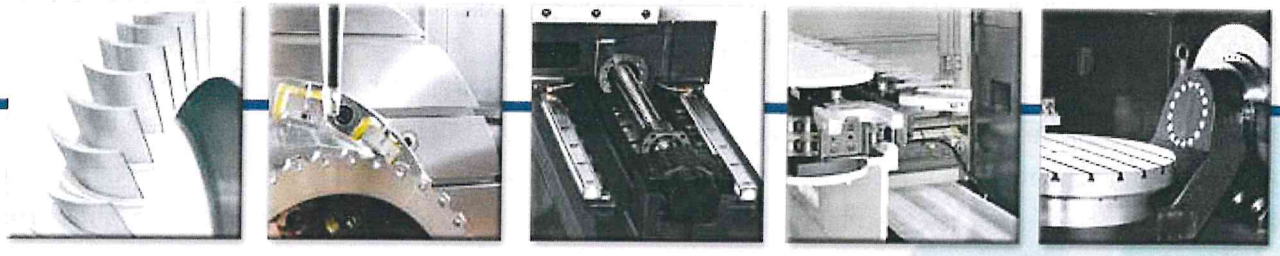
CHEVALIER®

Grinding / Turning / Milling

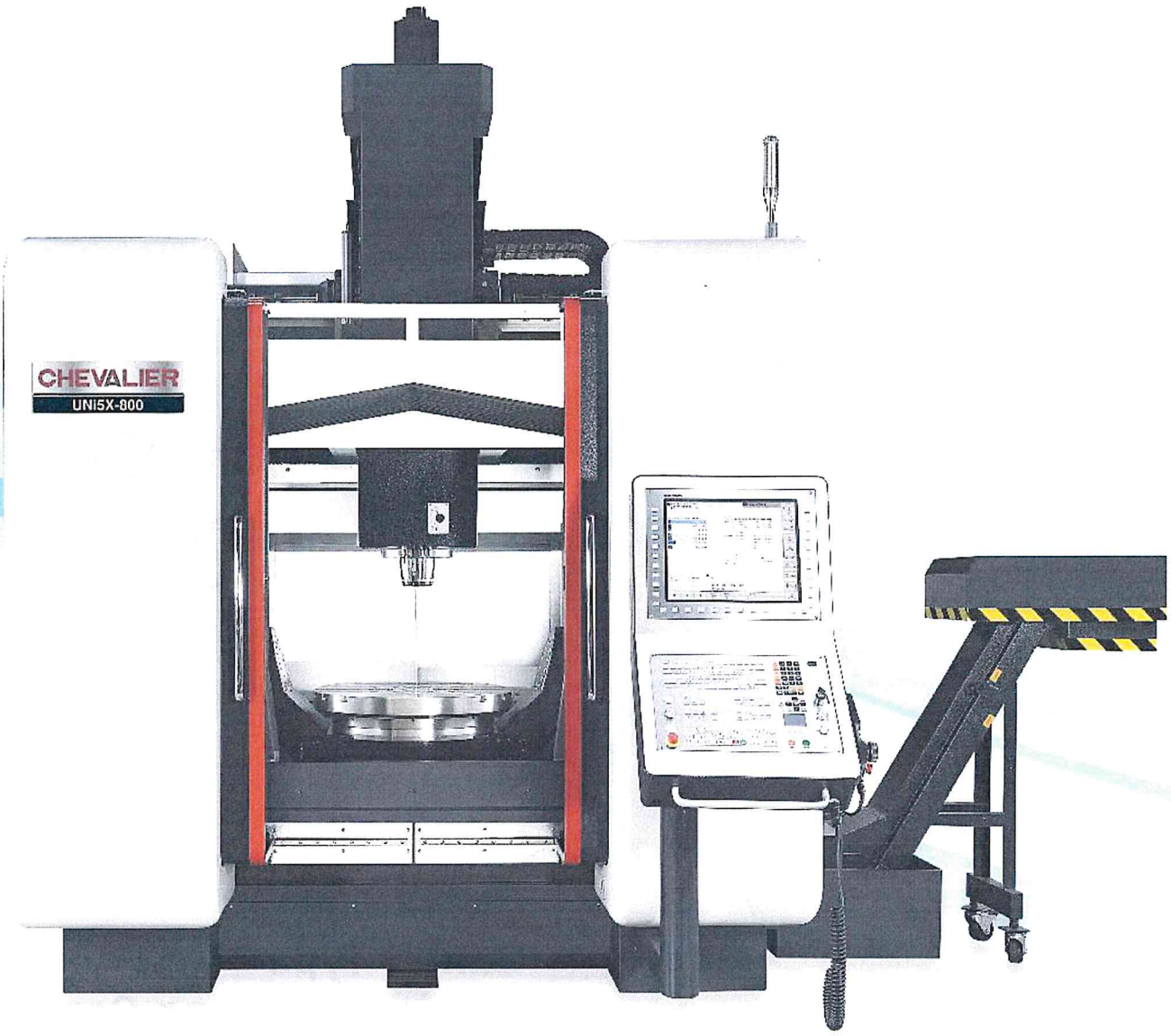


UNi5X-800
Gantry Type
5-Axis Machining Center

UNi5X-800

5-Axis Gantry Type Machining Center

The UNi5X-800 design is based on an advanced gantry construction giving the most rigid structure. The 18,000 rpm built-in spindle represents high geometric accuracy and the competence of high-speed machining. Five-axis simultaneous machining can reduce the workpiece's fixing and positioning time to simplify the production process, shorten the machining time as well as perform the best positioning accuracy. To achieve excellent machining performance, HEIDENHAIN absolute encoders for X/Y/Z and A/C axes, can eliminate the transfer error from the mechanics and corrected by the control electronics to achieve 5-axis high accuracy machining as well as precisely fulfill the complex machining demands. The UNi5X-800 is extensively applied to the industries of aerospace, automotive, die & mold, medical, energy, shipbuilding, and furthermore, can realize the application needs of the customized products.



