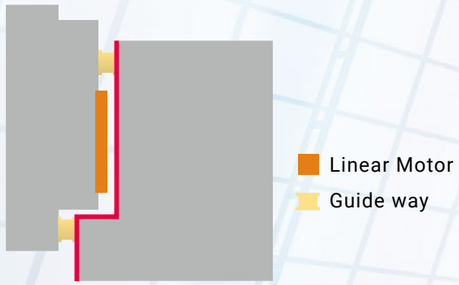


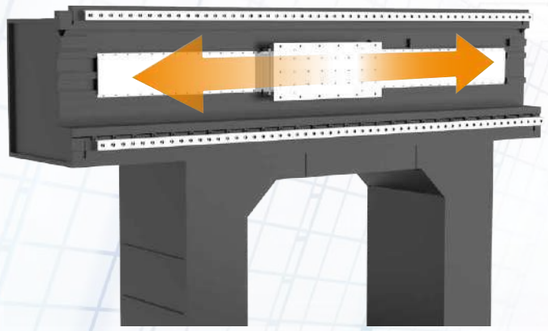
Excellent Design For
5-Axis High Speed Machine

Y-Axis

Excellent Rigidity One-Piece Column and Crossbeam

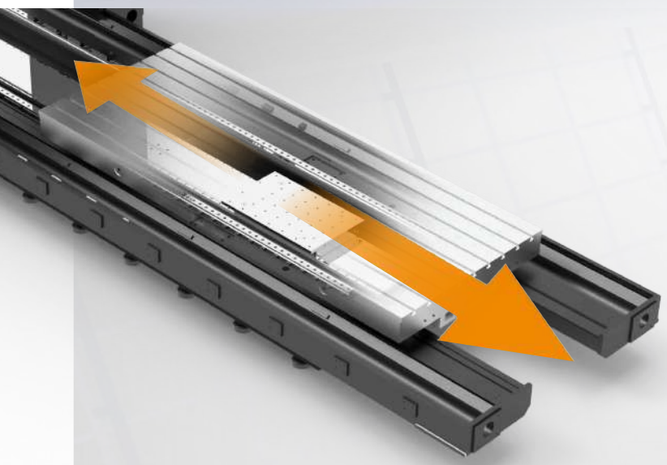
- Y-axis for the saddle to move on the crossbeam. Crossbeam uses roller bearing and linear guideways to ensure high rigidity and support for the saddle to increase rigidity.
- Y-axis uses linear motor movement without coupling for direct drive driven saddle, which can produce high-speed response and high-precision machining.





- The Y-axis adopts a differential high-rigidity linear guide design, which improves the overall rigidity of the machining.

X-Axis



- X-axis with 2 high-speed and heavy-duty roller type linear guide ways has large span design to provide high rigidity.
- The base is one-piece design can reach high rigidity with Direct Drive linear motor. It can improve the efficiency and stability during milling process and excellent control over gravity.
- Table on X-axis is driven by linear motor without belt and coupling to increase the responsiveness of the high-speed movement.

Z-Axis

Optimize the Rigidity and Accuracy of the Machine

- Z-axis moves up and down the crossbeam. It is equipped with two roller-bearings and linear guideways, each with three sliders to support the crossbeam.
- Z-axis is equipped with dual ball screw to achieve high speed response, process requirements and achieve high precision. It has spindle in the center of the 2-axis milling head to prevent uneven stress, thermal deformation and shift phenomenon.

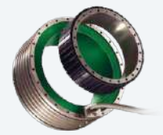
Full Enclosed Splash Guards

- Interference free with a large door. Easy for loading and unloading.

