



**L.K. Machinery Corp (Taiwan)**

No.30, Keyuan Rd., Xitun Dist.

Taichung 40763, Taiwan

TEL: +886-4-2461 9797

FAX: +886-4-2463 7695

E-MAIL: [lktw\\_sales@lkmachinery.com.tw](mailto:lktw_sales@lkmachinery.com.tw)

WEBSITE: [www.lkmachinery.com.tw](http://www.lkmachinery.com.tw) .

## **Technical Description of Bridge Type Machine LM-Series**

LM-Series machines were designed to reach customers request for machining massive parts for aerospace and energy industries. Using a solid gantry structure ensures high strength of the bed, such structure allows customer to move items weighing up to 12000 kg, so machine has specific design that makes machine more stable and less affected by vibration, allowing producing parts of any complexity.

Machines refer to heavy construction series of machines of and are designed for the following types of processing: roughing, finishing and final processing. Working under difficult conditions, the functional processing of large body parts with a complex structure made of cast iron, structural steel, stainless steel, heat-resistant steel and alloys, the center ensures high rigidity and resistance to vibrations. High-quality guides ensure the safety of the machine precision parameters, and the ability to cut hard materials.



## **Technical Specification of Machines:**



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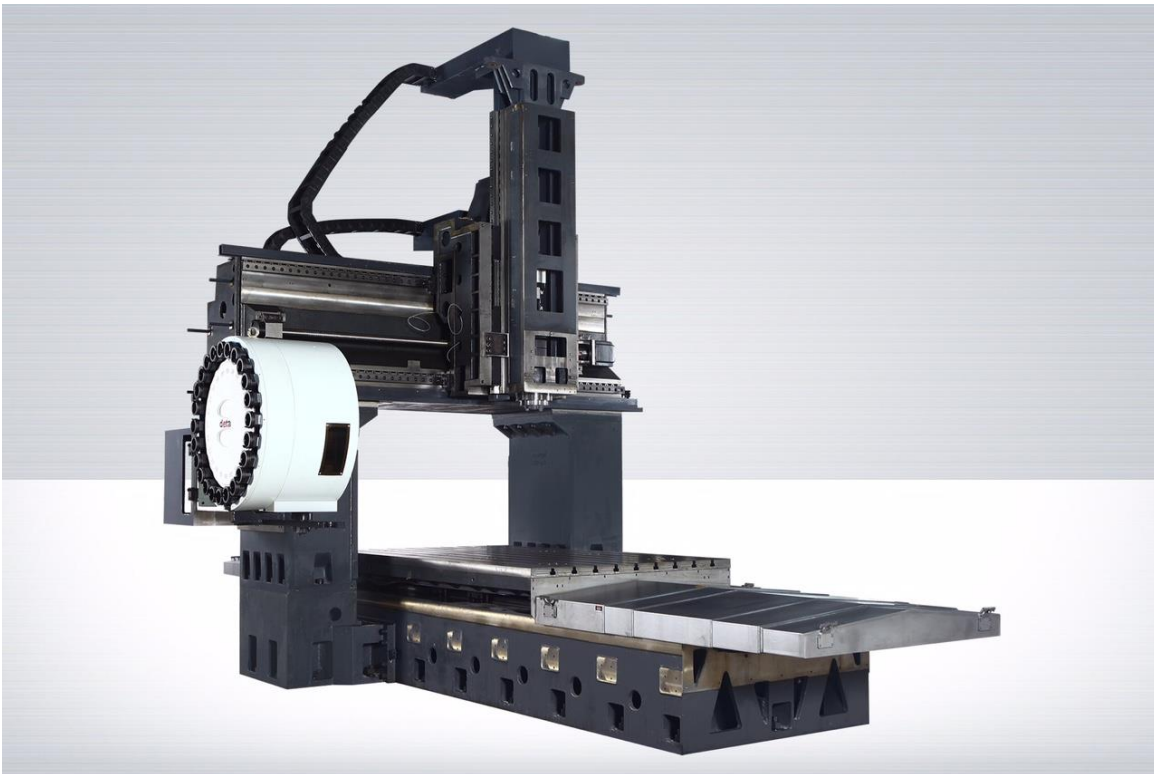
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- ✓ Ultra Rigid Casting;
- ✓ 3 types of Machines: LM-2616/3116/4116;
- ✓ Possibility of Heavy Duty Cutting with BT-50 Spindle Taper;
- ✓ Roller Type Linear Guideways on all axes;
- ✓ Big Table and High Maximum Table Load;
- ✓ Rapid traverse X/Y/Z axes – 24/24/15 m/min;
- ✓ High continuing maximum torque – 389 Nm for Siemens, 310 Nm for Mitsubishi;

### **Construction of the machine:**

Machine bed has a structure high rigid structure. Through the finite element analysis, machines were designed and optimized for the rigidity of the machines, this procedure allows the frame absorb vibration and be resistant to distortion, show the best performance.





