

# 5 Axes Machining Center U Series

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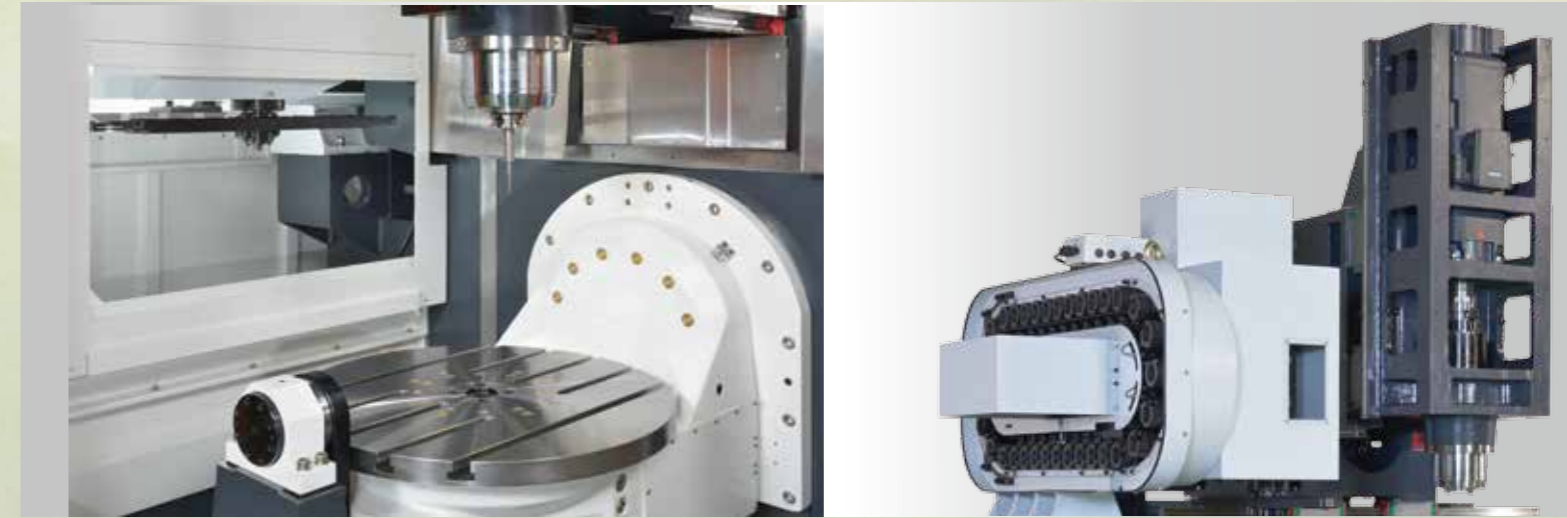
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**MASTER AUTOMATIC CO.,LTD.**

## Extreme or High Performance 5 Axes Machining Center

Excellent for machining multi-sided and complex parts with a higher level of precision and reduced set-up time.

MACO offers the U Sries 5 Axes machining centers for machining multi-sided and complex parts on five faces in a single set-up. MACO machining centers are designed to be extremely rigid, highly accurate, and very stable, making them the best cost-effective solution compared to the competition.



- Advanced B/C-axis rotary table.  
Maximum table loading is 300 kg (Horizontal).  
B-axis swiveling range is  $-50^{\circ} \sim +110^{\circ}$ .
- Standard equipped with Chain type 32 tools magazine.
- Standard equipped with BBT40 Direct Drive Spindle 12,000 rpm.
- With both simultaneous 5 axes and 3+2 machining machining we have the ability to complete complexed, high precision parts which are suitable for automobile, aerospace, medical and other high accuracy required industries.
- U Series are available with direct drive spindles 12,000 or 15,000 rpm for different machining applications.



## Superb Structural Design

All mechanical parts are guided by Finite Element Analysis and employing high tension casting structure allowing for a one-piece bed, column and saddle to achieve perfect match design.

The rigidity base can support provide the dual-axis rotary/swivel table (B / C-axis). Combined with a cross slide design on the X and Y-axis ensures high stability and the high machining accuracy.