Note: Machine shown with optional accessories

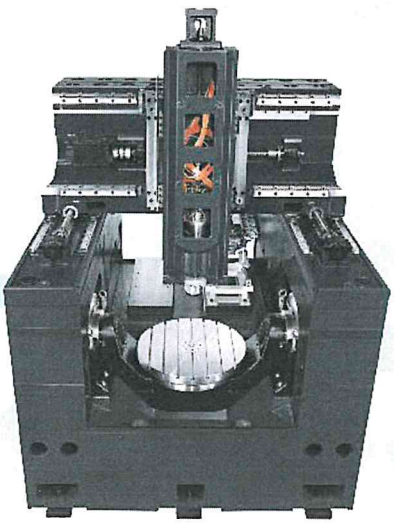
UNi5X-800

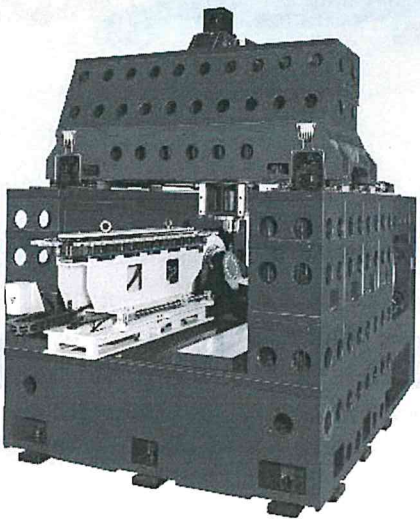
Machine Features

- Dual drive system with four-linear-guideway design on Y axis performs high-rigidity and high-precision machining.
- Dual linear guideways on Z axis and driven by the servo motor.
- Five axes are equipped with absolute encoders as standard to ensure a precise complex 5-axis simultaneous machining.
- Driven by three direct drive torque motors, A axis and C axis power transmitting efficiency and acceleration and deceleration, are more excellent than the worm and worm gear transmissions design.
- The built-in spindle is equipped with intelligent protection functions and can achieve 198Nm torque.
- The second tool magazine (opt.) is available on request. 32T+32T large capacity of dual tool magazines are compact design and space saving. Driven by servo motor, automatic tool changing is fast and precise.
- High torque built-in spindle speed is up to 18,000rpm.
- The gantry structure of the machine features high rigidity.
- The controller position and swivel arm are ergonomically designed to facilitate the user to operate the controller and monitor the machining status easily.

Benefits for Customers

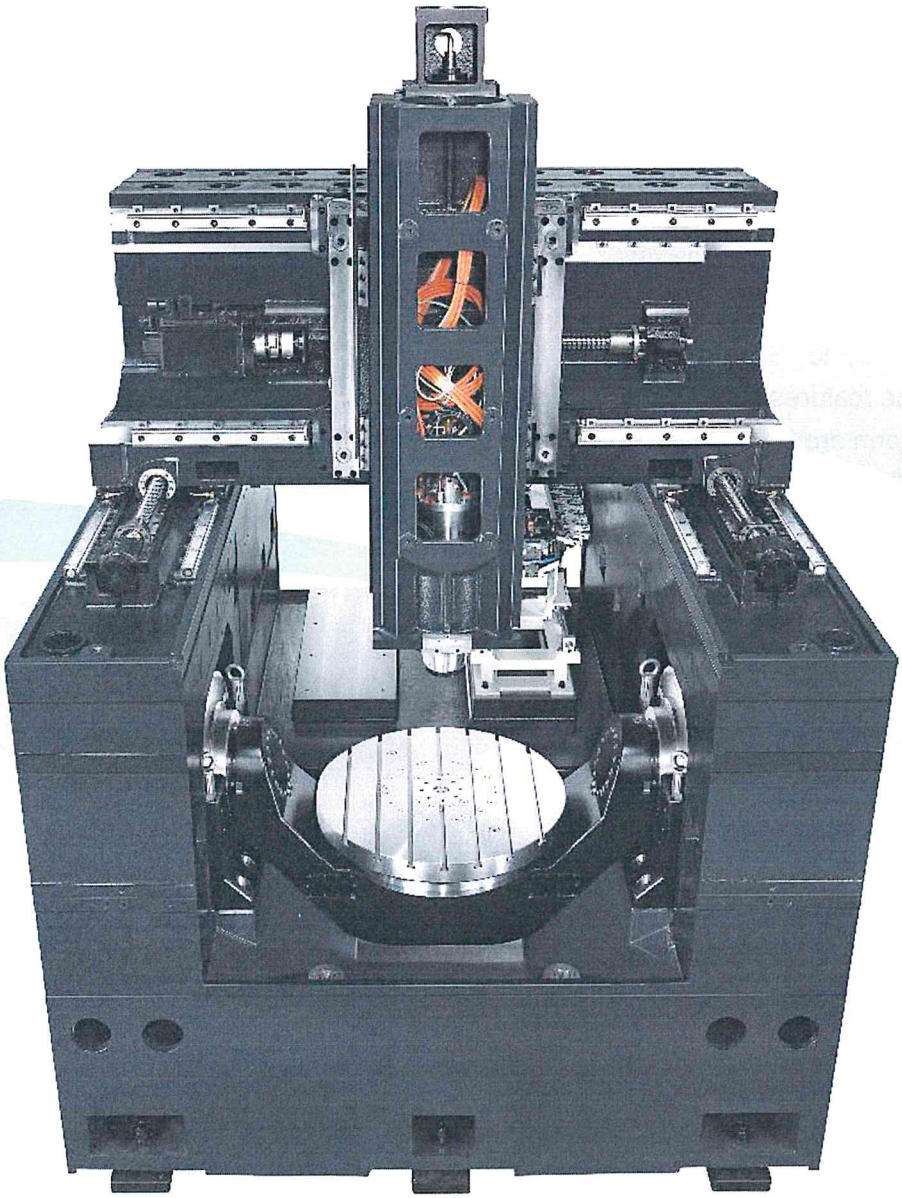
- Suitable for various complex shapes and high-precision parts or molds machining
- Simplify production process and save fixture costs.
- No special cutting tools needed.
- Machining by a single pass instead of many small incremental can improve the surface to present a better machining quality.
- Same feed but cutting length increased features tool lifetime extended and tool costs reduced.
- Fewer machines in use can save shop floor space to simplify the management of machines.
- Decrease machining cost as well as increase higher productivity.

