



SIRIUS-UL⁺

High Precision 600mm Y-Axis Vertical Machining Center



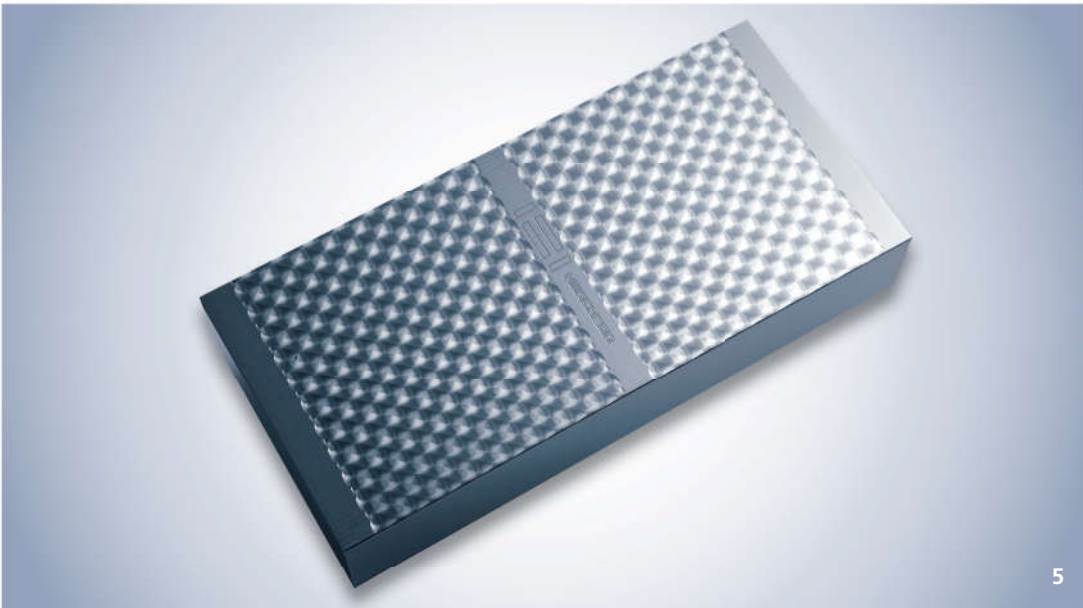
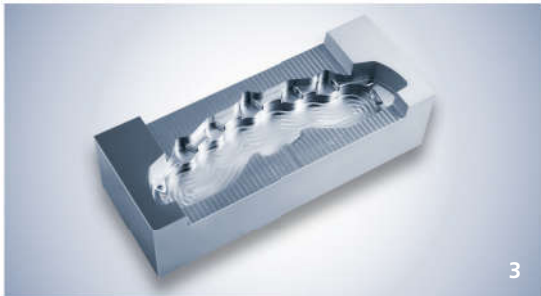


HIGH PRECISION 600mm Y-AXIS VERTICAL MACHINING CENTER

High-Precision Vertical Machining Center with Hard Roughing Capability

(New)SIRIUS-UL⁺ is a high-precision vertical machining center that boasts the world's best performance. Its powerful roughing and precise finish machining capabilities provide the best machining solution in terms of product quality.

1 Mold / Grill / KP4M 2 Motor Bike / Toy / NAK80 3 Break Calliper / Automobile / NAK80
4 LCD Back Cover(Cavity) / Home Appliances / NAK80 5 Surface Finishing / Automobile / NAK80



“HWACHEON PERFORMANCE LEAVES COMPETITION IN THE DUST- THIS IS THE BEST MACHINING CENTER YOU CAN GET, PERIOD.”

World's best precision machining center

(New) SIRIUS-UL⁺ is the best SIRIUS-UL⁺ Model yet.