### 36 M / min X / Y / Z Rapid Feed Rate

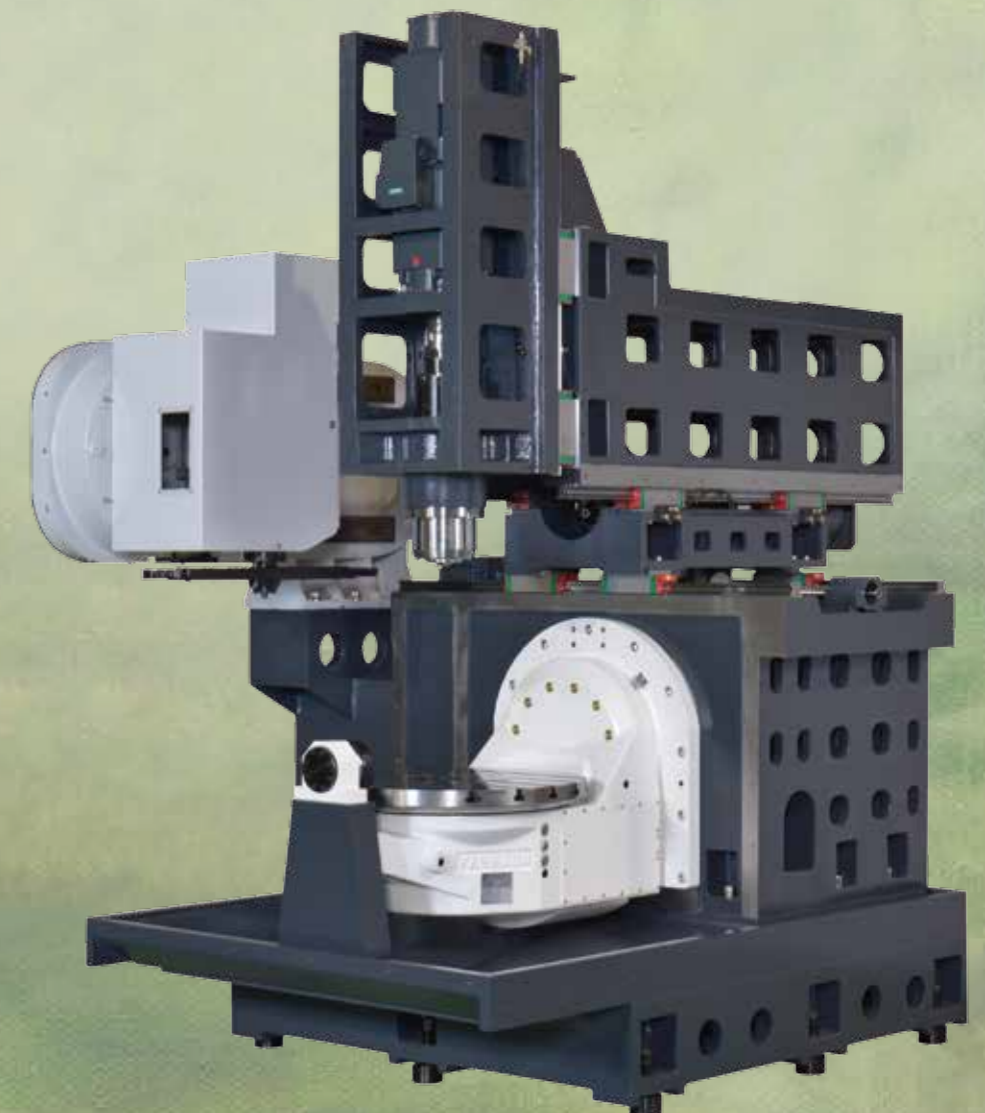


- All axes adopt roller type linear guide ways that support heavy cutting, fast movement and lower wear.



- X / Y / Z axes direct driven by AC servo motor to ensure that the high-speed axial load, which still provides the best dynamic accuracy and fast acceleration and deceleration capacity.

- The moving column structure design provides the best structural rigidity and minimizes floor space at the same time.
- Column adopts one-piece thick ribs structure with 4 large-sized linear motion blocks on each side to support the saddle well and remains steady while fast movement machining on Y-axis.

