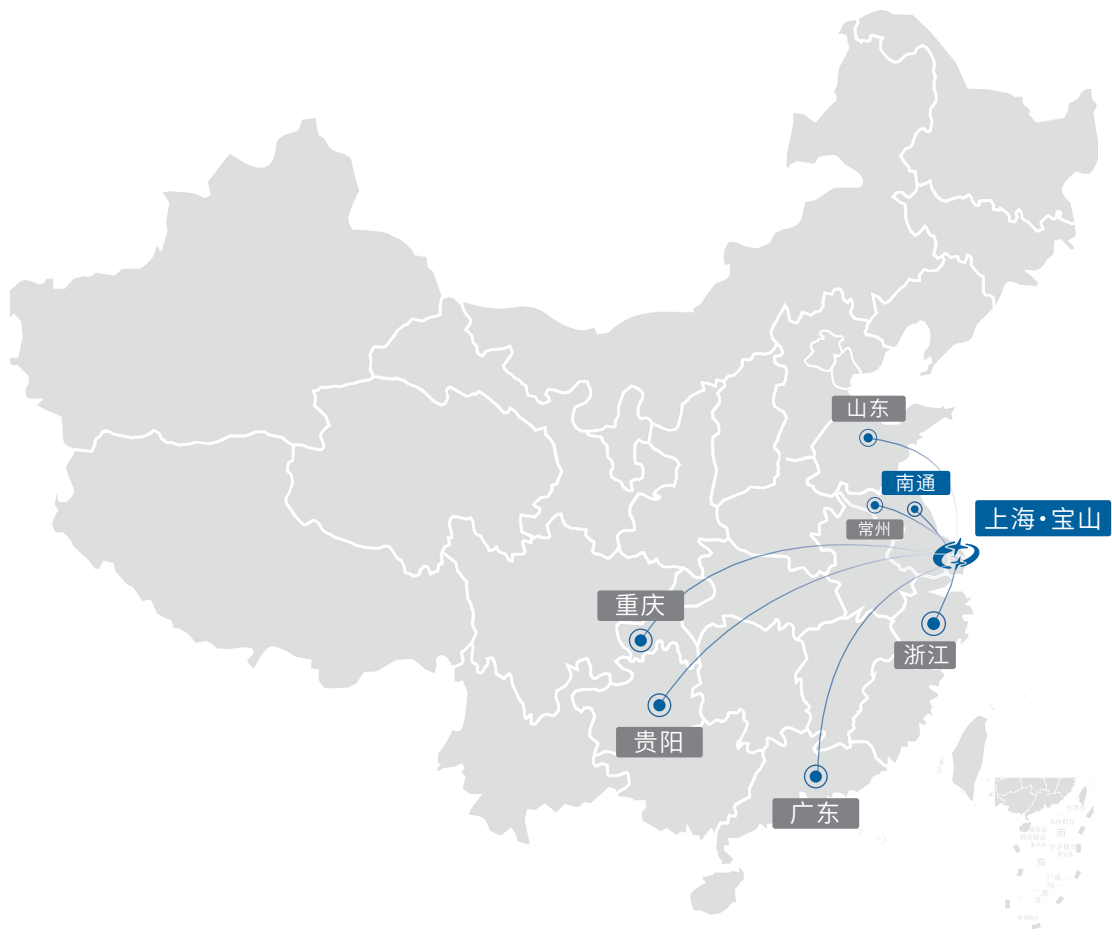




上海-宝山研发中心、南通-通州湾生产基地、南通-海门研发生产基地
Shanghai - Baoshan R&D Center, Nantong - Tongzhou Bay Production Base, Nantong - Haimen R&D and Production Base

● 营销服务网络：重庆、南通、常州、山东、浙江、广东、贵阳
Marketing and Service Network: Chongqing, Nantong, Changzhou, Shandong, Zhejiang, Guangdong, Guiyang

上海星合机电有限公司

Shanghai Thinkhead M&E Co., Ltd.

咨询电话 / Tel.: 400-999-0081 021-6686 1737

传真 / Fax: 021-5686 3167

官方网址 / Official Website: www.think-head.com

公司地址 / Company Address: 上海市宝山区威航路18弄Y10号
Y10, Lane 18, Weihang Road, Baoshan District, Shanghai, China



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高精度三轴&五轴加工中心

HIGH-PRECISION CRADLE 3-AXIS & 5-AXIS MACHINING CENTER



上海星合机电有限公司成立于2009年，为成形磨齿机的头部企业，致力于研发制造精密机床。产品范围覆盖齿轮磨床、螺纹磨床、加工中心三大系列的精密机床矩阵，可广泛应用于汽车制造、机器人、风电、半导体零部件、精密减速机等行业领域。在上海宝山、南通通州湾、南通海门设有三大研发生产基地，总面积超10万平方米，形成"研发-生产-销售-服务"全产业链闭环。

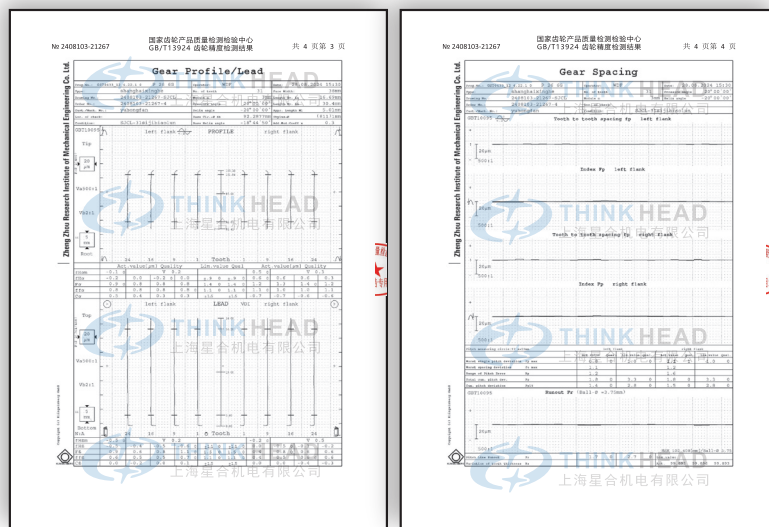
目前，上海星合已掌握高速主轴、高精度分度头、修整轴、伺服尾座、数控系统等多项核心零部件的关键技术并实现量产，具备全流程自主可控的机床研发实力及生产能力。上海星合始终以研发创新为引擎，深度参与“高端数控机床与基础制造装备”国家科技重大专项，携手上海交通大学、东华大学成立联合研究中心，与西班牙发格自动化有限公司成立“复杂曲面磨削联合实验室”，不断突破技术极限。

展望未来，上海星合将始终坚持以机电控软一体化设计为主导，以微米级磨削和低应力制造为依托，以高速主轴、直驱重切为亮点，以数控系统和机床材料为底层突破方向，技术体系完整而系统，并快速迭代，向世界一流水平的方向高速推进。

Shanghai Thinkhead M&E Co., Ltd. which was established in 2009 as a leading enterprise in profile gringding machine, dedicates to the research and manufacture of precision machine tools. Its products cover a precision machine tool matrix including three series of profile grinding machine,CNC thread grinding machine, and machining centers. It can be widely applied in industries such as automobile manufacturing, robotics, wind power, semiconductor components, precision reducers, etc. Three major R&D and production bases that are situated in Baoshan&Lingang in Shanghai, Tongzhou Bay&Haimen in Nantong, with a total area of over 100 thousand square meters have composed a complete supply chain "research-development-production-sales service".

Currently, Thinkhead has mastered the key technologies of multiple core components including high-speed spindles, high-precision indexing heads, numerical control systems and so on, and has realized mass production,possessing independent and controllable full-process R&D and production capabilities. Thinkhead also participated in major national science and technology project of "High end CNC machine tools and basic manufacturing equipment", set up joint research centers with Shanghai Jiao Tong University and Donghua University,and established the "Joint Laboratory for Complex Surface Grinding" with Spanish Fagor to push the limits of technology continuously.

In future, Thinkhead will continue to be being guided by Integrated design of electromechanical control and software, supported by micron-level grinding and low-stress manufacturing, highlighted by high-speed spindles and direct-drive heavy cutting, and take numerical control systems and machine tool materials as the underlying breakthrough directions.Thinkhead possesses comprehensive technology system. It iterates quickly to advance toward the world-class level.



位于上海市宝山区。
Located in Shanghai's Baoshan District.

磨齿研发中心，承担公司硬件测试、软件优化、功能完善等研发任务。
Gear Grinding R&D Center conducts hardware validation testing, software algorithm optimization and functional enhancement development.

机床展示中心，面向客户开放参观。
Machine Tool Demonstration Center is Open for customer visits with live machining showcases.

培训中心，覆盖机床操作，维护保养，齿轮加工等多项培训内容。
Technical Training Center covers machine operation certification, maintenance & warranty protocols and precision gear machining techniques.

客户试磨加工，NVH改善研发，产品试制磨齿。
Prototype grinding services, NVH improvement R&D, Trial production machining.

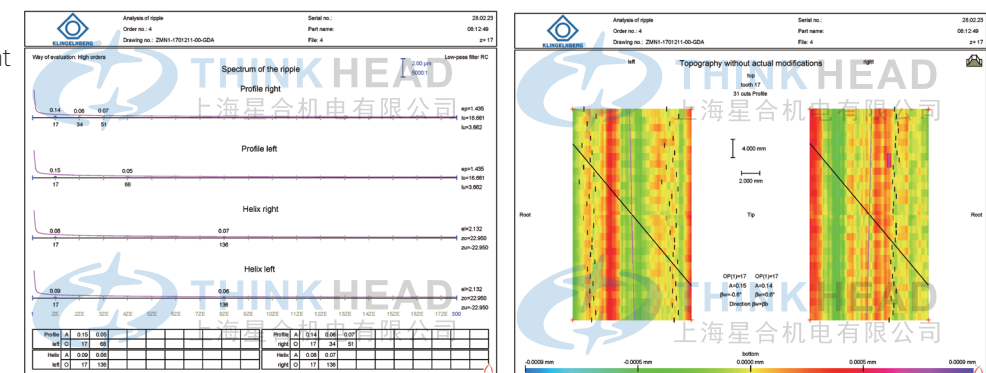
与上海交通大学机动学院共建“精密加工装备及工艺联合研究中心”。
Co-establishment of "Joint Research Center for Precision Machining Equipment and Technology" with Shanghai Jiao Tong University school of Mechanical Engineering.

与西班牙发格自动化联合成立“复杂曲面磨削联合实验室”。
Co-creation of "United Laboratory for Complex Surface Grinding" with Fagor Automation España.

设有磨齿中心，配合客户试磨加工，在前沿领域探索，并承担公司硬件测试、软件优化等研发任务。
Thinkhead features a Gear Grinding Center that collaborates with clients on trial grinding operations, pioneers exploration in advanced fields, and undertakes corporate R&D missions including hardware testing and software optimization.

设有培训中心，覆盖机床操作，维护保养等多项培训内容。
The facility houses a Training Center delivering comprehensive programs covering machine operation, maintenance, warranty services and related technical training.

- 精益生产管理
Lean Production Management
- 强大的研发支持
Full-cycle R&D Capabilities
- 专业高效的生产团队
Elite Machining Team
- 充足的产能储备
Robust Production Capacity Reserves



南通通州湾生产基地
Nantong Tongzhou Bay Production Base

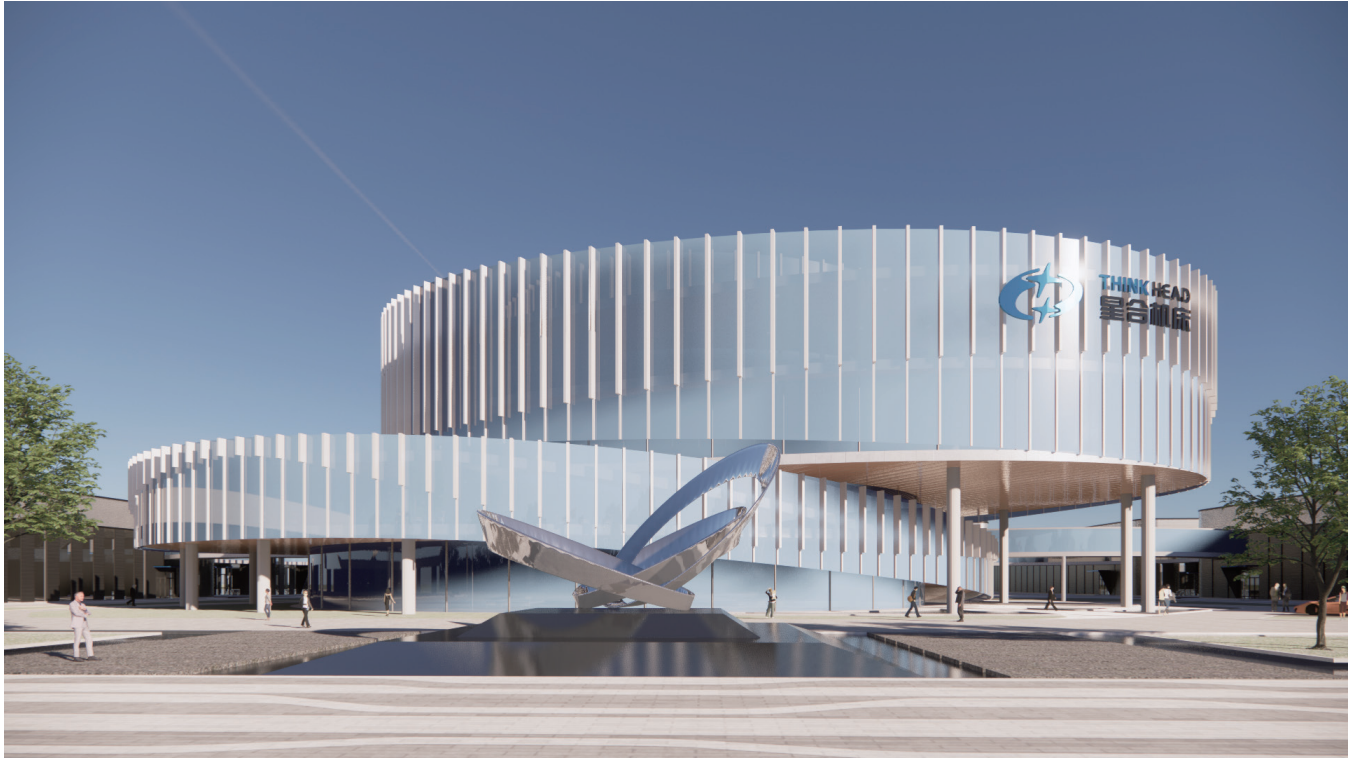


南通生产基地囊括了铸件加工，铸件回火，主轴制造，油箱制造，车铣钻磨等机床制造相关的绝大部分制造工艺。
The Nantong production base encompasses the vast majority of manufacturing processes related to machine tool production, including casting processing, casting tempering, spindle manufacturing, oil tank manufacturing, turning, milling, drilling and grinding.