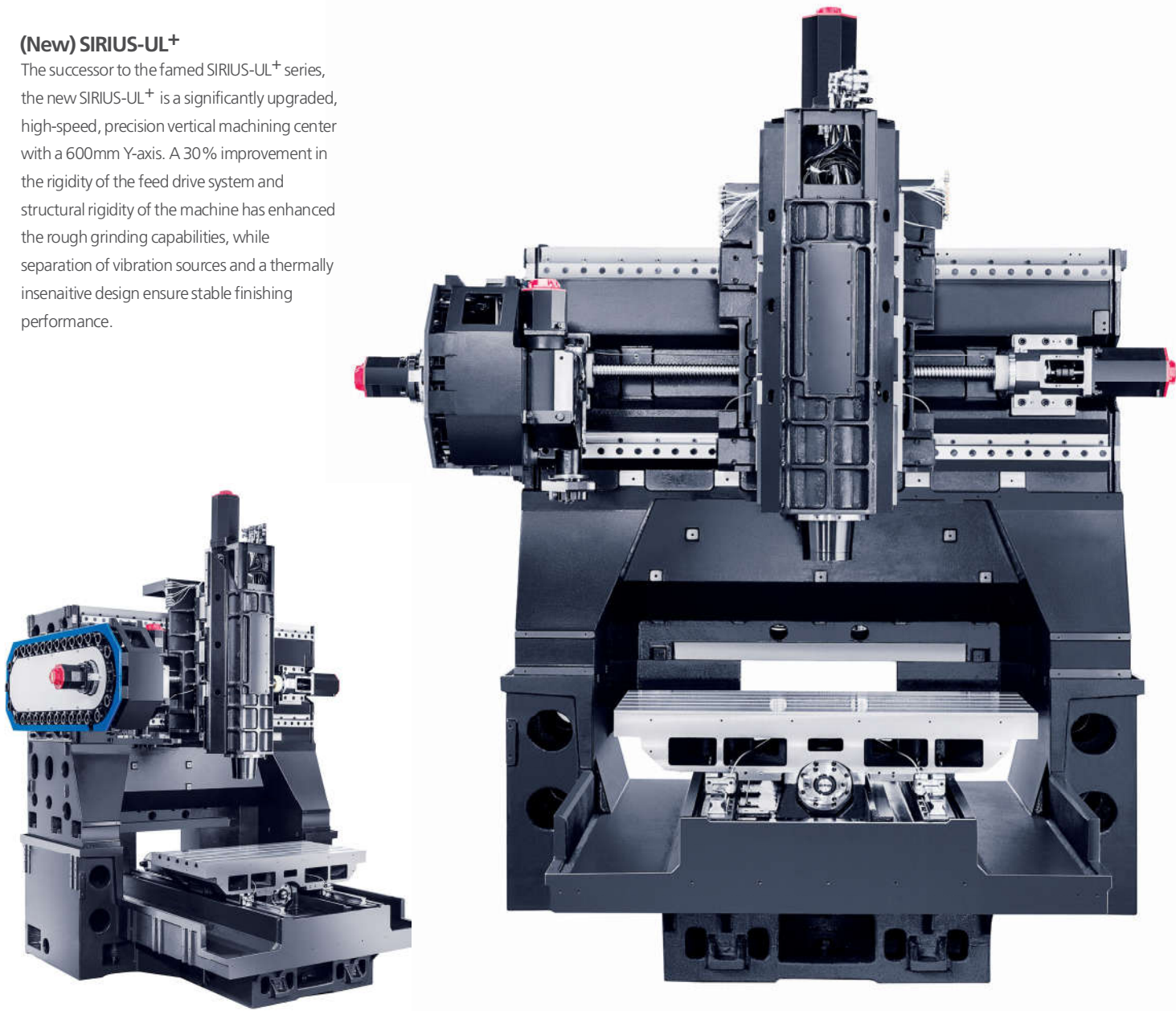
A long-time favorite and bestseller, SIRIUS-UL⁺, has been rejuvenated to present you with extraordinary perfection once again.

From the elegant design, superb machining performance, user convenience to a variety of extra features, (New)SIRIUS-UL⁺ doesn't miss a beat and delivers greater convenience and quality.



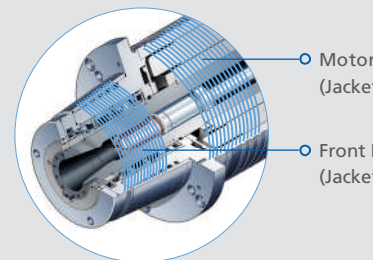
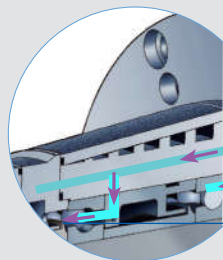
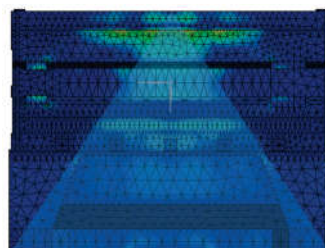
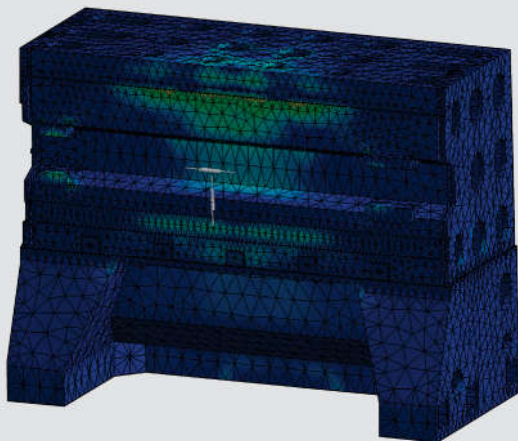
(New) SIRIUS-UL⁺

The successor to the famed SIRIUS-UL⁺ series, the new SIRIUS-UL⁺ is a significantly upgraded, high-speed, precision vertical machining center with a 600mm Y-axis. A 30% improvement in the rigidity of the feed drive system and structural rigidity of the machine has enhanced the rough grinding capabilities, while separation of vibration sources and a thermally insensitive design ensure stable finishing performance.