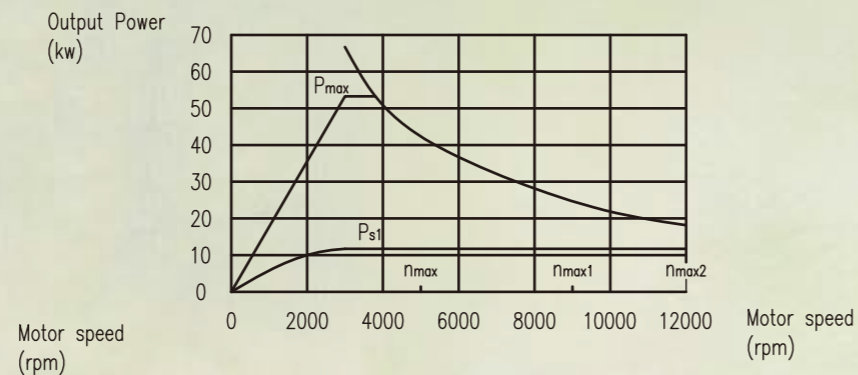
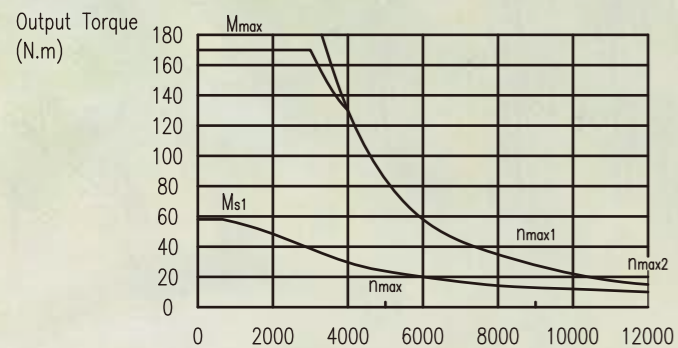


## Optimization Spindle System



- Using a high-speed 15,000 rpm Direct Drive Spindle, the vibration generated is relatively low, and isolates the heat from motor to enhance the accuracy of extended machining cycles.
- This model standard equipped with spindle oil cooler which effectively reduces the spindle thermal effects to ensure accuracy and prolonged life.

## Spindle Torque Diagram



## Efficient Chip Removal

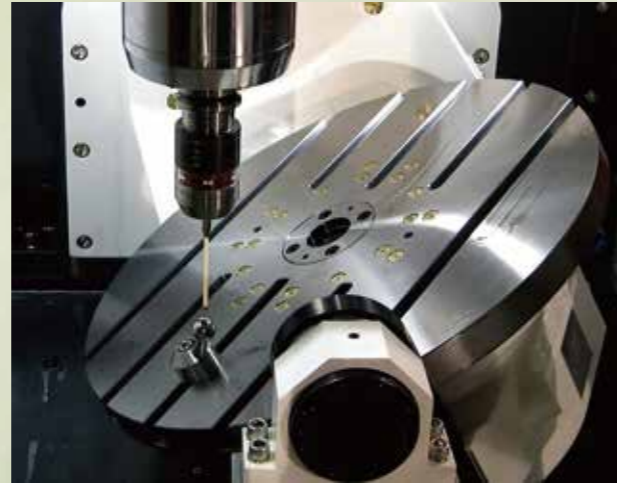
- Coolant Jet around Spindle with the bed flushing design, also with the Chain type Chip Conveyor to provide high-performance chip removal capacity, to ensure stable and excellent machining accuracy.
- In applications such as deep hole drilling, high speed machining and boring. Coolant Through Spindle optional is available and suggested.

- 1 Coolant Jet around Spindle
- 2 Bed Flushing
- 3 Chain type Chip Conveyor
- 4 Optional Coolant through spindle (20 bar)

