

專注航太·品質·創造未來
Aiming At Aerospace Solutions

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MEMBER OF
TTC GROUP
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Brand story

APEC takes "Aiming at aerospace solutions" as the core spirit of the brand and provides great application support and customized solutions to high-end aerospace users. In summary, APEC is the system provider who provides factory planning, and Turnkey solutions. With customer driven innovation, APEC is the best strategic partners of our customers.

Factory planning

Capabilities of planning the most suitable automatic/semi-automatic production cell and production line for the factory.

Process level up

Process improvement & optimization services could be provided to increase production efficiency.

High-end facility

Complete machining solutions for various aerospace structures and engine parts.

Aiming At Aerospace Solutions

Training program

- 5-axis operation
- Machine maintenance
- Tool & jig planning
- 5-axis programming upgrade

Talent supply

Industry-academia collaboration

Smart manufacturing

TLM system could be applied to monitor machine status and operation history. Production traceability and improvement could be made. TIMS could fulfill smart manufacturing purpose and the function includes tool management, order management and quality control.

Turnkey solution

With the optimal combination of perfectly adapted technology modules including process analysis, machine recommendation, clamping devices, tools and software, the optimized Turnkey solution could be provided.

AGA key components

- Spindle
- Milling Head
- Trunnion Table

Aerospace Gebert APEC is a brand which provide key components of aerospace processing. It is developed by APEC and Dr.Gebert's team from Germany.AGA provides the brilliant components such as high power high speed Spindle, Milling Head and Trunnion Table which are especially designed for APEC machines. The after-sales services could then be offered more efficient and accurate.



TIMS

Production management
Intelligent monitoring
RFID tool management
Workpiece management
Order management



TLM

Machine status
Utilization analysis
Alarm history
Operation history
Program upload/download



- **Box-in-Box structure**

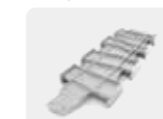
Symmetrical geometry design with Box-in-Box structure features full force flow and thermal symmetry and DCG(Driving at the center of gravity)
Benefits of DCG: Excellent dynamics, improved surface finish, reduced manual polishing time.

- **Unequal thickness of Ram**

Ram equipped with honeycomb structure performs the best balancing design and better geometry.

- **Suitable workpieces**

Wing structure



Wing rib(L)



Stringer

Fuselage structure



Bulkhead



Landing gear panel



Machine configuration for aerospace machining

Cross beam flushing system

High pressure pump with groups of powerful nozzles can quickly remove the chips.

Complex chip removal system

Dual chip removal system with a large-capacity water tank could make coolant and chip removal stable and efficient.

Automatic top-roof cover

Movable beam design of top-roof cover could prevent spreading of chips and coolant liquid.

5-axis simultaneous machining

5-axis machining accuracy difference is below 0.01mm.

Special spindle for aluminum alloy processing

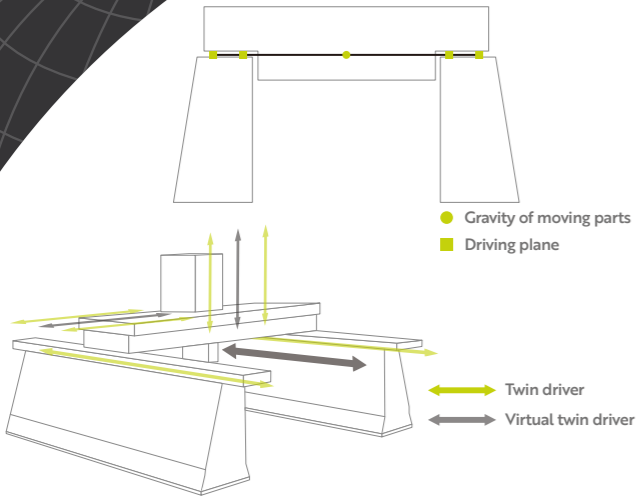
Ultra-high speed and power spindle with the best material removal rate.

X/Y/Z axis driven by linear motor

All three axes are driven by dual linear motors.
Max. feedrate : 60 m/min
Max. acceleration : 5 m/sec²

Automatic attachment head exchange system

Different angle heads could be mounted to match various applications and it is best for machining in narrow spaces



Symmetrical design with Box-in-Box structure

- The lowest gravity center in the world**
Zero distance between gravity of the moving parts and the driving plane. The machining stability could then be improved and the best machine rigidity could be ensured.
- Symmetrical force flow provide precision machining**
X,Y,Z axis are designed with force symmetric structure. Dual driving units and equivalent uniform force at the center of gravity can ensure optimal surface quality.