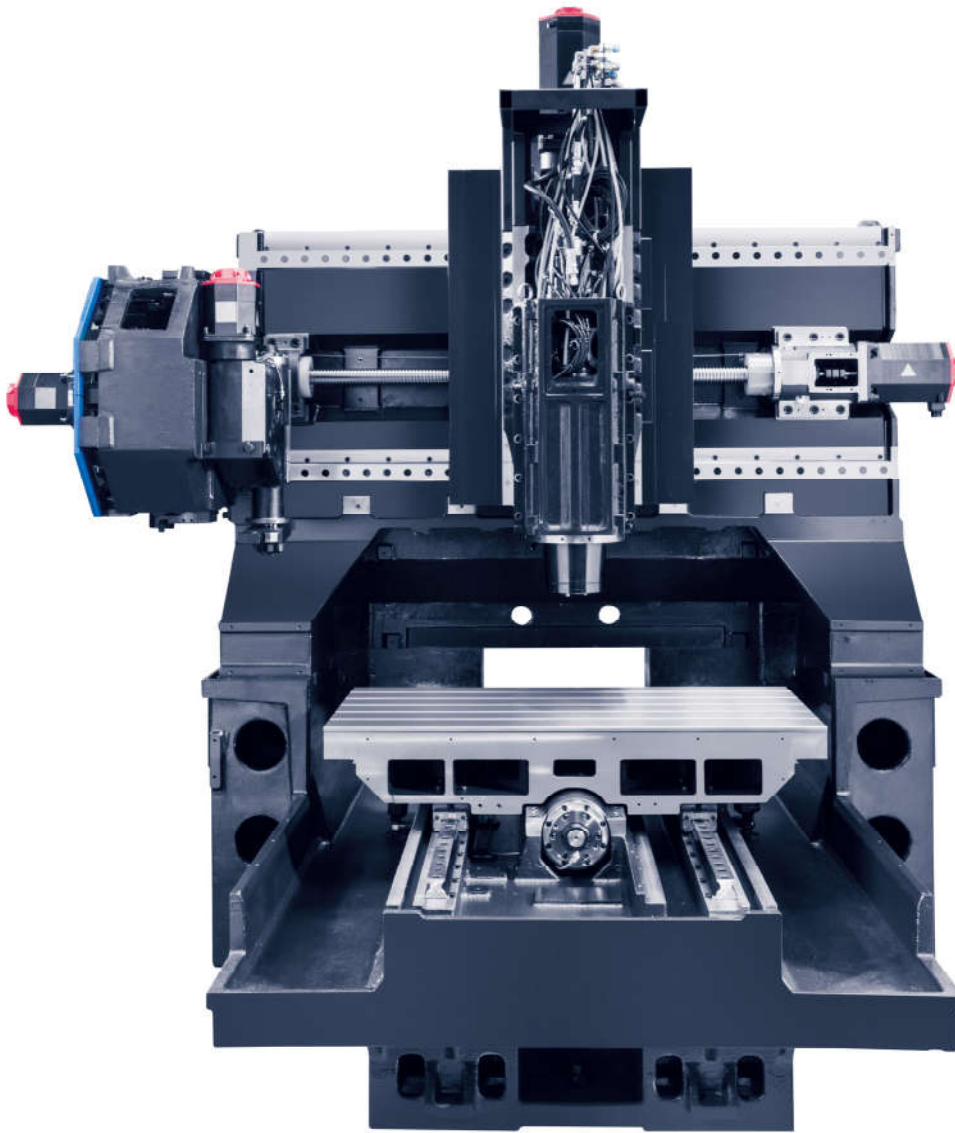


Optimized structural design through FEM analysis.

(New)SIRIUS-UL⁺ has an optimally-designed frame structure. Experience top quality, precise machining based on a powerful frame.



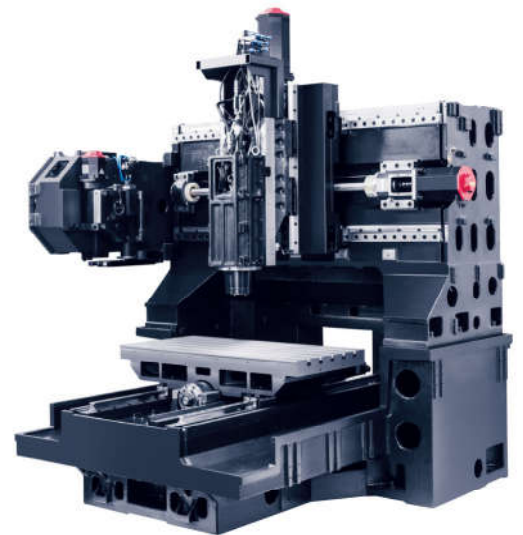
Motor
(Jack)
Front
(Jack)



(New) SIRIUS-UL⁺s

The new model is a high-precision vertical machining center that is more specialized than the previous SIRIUS-UL⁺ for high-quality, precision machining. A head structure that features a reduced overhang compared to the standard model realizes a low-centered, highly rigid structure, and minimizes machining performance variations caused by the height of the head.

Experience the same high quality of the previous SIRIUS-UL⁺ and even more powerful roughing performance.