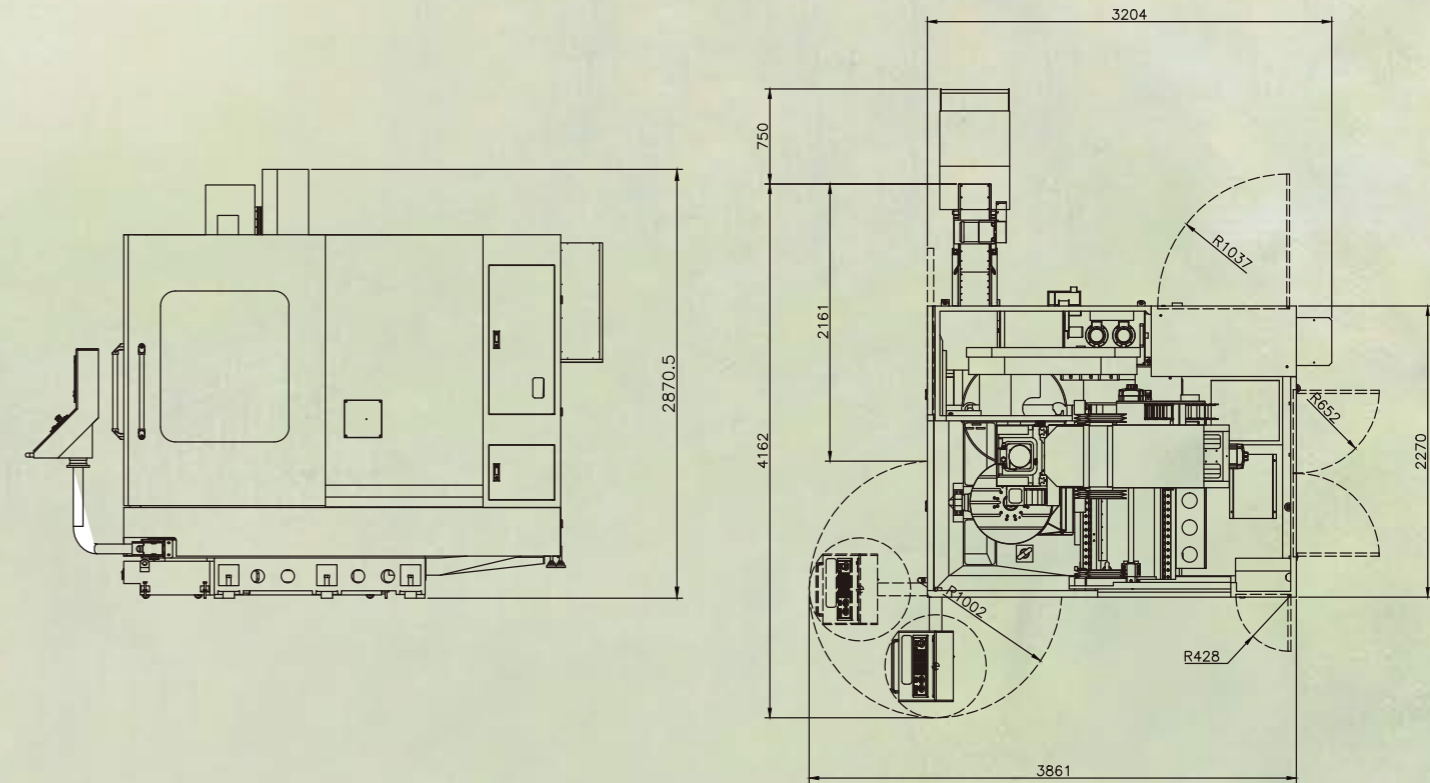


### Workpiece measurement system(Optional)

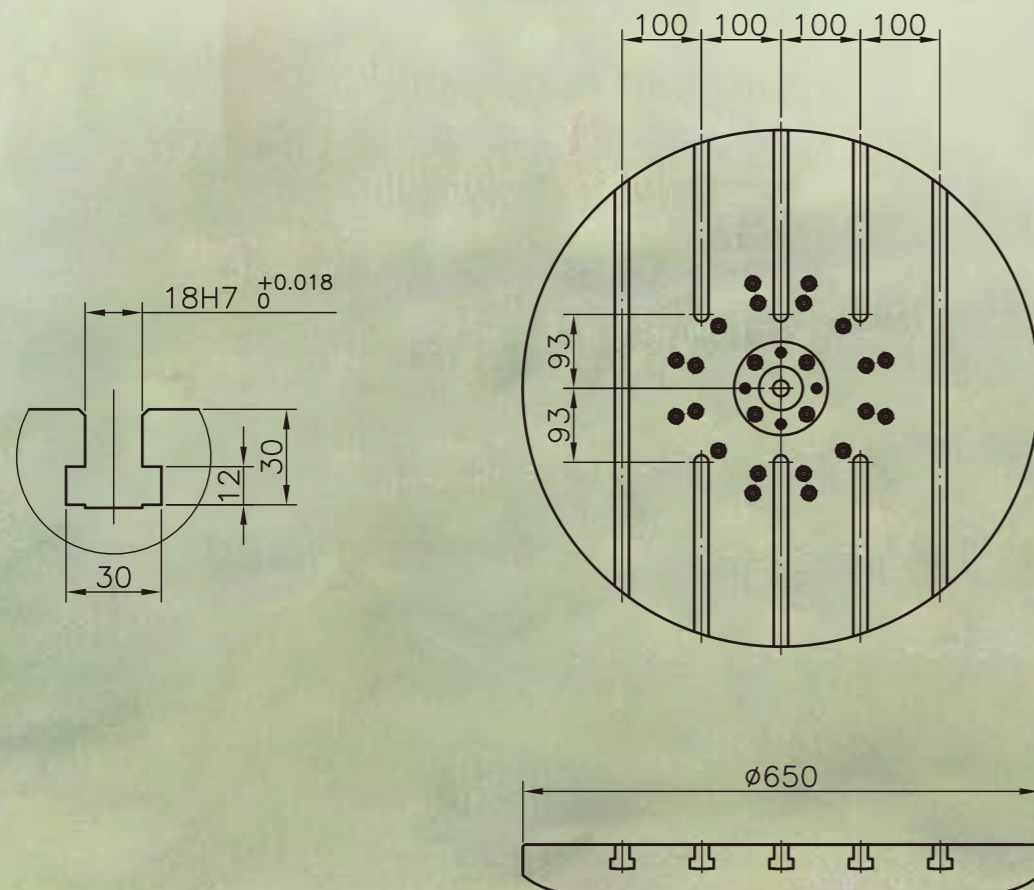
- The touch probe device employs a BLUM TC50 is ideally suitable for fast and highly accurate measurement on machine tools used in single and mass applications



