

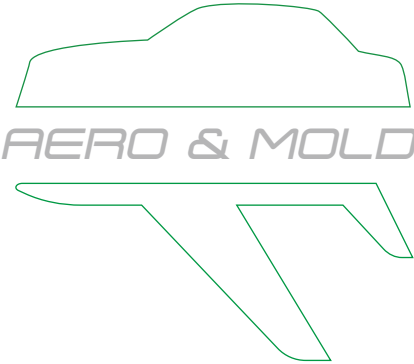
專注航太・品質・創造未來
Aiming At Aerospace Solutions

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MEMBER OF
T GROUP
2022/05

G800-TR
5-axis Gantry Vertical Machining Center





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.





The G800 series is mainly developed for the workpieces that require five-axis simultaneous machining in the aerospace, mold and automotive industries. Customers can choose the following spindles according to different processing requirements: 12,000rpm(HSK100A), 15,000rpm(HSK100A), 20,000rpm(HSK63A), 24,000rpm(HSK63A)

- **Gantry type five-axis**

The smallest footprint in the industry and the best 3D space configuration design.

- **X/Y/Z-axis driven by high-speed ball screw, A/C-axis driven by direct drive motor**

This design can ensure that the center moving part and counterweight remains concentric which can effectively reduce the vibration caused by the rapid movement.

- **The whole machine is equipped with Heidenhain optical scale**

Effectively ensure the accuracy and stability of each axis, and is equipped with a protection device to avoid dust, oil, water and gas pollution shortened life of the optical scale.

- **Gantry type structure design**

The driving centers of the three-axis are all located at the center of gravity, which greatly improves the dynamic stability of the structure.

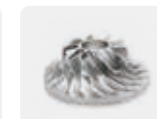
- **Short force flow design of spindle saddle**

Minimize the spindle overhang to improve the stability and rigidity of the machining process.

- **Suitable workpieces**



Engine blisk



Engine impeller



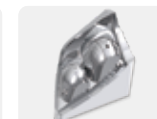
Engine case



Engine blade



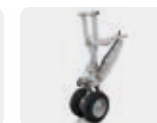
Precision mold



Stamping mold



Aluminum alloy structural parts

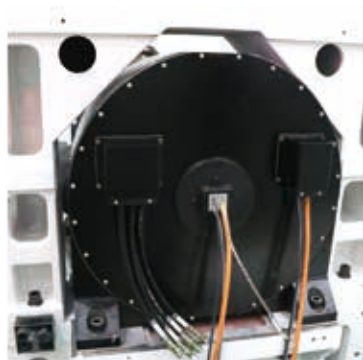


Titanium alloy structural parts

(The picture is only for reference, please make the object as the standard.)

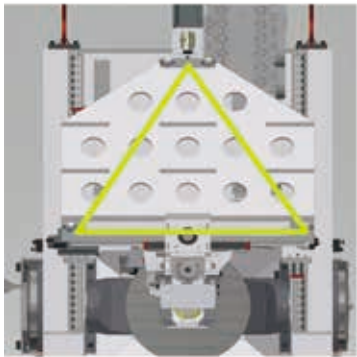
The Direct Drive Motor directly drives the rotary table to provide high-precision machining.

The A / C-axis are driven by direct drive motor .
The power can be completely transmitted and provides high-precision machining capabilities.



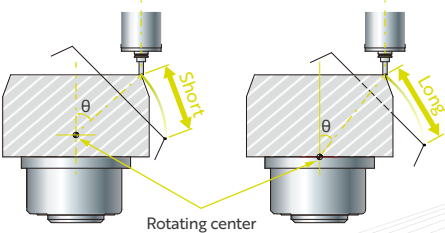
Compact trunnion rotary table

X/Y/Z axis moving and table rotation are working individually to make sure machining is free from 3 axis inertia influences. Perfect servo driven design gives excellent machining stability.