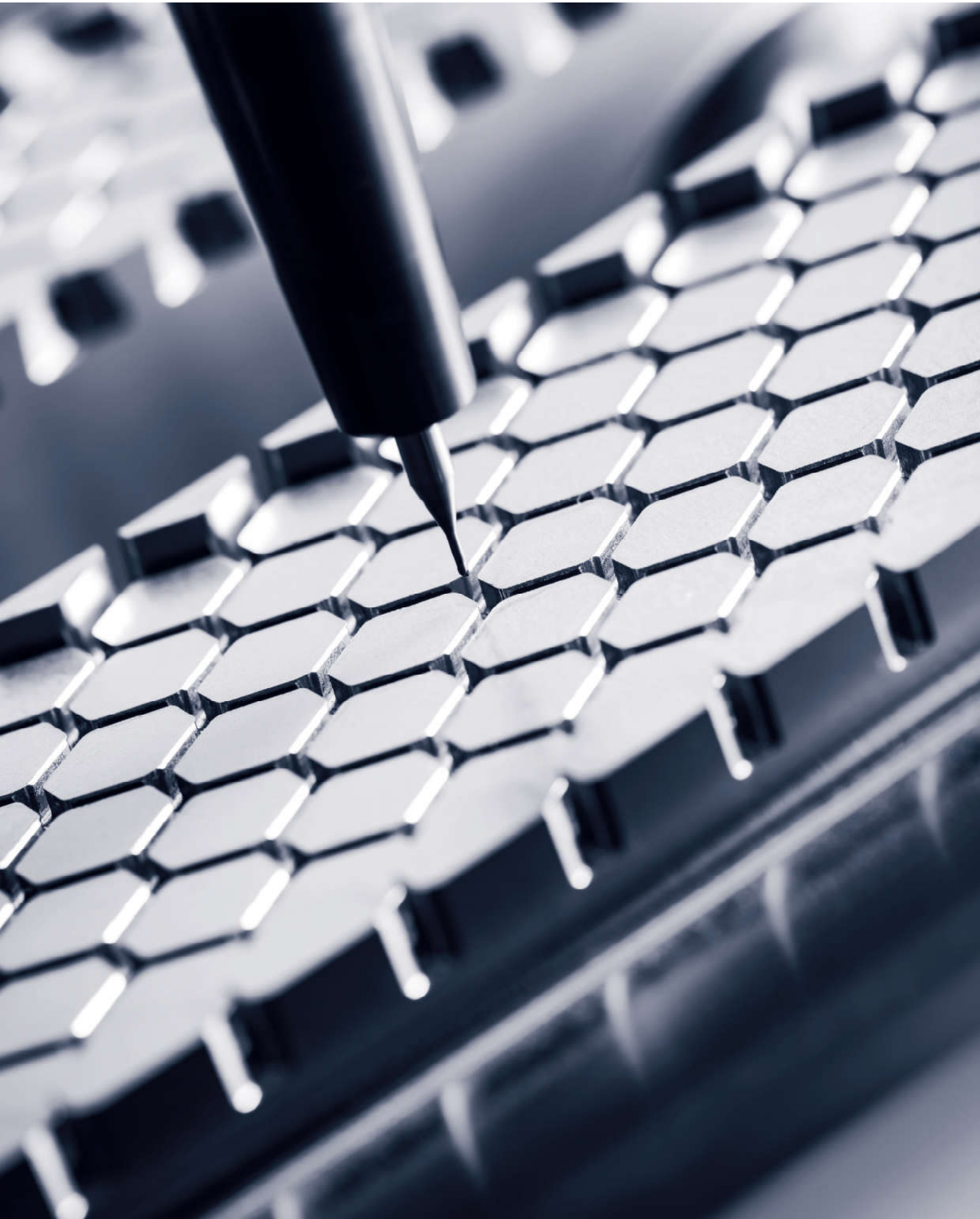


Spindle assembly

The Hwacheon clean room assembly facility, where the super-precision, super-speed spindle built inside SIRIUS-UL⁺ is manufactured, maintains optimal temperature and humidity, and is kept free of any foreign substances. Only the most skilled master engineers are allowed in the assembly facility, in the production of only the best equipment to comply with the toughest quality standard in the industry.

Oil-jet Cooling System

The jet of oil is injected directly onto the spindle bearing for effective cooling, and the motor and the spindle assembly are jacket-cooled to limit the displacement caused by heat.



MACHINING SOFTWARE

The Hwacheon Machining Software Components

The Hwacheon's developed machining software monitors different variables related to the work environment and machining conditions and makes adjustments for best quality results and optimum work efficiency.

RELIABILITY

HTDC (HSDC + HFDC)

Hwacheon Thermal Displacement Control System (HSDC + HFDC)

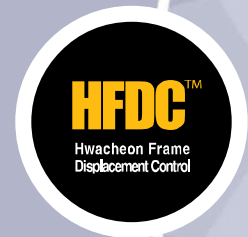
HTDC integrates the Hwacheon Spindle Displacement Control system and the Frame Displacement Control System.