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### Linear Guideways:

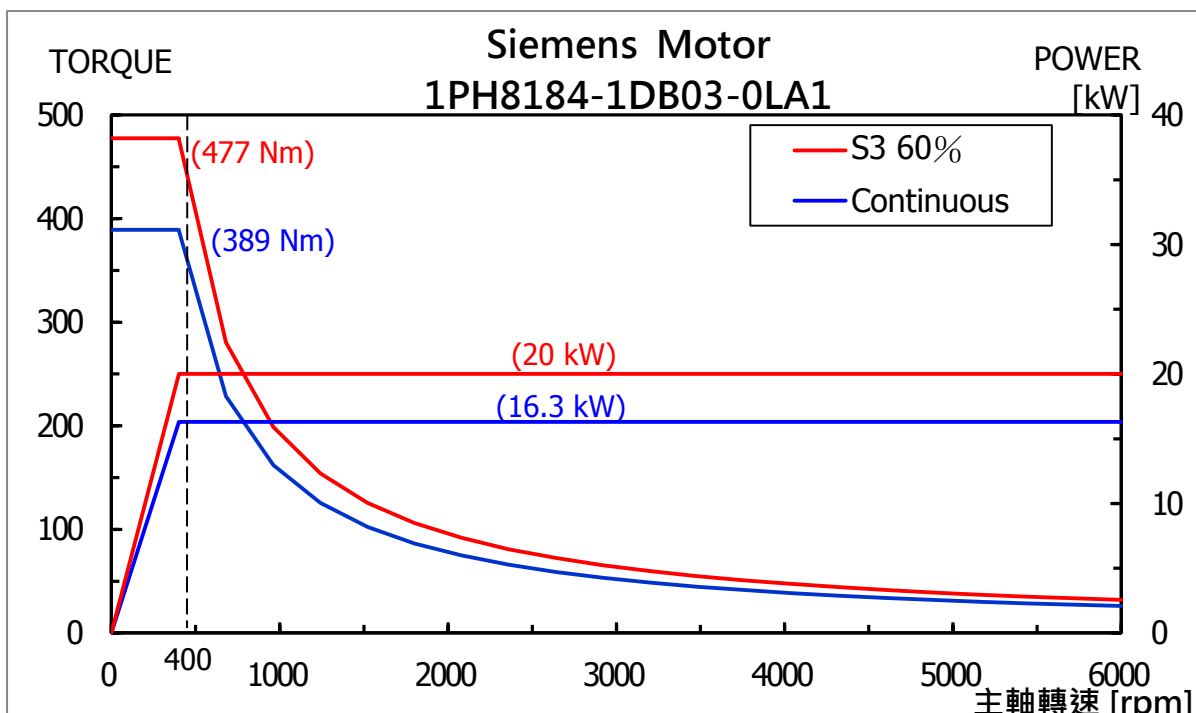
For the better performance of machines cutting, L.K. Machinery decides to use only roller type linear guideways, because it's well known for low heat, low coefficient of friction, lack of effect of "sticking", constancy of accuracy (low wear) and very low need for lubrication. Also machines use pre-tension ball screws on the axes X / Y / Z to deliver more torque and thrust, featuring low thermal deformation and high dynamic positioning accuracy, at the same time pre-tension ball screws provide superior load capacity, less power consumption, low friction and high reliability.

### Spindle and Motor Configuration:

L.K. Machinery provides various configurations of motors with direct drive and belt-drive for delivery rotation to the main spindle to meet different processing requirements. The spindle has an air cooling. Depending on the spindle, there are different capacity of 18.5/22 kW (For Mitsubishi Motors) or 16/20 kW (For Siemens Motors) and different speed rotation, and it also has a rigid structure and is equipped with precision bearings. The robust construction and usage of special bearings guarantee high processing.

