SIRIUS-UL+

High Precision 600mm Y-Axis Vertical Machining Center

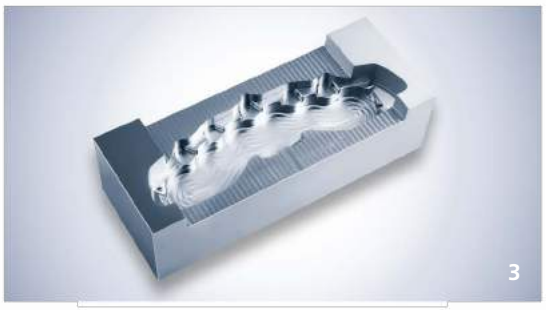
HWACHEON

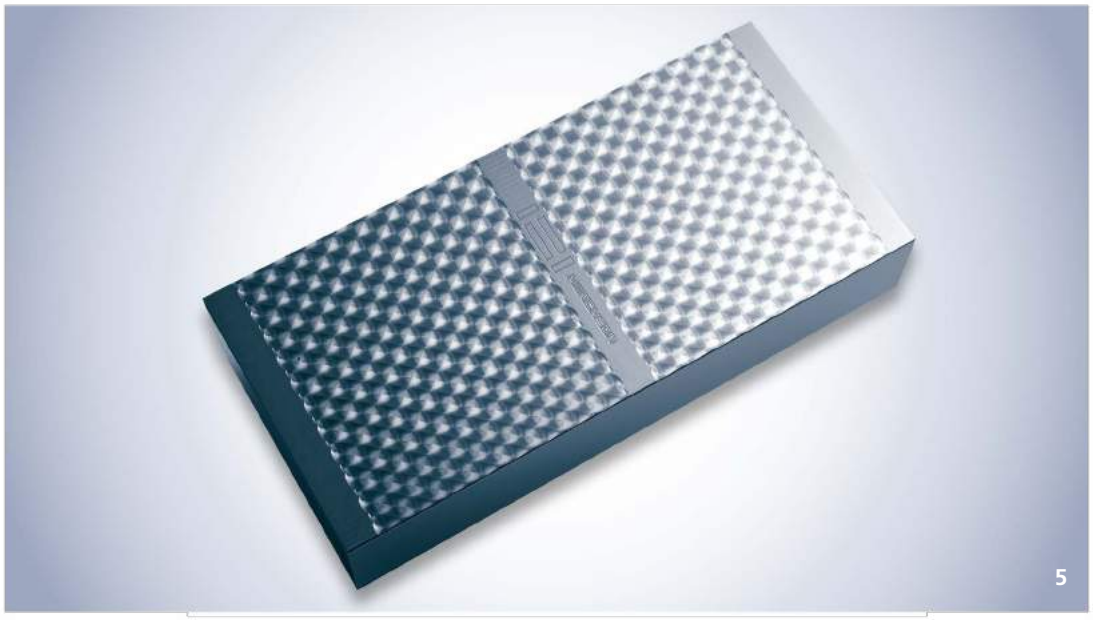
HIGH PRECISION 600mm Y-AXIS VERTICAL MACHINING CENTER

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."