HFDC

Hwacheon Frame Displacement Control System

HFDC is equipped with highly sensitive thermal sensors in the casting region where thermal activity is suspected; monitoring and correcting displacement.



HSDC

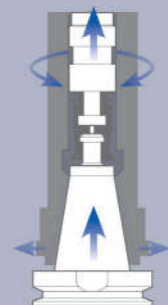
Hwacheon Spindle Displacement Control System

When the spindle rotates at high speed, the centrifugal force drives the taper to expand, causing errors in Z axis. HSDC constantly monitors the temperature at each spindle region and makes optimal prediction for thermal displacement. The system then makes necessary adjustments and effectively minimizing thermal displacement.



Static displacement compensation

The HSDC system corrects the Z-axis error occurring from the taper expansion during the spindle's high speed rotation.



PRECISION +



HTLD

Hwacheon Tool Load Detect System

HTLD constantly monitors the tool wear to prevent accidents, which may occur from a damaged tool and help to stop tool wear from deteriorating the workpiece.
(The load is measured every 8 msec to ensure accuracy)



HECC

Hwacheon High-Efficiency Contour Control System

HECC offers an easy-to-use programming interface for different work-pieces and different processing modes. The system provides a precise, custom contour control for the selected workpiece, while prolonging the life of the machine and decreasing process time. The customizable display provides real-time monitoring and quick access.



- Program offers different options for different cutting speed and accuracy for roughness and shapes.
- The customizable display provides real-time monitoring and quick, easy access.
- The program is executable on an existing NC DATA system and works with the G Code system.



OPTIMA

Cutting Feed Optimization System

OPTIMA utilizes an adaptive control method to regulate the feed rate in real time, to sustain the cutting load during a machining process. As a result the tools are less prone to damage and the machining time is reduced.



SPEED +

USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

User convenience, a variety of extra features

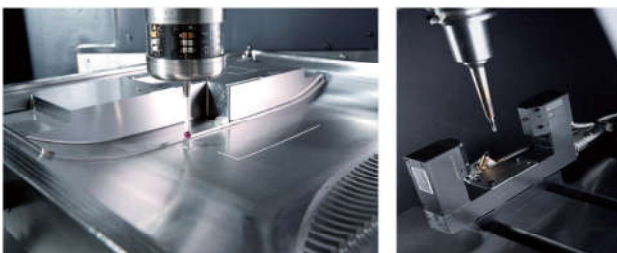
With a user-centric architecture, (New) SIRIUS-UL+ offers a user-friendly design and a variety of options. The standard options include lift-type screw conveyors, air/coolant gun and 3-color warning lamp.

These functions help operators concentrate fully on machining operations and work more safely and efficiently.

Based on Hwacheon's exceptional technological expertise, a wide range of options are available for upgrading performance, ensuring more powerful and precise results.

Auto measurement system (Option)

When the machine begins to work, the measurement system automatically measures the workpiece reference and the tool, and makes necessary adjustment. This system saves machining time and guarantees high quality result every time regardless of the machinist's skill and because the system constantly monitors the tools and the work -piece for any abnormality, potential machine-related accidents can be prevented. The system integrates perfectly with other equipment to make your automated production line more productive and efficient.



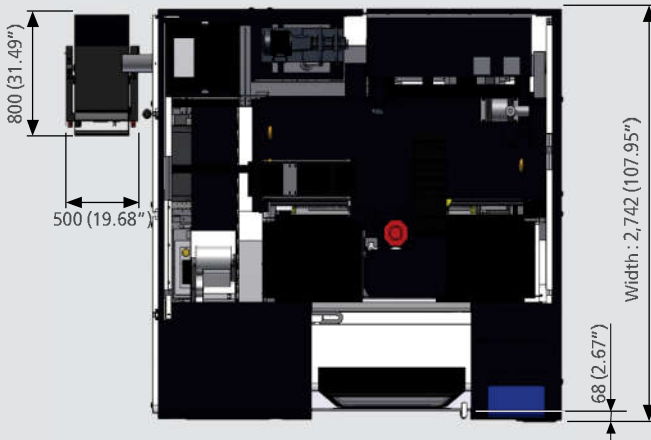
Enhanced table space utilization

Enhanced table space utilization by placing the tool measuring unit outside the processing area.