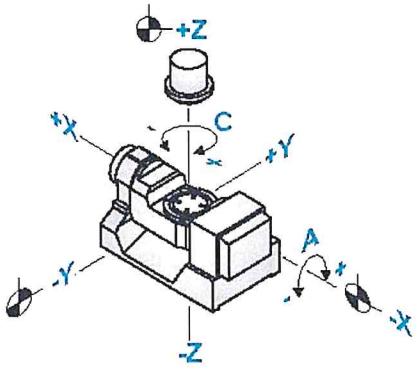




UNi5X-800

Machine Structure
機械結構





Axis Arrangement ISO 841

1 Spindle
With intelligent protection function

2 Y Axis
Dual driving system with four linear guideways

3 Absolute Encoders
As standard accessories on 5-Axis feed system

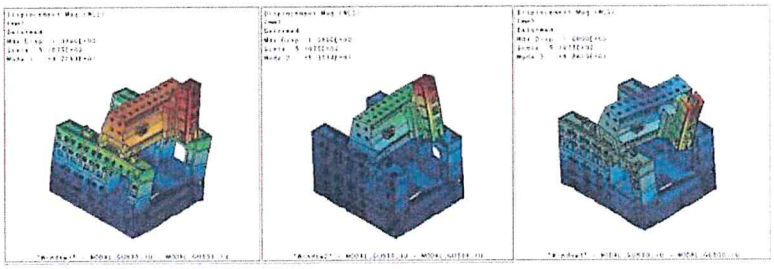
4 Dual Tool Magazines
Large Capacity 32T+32T (Opt.)

5 Spacious Working Area
Free movement for 5-axis machining with large space

6 A/C Axis
Torque Motors

Topology Analysis & Finite Element Method (FEM)

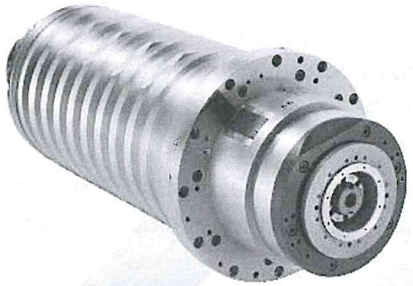
Simulation uses Topology analysis & FEM methods to calculate the displacements and stresses in a machine design due to operational loads, such as forces and pressures, to ensure superior stability and rigidity.



UNi5X-800

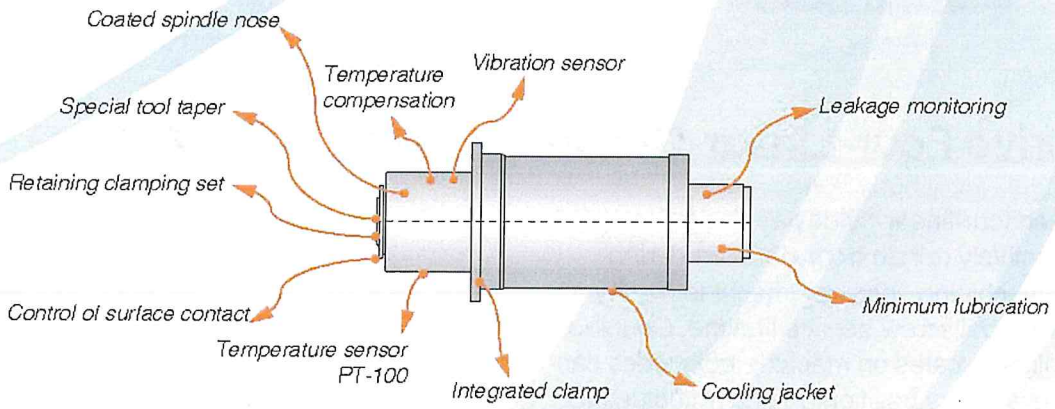
Spindle designed with Intellingent Technology

The German-made built-in spindle with torque overload protection, thermal growth compensation, anti-thermal expansion, vibration monitoring, and anti-collision, combined with 5-axis machining technology ensures a high quality machining and 5-axis continuous operation.