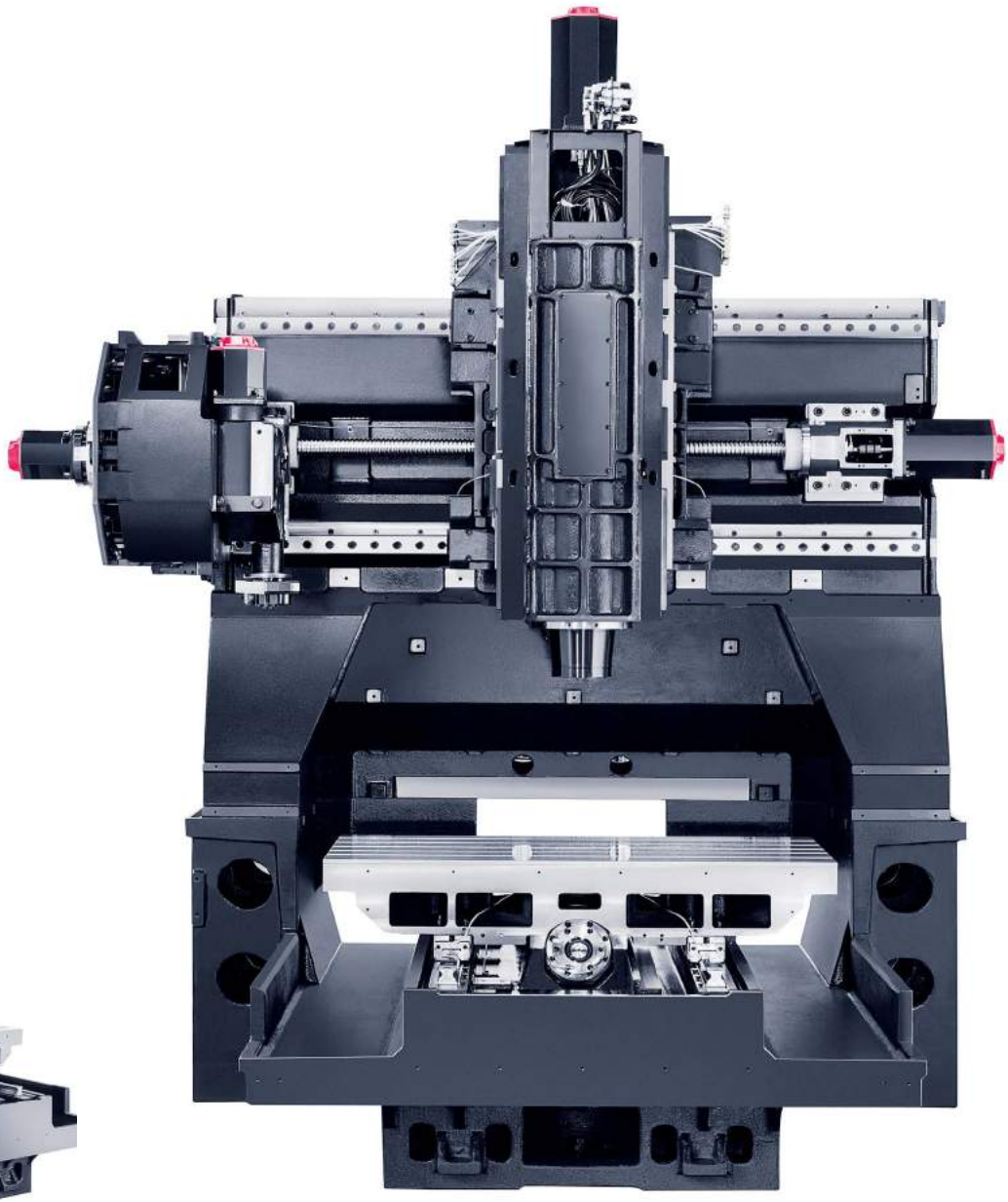
World's best precision machining center

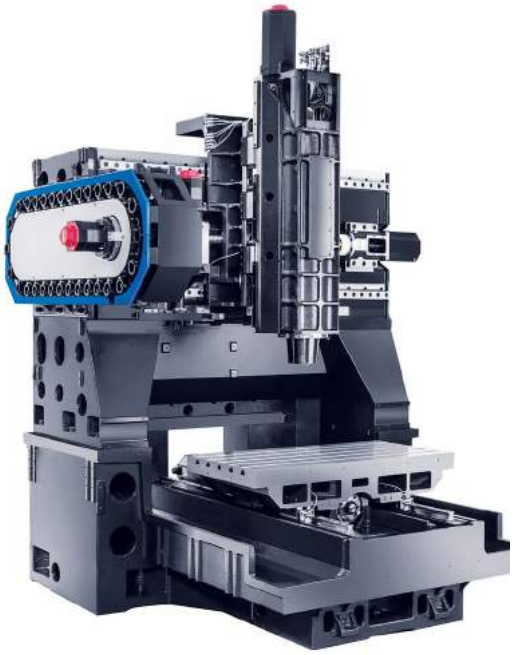
(New) SIRIUS-UL+ is the best SIRIUS-UL+ Model yet.