星合一直重视先进设备的引进，现已拥有克林贝格测量中心、蔡司三坐标、三丰圆度仪、尼古拉斯龙门五面体加工中心、日本高端工业母机等世界一流的测量设备和加工设备。
Thinkhead has always attached great importance to the introduction of advanced equipment, and now owns a range of world-class measuring and machining equipment, including Klingelnberg measuring centers, Zeiss coordinate measuring machines, Mitutoyo roundness testers, Nicolas gantry-type five-face machining centers, and high-end industrial machine tools from Japan.

机床铸件经过四道去应力时效处理，实现了可与国外一流机床相媲美的低应力制造，确保设备经久耐用。
The machine tool castings undergo four stress-relief aging treatments, achieving low-stress manufacturing that is comparable to that of first-class foreign machine tools and ensuring the equipment is durable and long-lasting.

南通海门研发生产基地
Nantong Haimen Production Base



海门生产基地在建，为星合第4个生产基地，占地150亩。可进一步扩大产能，满足客户对高端工业母机的市场需求。
Haimen Production Base is under construction.As Thinkhead’s fourth production base, the 150-acre facility has the capacity to increase its output to meet market demands for premium gear manufacturing machines.

一期占地50亩，可实现200台轻型机床和100台重型机床的年产能。2026年5月开始投产，可实现800台高端机床的年产能。
Phase I covers an area of 50 mu (approximately 3.33 hectares) and can achieve an annual production capacity of 200 light machine tools and 100 heavy machine tools. It will start production in May 2026, with an annual production capacity of 800 high-end machine tools.

厂区采用太阳能和地源热泵，实现低碳排放，成为绿色工厂。
The facility utilizes solar power and ground-source heat pumps to achieve low-carbon operations, certified as a green factory.

自研电主轴

Self-developed electric spindle

FGV650 配置高性能星合电主轴，一机可完成超高速切削和高表面质量的铣削加工任务。主轴结构尺寸更紧凑，前后轴承的跨距小，旋转部件的刚性自然更好，采用市面上商品化最好的 SNFA 及 FAG 陶瓷轴承。

FGV650 is equipped with a high-performance Starham electro-spindle, enabling ultra-high-speed cutting and milling with high surface quality in a single machine.The spindle features a more compact structural design with a smaller span between the front and rear bearings, resulting in naturally enhanced rigidity of rotating components.It adopts top-quality commercially available ceramic bearings from SNFA and FAG.



具有良好的切削精度和表面质量。

Exceptional cutting accuracy and surface quality.

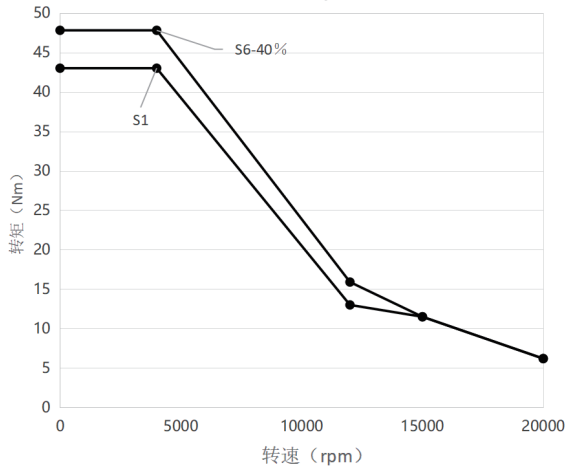
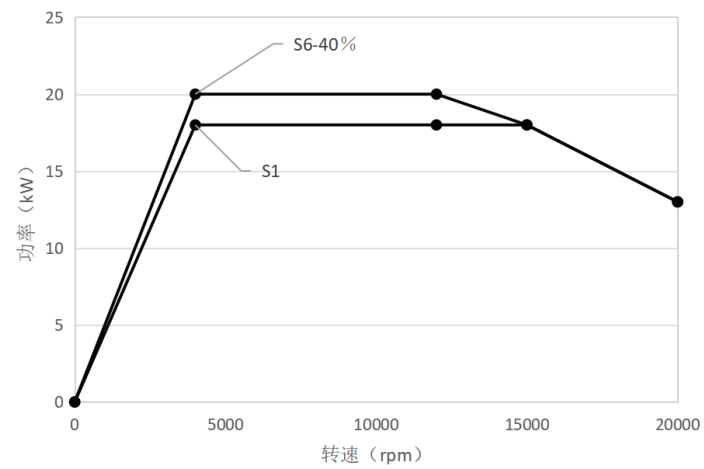
具有大尺寸、高刚性轴承，保证重载的切削能力。

Capable of handling heavy cutting operations with ease.

油脂润滑方式

Grease Lubrication Method

高性能电主轴/ High Performance Spindle			
最高转速 Spindle Speed		r/min	20,000
刀具类型 Tool Interface			HSK-A63
主轴功率 Spindle Power	S1/S6-40%	kW	18/20
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	43/47
润滑方式 Lubrication Method	油脂润滑 Grease Lubrication		
冷却方式 Chiller Type	变频水冷 Inverter-Controlled		



自研电主轴

Self-developed electric spindle

运行状态稳定，工况表现优异

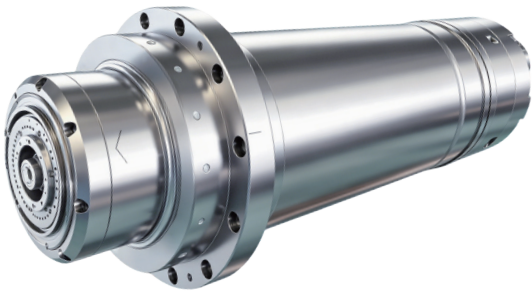
Stable operation and excellent working performance

轴承结构优化，承载调速性能出众

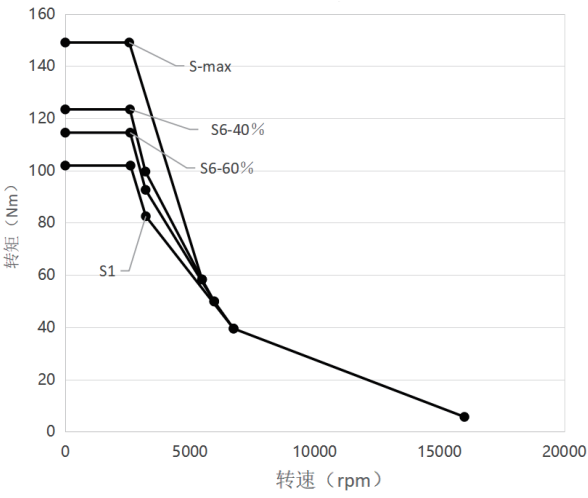
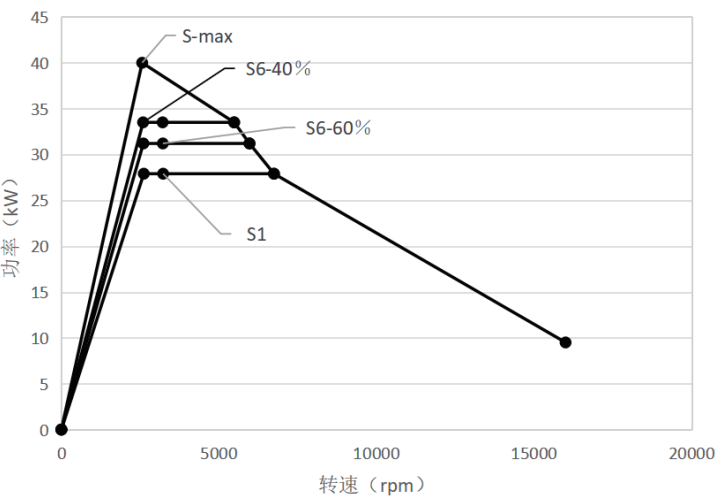
Optimized bearing structure with outstanding load-bearing and speed regulation performance

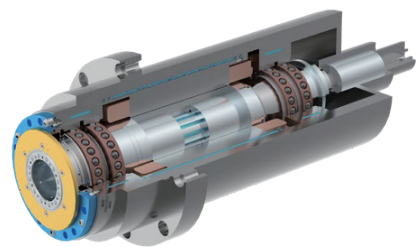
定位控制精准，重复定位稳定

Precise positioning control and stable repeat positioning

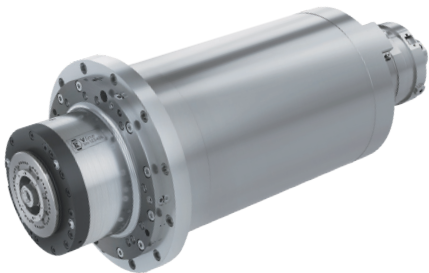
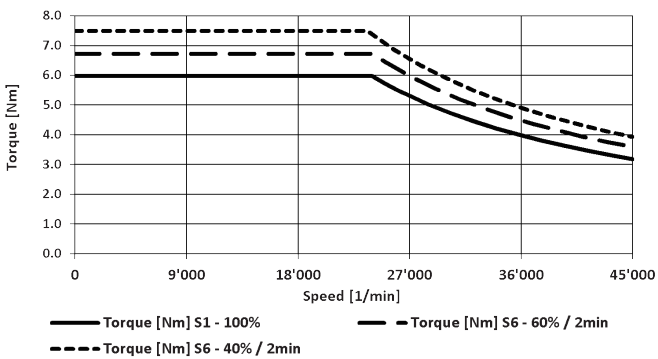
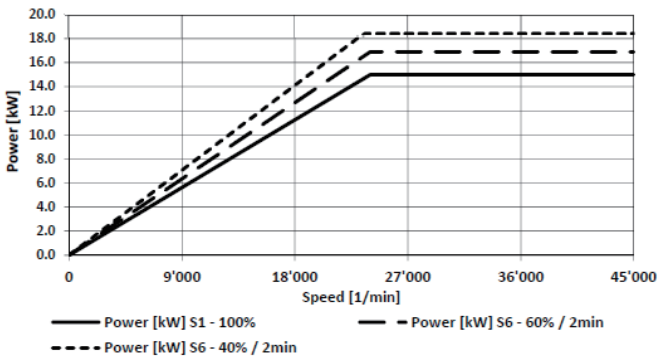


FL195-1S100 高扭矩主轴/ High torque Spindle			
最高转速 Spindle Speed		r/min	16,000
刀具类型 Tool Interface			HSK-A63
主轴功率 Spindle Power	S1/S6-40%	kW	27/33
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	101/123
润滑方式 Lubrication Method	油脂润滑 Grease Lubrication		
冷却方式 Chiller Type	变频水冷 Inverter-Controlled		

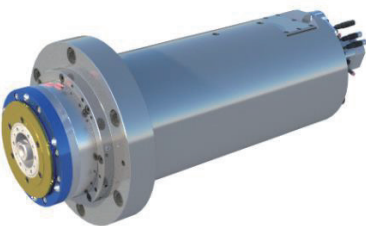
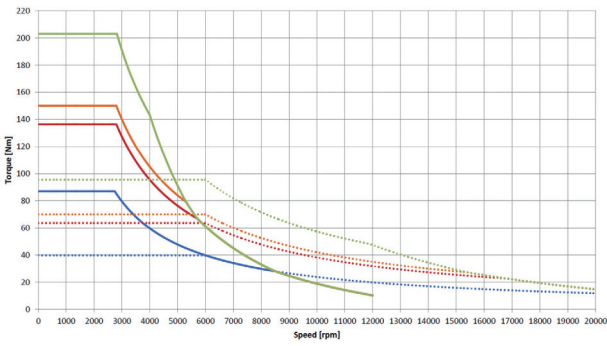
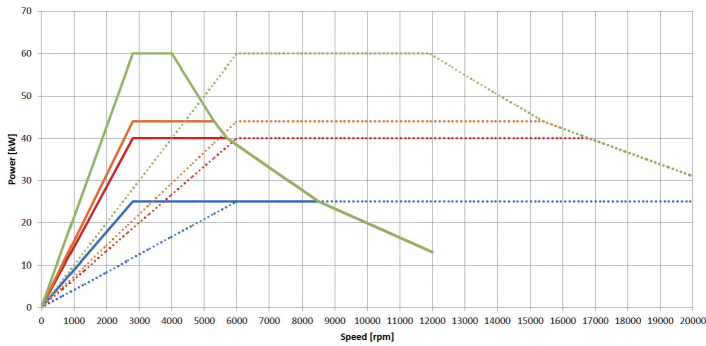




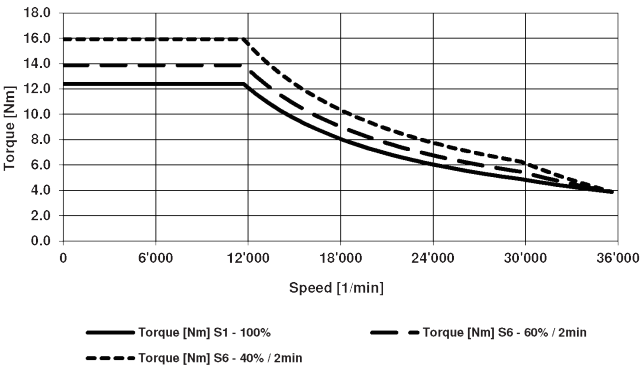
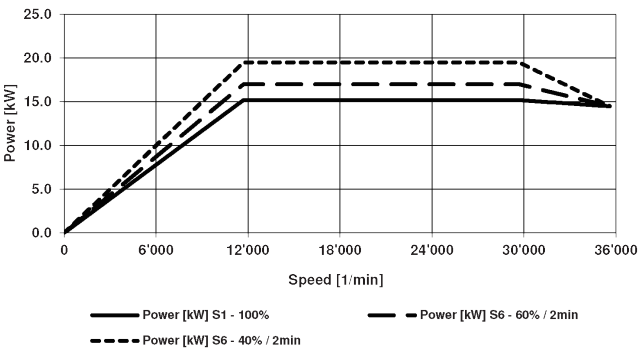
45000转 CSC轴芯冷却/ 45,000 rpm with CSC			
最高转速 Spindle Speed		r/min	45,000
刀具类型 Tool Interface		HSK-E40	
主轴功率 Spindle Power	S1/S6-40%	kW	15/18.5
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	6/7.5
润滑方式 Lubrication Method		油气润滑 Oil-air Lubrication	
冷却方式 Chiller Type		变频水冷 Inverter-Controlled	