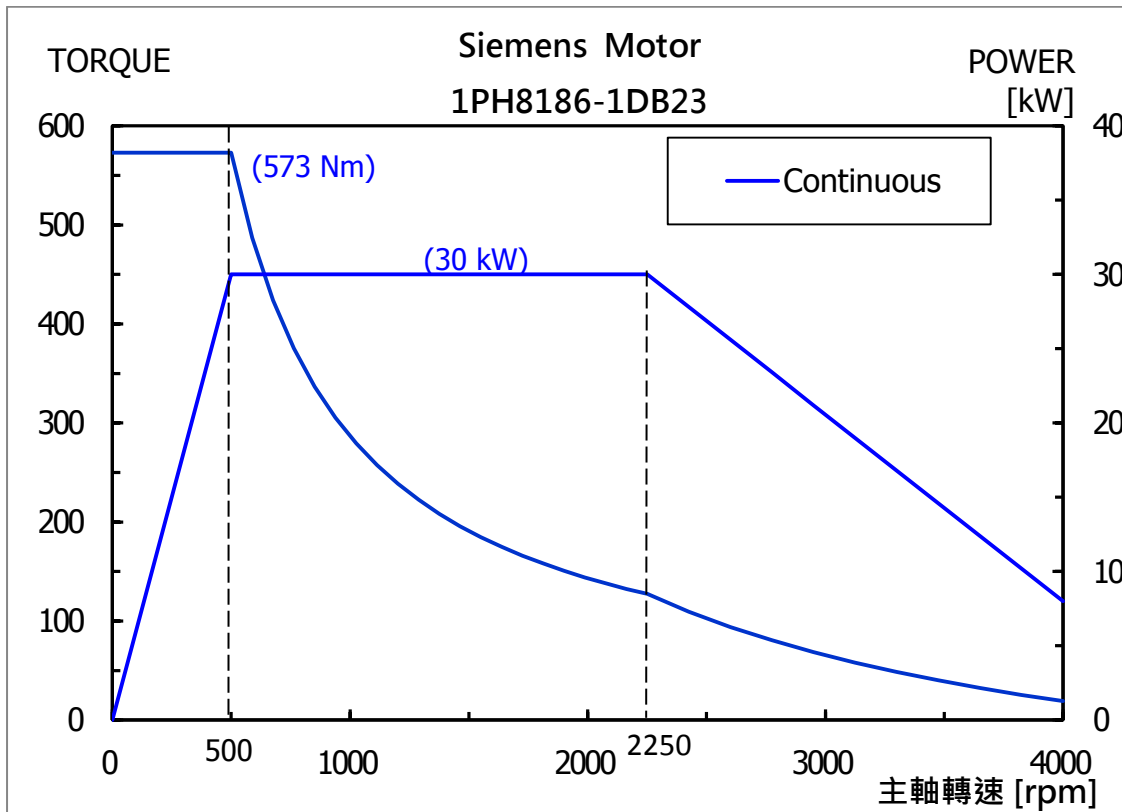
The standard Bridge-Type Machining Center is equipped with spindle and motor with the following characteristics: 16/20 kW, 7500 rpm for Siemens and 18.5/22 kW, 7000 rpm for Mitsubishi.

L.K. Machinery chooses such motors, because of special performance and delivery the maximum continues torque: for the Siemens continuing torque could be 389 Nm, for the Mitsubishi continuing torque could be 310 Nm.





If customer needs more powerful motor for the spindle, machine could be equipped with special Siemens motor with higher capacity and higher continuing torque compare with standard motor.



**Working Axes Travel:**

Currently the maximum rapid travel on X/Y/Z axes could be 24/24/15 m/min, the maximum feed rate is 10000 mm/min.