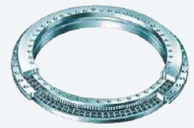
Torque Motor Milling Head

Torque Motor Direct Drive

- High feed rate, high acceleration & deceleration
- Backlash free offers high-positioning accuracy
- Simple structure, easy maintenance
- No ball screw, no worn gears,
  no belts and other wearable mechanism transmission



Torque Motor



Cross Roller Bearing

Encoder

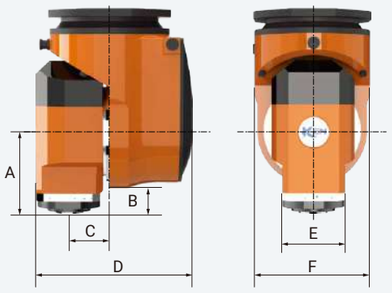
Side Type

Specify for Plastic Injection Mold

Compact Design,
Low Interference

- Torque motor direct drive on A/C-axis with high torque and high precision performance.
- High braking torque on A/C-axis can satisfy any position of the milling requirements.

Unit: mm



	(A63) 24,000	(A100) 15,000
A	233	268
B	43	78
C	135	

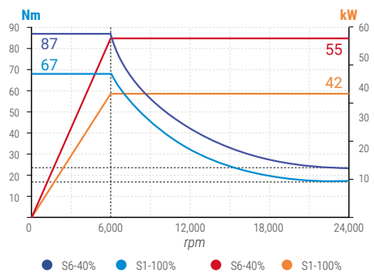
	(A63) 24,000	(A100) 15,000
D	526	
E	210	
F	400	

Milling Head (Torque Motor)

Specification		A / C-axis
Max. rotation speed	rpm	50 / 50
Max. rotation accerelation	rad/s²	30 / 30
Max. rotation torque	Nm	500 / 500
Brake torque	Nm	4,000 / 4,000
Position accuracy	arc.sec	5 / 5
Rotate angle	degree	±115°/±360°

Spindle 24,000 rpm (HSK-A63)

Spindle power S1-100% (S6-40%)	kW	42 (55)
Spindle torque S1-100% (S6-40%)	Nm	67 (87)



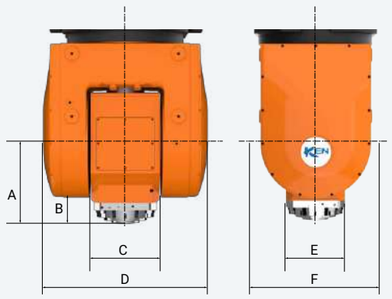
Fork Type

Modular Design

High Rigidity,
Dual Side Bearing Support

- Fast and convenient maintenance, low maintenance cost.
- High rigidity cross roller bearings on B/C-axis ensure high accuracy and rigidity of milling head.
- High braking torque on B/C-axis can satisfy any position of the milling requirements.

Unit: mm



	(A63) 24,000	(A100) 15,000
A	273	308
B	88	123
C	230	

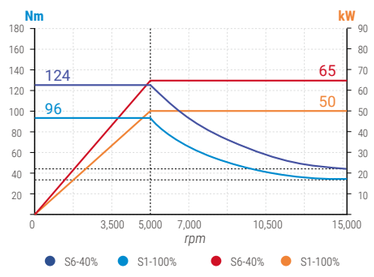
	(A63) 24,000	(A100) 15,000
D	564	
E	205	
F	380	

Milling Head (Torque Motor)

Specification		B / C-axis
Max. rotation speed	rpm	50 / 50
Max. rotation accerelation	rad/s²	30 / 30
Max. rotation torque	Nm	500 / 698
Brake torque	Nm	4,000 / 4,000
Position accuracy	arc.sec	5 / 5
Rotate angle	degree	±110°/±360°

Spindle 15,000 rpm (HSK-A100)

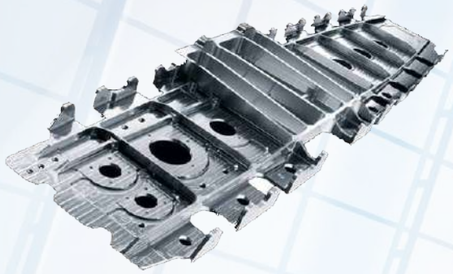
Spindle power S1-100% (S6-40%)	kW	50 (65)
Spindle torque S1-100% (S6-40%)	Nm	96 (124)