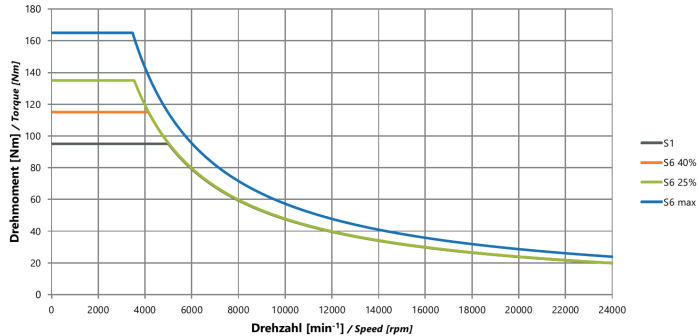
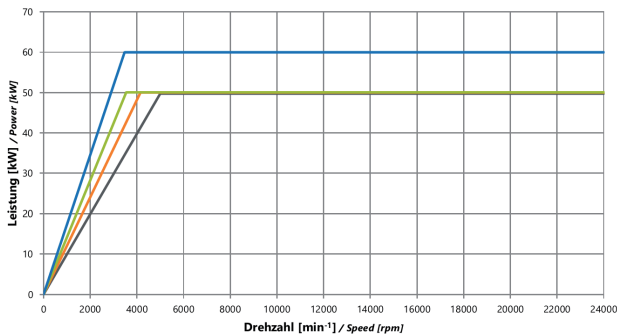
20000 rpm V100-A20			
最高转速 Spindle Speed		r/min	20,000
刀具类型 Tool Interface			HSK-A63
主轴功率 Spindle Power	S1/S6-40%	kW	25/40
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	87/135
润滑方式 Lubrication Method			油气润滑 Oil-air Lubrication
冷却方式 Chiller Type			变频水冷 Inverter-Controlled



36000转 CSC轴芯冷却/36,000 rpm with CSC			
最高转速 Spindle Speed		r/min	36,000
刀具类型 Tool Interface			HSK-E50
主轴功率 Spindle Power	S1/S6-40%	kW	15.2/20
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	12.1/15.9
润滑方式 Lubrication Method		油气润滑 Oil-air Lubrication	
冷却方式 Chiller Type		变频水冷 Inverter-Controlled	



24000 rpm V100-S24			
最高转速 Spindle Speed		r/min	24,000
刀具类型 Tool Interface		HSK-A63	
主轴功率 Spindle Power	S1/S6-40%	kW	50/50
主轴扭矩 Spindle Torque	S1/S6-40%	Nm	95/115
润滑方式 Lubrication Method		油气润滑 Oil-air Lubrication	
冷却方式 Chiller Type		变频水冷 Inverter-Controlled	





西门子ONE
SIEMENS ONE

● 三轴/五轴系统
3-Axis / 5-Axis System



西门子828D
SIEMENS 828D

● 三轴/四轴系统
3-Axis / 4-Axis System



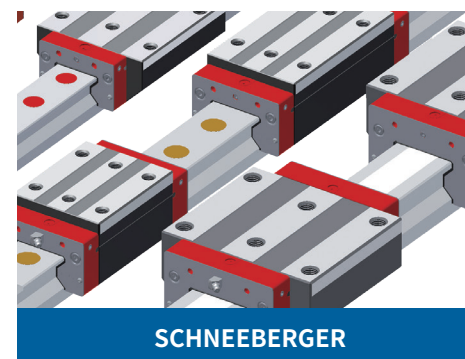
海德汉TNC620
HEIDENHAIN TNC 620

● 三轴系统
3-Axis System



海德汉TNC640
HEIDENHAIN TNC 640

● 五轴系统
5-Axis System



SCHNEEBERGER、INA、PMI

- 润滑构造简单
- 磨耗少 长时间维持精度
- 导轨组装容易 可互换性
- 高定位精度
- 同时承受各个方向的负荷
- 适用高速运行所需驱动小
- Simple lubrication design
- Wear-resistant and long-lasting precision
- Easy to install and interchangeable
- Suitable for high speed and acceleration within low friction
- High position accuracy
- Super rigidity in all constrained directions

直驱重切技术

Direct-Drive Heavy-Cutting Technology

直线电机和力矩电机, 可消除传统机械传动系统带来的反向间隙, 提供极高的加速度。

Linear motors and torque motors eliminate the backlash caused by traditional mechanical transmission systems, providing extremely high acceleration.

独特的刚性和多功能的设计, 可满足长型材的高精、高速、高效率的重型加工需求。整个数控机床具有极高的动态响应性, 同时具备优越的抗震性能。

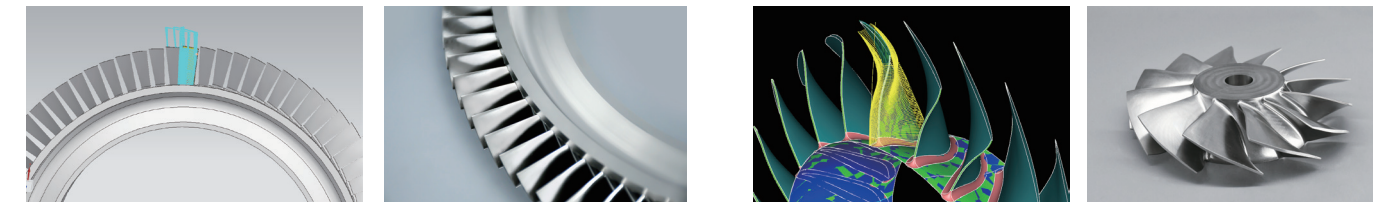
With a uniquely rigid and versatile design, this technology meets the demands of high-precision, high-speed, and high-efficiency heavy machining for long workpieces. The entire CNC machine tool offers exceptional dynamic responsiveness while maintaining superior vibration resistance.

直线电机应用于轻载高速设备如半导体各制程的设备上已十分成熟, 但在重载、强切削设备应用上较为落后。

While linear motors are well-established in light-load, high-speed applications such as semiconductor manufacturing equipment, their adoption in heavy-load, high-power cutting applications has been relatively limited.

立足于重载(运动部件以吨计)、运控强干扰(高速重切削)应用, 在全球行业内独树一帜, 克服了工业界对直驱不能重载、重切削的技术偏见; 构建了重载、强切削直驱运控应用的技术体系。

Based on applications featuring heavy loads (where moving components are measured in tons) and strong motion control interference (high-speed heavy cutting), it has established a unique position in the global industry. It has overcome the technical prejudice in the industry that direct drive systems cannot handle heavy loads and heavy cutting tasks, and has built a technical system for direct drive motion control applications in heavy-load and heavy-cutting scenarios.



钛合金叶盘 Titanium alloy turbine blade

高温合金叶盘 High-temperature alloy turbine blade

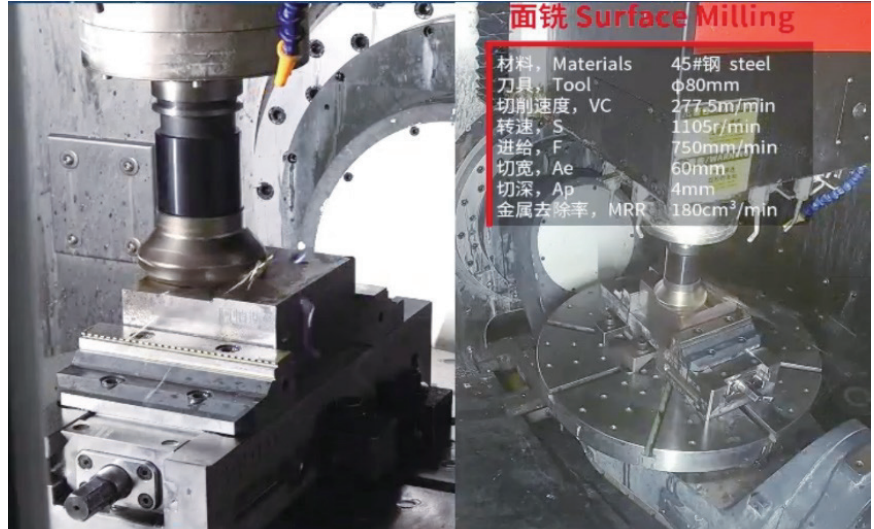


重切削

Heavy cutting

切深 4mm
盘刀面铣 (材料 45C)

Depth of cut 4mm
Surface milling with a disk cutter (Materials 45C)



热补偿技术

Thermal Compensation Technology

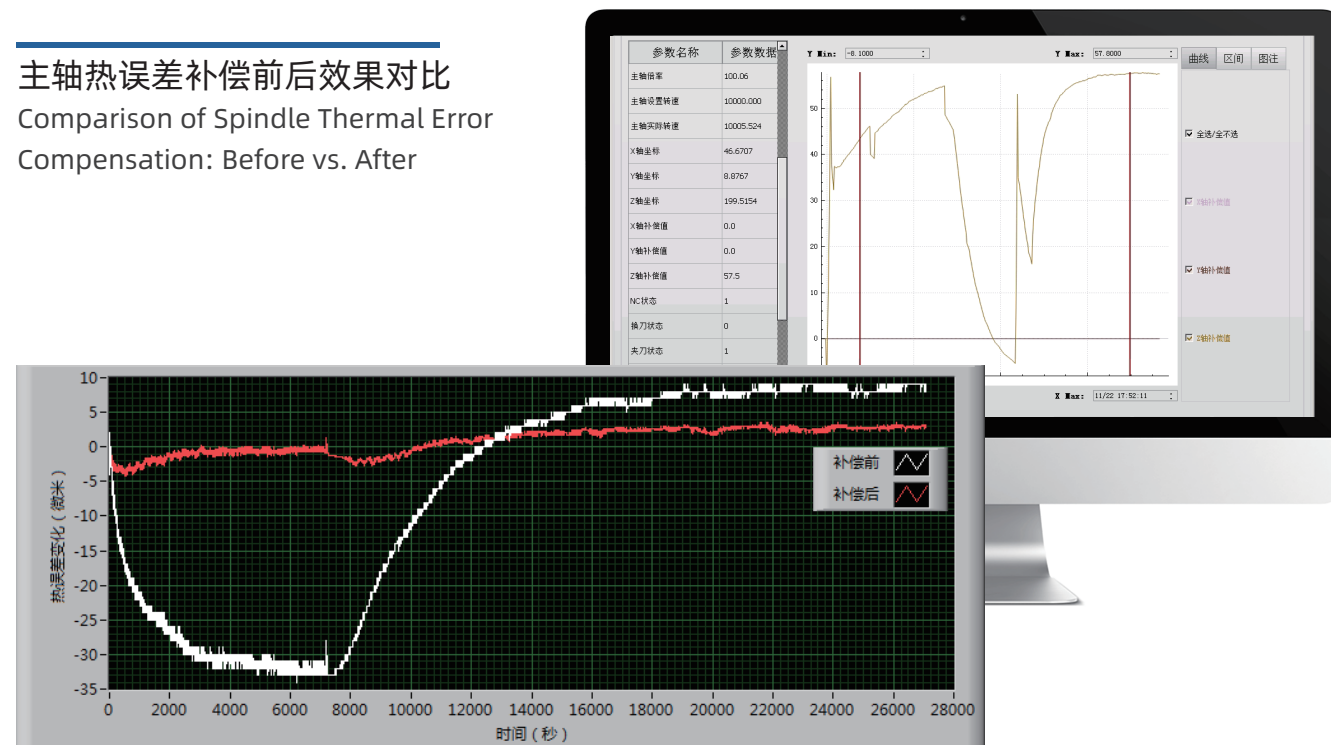
专用热补偿系统, 功能包括主轴热伸长补偿、结构补偿。

Proprietary thermal compensation system includes functions such as spindle thermal expansion compensation and structural compensation.

运用分布于机床本体、主轴内部的各个高精度、高灵敏度温度传感器, 实时感测主轴、机床结构以及环境的温度变化, 结合每台机器量身定制的热力学补偿算法, 将因为温度引起的结构变形通过数控系统的实时补偿功能加以修正, 实现温度变而位置不变的目标, 进而实现机器在全时、全域的刀尖动态精度都处于设定的公差范围内, 实现客户所需加工精度。

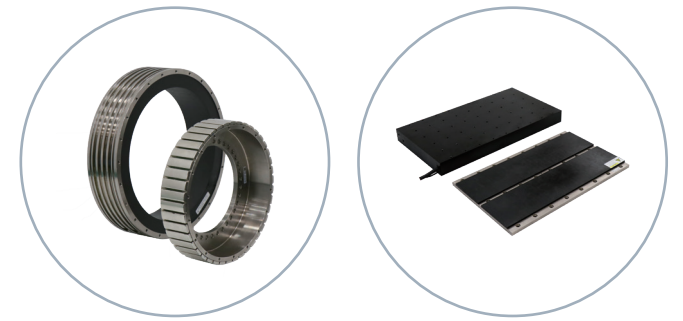
By utilizing high-precision, highly sensitive temperature sensors distributed across the machine tool body and spindle, the system monitors real-time temperature variations in the spindle, machine structure, and surrounding environment. Combined with a tailor-made thermodynamic compensation algorithm for each machine, it dynamically corrects structural deformations caused by thermal effects through real-time CNC system adjustments. This ensures consistent positioning accuracy despite temperature fluctuations, maintaining the tooltip's dynamic precision within specified tolerances at all times and across all working conditions to meet customers' machining accuracy requirements.

主轴热误差补偿前后效果对比 Comparison of Spindle Thermal Error Compensation: Before vs. After



直驱技术

Direct Drive Technology



直接驱动技术简称直驱技术, 是指使用直线电机, 低速大扭矩旋转电机, 不依赖任何传动, 实现力, 力矩, 直接传递的技术。

Direct drive technology refers to the use of linear motors and rotary motors to achieve direct transmission of force and torque without relying on any intermediate transmission mechanism.



无磨损

Near zero wear



高刚性

High rigidity



结构简单

Simple structure



噪音低

Low noise



无反向间隙

Zero backlash

正向设计

Forward Design

区别于逆向设计, 正向设计知其然, 也知其所以然。需要深厚的数学, 力学和机械设计功底。

Forward design understands not just the 'how', but the 'why', requires profound expertise in mathematics, mechanics, and mechanical design.

国内掌握正向设计完整方法的机床企业, 极其稀少。

Rare domestic machine tool manufacturers have mastered comprehensive forward design methodologies.

星合坚持正向设计, 虽然初期成本高, 但是一旦掌握, 一通百通, 可以为不同的客户不同的应用场景, 打造相适用的机床, 可以对机床设计反复迭代从而获得卓越的机床作品。

Thinkhead is committed to forward design. While forward design entails higher initial costs, its mastery unlocks universal adaptability - enabling customized machine tools for diverse applications through iterative optimization, ultimately achieving engineering excellence.