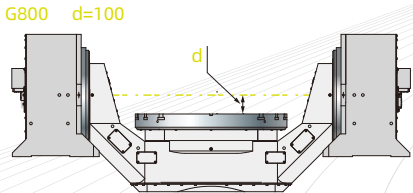


Rotating center is higher than table surface

Rotating center of A axis is 100 mm higher than table surface, that reduces the distance while tool moving and table rotation simultaneously to save cycle time and gives perfect surface finishing in profile machining.

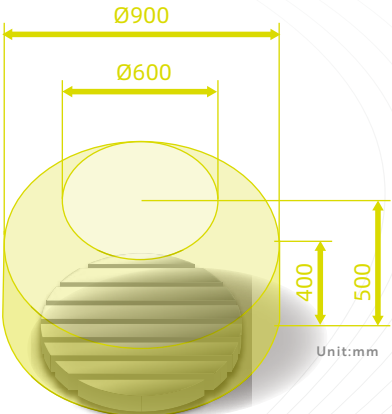
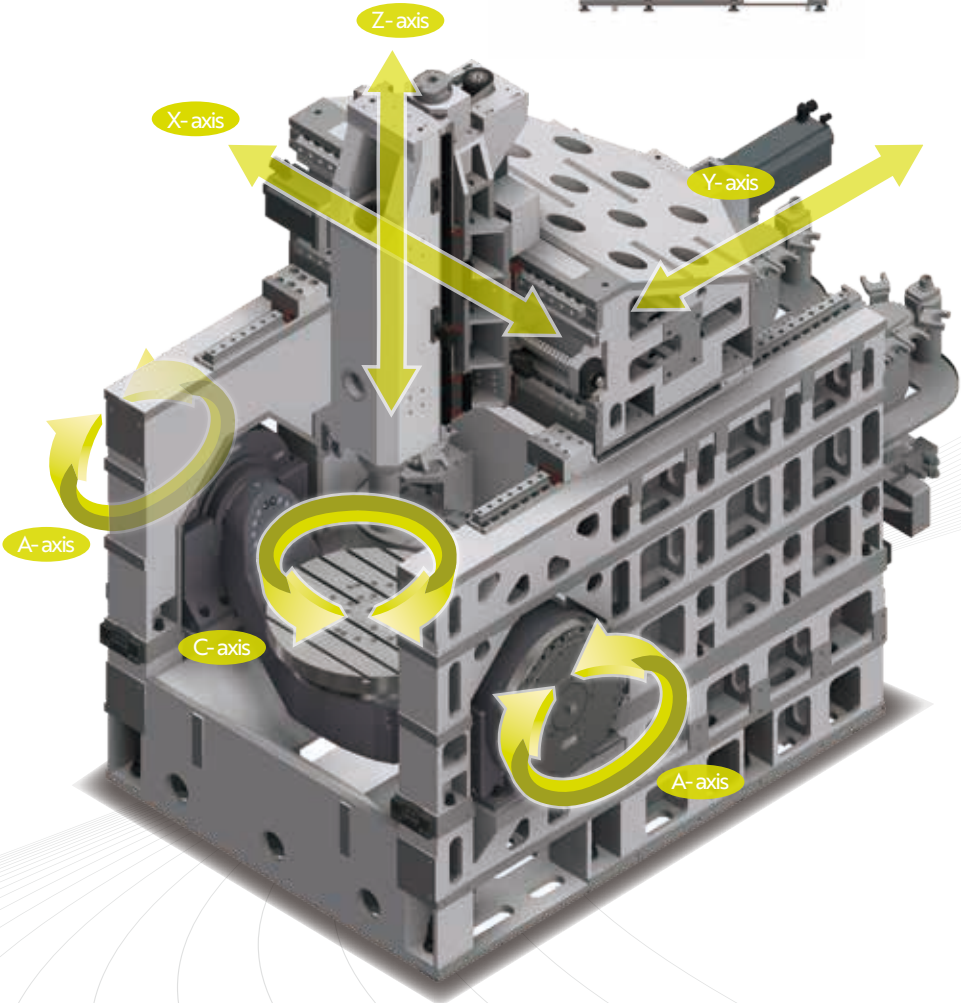
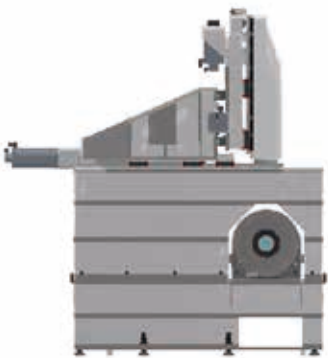