Applications

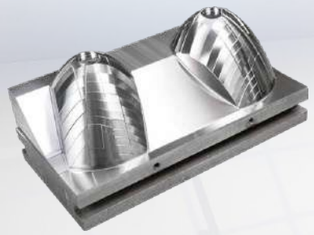
Aerospace Precision Parts

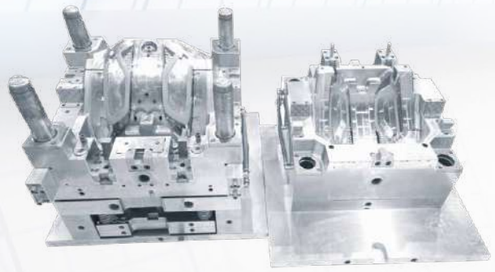
Floor, wing ribs, hatch door and etc.

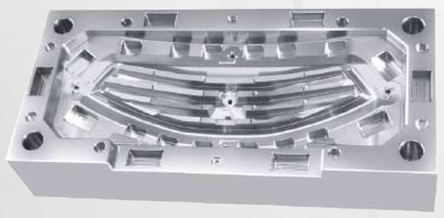


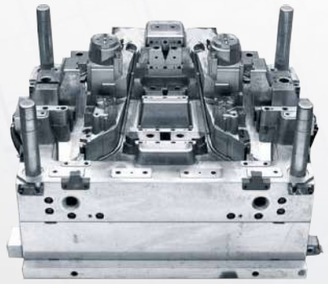
Automotive Plastic Injection Mold

Lamp mold, front grill, panel and etc.









Machine Specifications

Y-axis direction

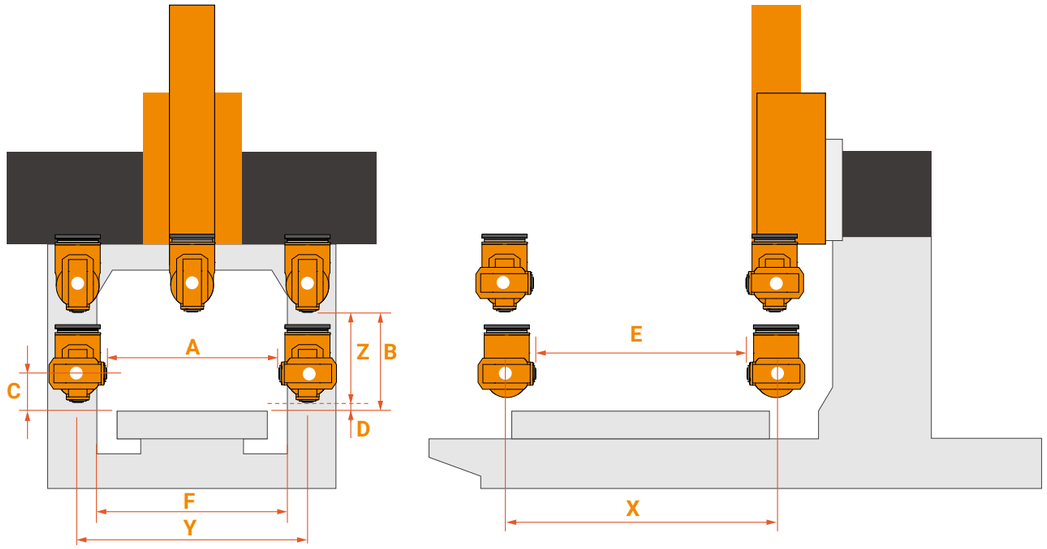
X-axis direction

Machine Model		Focus5 2020	Focus5 2030	Focus5 2040	Focus5 2330	Focus5 2340
Travel						
X-axis travel	mm	2,060	3,060	4,060	3,060	4,060
Y-axis travel	mm	2,000			2,300	
Z-axis travel	mm	800 (opt. 1,000)				
Spindle nose to table distance*1	mm	30 ~ 830 (opt. 30 ~ 1,030)				
Distance between columns	mm	1,500			1,800	
Table						
Table (X-axis direction)	mm	2,000	3,000	4,000	3,000	4,000
Table (Y-axis direction)	mm	1,200			1,500	
T-slot width	mm	18				
T-slot space	mm	125				
Table load	kg	3,000	4,000	4,500	4,500	5,000
Feedrate						
X/Y/Z-axis drives		Linear Motor / Linear Motor / Dual Ball Screw				
X/Y/Z-axis feedrate	m/min	60 / 60 / 48				