APEC linear motor not only save energy but also increase motor thrust

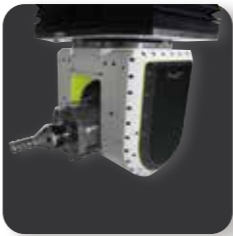
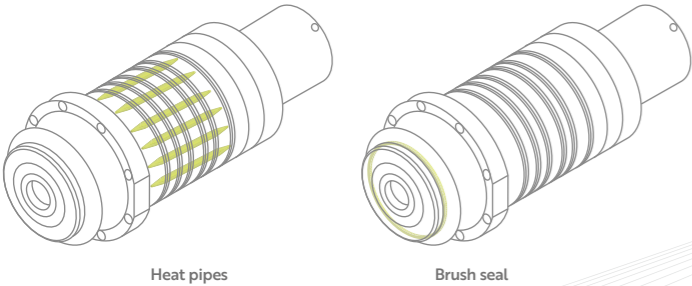
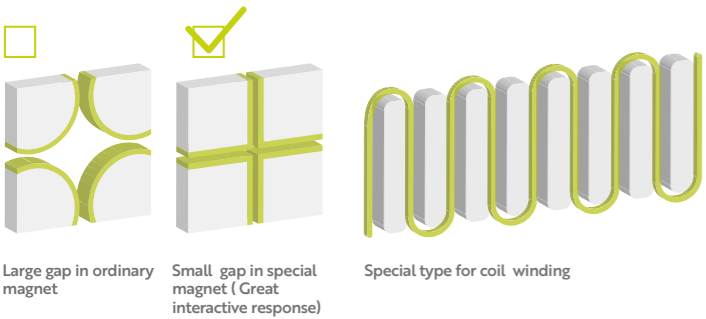
APEC linear motor can save 32% of energy thanks to special magnet and cooling design.

- Linear motor thrust increased by 10%.**
New linear motor magnet design increases magnetic flux and makes linear motor thrust increased by 10%.
- Best cooling**
Special coil winding makes motor temperature constant.

AGA ultra-high speed & power spindle

With the optimized 124kw,30000rpm spindle, the material removal rate(MRR) could reach 9,920 cm³/min.

- Heat pipes for efficient heat transfer**
AGA Heat pipes have 1000x better heat conductivity than comparable sticks made of copper which also cause a homogenous temperature inside components.
- Use of brush seals for aircraft engines**
 - Maximal gap (≤0.003 mm) for best protection against fluid (≤ 10bar) and aggressive particles. (carbon fibers or ceramic materials)
 - Protection could be provided even if purge air fails or air is very humid.
 - Electrostatic discharge protection of the shaft could be provided if drive currents are not perfectly symmetric.
 - Damping of vibrations.



Fork Type Milling Head - Standard
(High power spindle)

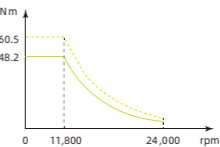
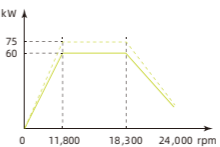


Fork Type Milling Head
(Ultra-high power spindle)

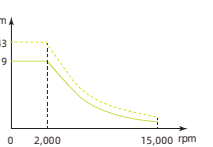
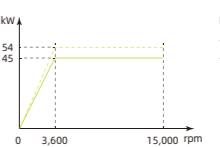
Spindle Taper	HSK63A/HSK100A	HSK63A/HSK100A
Swivel/Rotation Torque	B=1,192/1,980Nm C=1,050/1,740Nm	B=1,192/1,980Nm C=1,050/1,740Nm
Swivel/Rotation Speed	B=C=30(cont)rpm B=C=60(max)rpm	B=C=30(cont)rpm B=C=60(max)rpm
Swivel/Rotation Angle	HSK63A:B=±120° C=±360° HSK100A:B=±115° C=±360°	HSK63A:B=±115° C=±360° HSK100A:B=±110° C=±360°
Clamping Torque	B=4,000Nm C=4,000Nm	B=4,000Nm C=4,000Nm

High power spindle			
24,000rpm		15,000rpm	
Spindle taper	HSK-63A	Spindle taper	HSK-100A
Lubrication	Oil air	Lubrication	Oil air
Power(kW)	S1 60 S6 75	Power(kW)	S1 45 S6 54
Torque(Nm)	S1 48.2 S6 60.5	Torque(Nm)	S1 119 S6 143

24,000rpm, HSK63A

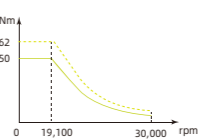
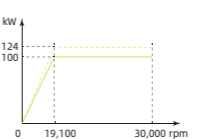


15,000rpm, HSK100A

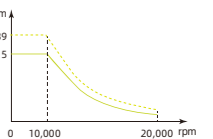
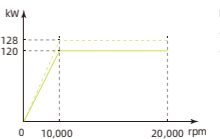