Max. table load	1,300 kg
Table size	Ø800 mm
Table speed	A-axis 80 rpm
	C-axis 100 rpm



Three axis driven at center of gravity(DCG)

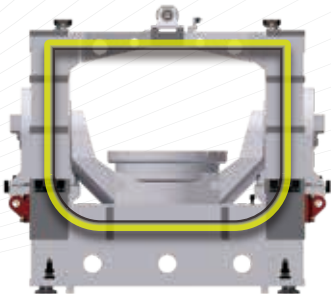
The driven centers of three axis are all on these gravity centers, which greatly improves the dynamic stability of the structure.



Max workpiece size

High rigidity U-frame structure

The saddle and column form a closed structure. High rigidity machine could reduce vibration effectively , increase processing stability and improve machining accuracy.



✓ Excellent rigidity

The high-strength structure can be matched with a 500 N m high-torque spindle to easily cutting titanium alloy, zinc alloy...etc.

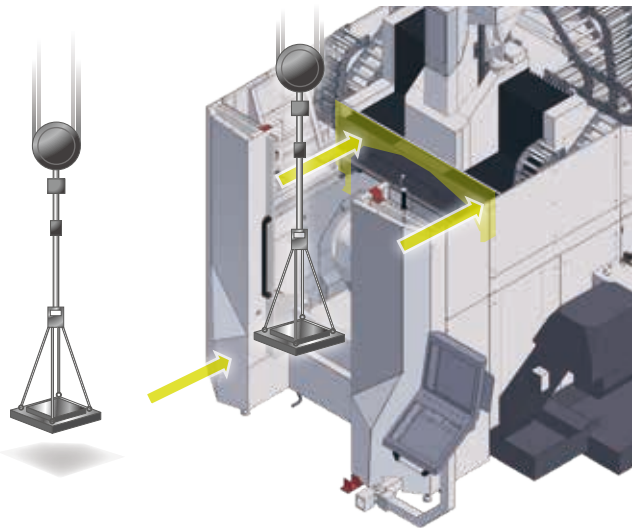
✓ Highest precision

Ultra-high precision designed and adjusted for car lamp molds, engine parts... etc.

✓ Brilliant stability

The symmetrical structure and cradle with double supports, double drives, full casting structure.It makes the center of gravity drive achieve the best stability.

Open top telescopic cover



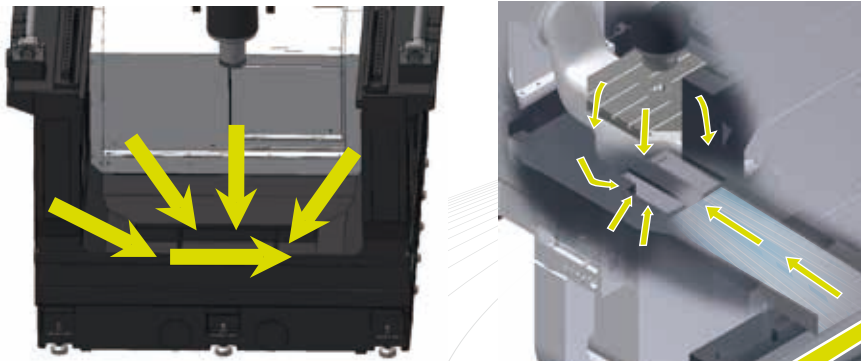
Door opening width

Wide door opening facilitates the operation and maintenance.



Well chip flow

Central chip flow design. Chips can be carried out immediately while machining. It prevents casting structure from being affected by hot chips and maintains machining accuracy.

