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## HTT-500



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#### Main Specifications

Item	Unit	HTT-500
Spindle	rpm	15,000 Built-in Spindle
X/Y/Z Rapid Traverse	m/min	60
X/Y/Z travel	mm	X : 800 / Y : 800 / Z : 830
X/Y/Z Accel. & Decel.	G	X : 0.8 / Y : 0.8/ Z : 0.8
A Axis Travel	deg	+20 ~-120°
B Axis Travel	deg	360°
A/B Axis Speed	rpm	50 / 100
Working Table Size	mm	500 x 500
Max. Workpiece Dim.	mm	Ø700 x H500

%Remark: Please refer to p.8 for the working area defined by Z axis travel with A axis tilting angle.



• HTT-500, the 5-axis horizontal machining center, is Tongtai's new solution of process integration

• Excellent machine rigidity and stability to ensure high accuracy during precision machining.

· Orthogonal mechanical coordinate system for easy programming and enhance the precision

· Central chip removal system effectively prevents the problem of internal temperature rise from accumulated cutting chips and reduces the environmental variables for higher precision.

· Built-in thermal compensation function to ensure ideal machining accuracy under different

### Structure & Characteristics

### Stable and Efficient Machine Foundation

- · Excellent rigidity and vibration-resistant performance
- · Design with finite element analysis (FEA), static & dynamic analysis, modal analysis
- · Optimal design of guide rails to enhance machining stability

### **3 Axis Specifications**

Traverse X/Y/Z axis 800/800/830(\*note)mm Rapid traverse

X/Y/Z axis 60/60/60m/min

Acceleration

X/Y/Z axis 0.8/0.8/0.8G

\*Note: For the definition of the processing area, please refer to the travel relationship diagram on page 13, where the Z-axis travel is determined based on the tilt angle of the A-axis.

### Working table

Dimension: 500x500mm Max. work area: Ø700xH500mm



### Orthogonal Table-Table five-axis system for more intuitive operation

The A/B axis provides milling flexibility, enabling the processing of parts with multiple operations and complex angles, leading to efficient engineering and reduced processing time.

The A/B axis driven by DD motors, providing high torque and zero backlash advantages.

- A axis traverse: +20 ~-120°
- B axis traverse: 360°

#### Automatic Pallet Changer system (APC) 2

Fixtures and workpieces can be prepared in advance, allowing for quick pallet exchange upon completion of processing. reduces downtime, minimizes manual intervention, and increases production capacity.

#### X-axis saddle with height 3 difference-rail design

The height-difference rail design not only increases structural rigidity but also effectively achieves lighten of the moving structure and reduces the footprint.



Without APC



### 4 Optimized column structure

• The column features a dual-layer wall and symmetrical design, providing high rigidity and helping to minimize asymmetric deformations caused by thermal elevation. · The internal structure adopts a honeycomb design, reducing weight by 25% and improving rigidity by 20%, which is beneficial for high-dynamic cutting processes.



### Introduction of Machine Units

#### **Build-in spindle**

- Spindle cooling system
- · Spindle with oil-air lubrication

Spindle speed: 15,000 rpm (Std.) Tool shank: BBT40/HSK-A63 Spindle motor power: 37/18.5 kW Output torque: 249/95 Nm





Spindle speed: 20,000 rpm(Opt.) Tool shank: BBT40/HSK-A63 Spindle motor power: 25/22 kW Output torque: 83.2/10.7 Nm



### Swiveling NC rotary table (A/B axes) Orthogonal cradle with five axes for more intuitive operation

- · The AB axis provides milling flexibility and can complete multi-process part processing and complex angle processing, achieving engineering intensification and reducing processing time.
- · Integrated cradle base, high rigidity and resistance to cutting forces
- · Adopt DD motor drive, which brings the advantages of high torque and zero backlash, improving processing accuracy and capability

A/B axes rapid traverse: 50/100 rpm A-axis travel: +20 ~-120° B-axis travel: 360° Max. loading capacity: 500kg \*註:AB軸能力依據選配規格而不同



### Automatic pallet changer(APC)

- · While the machine is in process, operator can load/unload the next workpieces in the external pallet of APC unit and then move into the internal pallet after the machining process is completed. The APC unit can reduce idle time and increase productivity.
- The APC unit is driven by the servo motor. the advantages are fast change-over, stability, and low noise.

APC time: 14 sec

### Modular tool magazine to meet diverse processing needs

To fully utilize the engineering-intensive characteristics of the horizontal five-axis machine, the number of tools is selected according to the process, which can reduce the downtime to replace tools, increase production capacity and convenience

Standard configuration is 60 tools, optional configuration is 90/120 tools

• Effectively reduce the downtime and improve the production efficiency

\*The example of standard configuration 60 tools

### Automatic Tool Changer(ATC)

Japanes made CAM mechanism is used on ATC gear box which has the features of high stability, high durability and rapid tool changing.

Max. tool weight: 12kg Max. tool length: 550mm Max. tool weight(with/without Adjacent Tool): 75/170mm T to T : 1.6 sec C to C : 4.5 sec







## Operation

With excellent access to the table and a wide door opening facilitates loading/unloading and jig & fixture operations.

Through centralized mangment of air FIRL unit and lubricant pump, daily maintenance is made easily.



400 mm

### Swivel-type operation panel

The wide door opening makes machine operation and loading/unloading more convenient.





### Easy daily maintenance

Through centralized mangment of air FIRL unit and lubricant pump, daily maintenance is made easily.