技术能力

Technical Capabilities

五轴应用成套技术

Five-Axis Application Turnkey Technology

五轴应用中心, 研究机床应用遇到的各种问题和解决方案。

Five-Axis Application Center specializes in machine tool problem-solving and process optimization for five-axis machining.

售前售后可提供成套解决方案, 提供培训服务。

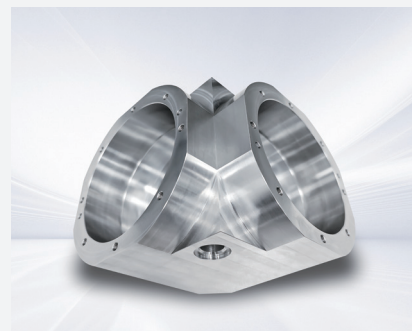
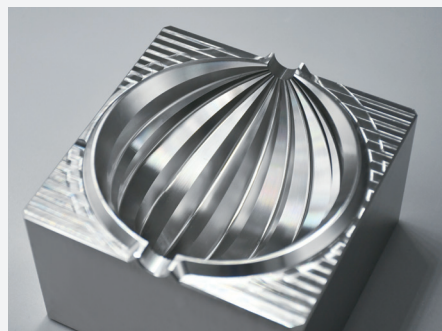
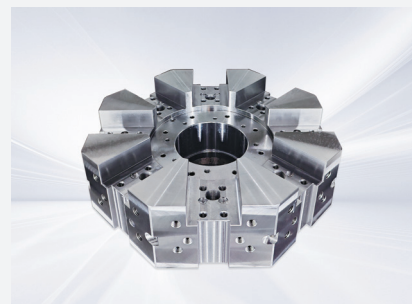
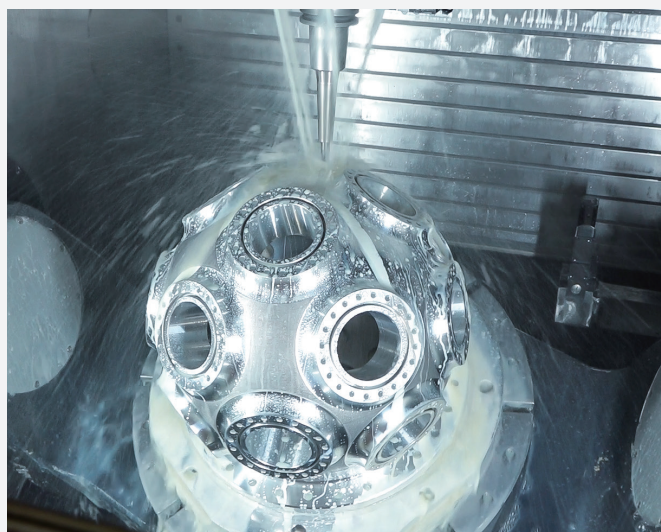
Offers pre-sales & after-sales support, including operator training and technical consulting.

为国内制造提供高精尖的进口替代方案。

Providing high-end import substitution solutions for domestic manufacturing.

为民用领域三轴转五轴的过程提供全套技术支持。

Full technical support for 3-axis to 5-axis processes in the civilian industry.



U600/800

直驱、高速、高精摇篮五轴加工中心

Direct-drive High-speed, High-precision
Cradle Five-axis Machining Center

高精度、高刚性与稳定性的结构设计

Structural design for high precision, rigidity and stability

五轴联动加工轮廓精度 ± 0.020 mm, 可满足各类叶轮、精密复杂轮廓零件、模具等加工精度需求。500 cc/min的单刀粗加工去除能力。“U600/U800 继承了U600H/U800H的优秀机械结构, 保持了几乎H机型的所有优点, 在适当缩小Z轴行程的基础上减轻了横梁轴的质量, 使其与H机型保持几乎一致的切削效率及精度。”

5-axis linkage machining contour accuracy ± 0.020 mm, which can meet the machining accuracy requirements of various impellers, precision and complex contour parts, molds, etc. 500 cc/min roughing removal capability of single cutter. “The U600/U800 inherits the excellent mechanical structure of the U600H/U800H and maintains almost all the advantages of the H-model, and reduces the mass of the crossbeam axis based on appropriately narrowing the Z-axis travel, so that it maintains almost the same cutting efficiency and accuracy as the H-model.”

直驱结构

Five-axis full direct drive structure

五轴直驱结构, 使得所有进给轴均可获得极高的动态刚性, 轻松实现超高速精密切削。

3 linear motor driven axes plus 2 direct drive rotary turntable axes achieve excellent dynamic rigidity, enabling high feed precision machining effortlessly.

龙门双驱结构

Gantry dual-drive structure

Y轴采用双轨龙门双驱结构, 使得直线电机驱动的横梁负载既具备高速高精的定位特性, 也保证了切削时的高刚性, 使得重切削、高精密切削在同一台机上轻松实现, 为五轴产品的粗加工提供了极高的效率; Y轴龙门双驱轴的误差可控制在 5 微米以内。

Y-axis adopts a dual linear motor driven structure on a 2 linear guide sets gantry ensures exceptional rigidity during cutting owing to the closed force loop configuration. This also enables seamless transition between heavy roughing and high-precision finishing on the same machine.

矿物铸造床身

Mineral casting bed

矿物铸造床身使得机床具备极佳的抑振能力, 为五轴零件粗加工提供了坚实的机床本体刚性, 也为 ± 0.020 mm 等级的五轴联动 RTCP 精度提供了坚实保障。

Mineral cast structure provides exceptional vibration suppression damping properties. This provides a stable system to realise 5 axis precision applications.

Z 轴结构

Z-axis structure

高刚性滑座滑枕组合, 使得Z轴在全行程范围都有良好的刚性, 使得机器有更大的Z向行程。

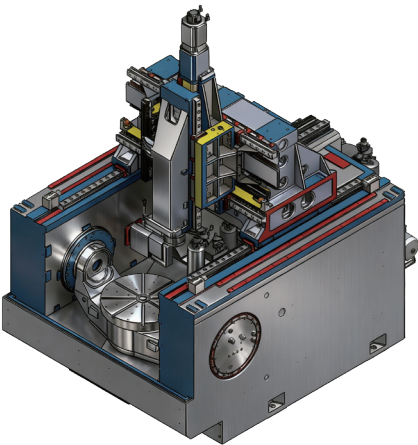
High-stiffness saddle & ram combination provide the Z-axis with full stroke good rigidity.

U600/800

直驱、高速、高精摇篮五轴加工中心
Direct-drive High-speed, High-precision
Cradle Five-axis Machining Center

Z轴精密丝杆/全闭环

Z-axis precision screw/fully closed loop



产品介绍

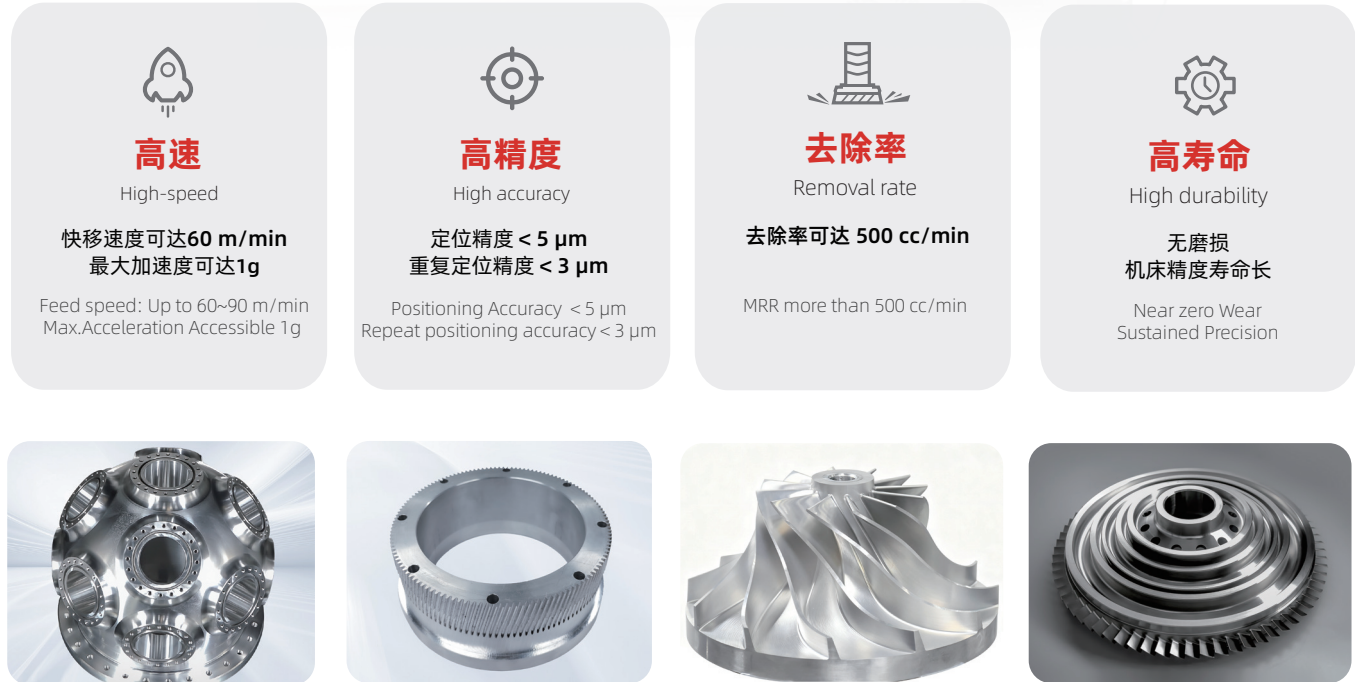
U600/U800产品是一款高端中型摇篮五轴加工中心，采用高刚性、高稳定性天车式龙门结构，床身采用优质矿物材料铸造而成，具备出色的热稳定性和吸振能力；X/Y轴均采用直线电机驱动技术加持，具备优异的动态精度与高响应性能；优异的人机交互体验；广泛应用于汽车工业、能源技术、精密模具、民用航空航天、医疗工程、刀具技术等领域零件的加工。

The U600 / U800 is a high-end, medium-sized, 5-axis machining center. The machine features a high-rigidity and high-stability gantry structure and a high-quality mineral material casting, which exhibits excellent thermal stability and vibration absorption. X/Y axes are supported by linear motor drive technology, which ensures excellent dynamic accuracy, high responsiveness and excellent human-machine interaction experience. The U800 is widely used in the automotive industry, energy technology, precision molds, civil aerospace, medical engineering and tool technology.

配置及技术参数表
Configuration and Parameter Table

U600		U800
行程 Stroke		
X/Y/Z	700/ 700/ 550 mm	900/ 900/ 600 mm
主轴鼻端至工作台面 Spindle nose to table surface	160 ~ 710 mm	160 ~ 760 mm
直驱转台 Rotary Table [*] (台面直径可指定尺寸) Table diameter customizable in specified sizes		
A轴行程 A-axis	±120 deg	±120 deg
C轴行程 C-axis	N*360 deg	N*360 deg
C轴台面直径 Rotary table diameter	Ø540*600 mm	Ø800 mm
最大承重 Table payload	500 kg	1,400 kg
进给速度 Travel Speed		
G0 快速移动 (X / Y / Z) G0 Rapid traverse	60/ 60/ 48(60) m / min	60/ 60/ 48(60) m / min
G0 快移速度 (A/C) G0 Rapid traverse	60/ 100 rpm	20/ 70 rpm
主轴 Spindle [*] (可使用其他主轴) Other spindles optional		
主轴传动方式 Spindle type	电主轴/Electrical Integral spindle	
主轴最高转速 Spindle speed	16000/20000/ 24000 rpm	
主轴内锥 Spindle taper	HSK-A63	
主轴电机功率 (S1) Max. power	27/25/29 kW	
主轴电机功率 (S6 - 40%) Max. torque	33/40 /38 kW	
主轴电机扭矩 (S1) Max. power	101/87/69 Nm	
主轴电机扭矩 (S6 - 40%) Max. power	123/135/90 Nm	
刀库 Tool changer		
刀位数量 Tool quantity	40 T	32/ 40 T
选刀方式 Tool selection method	随机就近刀位/ Random pots	
刀具最大直径 (相邻有刀 / 无刀) Max. tool diameter (adjacent with/without tool)	75/ 120 mm	
刀具最大长度 Max. tool length	300 mm(可兼容HSK100)	
刀具最大重量 Max. tool weight	8 kg	
电源/气源 Power/Air requirement		
电源 Power supply	380V 50Hz 55kVA	380V 50Hz 60kVA
气源 Air supply	0.6MPa 700L/min	
设备重量尺寸 Weight and size		
尺寸 (宽×深×高) Dimension (W×D×H)	3100 x 3335 x 3875mm	3300 x 3600 x 4000mm
重量 Weight	14000 kg	18000 kg
数控系统 CNC Controller		
海德汉TNC640/西门子ONE HEIDENHAIN TNC 640/SIEMENS ONE		

*U800可选铸铁床身 The U800 model offers an optional cast iron bed.



U600S

直驱、高速、高精摇篮五轴加工中心

Direct-drive High-speed, High-precision Cradle Five-axis Machining Center

Z轴精密丝杆/全闭环
Z-axis precision screw/fully closed loop

*Z轴可根据客户要求定制
Z-axis can be customized according to customer requirements.



高速
High-speed

快移速度可达60 m/min
最大加速度可达1g

Feed speed: Up to 60 m/min
Max.Acceleration Accessible 1g

高精度
High accuracy

定位精度 < 6 μm
重复定位精度 < 4 μm

Positioning Accuracy < 6 μm
Repeat positioning accuracy < 4 μm

去除率
Removal rate

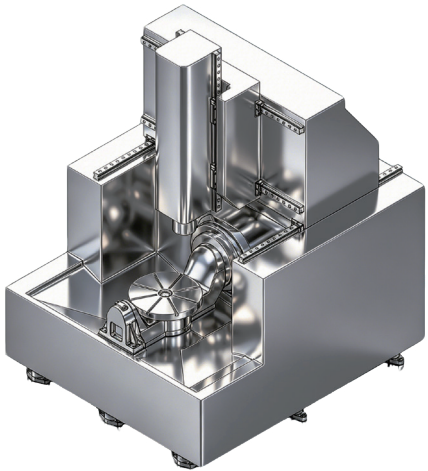
去除率可达 500 cc/min

MRR more than 500 cc/min

高寿命
High durability

无磨损
机床精度寿命长

Near zero Wear
Sustained Precision



产品介绍

U600S采用桥式龙门结构，床身采用矿物铸造，具有出色的热稳定性和吸振性，性能稳定可靠。五轴全直驱使得机床具有较高的动态响应特性，广泛应用于包括模具、高精度复杂轮廓零件、硬质材料等加工领域，平置式刀库搭配独立换刀臂，可提前备刀，实现与圆盘式刀库一样的换刀速度，右侧可配合机器人实现自动化功能。

U600S adopts bridge type gantry structure, and the machine is made of mineral casting with excellent thermal stability and vibration absorption for stable and reliable performance. The 5-axis full direct drive gives the machine high dynamic response characteristics, which is widely used in machining areas including molds, high-precision and complex contour parts, hard materials, etc. The flush-mounted tool magazine is equipped with an independent tool changer arm, which can be used to prepare tools in advance and achieve the same tool change speed as the disc type magazine, and the right side can be used with robot to realize automation functions.