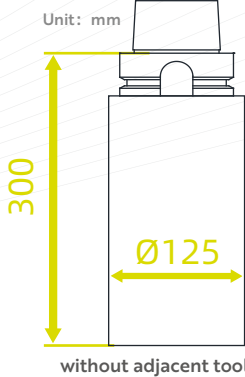


ATC (Automatic Tool Changer)



Tools Specification

G800-TR	HSK63A	HSK100A
Standard	32T	24T
Optional	64T	60T
Max. tool weight	7kg	15kg
Max. tool diameter	Ø80 Ø125 (w/o adjacent tool)	Ø125 Ø125 (w/o adjacent tool)
Max. tool length	300 mm	300 mm



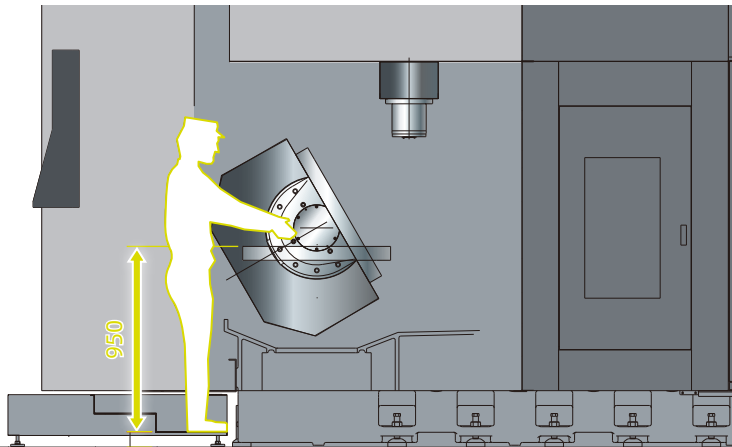
Operation / Accessibility

Easily reachable distance to working table and widely door open space is convenient for loading/unloading.

Safety/Full enclosure working zone

Top roof sliding cover

Avoid any flying chips, coolant and coolant mist splashed out.



Rotary table



Rotary table

Swing/rotation speed	rpm	A=80 / C=80
Max. swing/rotation torque (S1/S6)	Nm	A=4,268 / 7,554 C=2,134 / 3,777
Clamping torque	Nm	A=8,000 / C=8,000
Swing/rotation angle	deg	A=±120 / C=Cont.

1. The A / C-axis are driven by direct drive motor

The power can be completely transmitted and provides high-precision machining capabilities.

2. The A-axis is driven by a symmetrical double direct drive motor

The DD motor is on both sides of the table which prevents the cradle structure be twisting or deforming after loading.

3. 80 rpm of A axis feed rate

The maximum torque could be 7,554Nm and clamping torque up to 8,000Nm. (The highest in the industry)

4. Modular design rotary table

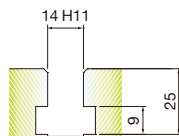
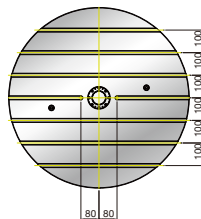
According to different industrial processing types, you can customize and replace workbench modules of various sizes and grooves.

5. The cradle rotating table can flush chips

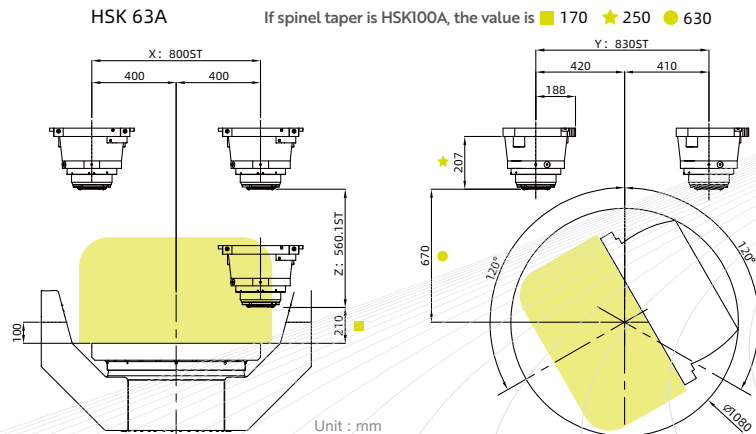
The cutting fluid spray column can be supplied synchronously with the working table, regardless of the rotation angle.