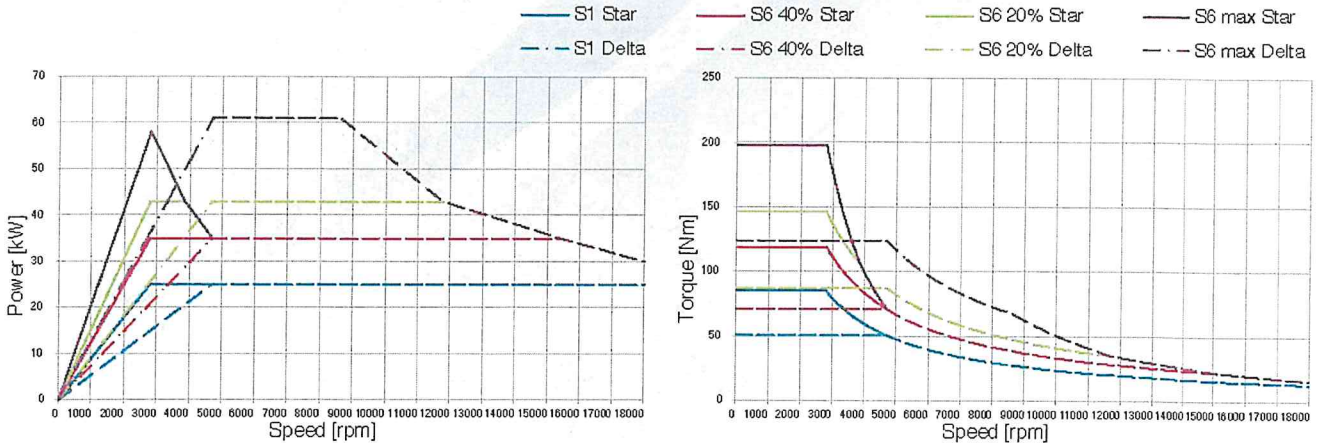


Built-In Spindle Design

- The rear side bearing adopts roller type bearing, which can make the axis extend rearward during thermal growth and avoid causing axial load; moreover, the spindle nose installed with cooling system can also reduce the extension problem.
- The bearing adopts FAG or NSK ceramic balls with high rigidity and high precision.
- The temperature sensor is installed on the bearing for thermal compensation, monitoring and protecting the bearings.
- Temperature sensor can effectively prevent the motor overheated and burnt down.
- The spindle inner side is installed with air purge set for providing bearings a protection against the ingress of coolant and contaminants.
- Optional vibration sensor and recorder are provided to monitor the spindle operational status and wearing status.
- 198Nm (S6 10%) high torque built-in spindle



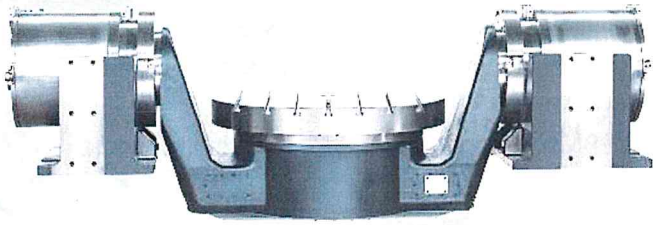
Power & Torque Characteristic Chart



UNi5X-800

High-Precision Direct-Drive Torque Motors on A/C Axis

- A axis is driven by two DD motors. The rotary table speed is up to 80rpm. With the capability of big clamping force, 90° angle table clamping is still easy and stable.
- C axis is driven by one DD motor. The rotary speed is up to 100rpm to provide a high-efficiency machining.
- The rotary table disk is easy for exchange. Especially for different dimensions or T-slot sizes, all can be replaced in user's factory.
- With flanges on both sides of A axis, accuracy and angular deviation can be adjusted at the user's side.

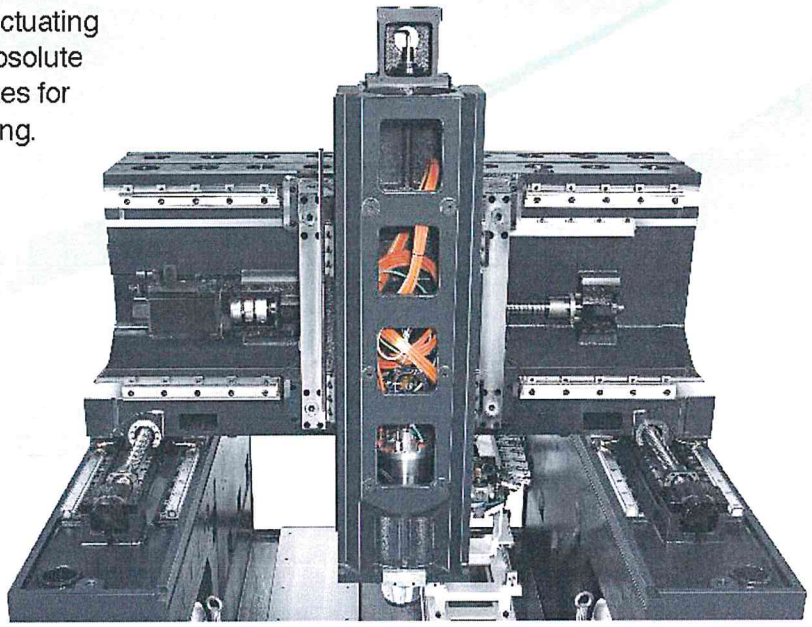


Advantages of Direct-Drive Torque Motor

- Lower Noise: With fewer mechanical parts, the motor maintenance is minimized and the service cost is reduced.
- High Torque & Low Speed: Strong cutting force and high drive rigidity.
- Excellent Reliability and Long Lifetime: Directly coupling results in no mechanical wear, such as gearbox, timing belts, speed reducers, and worm gear drives.
- Rapid positioning and High Positioning Accuracy: The direct-drive permanent-magnet synchronous servomotor features the faster positioning time. With direct-coupling design, the error resulted from mechanical transmission can be reduced significantly, which guarantees high-accuracy machining especially for the complex 5-axis application.