配置及技术参数表
Configuration and Parameter Table

U600S

行程 Stroke	
X/Y/Z	700/ 700/ 550 mm
主轴鼻端至工作台面 Spindle nose to table surface	150 ~ 700 mm
直驱转台 Rotary Table *(台面直径可指定尺寸) Table diameter customizable in specified sizes	
A轴行程 A-axis	±120 deg
C轴行程 C-axis	N*360 deg
C轴台面直径 Rotary table diameter	Ø540 mm
最大承重 Table payload	350 kg
进给速度 Travel Speed	
G0 快速移动 (X / Y / Z) G0 Rapid traverse	60/ 60/ 60 m / min
G0 快移速度 (A/C) G0 Rapid traverse	60/ 120 rpm
主轴 Spindle *(可使用其他主轴) Other spindles optional	
主轴传动方式 Spindle type	电主轴/Electrical Integral spindle
主轴最高转速 Spindle speed	16000/20000/24000 rpm
主轴内锥 Spindle taper	HSK-A63
主轴电机功率 (S1) Max. power	27/25/29 kW
主轴电机功率 (S6 - 40%) Max. torque	33/40/38 kW
主轴电机扭矩 (S1) Max. power	101/87/69 Nm
主轴电机扭矩 (S6 - 40%) Max. power	125/135/90 Nm
刀库 Tool changer	
刀位数量 Tool quantity	40 T
选刀方式 Tool selection method	随机就近刀位/ Random pots
刀具最大直径 (相邻有刀 / 无刀) Max. tool diameter (adjacent with/without tool)	75/ 120 mm
刀具最大长度 Max. tool length	300 mm
刀具最大重量 Max. tool weight	8 kg
电源/气源 Power/Air requirement	
电源 Power supply	380V 50Hz 45kVA
气源 Air supply	0.6MPa 600L/min
设备重量尺寸 Weight and size	
尺寸 (宽×深×高) Dimension (W×D×H)	2800 x 3500 x 3800mm
重量 Weight	18000 kg
数控系统 CNC Controller	
海德汉TNC640/ Heidenhain TNC 640	

U700

高速摇篮五轴加工中心
High-speed Cradle Five-axis Machining Center

Z轴精密丝杆/全闭环
Z-axis precision screw/fully closed loop

*U700可选Z轴500mm
*U700 Optional Z-Axis 500mm

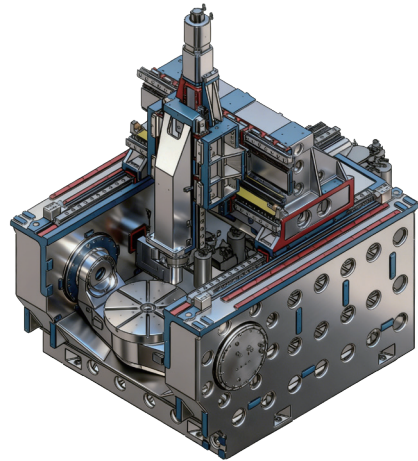
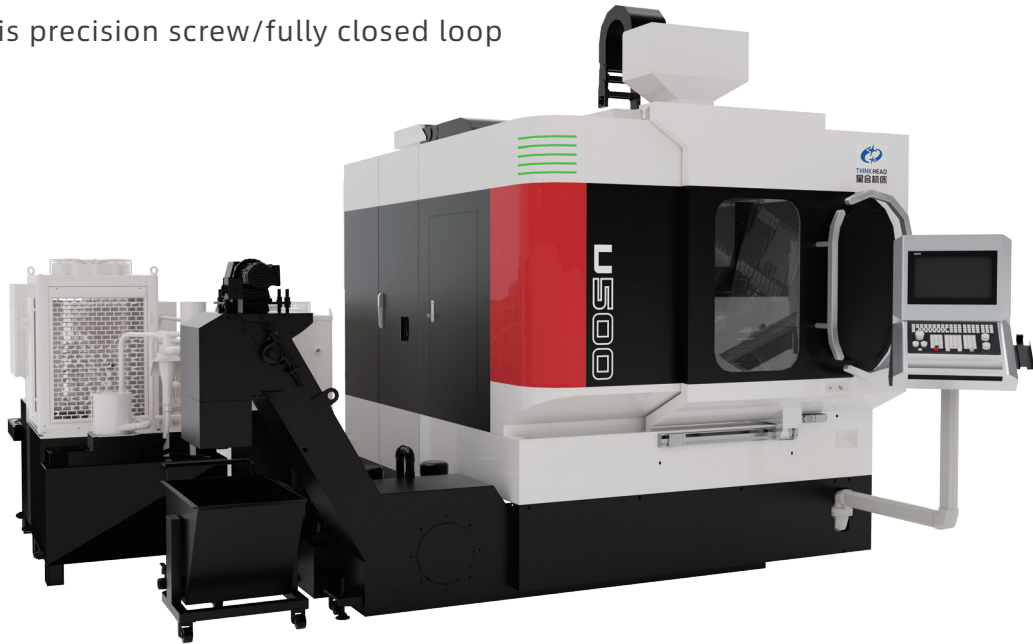


U700—XY直驱

U500

高速摇篮五轴加工中心
High-speed Cradle Five-axis Machining Center

Z轴精密丝杆/全闭环
Z-axis precision screw/fully closed loop



产品介绍

U700/U500 是一款中型摇篮五轴加工中心，采用高刚性、高稳定性天车式龙门结构，整机结构件采用优质铸铁一体铸造，具备出色的刚性、吸振性和稳定性；X轴与Y轴使用直线电机驱动，转台采用高响应力矩电机驱动，具备优异的动态精度和高响应性能。Z轴采用高精度滚珠丝杆+外置光栅尺结构，使得机床精度媲美国际一流。具备优异的动态精度与高响应性能；广泛应用于模具、复杂轮廓零件、硬质材料、人形机器人五轴高效加工等领域。

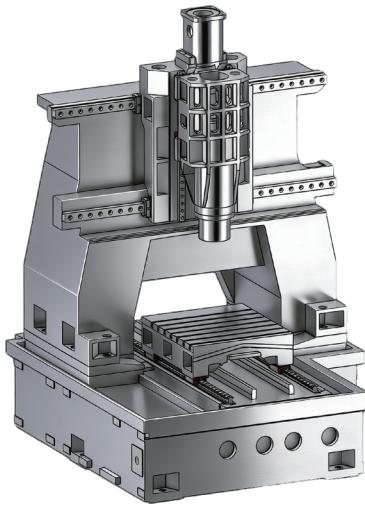
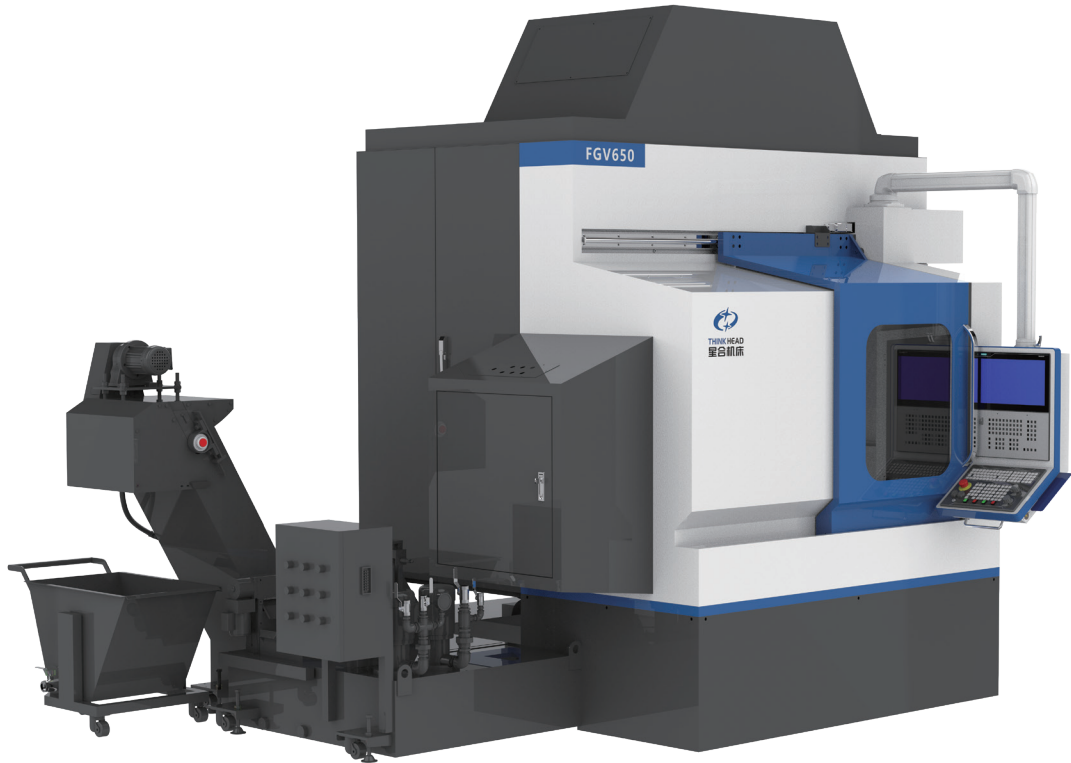
U700/U500 is a medium-sized 5-axis machining center, which adopts high rigidity and high stability overhead gantry structure, and the whole machine structural parts are made of high-quality cast iron with excellent rigidity, vibration-absorbing property and stability; the X-axis and Y-axis are driven by linear motors, and the rotary table is driven by a high-response torque motor, which provides excellent dynamic precision and high responsiveness, while the Z-axis is driven by a high-precision ball screw + external scale structure, which makes the machine accuracy comparable to the international first-class ones. Z-axis adopts high-precision ball screw + external scale structure, which makes the precision of the machine comparable to the international first-class. It is widely used in fields such as mold processing, complex contour part machining, hard material processing, and five-axis high-efficiency machining for humanoid robots.

配置及技术参数表
Configuration and Parameter Table

U700		U500
行程 Stroke		
X/Y/Z	700/ 700/ 500 mm	500/ 500/ 400 mm
主轴鼻端至工作台面 Spindle nose to table surface	150 ~ 600 mm	150 ~ 550 mm
直驱转台 Rotary Table [*] (台面直径可指定尺寸) Table diameter customizable in specified sizes		
A轴行程 A-axis	±120 deg	±120deg
C轴行程 C-axis	N*360 deg	N*360 deg
C轴台面直径 Rotary table diameter	Ø600 mm	Ø400 mm
最大承重 Table payload	500 kg	300 kg
进给速度 Travel Speed		
G0 快速移动 (X / Y / Z) G0 Rapid traverse	60/ 60/ 48 m / min	
G0 快移速度 (A/C) G0 Rapid traverse	60/ 100 rpm	60/ 100 rpm
主轴 Spindle [*] (可使用其他主轴) Other spindles optional		
主轴传动方式 Spindle type	电主轴/Electrical Integral spindle	
主轴最高转速 Spindle speed	16000/15000 rpm	16000 rpm
主轴内锥 Spindle taper	HSK-A63	
主轴电机功率 (S1) Max. power	27/26 kW	20 kW
主轴电机功率 (S6 - 40%) Max. torque	33/30 kW	25 kW
主轴电机扭矩 (S1) Max. power	101/165 Nm	47.7 Nm
主轴电机扭矩 (S6 - 40%) Max. power	123/192 Nm	59.6 Nm
刀库 Tool changer		
刀位数量 Tool quantity	40 T	
选刀方式 Tool selection method	随机就近刀位/ Random pots	
刀具最大直径 (相邻有刀 / 无刀) Max. tool diameter (adjacent with/without tool)	75/ 120 mm	
刀具最大长度 Max. tool length	300 mm	
刀具最大重量 Max. tool weight	8 kg	
电源/气源 Power/Air requirement		
电源 Power supply	380V 50Hz 45kVA	
气源 Air supply	0.6MPa 500L/min	
设备重量尺寸 Weight and size		
尺寸 (宽×深×高) Dimension (W×D×H)	2400 x 3200 x 3200mm	2100 x 3200 x 3200mm
重量 Weight	12000 kg	10000 kg
数控系统		
海德汉TNC640/ 西门子ONE HEIDENHAIN TNC 640/SIEMENS ONE		

FGV 650

三轴直驱定梁龙门加工中心
3-axis direct-drive fixed-beam
gantry machining center



产品介绍

整体结构采用高刚性的定梁龙门结构，即X轴和Z轴坐落在龙门架上，Y轴为动台面式，工作台移动；解决传统C型结构带来的切削刚性不足的问题。

床身等部件均采用优质HT300铸铁材料铸造而成；铸件采用强韧的加强筋，保持床体的足够刚性，从而保持整体设备性能的更好动态响应能力、稳定性，可以连续稳定工作，精度保持寿命长。

The overall structure adopts a high-rigidity fixed-beam gantry structure, where the X-axis and Z-axis are located on the gantry frame, and the Y-axis is of a moving table type with a movable worktable. This solves the problem of insufficient cutting rigidity caused by the traditional C-type structure. Components such as the bed are all cast from high-quality HT300 cast iron. The castings use strong and tough reinforcing ribs to maintain sufficient rigidity of the bed, thereby ensuring better dynamic response capability and stability of the overall equipment performance, enabling continuous and stable operation with a long precision retention life.