	LM-2616		LM-2616
X-axis Travel	2600 mm	Distance from spindle center to table surface	200 – 1000 mm
Y-axis Travel	1600 mm	Table Dimension	2500 x 1500 mm
Z-axis Travel	800 mm	Maximum table capacity	9000 kgs

	LM-3116		LM-3116
X-axis Travel	3100 mm	Distance from spindle center to table surface	200 – 1000 mm
Y-axis Travel	1600 mm	Table Dimension	3000 x 1500 mm
Z-axis Travel	800 mm	Maximum table capacity	10000 kgs



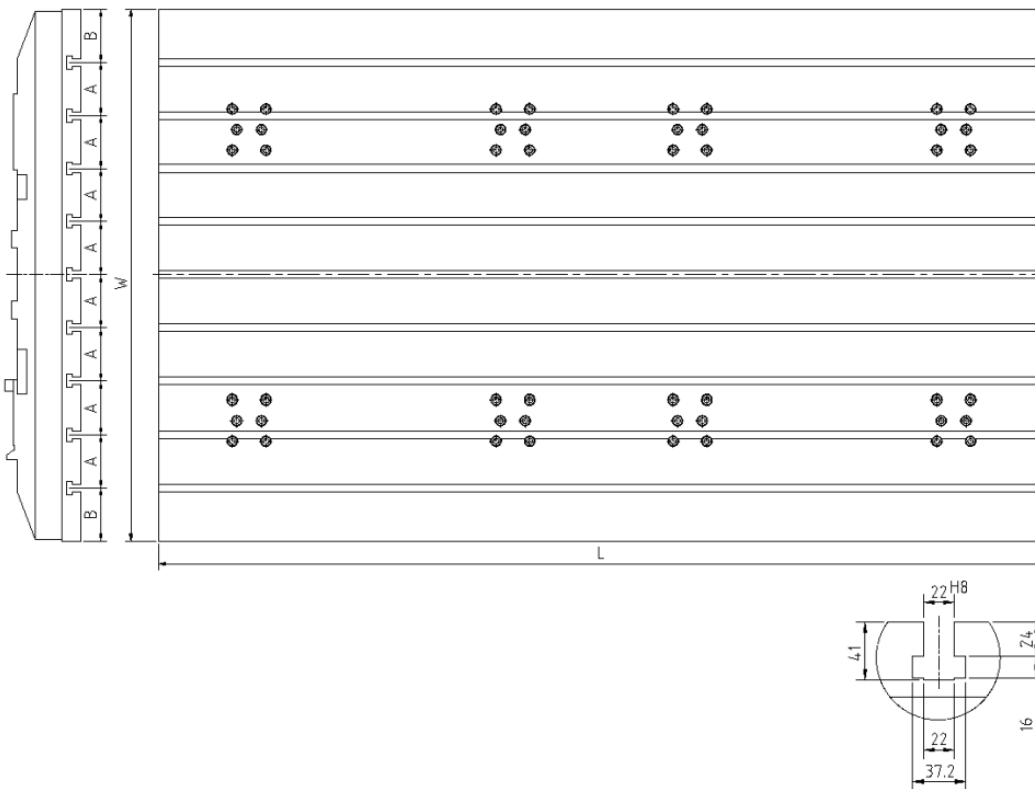
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	LM-4116		LM-4116
X-axis Travel	4100 mm	Distance from spindle center to table surface	200 – 1000 mm
Y-axis Travel	1600 mm	Table Dimension	4000 x 1500 mm
Z-axis Travel	800 mm	Maximum table capacity	12000 kgs

**Table (T-Slot Seize):**



Model	T-Slot Quantity	W	L	A	B
LM-2616	9	1500	2500	150	150
LM-3116	9	1500	3000	150	150
LM-4116	9	1500	4000	150	150



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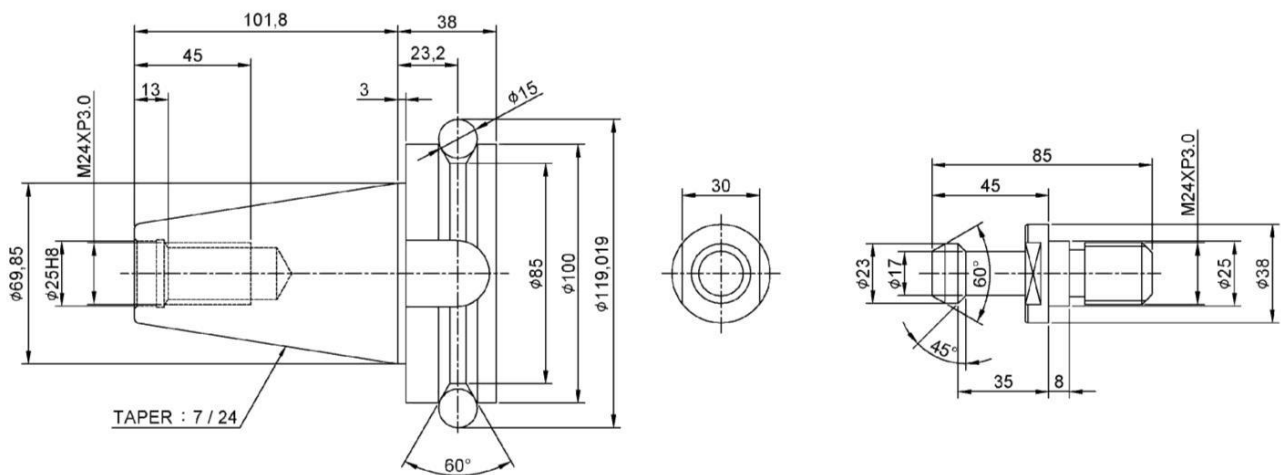
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**Tool Magazine:**