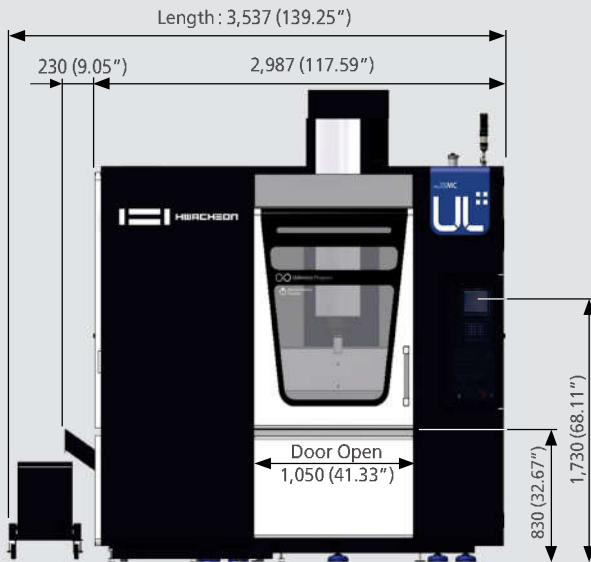


Product Data

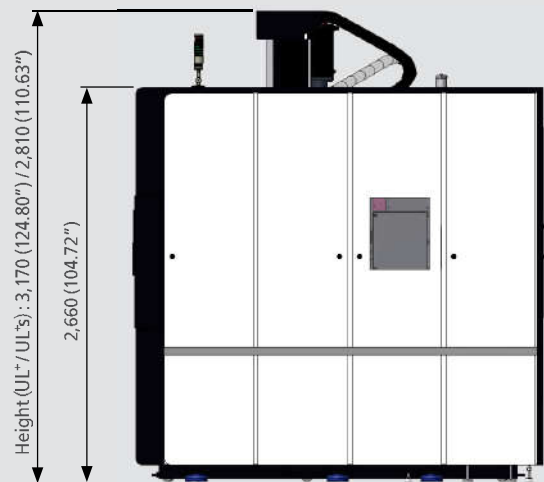
* Unit: mm(inch)



Top



Front

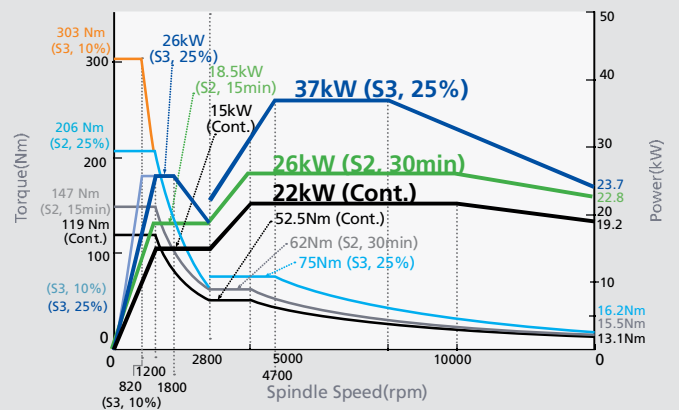
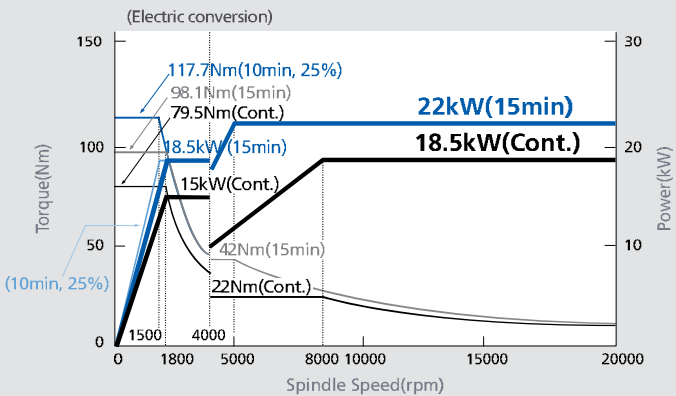


Right side

Spindle Power – Torque Diagram

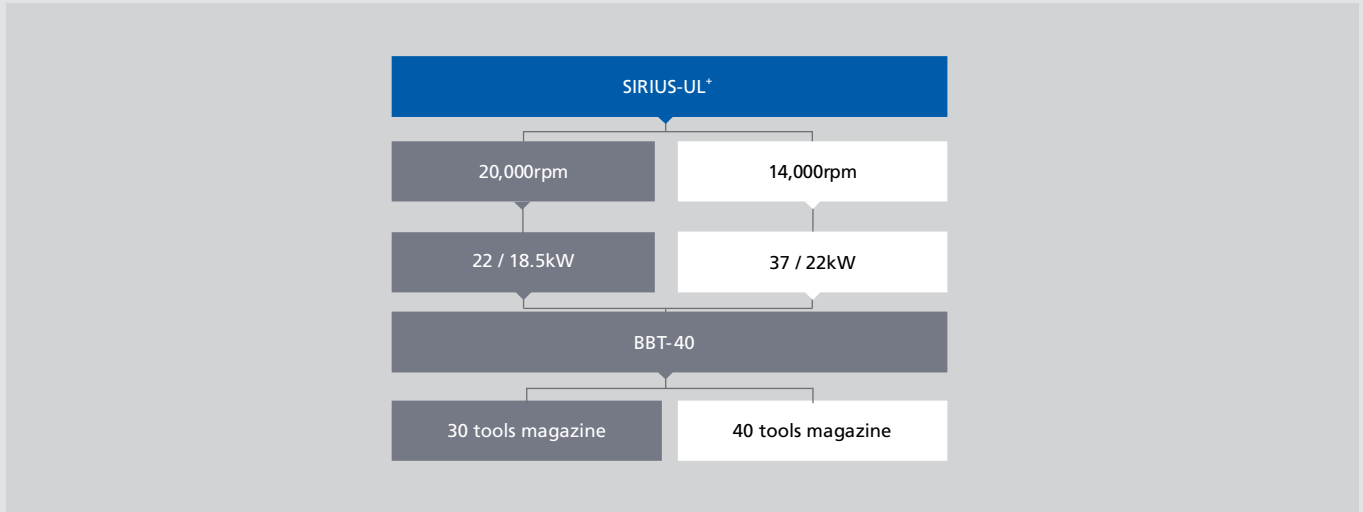
Standard (20,000rpm)