6. Large angle rotation/swing axis

Improve production efficiency; high-precision rotating/swing shafts ensure product quality.

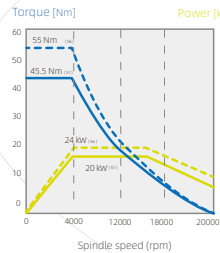


T-slot dimension



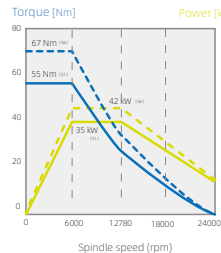
Unit : mm

Item	Specification	Application Recommendation
A Standard	20,000rpm_HSK63A 20/24kW, 45.5/55Nm ※The spindle without CTS function.	✓ Standard
		✓ Comprehensive processing
		✓ Die&Mold processing especially for finishing
B Optional	24,000rpm_HSK63A 35/42kW, 55/67Nm	✓ Aluminum alloy processing
		✓ High-power aluminum alloy processing
		✓ Die&Mold processing especially for finishing
C Optional	24,000rpm_HSK63A 60/75kW, 48/60Nm	✓ Ultra-high efficiency aluminum alloy processing
		✓ Mass removal rate
		✓ Comprehensive processing
D Optional	15,000rpm_HSK100A 45/54kW, 119/143Nm	✓ Aluminum alloy processing
		✓ Die&Mold processing
		✓ Titanium alloy processing
E Optional	12,000rpm_HSK100A 50/76kW, 200/302Nm	✓ Nickel-based alloy processing
		✓ Engine case processing
		✓ Heavy-duty cutting ability
F Optional	12,000rpm_HSK100A 50 ^{S1-100%} / 62.5 ^{S6-40%} / 78.5 ^{S6-5%} kW, 318 ^{S1-100%} / 398 ^{S6-40%} / 500 ^{S6-5%} Nm	✓ Titanium alloy processing
		✓ Nickel-based alloy processing
		✓ Engine case processing
		✓ Heavy-duty cutting ability



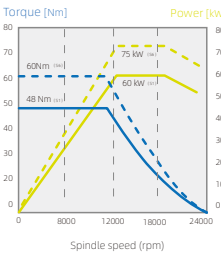
20,000 rpm HSK63A
A standard

24 kW



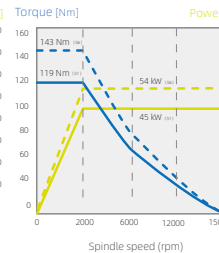
24,000 rpm HSK63A
B optional

42 kW



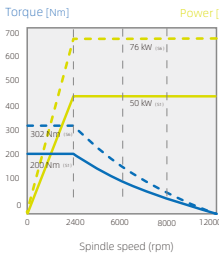
24,000 rpm HSK63A
C optional

75 kW



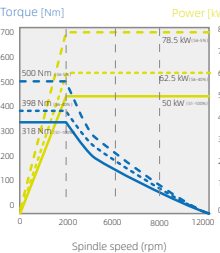
15,000 rpm HSK100A
D optional

144 Nm



12,000 rpm HSK100A
E optional

302 Nm



12,000 rpm HSK100A
F optional

500 Nm

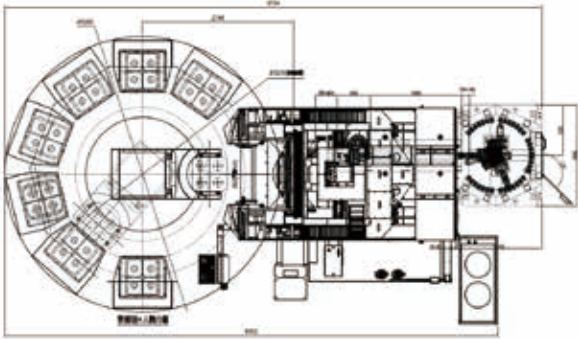
Spindle

Optional accessories



Smart Factory-Tool Management System

The database records tool status and usage history which can effectively manage tool data (tool length, radius, life... etc.). Moreover, tool compensation data is automatically uploaded and reducing tool data input errors and time.