配置及技术参数表
Configuration and Parameter Table

FGV650

行程 Stroke	
X/Y/Z	600/ 500/ 300 mm
主轴鼻端至工作面 Spindle nose to table surface	200 ~ 500 mm
工作台 worktable [*] (台面直径可指定尺寸) Table diameter customizable in specified sizes	
工作台尺寸 Table size	600 x 500 mm
最大承重 Table payload	500 kg
进给速度 Travel Speed	
G0 快速移动 (X / Y / Z) G0 Rapid traverse	60/ 60/ 48 m / min
切削最大速度(X/Y/Z) Feed rate	30/ 30/ 24 rpm
第四轴快移速度 Rapid traverse speed of the fourth axis	\
主轴 Spindle	
主轴传动方式 Spindle type	电主轴/Electrical Integral spindle
主轴最高转速 Spindle speed	20000 rpm
主轴内锥 Spindle taper	HSK-E50
主轴电机功率 (S1) Max. power	18 kW
主轴电机功率 (S6 - 40%) Max. torque	20 kW
主轴电机扭矩 (S1) Max. power	43 Nm
主轴电机扭矩 (S6 - 40%) Max. power	47 Nm
刀库 Tool changer	
刀库类型 Tool magazine type	链式刀库/ chain-type tool magazine
刀位数量 Tool quantity	24 T
选刀方式 Tool selection method	随机就近刀位/ Random pots
刀具最大直径 (相邻有刀 / 无刀) Max. tool diameter (adjacent with/without tool)	75/ 100 mm
刀具最大长度 Max. tool length	250 mm
刀具最大重量 Max. tool weight	5 kg
电源/气源 Power/Air requirement	
电源 Power supply	380V 50Hz 45kVA
气源 Air supply	0.6MPa 500L/min
设备重量尺寸 Weight and size	
尺寸 (宽×深×高) Dimension (W×D×H)	2800 x 2300 x 2800mm
重量 Weight	6000 kg
数控系统 CNC Controller	
海德汉TNC620/ 西门子828D HEIDENHAIN TNC 620/SIEMENS 828D	

高速
High-speed

快移速度可达**40 m/min**
最大加速度可达**1g**

Feed speed: Up to 40 m/min
Max.Acceleration Accessible 1g

高精度
High accuracy

定位精度 < **3 μm**
重复定位精度 < **2 μm**

Positioning Accuracy < 3 μm
Repeat positioning accuracy < 2 μm

去除率
Removal rate

去除率可达 **500 cc/min**

MRR more than 500 cc/min

高寿命
High durability

无磨损
机床精度寿命长

Near zero Wear
Sustained Precision

23

24

FGV 1060

三轴直驱定梁龙门加工中心

3-axis direct-drive fixed-beam gantry machining center



高速

High-speed

快移速度可达60 m/min
最大加速度可达1g

Feed speed: Up to 60 m/min
Max.Acceleration Accessible 1g

高精度

High accuracy

定位精度 < 4 μm
重复定位精度 < 3 μm

Positioning Accuracy < 4 μm
Repeat positioning accuracy < 3 μm

去除率

Removal rate

去除率可达 500 cc/min

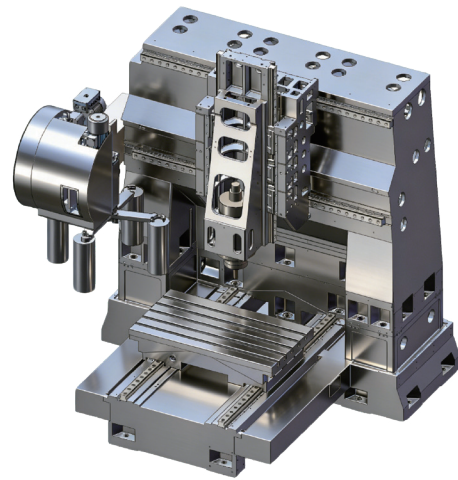
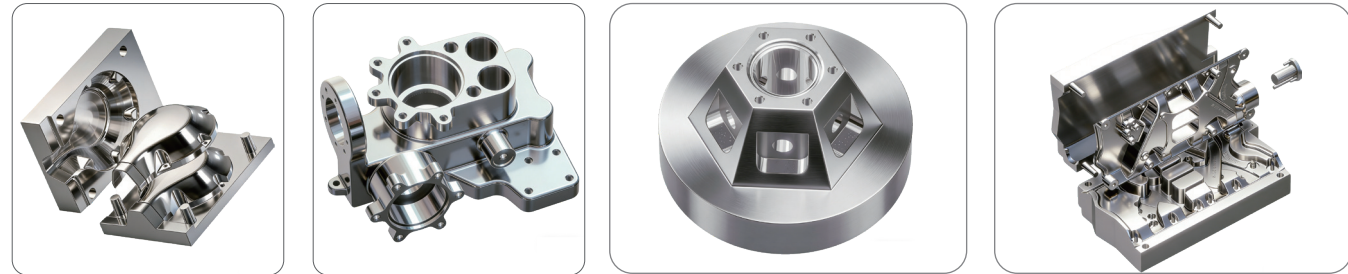
MRR more than 500 cc/min

高寿命

High durability

无磨损
机床精度寿命长

Near zero Wear
Sustained Precision



产品介绍

FGV1060采用高刚性龙门结构，横梁立柱一体化确保了X轴负载在横梁上移动时最小的Z向误差，应对Y向的切削力时有更好的响应特性。三轴全直驱结构，使得所有进给轴均可获得极高的动态刚性，轻松实现超高速精密切削。经过有限元仿真分析、实践充分验证的高刚度机床结构，机床整体质量14吨，配以符合安装标准的机床安装基础，为微米级超高速切削提供了坚实的机床本体刚性保证。

FGV1060 adopts a high-rigidity gantry structure. The integrated beam and column design ensures minimal Z-axis deviation when the X-axis load moves along the beam, and delivers better response characteristics under Y-axis cutting forces. With a full three-axis direct-drive configuration, all feed axes achieve extremely high dynamic rigidity, enabling effortless ultra-high-speed precision cutting. The high-stiffness machine structure has been fully verified through finite element simulation and practical application. With a total machine weight of 14 tons and a standard-compliant installation foundation, it provides solid inherent rigidity for micron-level ultra-high-speed cutting.

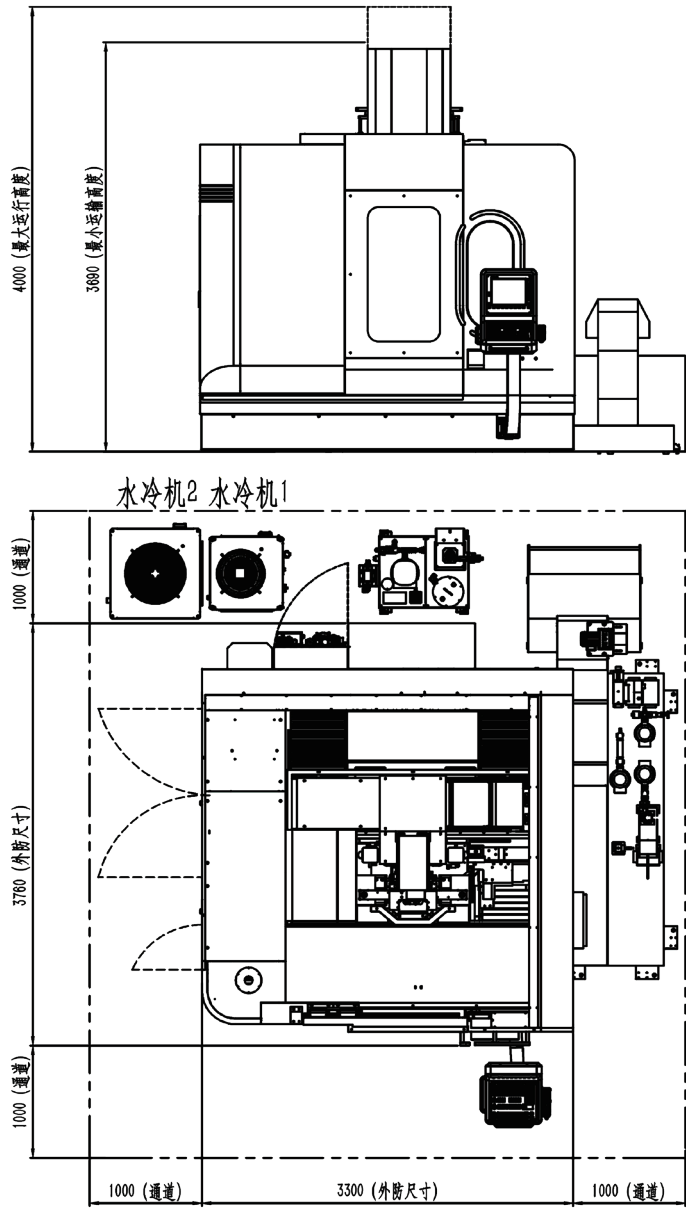
配置及技术参数表
Configuration and Parameter Table

FGV1060

行程 Stroke	
X/Y/Z	1000/600/500 mm
主轴鼻端至工作台面 Spindle nose to table surface	100 ~ 600 mm
工作台 worktable	
工作台尺寸 Table size	1100 x 600 mm
最大承重 Table payload	1000 kg
进给速度 Travel Speed	
G0 快速移动 (X / Y / Z) G0 Rapid traverse	60/ 60/ 60 m/min
切削最大速度 (X/Y/Z) Feed rate	30/ 30/ 30 m/min
加速度 (X/Y/Z) Acceleration	30/ 30/ 30 m/s ²
主轴 Spindle * (可使用其他主轴) Other spindles optional	
主轴传动方式 Spindle type	电主轴/Electrical Integral spindle
主轴最高转速 Spindle speed	16000 rpm
主轴内锥 Spindle taper	HSK-A63
主轴电机功率 (S1) Max. power	27 kW
主轴电机功率 (S6 - 40%) Max. torque	33 kW
主轴电机扭矩 (S1) Max. power	101 Nm
主轴电机扭矩 (S6 - 40%) Max. power	123 Nm
刀库 Tool changer	
刀库类型 Tool magazine type	圆盘刀库/ Disc tool magazine
刀位数量 Tool quantity	24/ 32 T
选刀方式 Tool selection method	随机就近刀位/ Random pots
刀具最大直径 (相邻有刀 / 无刀) Max. tool diameter (adjacent with/without tool)	80/ 150 mm
刀具最大长度 Max. tool length	300 mm
刀具最大重量 Max. tool weight	8 kg
电源/气源 Power/Air requirement	
电源 Power supply	380V 50Hz 45kVA
气源 Air supply	0.6MPa 500L/min
设备重量尺寸 Weight and size	
尺寸 (宽×深×高) Dimension (W×D×H)	3280 x 2350 x 4100 mm
重量 Weight	14000 kg
数控系统 CNC Controller	
海德汉TNC620/ 西门子828D HEIDENHAIN TNC 620/SIEMENS 828D	