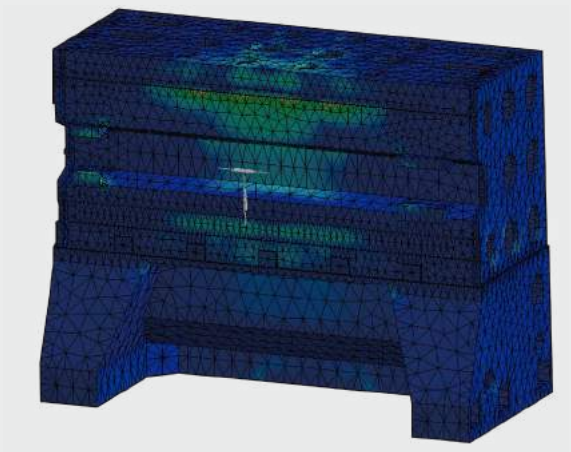
A long- time favorite and bestseller, SIRIUS-UL+, has been rejuvenated to present you with extraordinary perfection once again.

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.

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 insenaitive design ensure stable finishing performance.

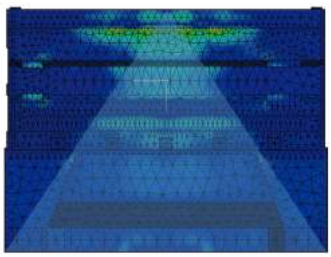


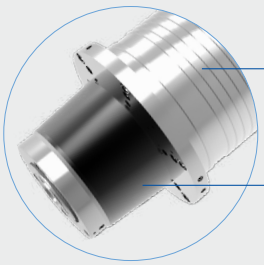


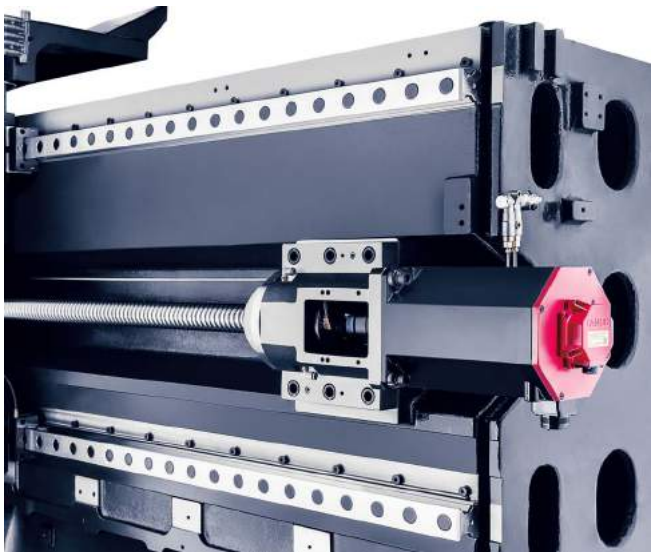


Optimized structural design through FEM analysis.

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





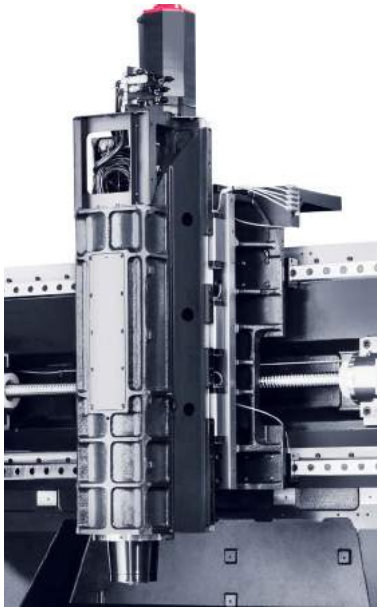


Excellent performance in Roughing machining

Increase the stiffness of the X-axis by expanding the X axis LM Guide

Improved X-axis stiffness and precision

The rigidity of the driveline element such as ball screw, bracket, and frame is strengthened to precise feed is possible