For LM-series machines, chain type of tool changing system is standard application for the BT-50 spindle taper. The maximum tool magazine capacity is 32 tools. The automatic tool change time “tool to tool” is 8 seconds, the automatic tool change time “chip to chip” is 13 seconds.

Tool change time (T – T):	8 seconds
Tool change time (C – C):	13 seconds
Max. Tool diameter:	125 mm
Max. Tool length:	350 mm
Max. Tool weight	20 kgs
Max. Tool Capacity	32 tools



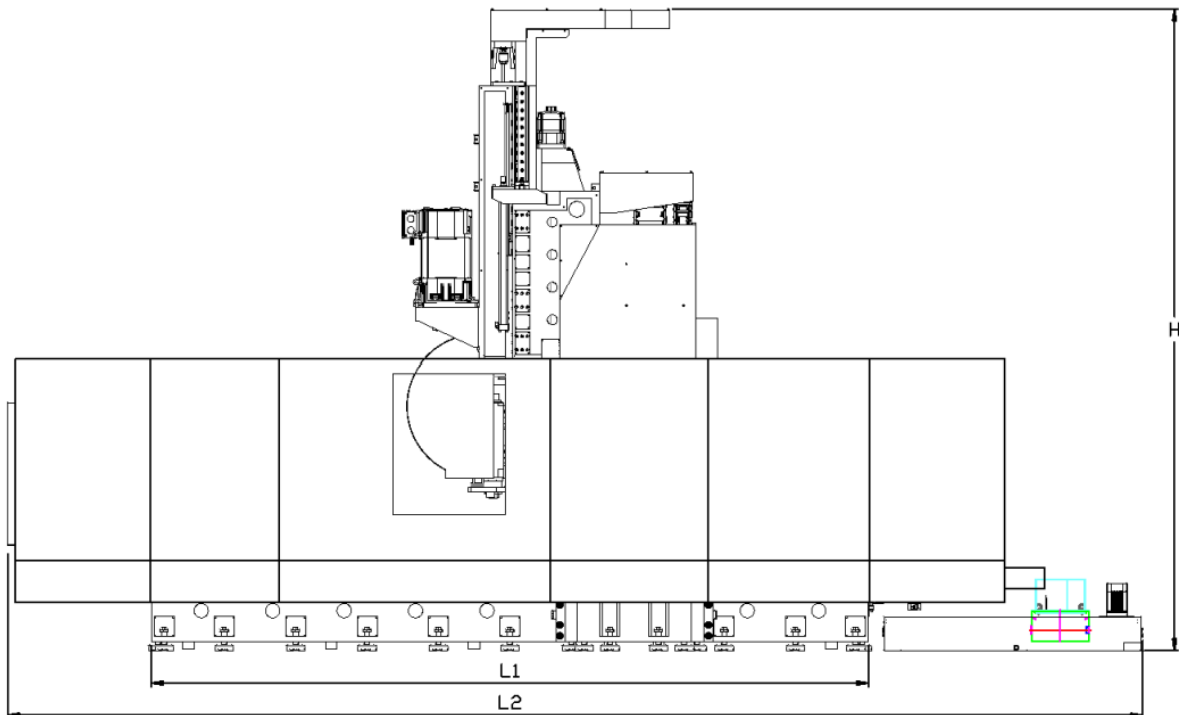
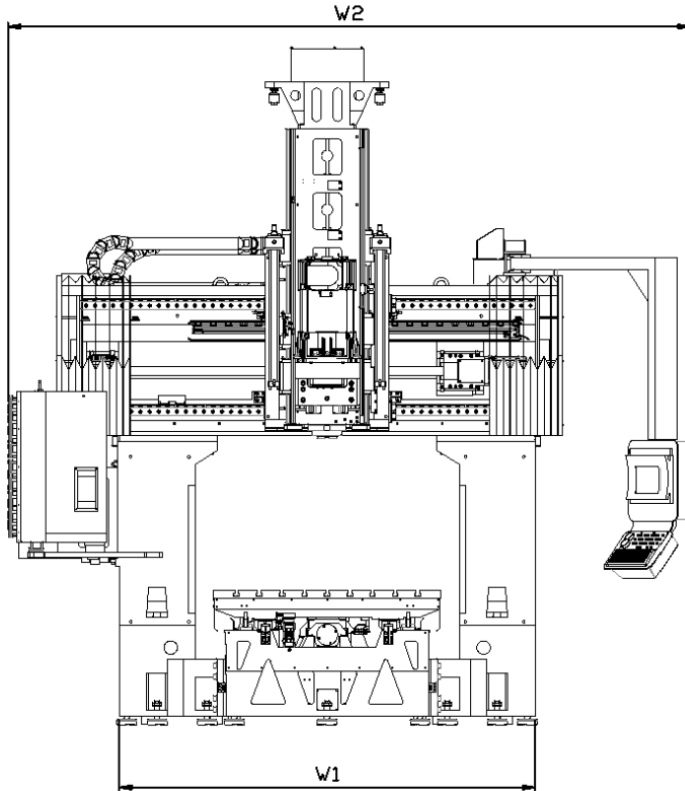
**Machine dimension:**