U800 平面图

U800 Floor Plan



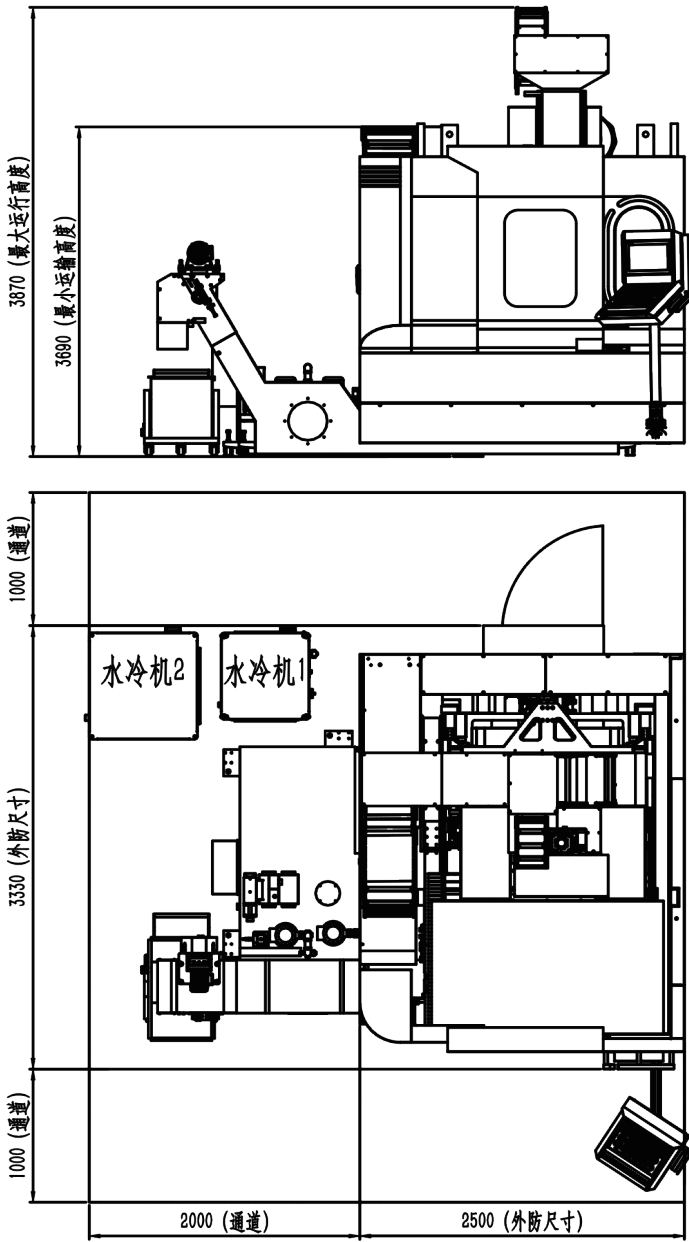
可选配置

Optional Configuration

U800			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

U600 平面图

U600 Floor Plan



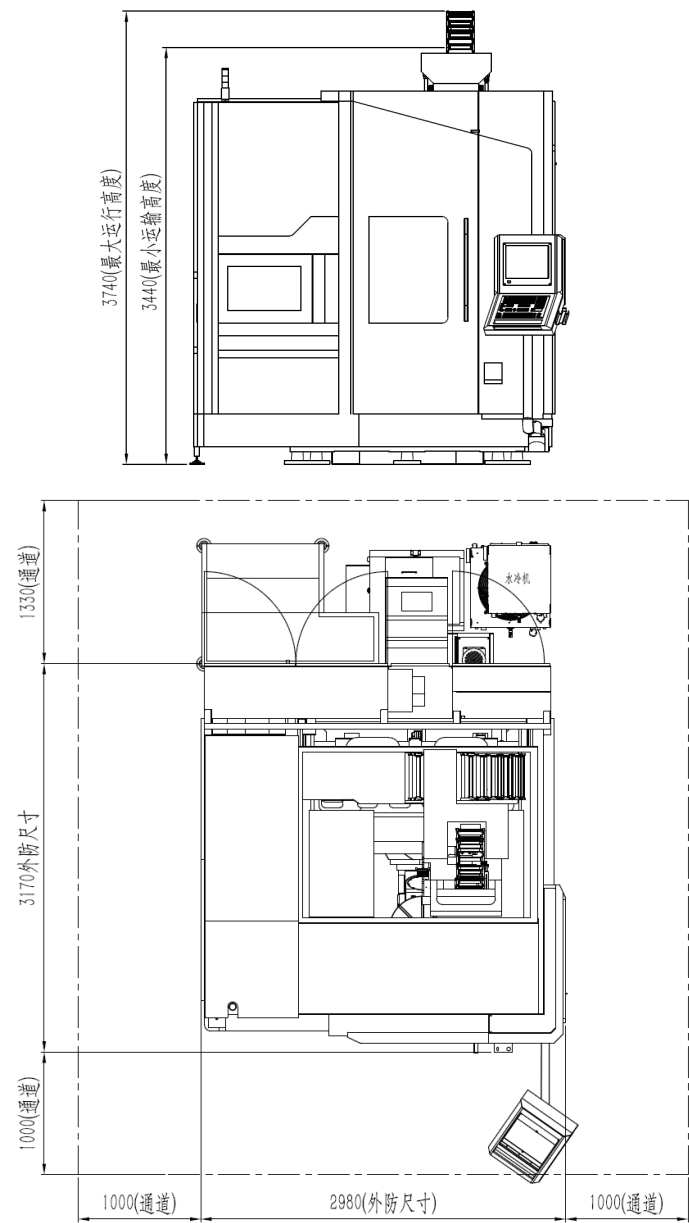
可选配置

Optional Configuration

U600			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

U600S 平面图

U600S Floor Plan



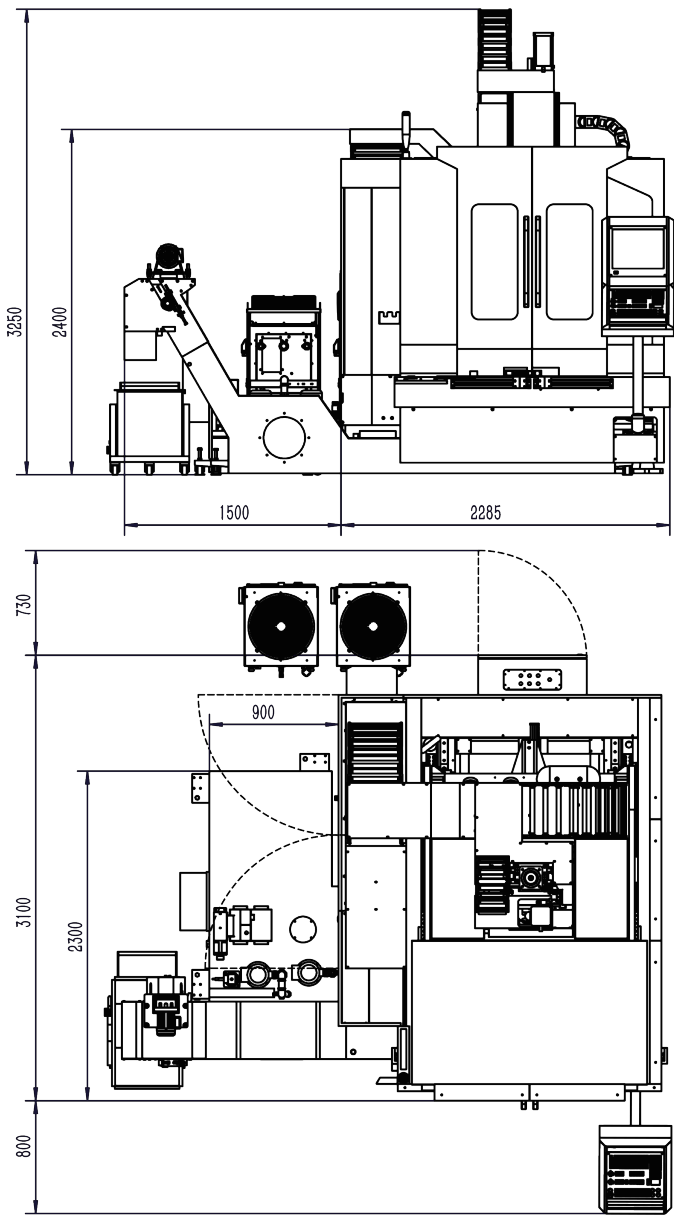
可选配置

Optional Configuration

U600S			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

U700 平面图

U700 Floor Plan



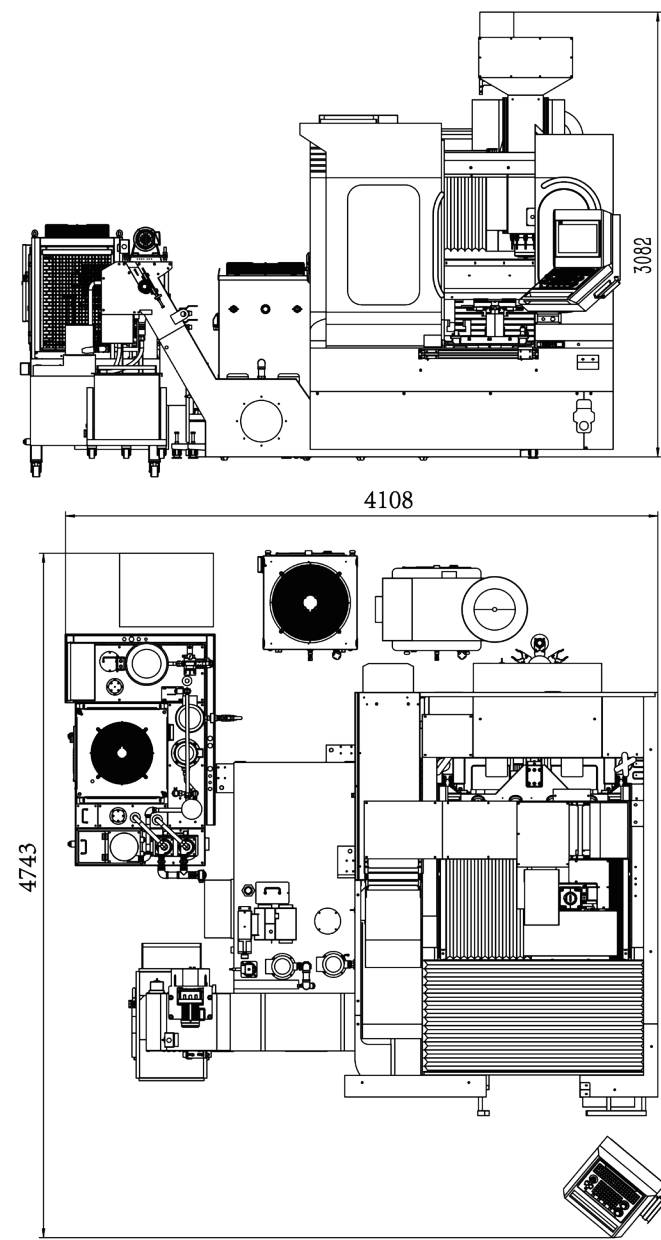
可选配置

Optional Configuration

U700			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

U500 平面图

U500 Floor Plan



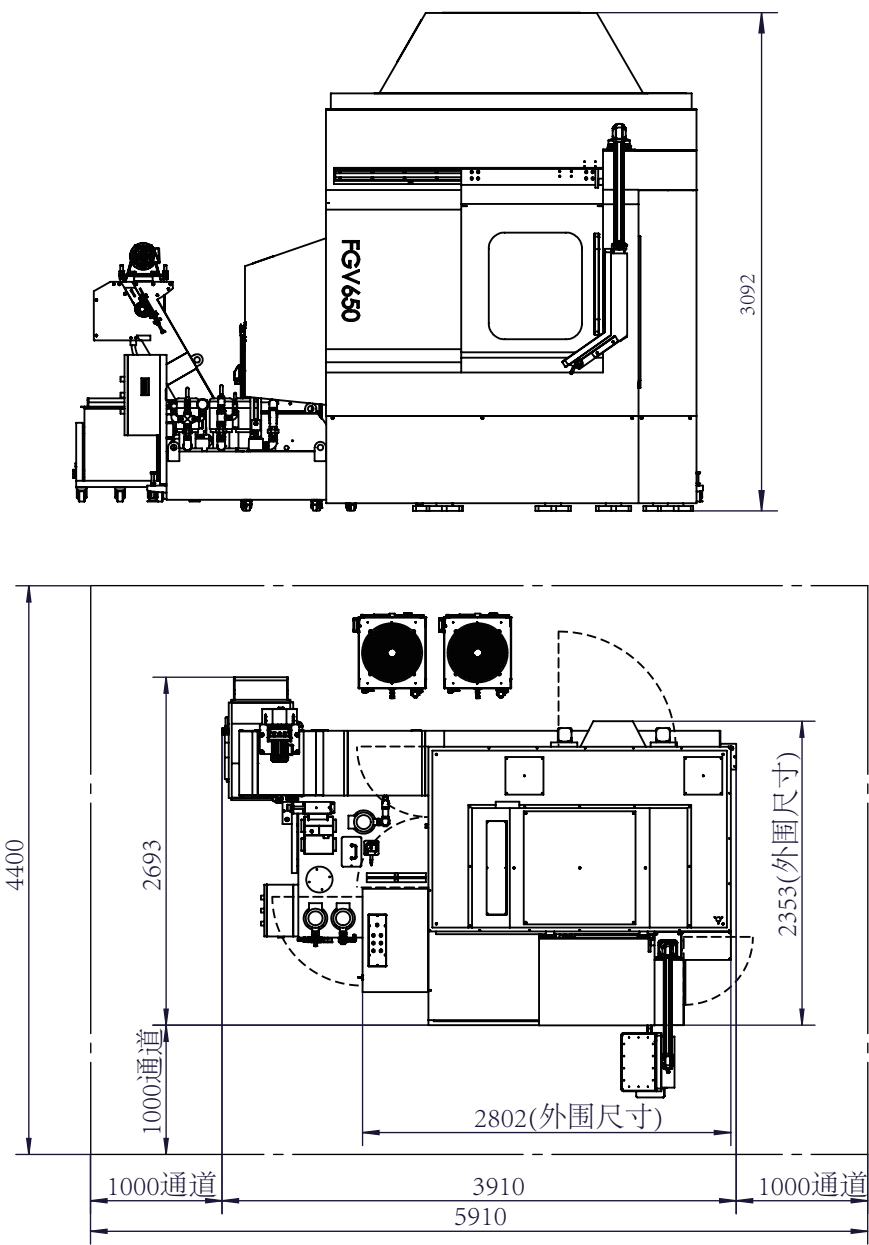
可选配置

Optional Configuration

U500			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

FGV650 平面图

FVG650 Floor Plan



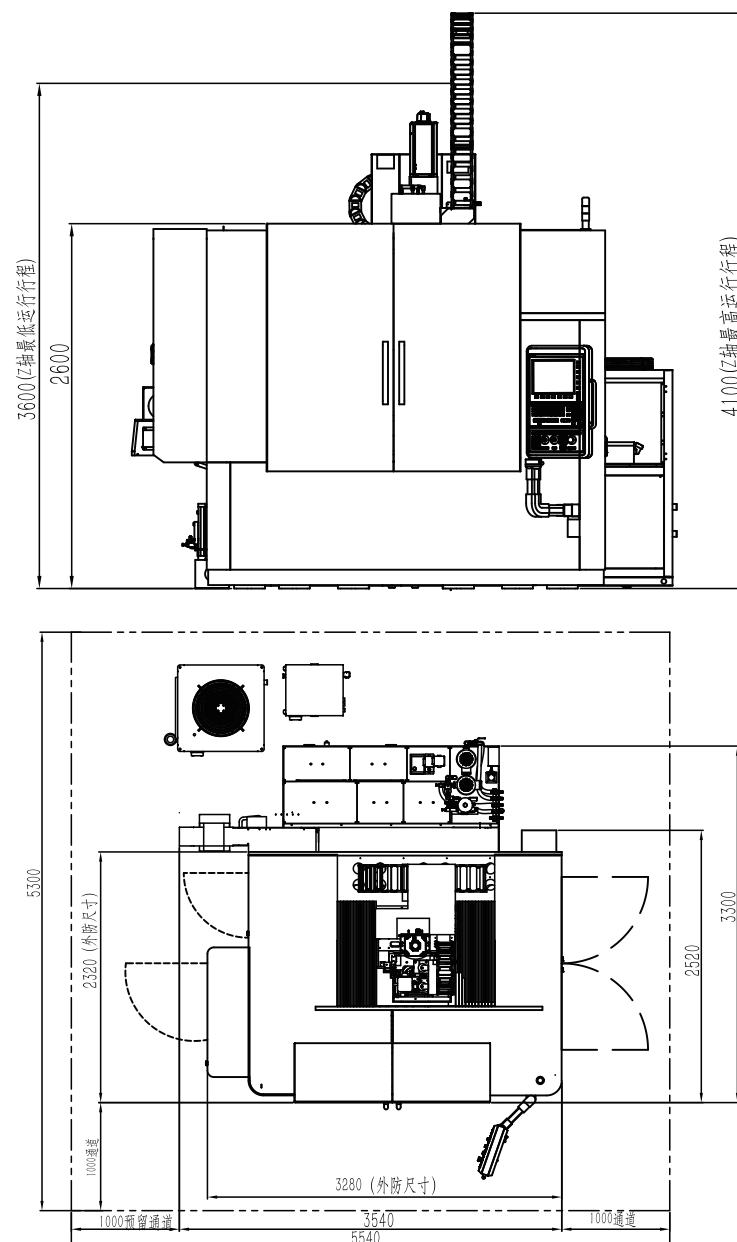
可选配置

Optional Configuration

FGV650			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	磨削装置 Grinding Device		○	

FGV1060 平面图

FVG1060 Floor Plan



可选配置

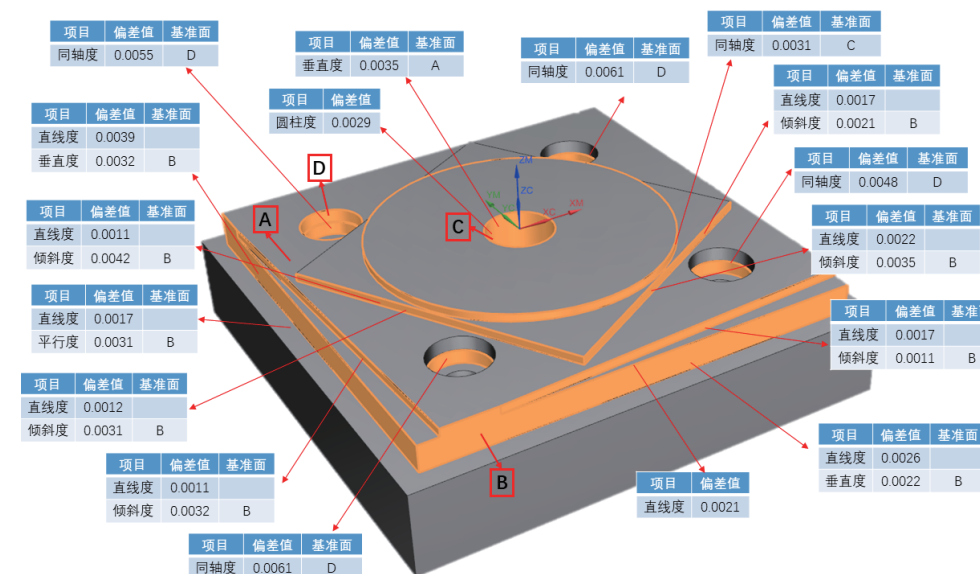
Optional Configuration

FGV1060			选装 ○	无 ×
1	激光对刀仪 Laser Tool Setter		○	
2	工件测头 Workpiece probe		○	
3	自动门 Automatic door		○	
4	油雾收集器 Oil Mist Collector		○	
5	中心出水 Through Spindle coolant		○	
6	电主轴 Electrical Integral spindle	凯斯勒 20000 rpm	○	
		飞速2104 24000 rpm	○	