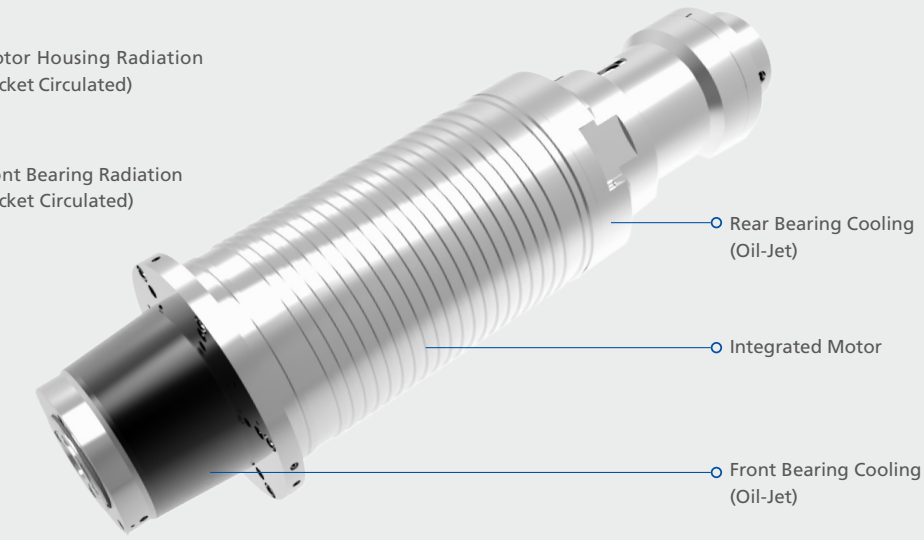


Meeting the customer's machining purposes

Various Specifications for Direct-Coupled Spindles

	Max Spindle Speed rpm		Spindle Motor kW	Max Torque Nm
BBT-40 (HSK-A63)	20,000	Regular Type	22	117.7
		CTS (OPT)		
	12,000 (OPT)	Regular Type	22	117.7
		CTS (OPT)		
	14,000 (OPT)	Regular Type	37	303
		CTS (OPT)		
HSK-A63	24,000 (OPT)	Regular Type	37	221
		CTS (OPT)		

* For 24,000 rpm, The tool type is only used 'HSK-A63'.