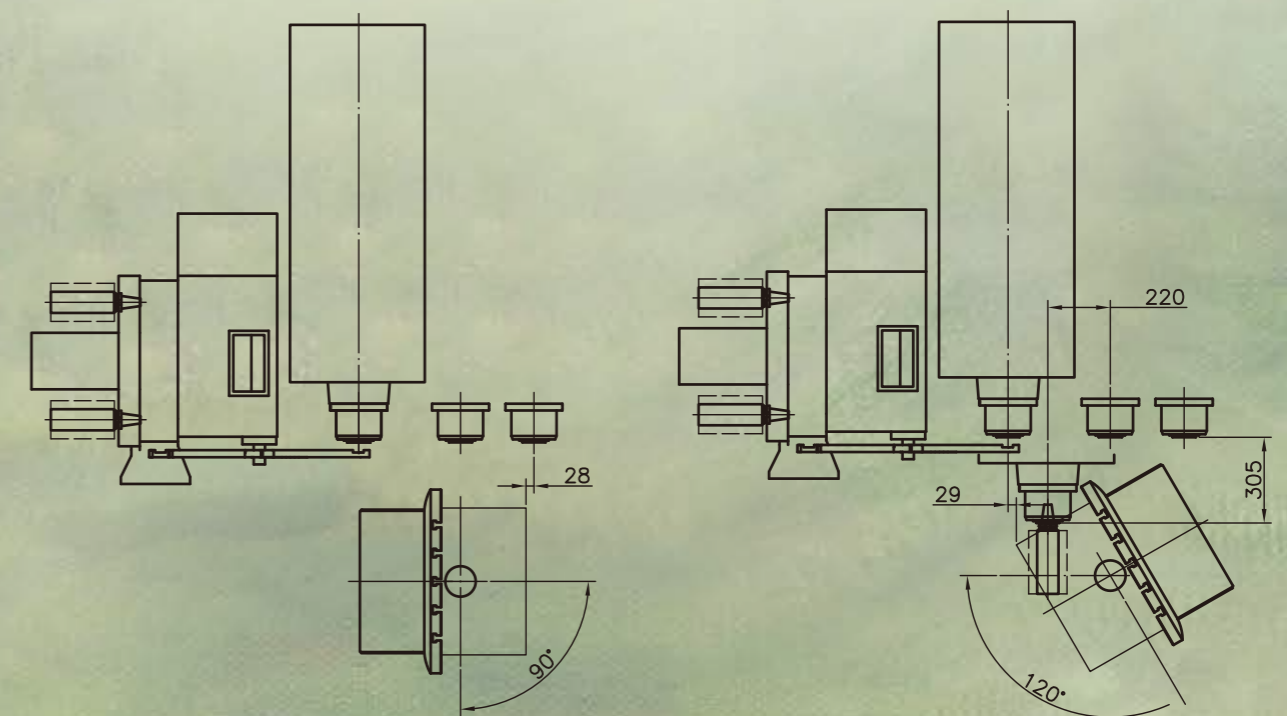
### Floor Space Diagram



### Pallet Dimension



### Workpiece Interference Diagram



Model		U 4	U 6	U 8
<b>Controller</b>		SIEMENS		
<b>Travel</b>				
X-axis travel	mm	400	620	800
Y-axis travel	mm	350	520	900 + 300
Z-axis travel	mm	350	460	620
B-axis tilting range	degree	-50° ~ +110°	-50° ~ +110°	±120°
C-axis rotating range	degree	360°		
Spindle nose to table	mm	150 ~ 500	150~ 610	150 ~770
<b>Spindle</b>				
Type of spindle		BBT40		
Spindle transmission		Direct Drive		
Spindle speed	rpm	12,000 OPT : 15,000		
Spindle motor	kw	12 / 14.4	12 / 14.4	17 / 20.4
<b>Feedrate</b>				
X/Y/Z rapid traverse	M/min	48 / 48 / 48	36 / 36 / 36	48 / 48 / 48
Cutting feed rate	mm/min	1 ~ 20,000	1 ~ 20,000	1 ~ 20,000
<b>Accuracy</b>				
X/Y/Z Positioning accuracy	mm	0.008 / 0.008 / 0.008		
X/Y/Z Repeatability accuracy	mm	0.006 / 0.006 / 0.006		
B/C Positioning accuracy	arc-sec	20 / 20 (OPT: 10 / 10)		
B/C Repeatability accuracy	arc-sec	5 / 5		
<b>Table</b>				
Table size	mm	Ø450	Ø650	Ø800
T-slot (WxNo.xPitch)	mm	18 x 5 x 100		
Table loading capacity	kg	150 (Tilting) / 200(Horizontal)	200 (Tilting) / 300(Horizontal)	500(Tilting) / 1000(Horizontal)
<b>ATC</b>				
Tool station		Chain type (Arm type)		Chain type (Armless type)
No. of tools	pcs	32		
Max. tool weight	kg	7		
Max. tool length	mm	300		
<b>Miscellaneous</b>				
Coolant tank capacity	L	250	300	400
Air pressure	kg	6		
Power requirement	KVA	25	35	40
Max. machine weight	kg	6,000	8,500	22,000
Machine size ( Floor space, LxW)	mm	2,080 x 2,400	3,860 x 4,160	4,528 x 2,240
Machine height	mm	2,720	2,870	3,605