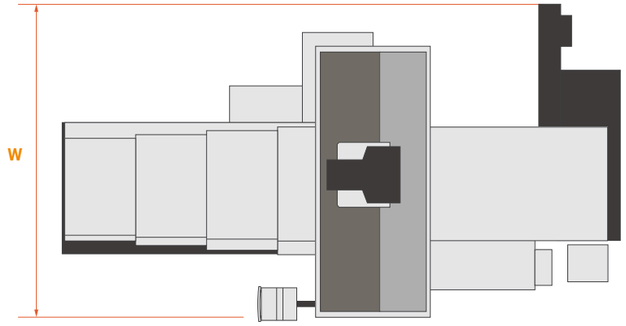
*1 : Standard Configuration is with Side Type 24,000rpm (HSK-A63), other milling head please review p.12

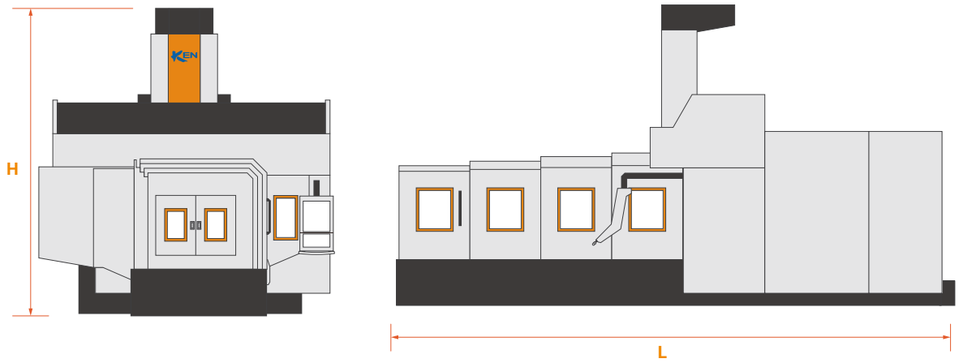
Automatic Tool Changer		HSK-A63	HSK-A100
Tool capacity	T	24 (opt. 32 / 40 / 60)	24 (opt. 32 / 40 / 60)
Max. tool weight	kg	7	15
Max. tool length	mm	350	350
Max. tool diameter	mm	Ø75	Ø125

Work Area



Machine Dimension





Work Area

Machine Model				Focus5 2020	Focus5 2030	Focus5 2040	Focus5 2330	Focus5 2340
A	Y-axis distance (A/B-axis 90°)	Side Head 24,000 (A63)	mm	1,534			1,834	
		Side Head 15,000 (A100)	mm	1,464			1,764	
		Fork Head 24,000 (A63)	mm	1,454			1,754	
		Fork Head 15,000 (A100)	mm	1,384			1,684	
B	Z-axis opening height	Side Head 24,000 (A63)	mm	830 (opt. Z-axis 1,000 : 1,030)				
		Side Head 15,000 (A100)	mm	795 (opt. Z-axis 1,000 : 995)				
		Fork Head 24,000 (A63)	mm	850 (opt. Z-axis 1,000 : 1,050)				
		Fork Head 15,000 (A100)	mm	815 (opt. Z-axis 1,000 : 1,015)				
C	Z-axis distance (A/B-axis 90°)	Side Head 24,000 (A63)	mm	263				
		Side Head 15,000 (A100)	mm	298				
		Fork Head 24,000 (A63)	mm	323				
		Fork Head 15,000 (A100)	mm	358				
D	Spindle to table distance	Side Head 24,000 (A63)	mm	30				
		Side Head 15,000 (A100)	mm	-5				
		Fork Head 24,000 (A63)	mm	50				
		Fork Head 15,000 (A100)	mm	15				
E	X-axis distance (A/B-axis 90°)	Side Head 24,000 (A63)	mm	1,594	2,594	3,594	2,594	3,594
		Side Head 15,000 (A100)	mm	1,524	2,524	3,524	2,524	3,524
		Fork Head 24,000 (A63)	mm	1,514	2,514	3,514	2,514	3,514
		Fork Head 15,000 (A100)	mm	1,444	2,444	3,444	2,444	3,444
F	Distance between columns		mm	1,500			1,800	
X	X-axis travel		mm	2,060	3,060	4,060	3,060	4,060
Y	Y-axis travel		mm	2,000			2,300	
Z	Z-axis travel		mm	800 (opt. 1,000)				