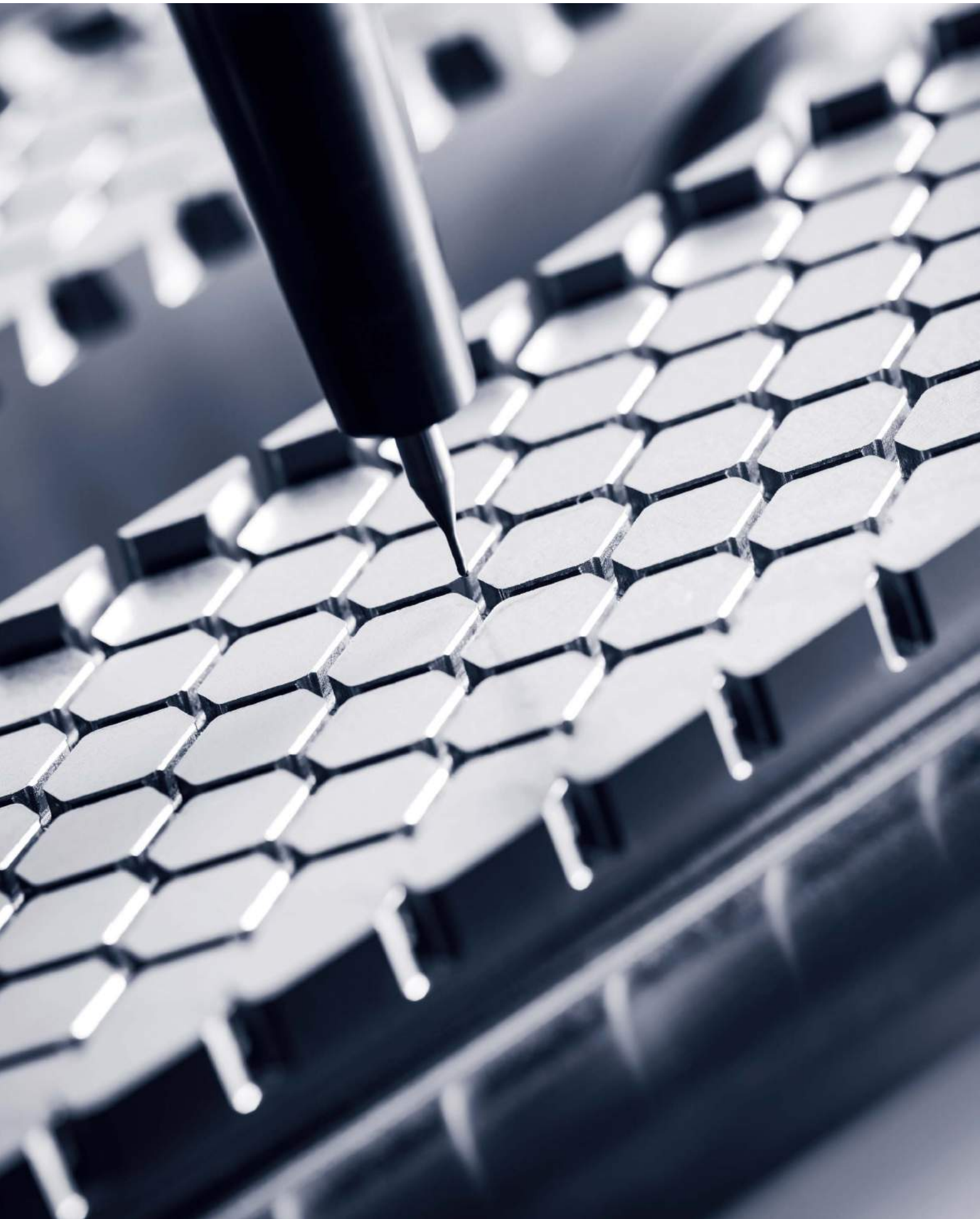


Spindle assembly

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

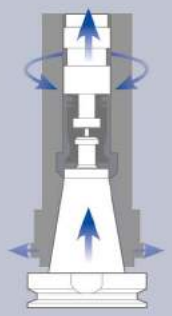
Hwacheon Frame Displacement Control System

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 occuring 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)