Option (14,000rpm)



Product Configuration

Each product can be configured to fit your application.



Machine Specifications

ITEM	SIRIUS-UL*		SIRIUS-UL*s		
	20,000	14,000	20,000	14,000	
Travel					
Stroke (X / Y)	mm(inch)	1,050 (41.34") / 600 (23.62")			
Stroke (Z)	mm(inch)	550 (21.65")		350 (13.78")	
Distance from Table Surface to Spindle Gauge Plane	mm(inch)	150 (5.91") ~ 700 (27.56")		120 (4.72") ~ 470 (18.50")	
Table					
Working Surface (W x L)	mm(inch)	1,200 (47.24") x 600 (23.62")			
Table Loading Capacity	kg,(lb _r)	800 (1,764)			
Table Surface Configuration (T slots WxP – No. of slots)	mm(inch)	18 x 100 (0.71" x 3.94") - 5ea			
Spindle					
Max. Spindle Speed	rpm	20,000	14,000	20,000	14,000
Spindle Motor	kW(HP)	22 / 18.5 (30 / 25)	37 / 22 (50 / 30)	22 / 18.5 (30 / 25)	37 / 22 (50 / 30)
Feedrate					
Rapid Speed (X / Y / Z)	m/min(ipm)	36 (1,417) / 36 (1,417) / 36 (1,417)		30 (1,181) / 30 (1,181) / 30 (1,181)	
Feedrate (X / Y / Z)	mm/min(ipm)	1 ~ 24,000 (0.04 ~ 945)			
ATC					
Type of Tool Shank	-	MAS-403 BBT-40 (Opt.: CAT-40, HSK-A63)			
Type of Pull Stud	-	MAS P40T-1 (45°)			
Tool Storage Capacity	ea	30 (Opt. : 40)			
Max. Tool Diameter [With / Without Adjacent Tools]	mm(inch)	Ø90 (3.54") / Ø170 (6.69")			
Max. Tool Length	mm(inch)	300 (11.81")		250 (9.84")	
Max. Tool Weight	kg,(lb _r)	8 (17.64)			
Motor					
Feed Motor (X / Y / Z)	kW(HP)	4.0 (5.4) / 4.0 (5.4) / 7.0 (9.4)			
Coolant Motor (Spindle / Chip Flushing / Coolant Gun)	kW(HP)	0.75 (1.0) / 0.4 (0.54) / 0.6 (0.80)			
Spindle Cooler (50 / 60Hz) – Inverter Type	kW(HP)	5.0 / 5.6 (6.7 / 7.5)			
Power Source					
Electric Power Supply	kVA	55			
Compressed Air Supply (Pressure X Consumption)	-	0.5 ~ 0.7MPa x 690Nℓ/min			
Tank Capacity					
Spindle Cooling / Lubrication / Coolant	ℓ (gal)	40 (10.57) / 12 (3.17) / 430 (113.59)			
Machine Size					
Height	mm(inch)	3,170 (124.80")		2,810 (110.63")	
Floor Space (Length x Width)	mm(inch)	3,537 (139.25") x 2,742 (107.95")			
Weight	kg,(lb _r)	11,800 (26,014)		11,500 (25,353)	
NC Controller		Fanuc 31i-B			

Standard and Optional Product Components

Standard Accessories		Optional Accessories	
• Adjust Bolt & Block	• Screw Chip Conveyor (1ea)	• Auto Door	• Workpiece Measuring System
• Air Blower	• Signal Lamp (R / G / Y, 3 Color)	• Data Server (1,024MB)	-Renishaw / Blum (Touch Type)
• Air Dryer	• Spindle Cooler	• Linear Scale (X / Y / Z)	• 40 tools magazine
• Air Gun	• Tool Box	• Manual Guide i	• 4-axis Interface
• Base Around Splash Guard	• Workpiece Coordinate System (48ea)	• Mist Collector	• Hwacheon Artificial Intelligence
• Coil Conveyor (2ea)	• Work Light	• MPG Handle (3ea)	System(HAI): 600/1000 Block
• Coolant Gun	• 10.4" Color LCD	• Nano Smoothing Interpolation	
• Coolant / Lubrication System	• Hwacheon Efficient Contour Control System (HECC)	• NURBS Interpolation	
• Data Server (256MB)	• Hwacheon Tool Load Detect System (HTLD)	• Oil Mist (Semi Dry Cutting System)	
• Data Server Interface	• Hwacheon Thermal Displacement Control System (HTDC)	• Oil Skimmer	
• Door Interlock	• Hwacheon Artificial Intelligence Control System(HAI): 200 Block	• Spindle Through Coolant (30bar, 70bar)	
• MPG Handle (1ea)	• Cutting Feed Optimization System (OPTIMA)	• Tool Life Management	
• Operation Manual & Parts List		• Tool Measuring System-Renishaw /Blum (Touch Type, Laser Type)	
• Pneumatics System		• Transformer	
• Rigid Tapping			