Dual-Drive Four-Linear-Guideway Design on Y Axis

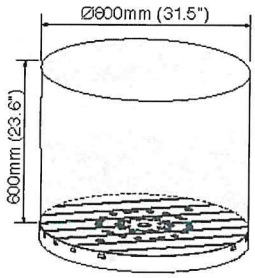
Double-driven four-linear-guideway design on Y axis can effectively refrain from vibration during high-speed machining, increase machine rigidity as well as prolong ballscrew service lifetime. Coupled with Y-axis linear scales on machine both sides can ensure the exact axis positioning under fluctuating temperatures. As standard accessories, absolute encoders are applied on X/Y/Z and A/C axes for precise execution of complex part machining.



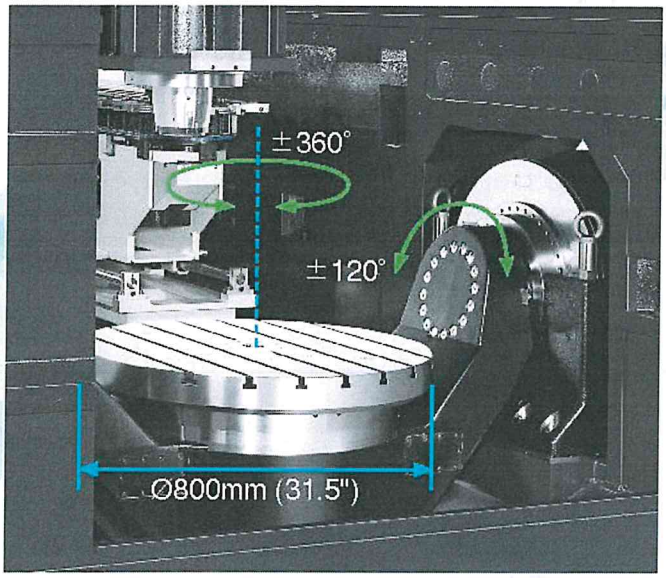
UNi5X-800

Rotary Table with High Torque and Heavy load Capacity

With 1,300kg super high loading capacity, the rotary table is one-piece design of rotating mandrel and a heavy-duty 3-piece cross roller bearing, which provides high rigidity and reduce angular error for an excellent part loading and machining capability. With Ø800mm (31.5") wide rotary table on X axis, 900mm (35.4") and 650mm (25.6") long travels on Y and Z axes, the spacious working area frees the movement for a complex multi-axis machining.