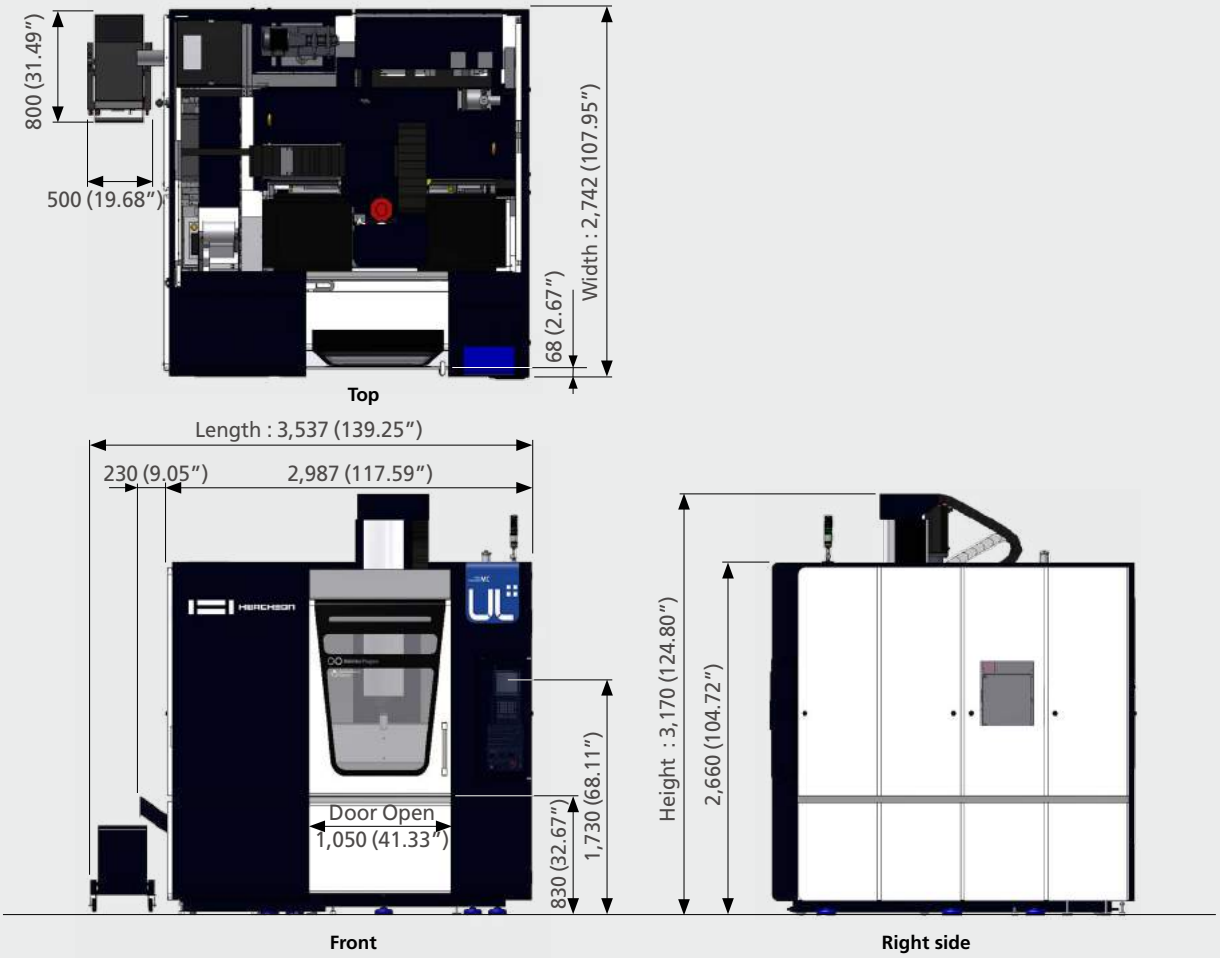
When the machine begins to work, the measurement system automatically measures the workpiece reference and the tool, and makes necessary adjustment. This system saves machining time and guarantees high quality result every time regardless of the machinist's skill and because the system constantly monitors 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.

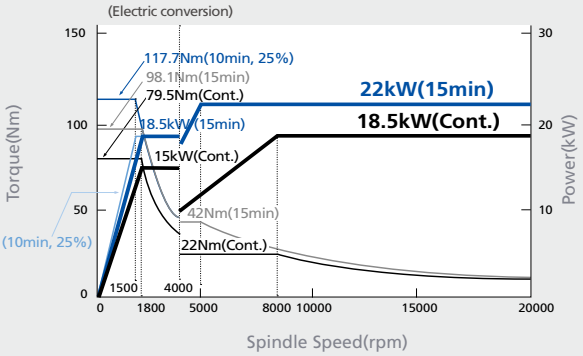
Product Data

* Unit: mm(inch)