Machine Dimension

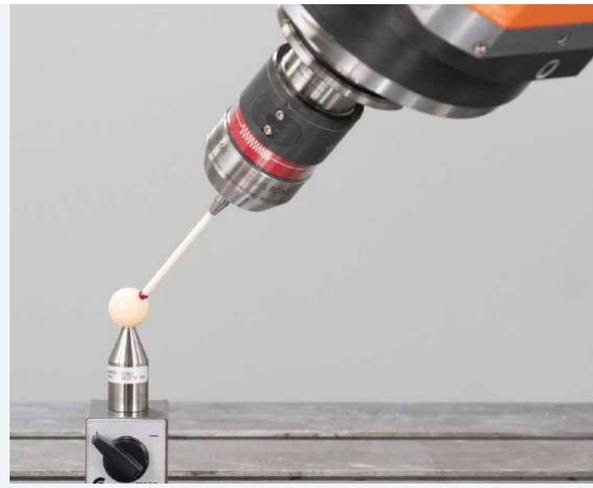
Machine Model			Focus5 2020	Focus5 2030	Focus5 2040	Focus5 2330	Focus5 2340
L	Length	mm	7,570	8,590	9,570	8,590	9,570
W	Width	mm	4,610			4,910	
H	Height	mm	4,640 (opt. Z-axis 1,000: 4,850)				