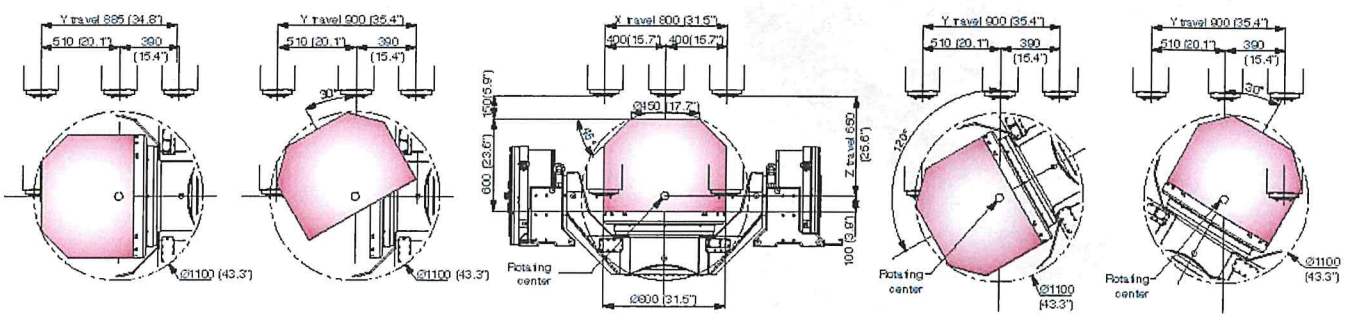


Max. workpiece dimensions

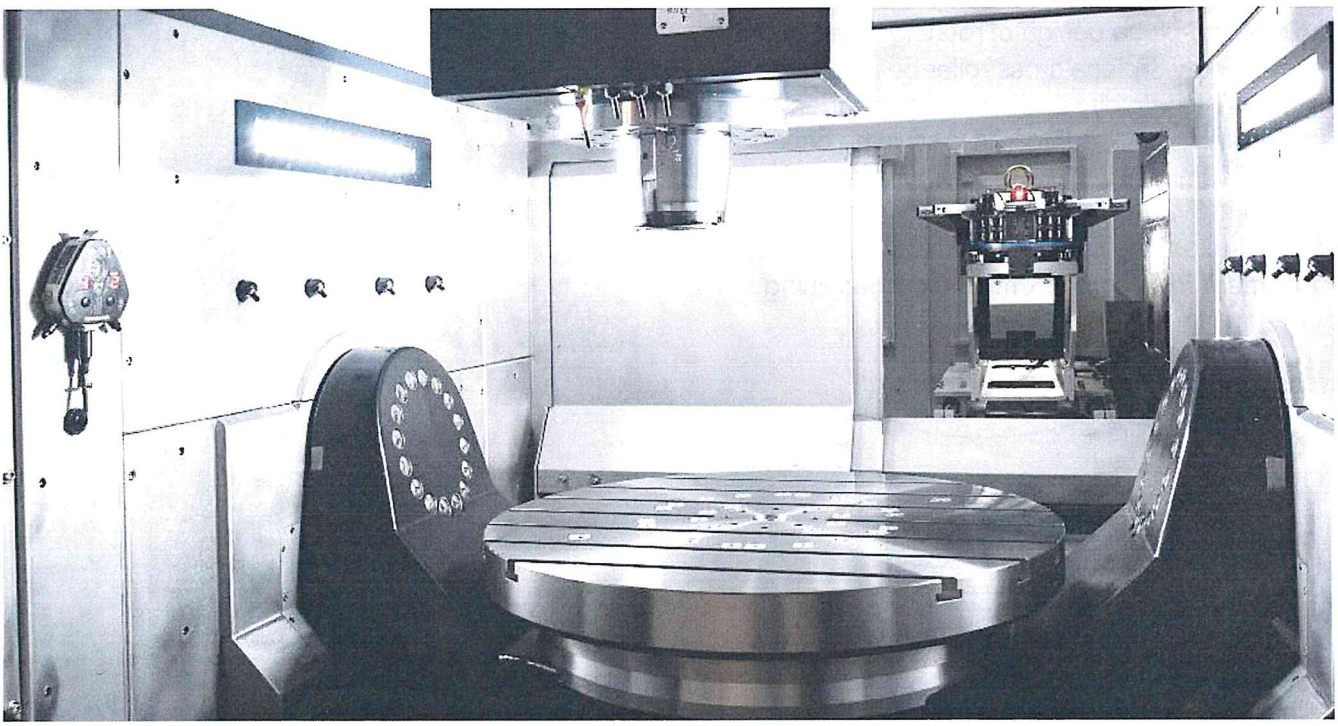


Work Range

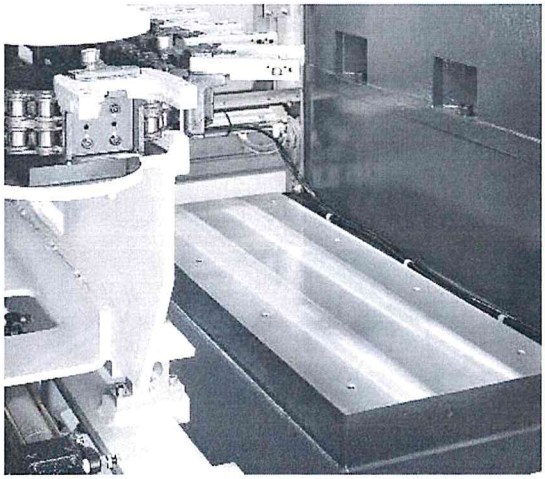
Unit: mm (")



UNi5X-800
Daul Tool Magazines (Opt.)

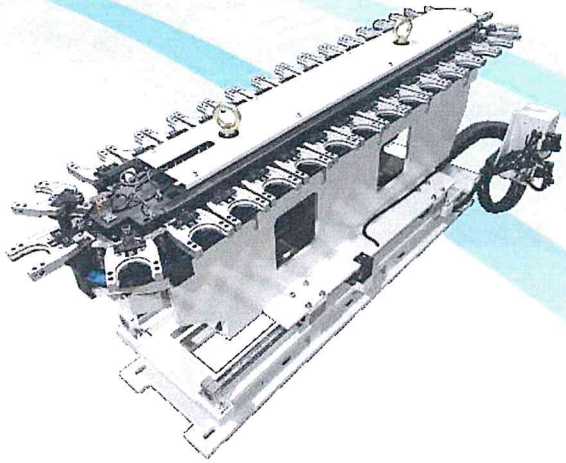


- The 2nd tool magazine (opt.): 32T+32T large storage capacity
- The flat-type tool magazine is compact design to maximize the utility of plant space.
- Driven by servomotor, automatic tool changing system provides fast and precise tool changing.
- Easy tool loading design
- Max. tool dia. with adjacent tool: Ø75mm (3")
- Max. tool dia. without adjacent tool: Ø125mm (5")
- Max. tool length: 350mm (13.7")
- Max. tool weight: 7kg (15.4 lbs)

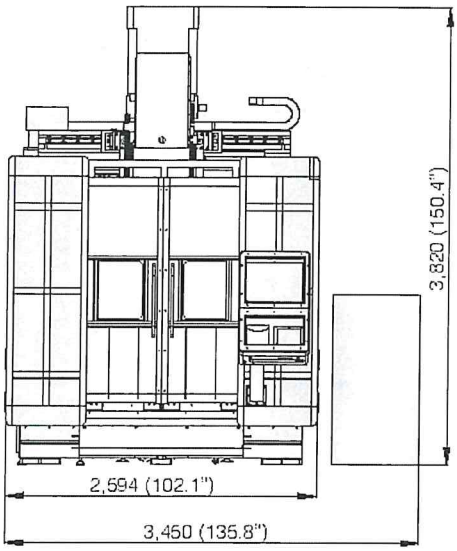


The 2nd Tool Magazine (Opt.)