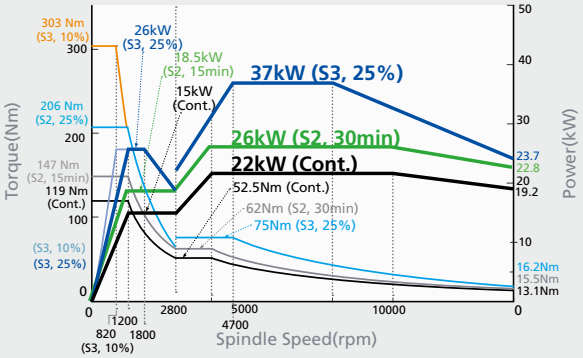


Spindle Power – Torque Diagram

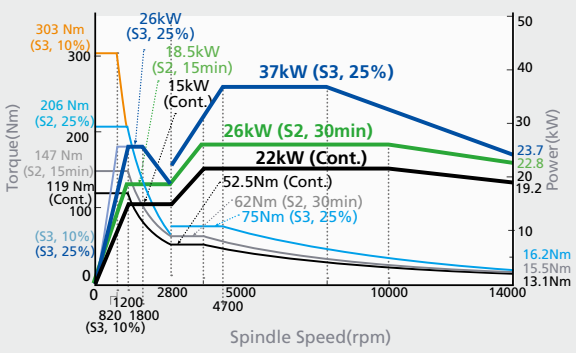
Standard (20,000rpm)



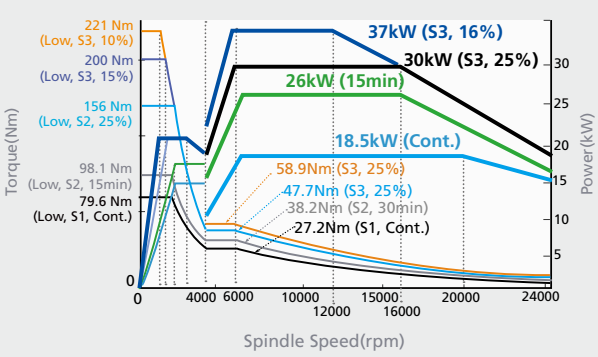
Option (14,000rpm)



Option (14,000rpm)

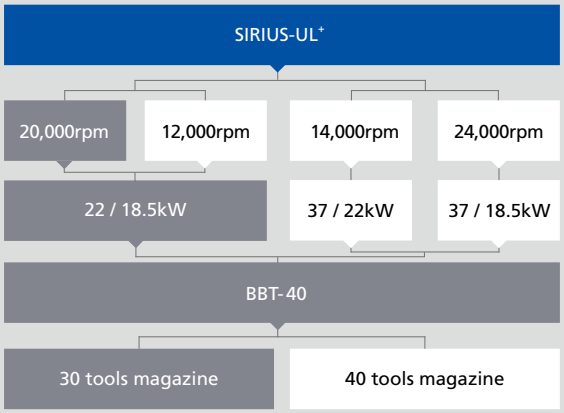


Option (24,000rpm)



Product Configuration

Each product can be configured to fit your application.