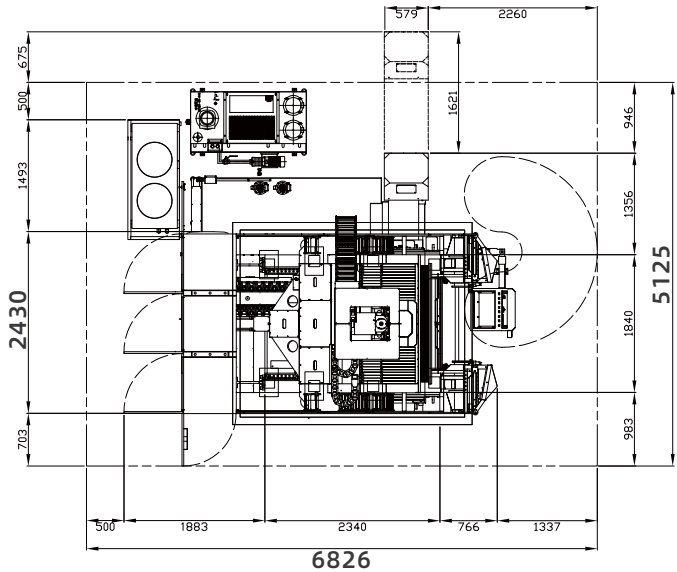
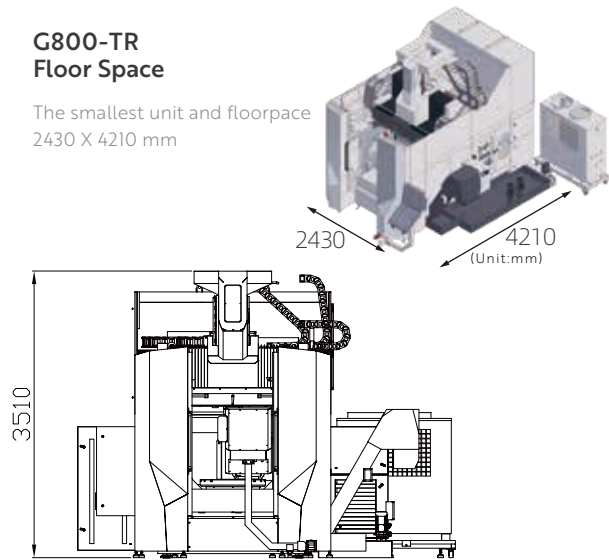
Whole Plant Planning-Single Machine with Multiple pallets

There are multiple pallets for a single machine and operators can arrange multiple identical parts or work independently without supervision, which greatly improves production efficiency.

- Convenient for heavy/large workpieces to be loaded outside the machine
- Increase the productivity of machines and operators
- Pallets can be easily interchanged between machines or multiple areas

G800-TR
Floor Space

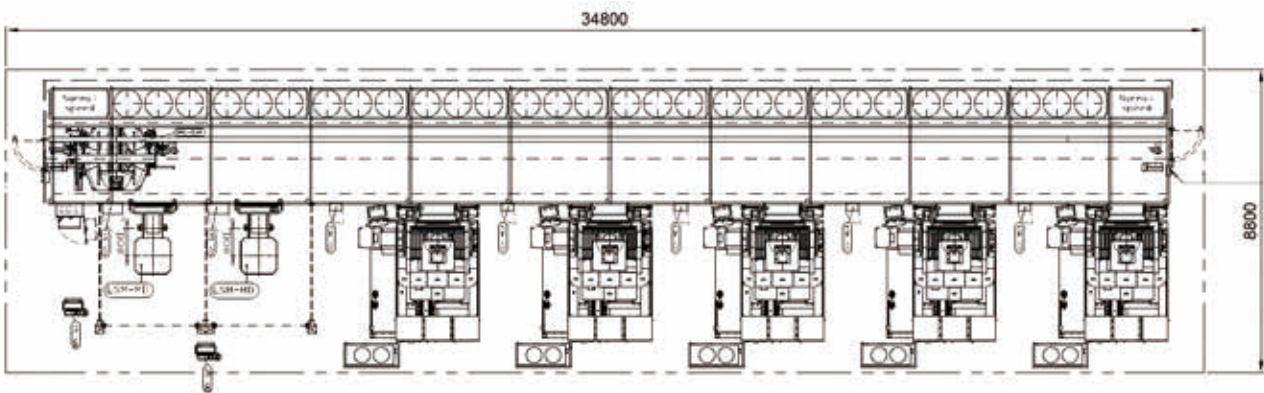
The smallest unit and floorpace
2430 X 4210 mm