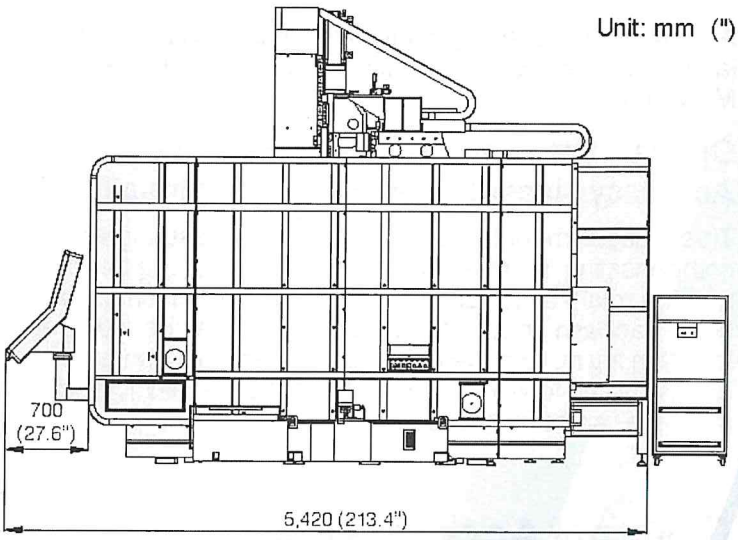
The 2nd tool magazine is available on request. The flat tool magazine at the machine rear side, 32T plus 32T large storage capacity can satisfy the needs of complex 5-axis machining.



UNi5X-800
Dimensional Drawing



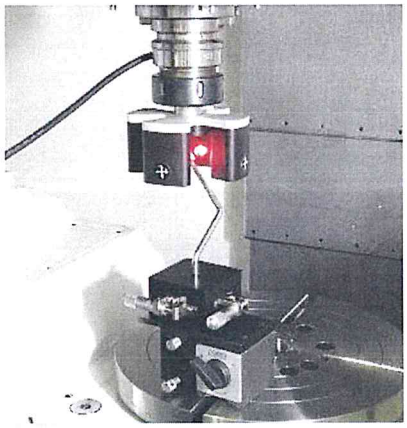
Unit: mm (")



Applications

UNi5X-800
Inspection

After assembling, all machines are measured and calibrated by laser calibration. Ball Bar testing and Non Bar Dynamic Accuracy Measuring.



Optical Type Non-Bar 5-Axis Machine Tool Dynamic Accuracy Measurement and Compensation System

This measurement technology includes measuring and compensating the static/dynamic backlash of the transmission and the rotary axes. Especially for static backlash calibration, the static backlash error of transmission axis can be compensated to within 1 μm, and the rotary axis static backlash error can be compensated to within 0.001°. Thus the machining accuracy of the machine can be increased.

Optional Accessories

- SIEMENS 840D Controller with19" LCD Screen
- Direct Drive Spindle 15,000rpm
- Built-In Spindle 24,000rpm
- The 2nd Tool Magazine: 32T
- Coolant Through Spindle System
- Oil Skimmer
- Chain Type Chip Conveyor
- Tool Length Measurement System
- Workpiece Measurement System
- Transformer
- Pneumatic / Hydraulic Unit for Rotary Table Fixture
- CE Declaration of Conformity for EU Countries

Tool Length Measurement System

The tool setting and tool monitoring system is specially suitable for 5-axis machine application, which can perform reliable automatic wear control of tools, compensation of temperature drift of spindle and axes, runout control, tool tip control to enhance machining quality, prevent tool breakage, shorten tool setting time, decrease workpiece defect rate, minimize production cost and maximize productivity and benefit.

Workpiece Measurement System

The workpiece measurement system can precisely detect workpiece position and provide correct workpiece orientation. Also, the system can be applied for thermal compensation and performs contour measurement.