Ultra-high power spindle			
30,000rpm		20,000rpm	
Spindle taper	HSK-63A	Spindle taper	HSK-100A
Lubrication	Oil air	Lubrication	Oil air
Power(kW)	S1 100 S6 124	Power(kW)	S1 120 S6 128
Torque(Nm)	S1 50 S6 62	Torque(Nm)	S1 115 S6 139

30,000rpm, HSK63A



20,000rpm, HSK100A



Specification	Unit	SK M 25	SK M 27	SK M 32	SK M 37
Travel		SK M 2520/40	SK M 2740/50/60/80	SK M 3240/50/60/80	SK M 3740/50/60/80
X-axis	mm	2,000/4,000	4,000/5,000/6,000/8,000		
Y-axis	mm	2,500	2,700	3,200	3,700
Z-axis	mm	1,000			
Distance from spindle end to table	mm	According to the selected model, the configuration will be different.Please contact our sales for more details.			
Table					
T-slot size	mm	28			
Length	mm	2,000/4,000	4,000/5,000/6,000/8,000		
Width	mm	2,000	2,200	2,700	3,200
Max. table load	kg/m²	8,000			
Feedrate					
Rapid traverse	m/min	XYZ=60			
X.Y.Z axis acceleration	m/sec²	5			
Accuracy					
Positioning	mm	1000mm-3000mm	VDI344:0.005-0.008 ISO230-2:0.003-0.005		
Repeatability	mm	1000mm-3000mm	VDI344:0.003-0.005 ISO230-2:0.002-0.003		
DBB circularity	mm	0.15/XY,0.25/YZ,0.25/XZ			
Spindle(Standard)					
Spindle taper		HSK63A			
Spindle speed	rpm	24,000			
Spindle power(S1/S6)	kW	60/75			
Spindle torque(S1/S6)	Nm	48/60			
Automatic tool changer					
Tool shank	pcs	30T			
Max. tool length	mm	300			
Max. tool diameter with adjacent tool	mm	Ø100			
Max. tool diameter without adjacent tool	mm	Ø130			
Max. tool weight	kg	7			
Others					
Machine weight	tons.	52	67	84	99

☒ Standard accessories ☐ Optional accessories

Item	Specification		Item	Specification	
Controller	HEIDENHAIN TNC640 MPG HR520	<input checked="" type="radio"/>	Smart factory	TIMSystem	<input type="radio"/>
	HEIDENHAIN TNC640 MPG HR550	<input type="radio"/>		TLMsystem	<input type="radio"/>
	SIEMENS SINUMERIK 840D HT2	<input type="radio"/>		Security door interlocks	<input checked="" type="radio"/>
Spindle	AGA HSK63A 24,000rpm 60/75 kw	<input checked="" type="radio"/>	Others	Air dryer	<input checked="" type="radio"/>
	AGA HSK100A 15,000rpm 45/54 kw#1	<input type="radio"/>		Isolation transformer	<input checked="" type="radio"/>
	AGA HSK100A 20,000rpm 120/128 kw#1	<input type="radio"/>		Spindle oil/air lubrication system	<input checked="" type="radio"/>
	AGA HSK63A 30,000rpm 100/124 kw	<input type="radio"/>		Oil mist collecting system	<input checked="" type="radio"/>
Drive System	XYZ axis with linear motor drive	<input checked="" type="radio"/>		5 axis with Heidenhain optical scale	<input checked="" type="radio"/>
	30T	<input checked="" type="radio"/>		Waterproof working lamps	<input checked="" type="radio"/>
	40T	<input type="radio"/>		Brake system for linear motors	<input checked="" type="radio"/>
Automatic tool changer	60T	<input type="radio"/>		Automatic open/close top roof sliding cover	<input type="radio"/>
	Coolant around spindle	<input checked="" type="radio"/>		Automatic Kinematics measuring and calibration system	<input type="radio"/>
	Coolant through spindle 20bar	<input checked="" type="radio"/>		Stabilizer	<input type="radio"/>
Cutting coolant	Coolant through spindle 70bar	<input type="radio"/>	#1 If HSK 100A spindle is chosen, ATC standard would be 20T.Opt. would be 40T/60T		
	Chiller for spindle	<input checked="" type="radio"/>			
	Air conditioner for electrical cabinet	<input checked="" type="radio"/>			
Chip removal system	Complex chip conveyer	<input checked="" type="radio"/>			
	Enlarged coolant tank	<input checked="" type="radio"/>			
Workpiece measurement system	BLUM workpiece measurement system(TC60-RC66)	<input type="radio"/>			
	Renishaw workpiece measurement system(RMP600)	<input type="radio"/>			
Tool measurement system	BLUM tool measurement system(NT-A4)	<input type="radio"/>			
	Renishaw tool measurement system(NC4-F230)	<input type="radio"/>			

- Please contact with our sales if you have special requirement.
- All specifications and design are subject to change without notice.

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