Models	W1	W2	L1	L2	H
LM-2616	1356	5100	5030	8400	4570
LM-3116	1356	5100	5530	9200	4570
LM-4116	1356	5100	6030	10500	4570



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**Machine Specification:**

	Machine Model	Unit	LK		
			LM-2616	LM-3116	LM-4116
CNC	STD Control		Siemens 828D / Fanuc 0iMD / Mitsubishi		
3 axes travel	Main structure	---	X axes : roller type linear guideway ; Y axes : roller type linear guideway ; Z axes : roller type linear guideway		
	Weight center on Z axes	---	Hydraulic		
	X axes travel	mm	2600	3100	4100
	Y axes travel	mm	1600		
	Z axes travel	mm	800 ( OPT- 1000 )		
	Distance from spindle center to table surface (min.)	mm	200 ~ 1000 ( OPT: 200~1200 )		
	Distance between columns	mm	1700		
Working area	Table Length	mm	2500	3000	4000
	Table Width	mm	1500		
	Max. table capacity	kg	9000	10000	12000
	T-slot size (width*no.*pitch)	mm	22x9x150		
	Table height (distance from table surface to the ground)	mm	895		
Spindle	Spindle Nose	---	BT-50		
	Spindle speed	rpm	6000 ( OPT: 4000 )		
	Spindle drive	---	Belt driven		
	Spindle motor (conti.)	kW	16.3 (S)		
	Spindle motor	kW	16/20 kw 7500rpm (S) / a22/7000rpm (F) / 18.5/22 (M)		
	Max. spindle torque (conti.)	N-m	389 (S) / 310 (M)		
Rapid travel	Feedrate--X	m/min	24		
	Feedrate--Y	m/min	24		
	Feedrate--Z	m/min	15		
	Max. cutting speed	mm/min	1~10000		
3 axes motors	X axes servo motor	kW	8,17 kw 4000 rpm / a30 / 3000 rpm (S)		
	Y axes servo motor	kW	7,75 kw 2000 rpm / a30 / 3000 rpm (S)		
	Z axes servo motor	kW	4,29 kw 2000 rpm / a30b / 3000 rpm (S)		





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<b>ATC</b>	Type		Disc Type / Chain Type		
	Tool change type		ATC		
	Tool capacity		24 / 32		
	Max. tool diameter		125		
	Maximum tool length		350		
	Maximum tool weight		20		
	Automatic tool change time (tool to tool)		8		
	Automatic tool change time (chip to chip)		13		
<b>Dimension</b>	Weight of Machine		23 800	25 000	28 000
	Length of Machine		8400	9200	10500
	Width of Machine		5100		
	Hieght of Machine		4570		