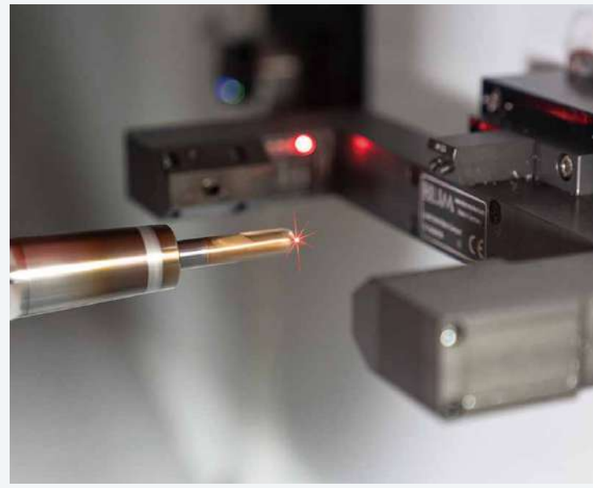
Standard Configuration

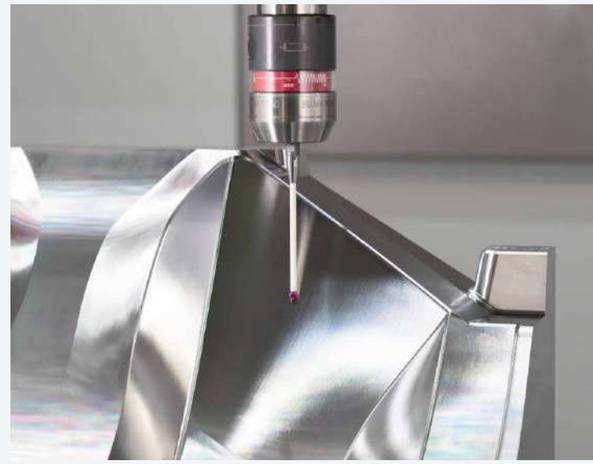
- HEIDENHAIN TNC-640 controller (5-axis continuous)
- HEIDENHAIN handwheel–HR520
- Torque Motor Side Type Milling Head
- Spindle HSK-A63/87Nm/55kW/24,000rpm
- 24 tools magazine
- X/Y-axis linear motor drive
- Z-axis adopt double server motor with dual ball screws drive
- 6 roller linear guide ways (X/Y/Z each 2)
- A/C Axis high resolution angle encoder
- 3 HEIDENHAIN linear scale (X/Y/Z-axis each 1 set)
- Cooler for X/Y Linear motors, milling head torque motors and spindle
- Cutting oil mist device
- Spindle coolant nozzles
- Spindle oil mist lubrication system
- Twin chip augers and front chip conveyor with a disposal cart
- Sub-coolant tank with filter system
- Oil skimmer
- Front and rear working door safety interlock
- Waterproof work light
- Electrical cabinet with air-conditioning system, filtration and ventilation installations and variety of electrical protection
- Used in all meta international system of units (SI) standards
- Protection devices complete and reliable, work area safety, according to ISO 12100-1 & -2 1992
- Machine standard paint

Option Configuration

- Torque Motor Side Type Milling Head HSK-A100/124Nm/65kW/15,000rpm
- Torque Motor Fork Type Milling Head HSK-A63/87Nm/55kW/24,000rpm HSK-A100/124Nm/65kW/15,000rpm
- SIEMENS controller (5-axis continuous)
- Wireless electronic handwheel HR550
- Automatic kinematics 5-axis compensation function
- HEIDENHAIN handwheel GPS (Global Pgm Setting) function
- BLUM form control software
- BLUM laser tool measuring system
- BLUM probe for workpiece measuring system
- 32 / 40 / 60 tools magazine
- Coolant through spindle 20/30/50/70 bar
- Oil mist collector
- Transformer
- Voltage stabilizer







ALL SERIES MACHINES

JET
Moving Column Type
5-Axis Profile Machine Center

GIANT
Moving Column Mobile Crossbeam Type
5-Axis Machine Center

Loader
Moving Column Type
5-axis Machine Center

LINMAX B TWIN
Double Gantry Type High Speed
5-Axis Machine Center

SABER
Double Column High Torque
5-Axis Machining Center

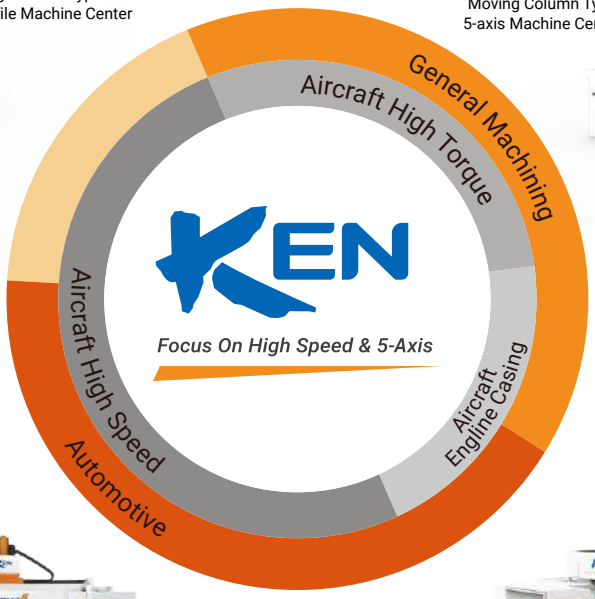
LINMAX B
Gantry Type High Speed
5-Axis Machine Center

RHINO
Horizontal
5-Axis Machining Center

COMPACT B
Gantry Type High Speed
5-Axis Machine Center

FOCUS 5
High Speed
5-Axis Machine Center

ROTOR
High Speed
5-Axis Machine Center



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PROFESSIONAL 5 AXIS GANTRY
MACHINING CENTER MANUFACTURER

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