### Accessory specifications

### Chip conveyor

Standard equipped integrated type (chain type plus drum type) chip conveyor, it has outstanding chip disposal efficiency for different materials and chip size.

	Steel		Cast	Aluminu	
Integrated type	Long chips	Short chips	Power chips	Short chips	Long chips
(Hinge type+Drum type)	0	0	0	0	0

Short chips: Chips shorter than 60 mm or ball type chips smaller than Ø40 mm. Curl long chips: Chips' length is longer than short ones.

### Chip disposal

Widely slanted sheet metal with central chip disposal device allows chips efficient removing efficiently.

### Roof-type flushing system

Flush metal chips into chip auger for avoiding the chip accumulation on the plate.



n/ Non-ferrous metal				
Short chips	Power chips			
0	0			

 $\bigcirc$ : suitable X : non-suitable







### LHL Lubrication System (Std.)

Advanced lubrication system to reduce the friction during high precision movement of linear guides and ball screws and benefit the function and life of the components.

#### Advantages of LHL Lubrication:

- Lubricant consumption 90% ↓
- Component failure rate 50% ↓
- Coolant lifetime 200%
- Power consumption 50% ↓



### Hydraulic/Pneumatic Supply for Jig/Fixture (Std.)

For the jig/fixture to perform workpiece positioning & clamping or seal confirmation by using quick connect fittings to supply hydraulic and pneumatic through the bottom of working table.



### Workpiece Measurement System (Opt.)

Workpiece measurement system to inspect the workpiece right after the machining.



### Coolant through Spindle (Opt.)

Coolant trhough spindle (C.T.S.) system will increase the efficiency of cutting chip removal and extend the tool life by cooling the cutting point.

Coolant pressure: 20/50/70 bar (2.0/5.0/7.0 Mpa)

Filtration accuracy: 40 µm

### Linear/Rotary Scales (Opt.)

Linear or rotary scales on each feeding axis mechanism to enhance the machining quality by compensating the deviation and error on positioning and repeatability due to temperature.



### Safety Light Curtains (Opt.)

Safety light curtains to prevent the potential risks or human hazards during machine operation.







## **Travel Diagram**

### Distance of spindle and workbench center



### Distance of spindle and worktable



### A axis rotation angle (+20~-120°)





Top view

Unit: mm

### Machine Dimensions

Machine layout



### \*Note:



Z-axis travel is 0~200mm; the A-axis can only utilize the origin point starting from 200~300mm, with the A-axis angle limited to ±20°.





Front view

Side view

## Standard/Optional Accessories

## Specifications

		Standard	Optional
Spindle	15,000 rpm built-in spindle	•	
-	20,000 rpm built-in spindle		0
A/B axis	NC 0.001* index table	•	
Without automatic pallet changer	One pallet		0
Automatic pallet changer	Two pallet	•	
Tool shank	BBT-40	•	
-	HSK-A63		0
	DIN-40		0
	CAT-40		0
Angle of BT-40 pull stud	MAS407 BTI(45%)	•	
	MAS407 BTII(60%)		0
	MAS407 BTIII(90%)		0
Capacity of tool magazine	60 pc	•	
	90 pc		0
	120 pc		0
Coolant through spindle pump	20 bar		0
-	50 bar		0
	70 bar		0
Coolant system	Spindle coolant system	•	
	Air conditioner for electrical cabinet	•	
	Coolant temperature control system		0
	Hydraulic oil temperature control system		0
Chip conveyor	Central chip removing coolant system	•	
	Integrated type conveyor	•	
Lubrication system	LHL integrated lubrication system	•	
Positioning accuracy control	Three axes linear scale		0
Tool measuring system	Non-contact tool measurement within the machine		0
	External swing-type touch sensor		0
Workpiece measuring system	Workpiece measuring device		0
Other accessories	Air gun/Coolant gun	•	
	Oil skimmer		0
	Oil mist collector		0
	Machining air blow		0
Controller	SIEMENS 840Dsl	•	

ltem	Specification	Unit	HTT-500
Table	Size of table (LxW)	mm	500x500
	Max. Loading capacity	kg	500
	Table height from floor	mm	1,200
	Max. Workpiece dimension	mm	Ø700xH500
	A/B axis min. Indexing increment	deg	0.001°
Travel	X/Y/Z axis travel	mm	800/800/830(*Note)
	Distance from spindle center line to table surface	mm	-50~750
	Distance from spindle nose to table center	mm	70~900
	A axis travel	deg	-120~+20
	B axis travel	deg	360
Spindle	Max. Spindle speed	rpm	15,000
	Spindle drive method	-	Built-in spindle
	Bearing lubrication method	-	Oil and gas lubrication
	Output power	kW	37/18
Feed axis	X/Y/Z axis rapid traverse	m/min	60
	Cutting feedrate	m/min	20
	Max. speed of A axis	rpm	50
	Max. speed of B axis	rpm	100
ATC	Tool shank	-	BBT40(opt.HSK-A63)
	Tool capacity	рс	60(opt.90/120)
	Max. Tool Diameter (with/without Adjacent Tool)	mm	Ø75/Ø170
	Max. Tool Length	mm	550
	Max. Tool Weight	kg	12
Machine size	Width x depth x high	mm	3,557x6,377x3,177
	Weight	kg	15,000
Controller	-	-	SIEMENS 840Dsl

◎Specifications may be changed without prior notice.

\*Note: The Z-axis travel is determined by the tilt angle of the A-axis within the machining area.