NC Specifications [Fanuc 31i-B]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION		ITEM	SPECIFICATION	
Controlled axis			Automatic corner override		O
Controlled axis	3 - Axes	S	Feedrate clamp based on arc radius		S
Controlled axis	5 - Axes(Max.)	O	Scaling		O
Simultaneously controlled axes	3 - Axes	S	Coordinate system rotation		S
Simultaneously controlled axes	4 - Axes(Max.)	O	Programmable Mirror Image		O
Least input increment	0.001mm, 0.001deg, 0.0001inch	-	Tape format for Fanuc series 15		O
Least input increment 1 / 10	0.0001mm, 0.0001deg, 0.00001inch	S	Manual Guide i		O
inch/metric conversion	G20, G21	S	Spindle speed function		
Store Stroke Check 1 / 2		S	Spindle override	50 - 120%	S
Mirror Image		S	Spindle orientation		S
Operation			Rigid tapping		S
Automatic & MDI operation		S	Tool function / compensation		
DNC operation by memory card	PCMCIA card is required	S	Tool function	T4 Digits	S
Dry Run, Single Block		S	Tool offset pairs	±6 Digits 200ea	S
Manual handle feed / feed rate	1Unit / x1, x10, x100	S	Tool offset pairs	±6 Digits 400ea, 999ea	O
Interpolation function			Tool offset memory C		S
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02,G03 / G04	S	Tool length compensation / Cutter compensation C		S
Cylindrical interpolation	4 - axis interface option is required	O	Tool life management		O
Helical interpolation	Circular interpolation plus max.2axis linear interpolation	S	Tool length measurement		S
Nano Smoothing		O	Editing operation		
Reference position return check / return	G27 / G28, G29	S	Part program storage length / Number of register able programs	256kB / 500ea	S
2nd reference position return / Skip	G30 / G31	S	Part program storage length / Number of register able programs	512kB / 1,000ea 1MB / 1,000ea, 2MB / 1,000ea	O
NURBS interpolation		O	Background editing / Extended part program editing		S
Feed function			Play Back		O
Rapid traverse override	F0, F25, F50, F100	S	Setting and display		
Feedrate (mm/min)		S	Display unit	10.4" Color LCD	S
Feedrate override	0 ~ 150%	S	Clock function		S
Jog feed override	0 ~ 4,000mm/min	S	Self-diagnosis function / Alarm history display		S
Override cancel	M48, M49	S	Help function / Graphic function		S
Program input			Run hour and parts count display		S
Optional block skip	1ea	S	Dynamic graphic display		O
Program number search	O4 - Digits	S	Multi-language display	English, German, French, Italian, Chinese, Spanish, Korean, Russian, Portuguese, Polish, Hungarian, Swedish	S
Sequence number	N8 - Digits	S	Data input/output		
Decimal point programming		S	Reader / Puncher interface CH1	RS232C	S
Coordinate system setting	G92	S	Data server	256MB	S
Workpiece coordinate system	G54 - G59	S	Data server	1,024MB	O
Workpiece coordinate system preset		O	Ethernet Interface		S
Addition of workpiece coordinate pair	48ea	S	Memory card / USB interface		S
Addition of workpiece coordinate pair	300ea	O	Auto Data Backup	SRAM + Part Program	S
Manual absolute on and off		S	HWACHEON Machining Software		
Chamfering / corner R		S	Hwacheon Artificial Intelligence Control System (HAI) 200 Block		S
Programmable data input	G10	S	Hwacheon Artificial Intelligence Control System (HAI) 600 / 1000 Block		O
Sub program call	10 folds nested	S	Hwacheon Tool Load Detect System (HTLD)		S
Custom Macro B		S	Cutting Feed Optimization System (OPTIMA)		S
Addition of custom macro common variables	#100 - #199, #500 - #999	O	Hwacheon Thermal Displacement Control System (HTDC)		S
Canned Cycles for Drilling		S	Hwacheon Efficient Contour Control System(HECC)		S
Small-hole peck drilling cycle		O			
Polar Coordinate System		O			
Program Restart		O			

Hwacheon Global Network

 Hwacheon Headquarters  Hwacheon Europe  Hwacheon Asia  Hwacheon America



HWACHEON

Please call us for product inquiries.

www.hwacheon.com

The product design and specifications may change without prior notice.
Read the operation manual carefully and thoroughly before operating the product,
and always follow the safety instructions and warnings labels attached on the surfaces of the machines.

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