▶ 国标检测报告/ ISO Test Piece Inspection Report

全尺寸精度约6 μm/Overall accuracy 6μm

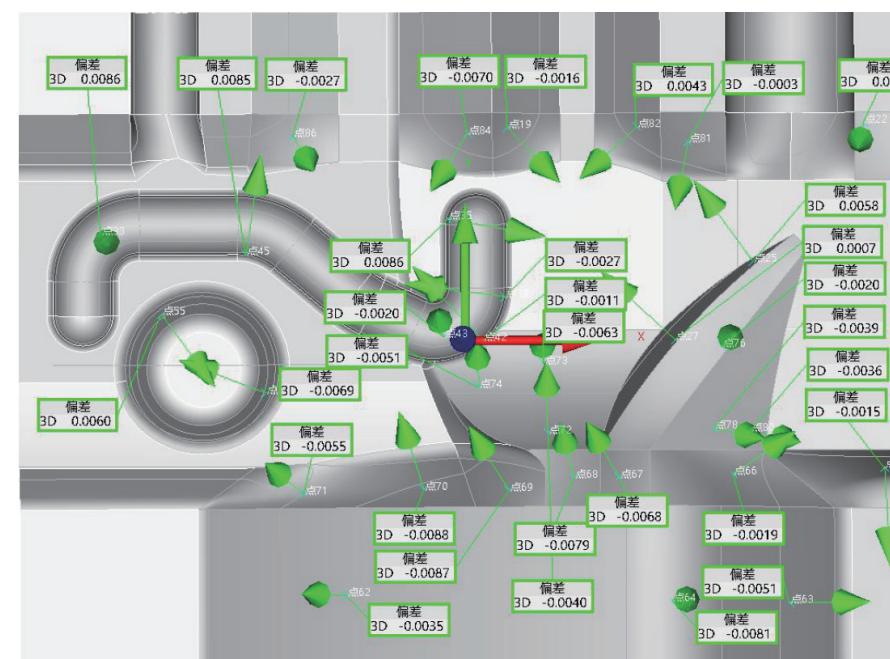
材料/Material: 6061 Aluminum Alloy 尺寸/Size: 320*320*80mm 加工时长/Machining Time:59min32s



► 奔驰件检测报告/ Mercedes Benz Workpiece Test

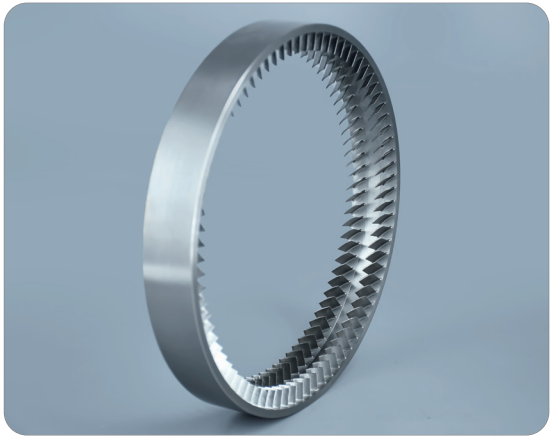
轮廓精度/Contour Accuracy: +9.2 μm /-8.8 μm

材料/Material: H13(50HRC)钢	尺寸/Size: 210*145*50mm	加工时长/Machining Time:3h30min
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应用案例

Applications



样件名称： 多级内开式叶盘

Workpiece： Multistage inwardly open blade disk

高端飞行器配套应用领域
The Supporting Application Industry of High-end Aircraft

加工材料： Machined material：	钛合金（TC4）
工件尺寸： Workpiece size:	D230*32.5mm
加工时间： Machining time:	51h15min
公差等级： Tolerance class:	IT4

加工难点： 难加工材料**TC4**钛合金，叶片**最薄0.1mm**，内开放式叶盘，六轴联动+直角头的方式。

Difficulties: Difficult to process material **TC4** titanium alloy, blade **thinnest 0.1mm**, open inside Put bladedisc, six axis linkage + right Angle head mode.



样件名称： 钛合金叶盘

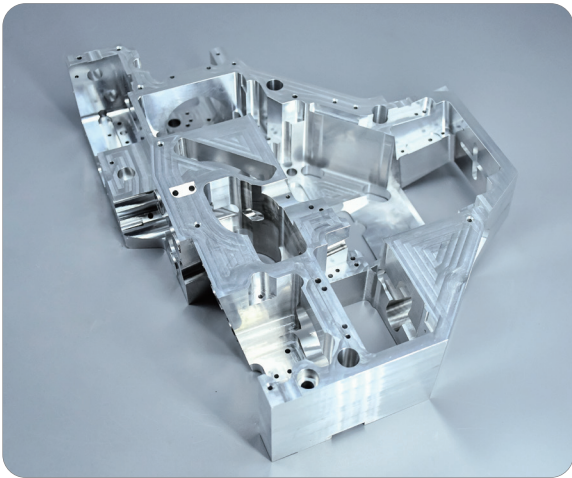
Workpiece： Titanium alloy disk

高端飞行器配套应用领域
The Supporting Application Industry of High-end Aircraft

加工材料： Machined material：	钛合金（TC4）
工件尺寸： Workpiece size:	Ø298*67mm
加工时间： Machining time:	52h
公差等级： Tolerance class:	IT4

加工难点： 钛合金叶盘采用“动态摆线开粗”+“联动点铣精加工”，叶片长度为：89.9mm，宽度82.4mm，叶片最薄位置厚度为0.9mm，经检测，叶片轮廓度<0.12mm,表面粗糙度Ra<0.6µm。

Difficulties: Titanium Alloy Blisk adopts "dynamic trochoidal roughing" + "simultaneous point milling finish machining". Blade dimensions: Length 89.9mm, width 82.4mm, minimum thickness 0.9mm. The inspection results show that the blade profile tolerance is less than 0.12mm and the surface roughness Ra is below 0.6µm.



样件名称： 光学模组零件

Workpiece： Lithography machine precision parts

半导体装备应用领域
Semiconductor equipment applications

加工材料： Machined material:	铝合金（6061Al）
工件尺寸： Workpiece size:	295*240*80mm
加工时间： Machining time:	13h5min
公差等级： Tolerance class:	IT4

加工难点： 尺寸公差等级**IT4**，铝合金大去除量、薄壁、深腔加工，内部最薄处仅有**0.3mm**。

Difficulties: The dimensional tolerances are **IT4**. Workpiece with large aluminum alloy removal, thin walls, deep cavities, and internal thinnest point of only **0.3mm**.

应用案例

Applications



样件名称： 真空腔体

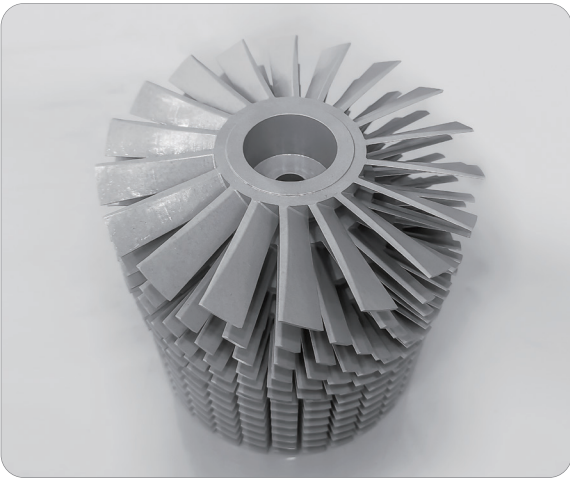
Workpiece： Vacuum chamber

半导体应用领域
Semiconductor equipment applications

加工材料： Machined material：	6061Al
工件尺寸： Workpiece size:	375*320mm
加工时间： Machining time:	28h30min
公差等级： Tolerance class:	IT4

加工难点： 铝合金真空腔体采用五轴联动开粗，加工深度最高**300mm**，Vc: 754m/min Fz: 0.6 mm Ap: 40mm ae: 3mm 实际切削时间和理论时间比例：1:1.13

Difficulties: The aluminum vacuum chamber undergoes 5-axis roughing with a depth capacity of **300mm**. Vc=754m/min, Fz=0.6mm, Ap=40mm, ae=3mm. Achieved 1:1.13 actual-to-theoretical cutting time ratio.



样件名称： 分子泵

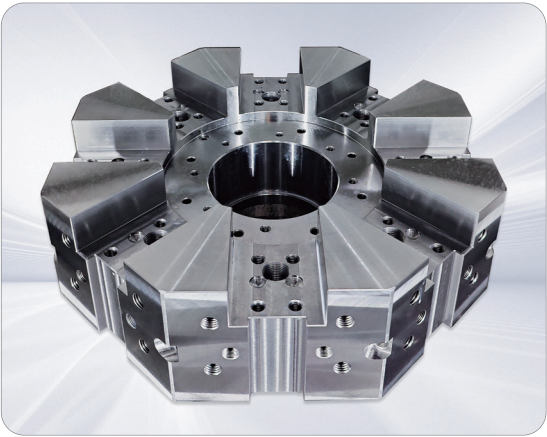
Workpiece： Molecular pump

新能源应用领域
New energy applications

加工材料： Machined material：	7075
工件尺寸： Workpiece size:	145*134mm
加工时间： Machining time:	20h16min
公差等级： Tolerance class:	IT5

加工难点： 多层薄壁长叶片属于难加工叶片。

Difficulties: Multilayer, thin-walled, long blades are difficult to machine.



样件名称： 精密刀盘

Workpiece： Precision discs

精密机械应用领域
Precision machinery applications

加工材料/硬度： Machined material /hardness:	40Cr/HRC30-40
工件尺寸： Workpiece size:	280*280*140mm
加工时间： Machining time:	1h
公差等级： Tolerance class:	IT6

加工难点： 槽宽尺寸精度**小于+0.01mm**、八个槽中心对称面的角度**累计误差小于±10"**，精加工时间小于30min。

Difficulties: The accuracy of the slot width is **less than +0.01 mm**, the **cumulative error** of the angle of the eight slot centers to the symmetrical surface **is less than ±10"**, and the finishing time is less than 30 minutes.

行业应用

Application Area

产品实现了相对于传统数控机床的更高效率、更高精度、更长寿命，集重切削、超高速切削、微米级切削能力于一体为制造业提供了全新的、革命性的金属切削方案，广泛服务于模具、压缩机及真空泵、工程机械、医疗设备及器械、半导体装备、汽车工业等各个制造业领域。

We offer a completely new machine tool blueprint to China's manufacturing sector. Our products are engineered to deliver higher efficiency and accuracy, longer lifespan, and the ability to handle heavy cutting, ultra high-speed cutting, and micro-level cutting. We are dedicated to the field of metal cutting and serve a diverse range of manufacturing industries including mold-making, compressors, engineering machines, medical equipment, semiconductor, and the automotive industry.

高端飞行器配套产业
The Supporting Sector of High-end Aircraft

复杂轮廓的超高精度硬质材料切削能力高稳定性需求。
Highly stable machining capability of tough material with complex profiles.

精密机械零件
Precision Parts/ Components

医疗器械、泵阀、精密液压、密封件等高精度需求。
High precision requirement for mechanical components, including medical devices, pumps, valves, precision hydraulics, and seals.

工业半导体装备
Industry and semiconductor equipment

大飞机产业、无人机产业、半导体、发动机及其附属部件，高效率需求。

High efficiency requirement in the industries of large aircraft, UAVs, semiconductors, engines, and their associated components.

齿轮产业
Gear industry

机器人产业、汽车产业等高精度、高效率需求。
The robot industry, the automotive industry, etc., require high precision and high efficiency.

精密模具
Precision Molds

汽车大型模具的高精度及高表面质量需求；
日用消费品模具的高精度、高表面质量要求；光学模组、医疗硅胶、人体工学类、消费电子产品模具等对超高精度机器的需求。

High precision and surface quality is required in large automotive molds, consumer goods molds, optical modules, medical silicone, ergonomics, electronics, etc.

应用技术服务培训

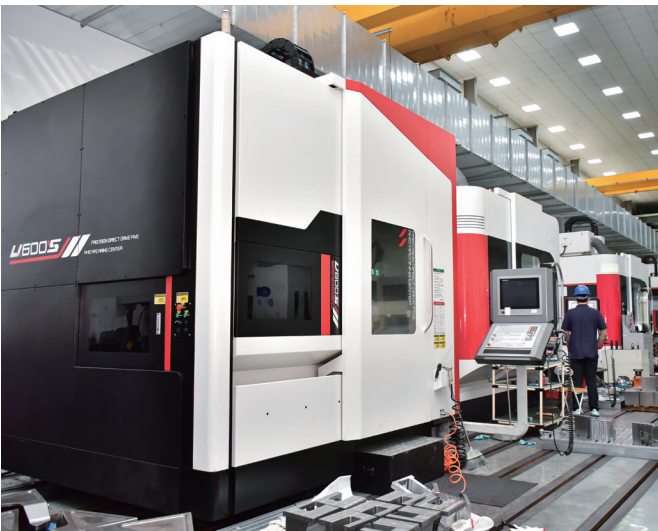
Application Technical Service Training



1小时内响应

24-48小时内提供专业技术支持

On-site/ remote support within 24-48 hours



服务原则

Service principle

主动上门服务
有益建议积极响应
及时处理客户来电来函
实行质量反馈单
质量跟踪卡制度

Proactive door-to-door service
Active respond to constructive suggestions
Handle customer calls timely
Implement quality feedback forms
Quality tracking card system



保修时间

Warranty period

验收合格当日起算
保修期内免费服务
保修期外终身服务

Start counting from the day of acceptance
Free service during the warranty period
Lifetime service out of warranty period