- Design and specification are subject to change without prior notice.
- Option tool shank selection: HSK / SK / CAT / BBT/ DIN/ ISO...and so on.

Model		U 4	U 6	U 8
<b>Contoller</b>	Siemens 840D (5 controllable / 5 simultaneous axes)	●	●	●
	Heidenhain TNC640 (5 controllable / 5 simultaneous axes)	○	○	○
	Siemens 828D (5 controllable / 4 simultaneous axes)	○	○	○
	Heidenhain TNC620 (5 controllable / 4 simultaneous axes)	○	○	○
	FANUC 0iMF (5 controllable / 4 simultaneous axes)	○	○	○
<b>Spindle</b>	12,000 rpm Direct Drive	●	●	●
	15,000 rpm Direct Drive	○	○	○
<b>ATC</b>	24 Tools	○	○	○
	30 Tools	●	○	○
	32 Tools	○	●	●
	40 Tools	○	○	○
<b>Others</b>	X/Y/Z Axes Roller Linear Guideways	●	●	●
	X/Y/Z Axes Linear Scale	○	○	●
	B-axis Encoder	●	●	●
	C-axis Encoder	●	●	●
	Z-axis Motor with Brake	●	●	●
	Spindle Oil Cooler	●	●	●
	Coolant Through Spindle 20 Bar	○	○	○
	Spindle Air Coutain	●	●	●
	Programmable Coolant Flushing Device	●	●	●
	Coolant Jet Around Spindle	●	●	●
	Table Tailstock Supported	●	●	●
	Table Fixture Air Source	○	○	○
	Rigid Tapping	●	●	●
	Coolant System	●	●	●
	X/Y/Z Axes Automatic Lubrication System	●	●	●
	Grease Lubrication System	●	●	●
	Disk Type Oil Skimmer	○	○	○
	Air Conditioner for Electrical Cabinet	●	●	●
	Chain Type Chip Conveyor	●	●	●
	Auger Type Chip Conveyor	○	○	○
	Chip Cart	●	●	●
	Coolant Gun / Air Gun	●	●	●
	Bed Flushing	●	●	●
	Top Cover of Machine	●	●	●
	Full Enclosure	●	●	●
	Automatic Tool Length Measurement	○	○	○
	Automatic Workpiece Measurement	○	○	○
	Oil Mist Collector	○	○	○
	Spin Window	○	○	○
	M30 Automatic Power off	●	●	●
	LED Working Light	●	●	●
	Interlock Front / Side Door	●	●	●
	CE Mark	○	○	○

●=Standard ○=Option