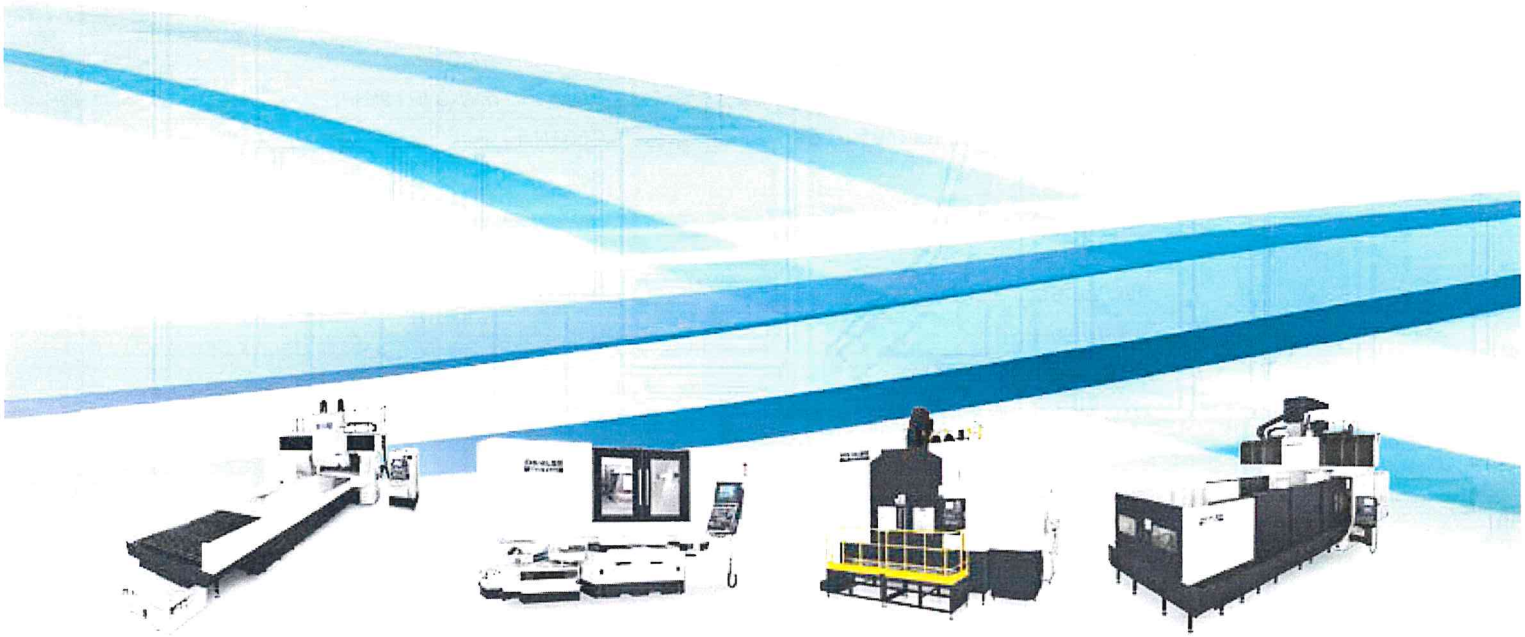
Standard Accessories

- HEIDENHAIN TNC640 19" LCD Controller
- Built-In Spindle 18,000rpm
- Spindle Thermal-Growth Protection Sensor
- Spindle Oil Cooling System
- Spindle Lubrication System
- Spindle Air Purge System
- Spindle Air Blast Chip Blower
- Coolant Through Spindle Preparation
- Tool Magazine 32T and ATC System
- Water Gun
- Air Gun
- Chain Type Chip Conveyor on Y Axis
- Coolant Tank
- Chip Cart
- Fully Enclosed Splash Guard
- Air Conditioner for Electric Cabinet
- LED Work Light
- LED Pilot Lamp
- RS232 Interface
- Absolute Encoder for X/Y/Z Axis and A/C Axis
- Safety Switch for Front Door
- Chip Flushing System
- Foundation Leveling Bolts and Pads
- Tool Box with Tools
- 3D Anti-Collision Function
- Central Correction Function

UNi5X-800
Specifications

Uni5X-800	Item		Specification
Travel	X travel		800 mm (31.5")
	Y travel + travel for tool change		900 +150 mm (35.4" + 5.9")
	Z travel		650 mm (25.6")
	Spindle nose to table surface		100~750 mm (4" ~ 29.5")
	Work table size (dia.)		Ø 800 mm (31.5")
	Max. workpiece dimensions		Ø 800 x H 600 mm (Ø31.5" x H 23.6")
	Max. work table loading		1,300 kg (2,866 lbs)
	T Slot (width x No.)		14mm (0.55") x 7
Feed rate	Rapid feed rate (X/Y/Z)		48 m/min (1,889 ipm)
	Cutting feed rate		15 m/min (590 ipm)
Rotary Axis	A Axis	rotation range	A Axis: + 120°
		rotation speed	80rpm
		rotation torque S1/Max	1,870Nm x 2 / 3,740Nm x 2
		rotation power S1/Max	6.9kW (9HP) x 2 / 15.7kW (21HP) x 2
		holding torque	3,500Nm x 2
	C Axis	rotation range	360°
		rotation speed	100rpm
		rotation torque S1/Max	1,870 Nm / 3,740 Nm
		otation power S1/Max	6.9kW / 15.7kW (9HP / 21HP)
		holding torque	2,500 Nm
Spindle	Spindle type		Built-in
	Spindle speed		18,000 rpm
	Spindle motor power (S1/S6 40%)		25 / 35 kW (34HP / 47HP)
	Max. spindle torque (S1/S6 40%)		86 / 130 Nm
	Spindle taper		HSK-A63
Accuracy	X/Y/Z positioning (VDI3441)		0.008mm (0.00032")
	X/Y/Z repeatability (VDI3441)		0.004mm (0.00016")
	A/C Axis positioning		+4 "
ATC & Tool Magazine	Tool magazine type		Flat-type tool magazine
	Tool change mode		Pick-up type
	Tool storage capacity		32 T
	Max. tool dia. w/ adjacent tool		Ø 75 mm (3")
	Max. tool dia. w/o adjacent tool		Ø125 mm (5")
	Max. tool length		350 mm (13.7")
	Max. tool weight		7 kg (15.4 lbs)
Floor space & System Requirement	Air capacity		6 kgf/cm²
	Power capacity		80 kVA
	Machine weight		20,000kg (44,092 lbs)
	Floor Space (L x W x H)		5,600 x 2,600 x 3,600 mm (220" x 102" x 141")
Miscellaneous	Controller		HEIDENHAIN TNC 640 (Opt. SIEMENS 840D)
	Cutting fluid capacity		750 L(198 gal)

※ All content is for reference only and may be subject to change without notice or obligation.



Grinding Machines | Grinding Machines | Turning Machines | Milling Machines

Headquarters

FALCON MACHINE TOOLS CO., LTD.

No. 34, Hsing Kong Road, Shang Kang, Chang Hua
TAIWAN 50971
Tel: +886 4 799 1126 Fax: +886 4 798 0011
www.chevalier.com.tw
overseas@chevalier.com.tw

U.S.A. Headquarters

CHEVALIER MACHINERY INC.

9925 Tabor Place, Santa Fe Springs, CA 90670 U.S.A.
Tel: (562) 903 1929 Fax: (562) 903 3959
www.chevalierusa.com
info@chevalierusa.com

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