Specification	Unit	G800-TR
Travel		
X-axis	mm	800
Y-axis	mm	830
Z-axis	mm	560
A-axis	deg	±120
C-axis	deg	±360(continuous)
Distance from spindle end to table	mm	210-770 (with std. spindle)
A/C-axis		
Drive type		DD Motor
Torque for A-axis(SI/max)	Nm	3,740/7,480
Torque for C-axis(SI/max)	Nm	1,870/3,740
Brake torque(A/C)	Nm	7,000/2,500
T-slot size	mm	14H11
Disk diameter	mm	Ø800
Load	tons	1.3
Feedrate		
Rapid traverse	m/min	XYZ=48
X.Y.Z axis acceleration	m/sec ²	6
Accuracy		
Positioning (VDI3441)	mm	X / Y / Z=0.008
Repeatability (VDI3441)	mm	X / Y / Z=0.005
Spindle (Std.)		
Spindle taper		HSK63A
Spindle speed	rpm	20,000
Spindle power(SI/S6)	kW	20/24
Spindle torque(SI/S6)	Nm	45.5/55
Automatic tool changer (Std.)		
Tool shank	pcs	32
Max. tool length	mm	300
Max. tool diameter with adjacent tool	mm	Ø75
Max. tool diameter without adjacent tool	mm	Ø120
Others		
Machine weight	tons.	15.5

● Standard accessories ○ Optional accessories		
Item	Specification	
Controller	HEIDENHAIN TNC640 MPG HR510	●
	HEIDENHAIN TNC640 MPG HR520 / HEIDENHAIN TNC640 MPG HR550 SIEMENS 840D MT series / SIEMENS 840D HT2	○
Spindle	AGA HSK63A 20,000rpm 20/24 kw	●
	AGA HSK63A 24,000rpm 35/42 kw / AGA HSK63A 24,000rpm 60/75 kw AGA HSK100A 15,000rpm 45/54 kw / AGA HSK100A 12,000rpm 200/302Nm AGA HSK100A 12,000rpm 318/500Nm	○
Drive system	XYZ axis with high speed ball screw driving / AC axis with direct drive motor	●
Automatic tool changer	HSK63A-32T	●
	HSK63A-64T / HSK100A-24T / HSK100A-60T	○
Chip removal system	Complex chip conveyer / Coolant tank	●
Cutting coolant	Coolant around spindle	●
	Coolant through spindle 20bar / Coolant through spindle 70bar	○
System coolant	Chiller for spindle / Chiller for A/C axis / Air conditioner for electrical cabinet	●
Workpiece measurement system	BLUM workpiece measurement system-TC-60+RC66	○
	Renishaw workpiece measurement system-RMP600	○
Tool measurement system	BLUM tool measurement system-NT-A4	○
	Renishaw tool measurement system-NC4-F230	○
Smart factory	TIMS system	○
	TLMsystem	○
Others	Security door interlocks / Fully enclosure splash guard / Oil mist around spindle	●
	Oil mist collecting system / Air dryer / Isolation transformer	○
	Stabilizer	○

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



Automated production line

The flexible manufacturing and production system for various workpieces is automated in the whole process, supplemented by automated inspections, which shortens the time for mold changeovers in an all-around way. And no defective products are produced. The equipment is also fully networked to monitor the production line in real-time, continuously optimize the process through big data, and even link M E S and E R P to create a smart automated production system that can reduce the burden of production management and integrate production information.

G800-TR