Machine Specifications

ITEM		SIRIUS-UL+			
		20,000	12,000	14,000	24,000
Travel					
Stroke (X / Y / Z)	mm(inch)	1,050 (41.34") / 600 (23.62") / 550 (21.65")			
Distance from Table Surface to Spindle Gauge Plane	mm(inch)	150 (5.91") ~ 700 (27.56")			
Table					
Working Surface (W x L)	mm(inch)	1,200 (47.24") x 600 (23.62")			
Table Loading Capacity	$kg_f(lb_f)$	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	12,000	14,000	24,000
Spindle Motor	kW(HP)	22 / 18.5 (30 / 25)		37 / 22 (49 / 29)	37 / 18.5 (49 / 25)
Feedrate					
Rapid Speed (X / Y / Z)	m/min(ipm)	36 (1,417) / 36 (1,417) / 36 (1,417)			
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")			
Max. Tool Weight	$kg_f(lb_f)$	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 / Coolant Gun)	kW(HP)	0.75 (1.0) / 0.75 (1.0)			
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")			
Floor Space (Length x Width)	mm(inch)	3,537 (139.25") x 2,742 (107.95")			
Weight	$kg_f(lb_f)$	11,800 (26,014)			
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)	• CTS (3MPa, 7Mpa)	-Renishaw / Blum (Touch Type)
• Air Dryer	• Spindle Cooler	• Data Server (1,024MB)	• 40 tools magazine
• Air Gun	• Tool Box	• Linear Scale (X / Y / Z)	• 4-axis Interface
• Base Around Splash Guard	• Workpiece Coordinate System (48ea)	• Manual Guide i	• Hwacheon Artificial Intelligence
• Coil Conveyor (2ea)	• Work Light	• Mist Collector	System(HAI): 600/1000 Block
• Coolant Gun	• 10.4" Color LCD	• MPG Handle (3ea)	
• Coolant / Lubrication System	• Hwacheon Efficient Contour Control	• Nano Smoothing Interpolation	
• Data Server (256MB)	System (HECC)	• NURBS Interpolation	
• Data Server Interface	• Hwacheon Tool Load Detect System (HTLD)	• Oil Mist (Semi Dry Cutting System)	
• Door Interlock	• Hwacheon Thermal Displacement	• Oil Skimmer	
• MPG Handle (1ea)	Control System (HTDC)	• Tool Life Management	
• Operation Manual & Parts List	• Hwacheon Artificial Intelligence Control	• Tool Measuring System-Renishaw /Blum	
• Pneumatics System	System(HAI): 200 Block	(Touch Type, Laser Type)	
• Rigid Tapping	• Cutting Feed Optimization System (OPTIMA)	• Transformer	

NC Specifications [Fanuc 31i-B]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION	
Controlled axis		
Controlled axis	3 - Axes	S
Controlled axis	5 - Axes(Max.)	O
Simultaneously controlled axes	3 - Axes	S
Simultaneously controlled axes	4 - Axes(Max.)	O
Least input increment	0.001mm, 0.001deg, 0.0001inch	-
Least input increment 1 / 10	0.0001mm, 0.0001deg, 0.00001inch	S
inch/metric conversion	G20, G21	S
Store Stroke Check 1 / 2		S
Mirror Image		S
Operation		
Automatic & MDI operation		S
DNC operation by memory card	PCMCIA card is required	S
Dry Run, Single Block		S
Manual handle feed / feed rate	1Unit / x1, x10, x100	S
Interpolation function		
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02,G03 / G04	S
Cylindrical interpolation	4 - axis interface option is required	O
Helical interpolation	Circular interpolation plus max.2axis linear interpolation	S
Nano Smoothing		O
Reference position return check / return	G27 / G28, G29	S
2nd reference position return / Skip	G30 / G31	S
NURBS interpolation		O
Feed function		
Rapid traverse override	F0, F25, F50, F100	S
Feedrate (mm/min)		S
Feedrate override	0 ~ 150%	S
Jog feed override	0 ~ 4,000mm/min	S
Override cancel	M48, M49	S
Program input		
Optional block skip	1ea	S
Program number search	O4 - Digits	S
Sequence number	N8 - Digits	S
Decimal point programming		S
Coordinate system setting	G92	S
Workpiece coordinate system	G54 - G59	S
Workpiece coordinate system preset		O
Addition of workpiece coordinate pair	48ea	S
Addition of workpiece coordinate pair	300ea	O
Manual absolute on and off		S
Chamfering / corner R		S
Programmable data input	G10	S
Sub program call	10 folds nested	S
Custom Macro B		S
Addition of custom macro common variables	#100 - #199, #500 - #999	O
Canned Cycles for Drilling		S
Small-hole peck drilling cycle		O
Polar Coordinate System		O
Program Restart		O

ITEM	SPECIFICATION	
Automatic corner override		O
Feedrate clamp based on arc radius		S
Scaling		O
Coordinate system rotation		S
Programmable Mirror Image		O
Tape format for Fanuc series 15		O
Manual Guide i		O
Spindle speed function		
Spindle override	50 - 120%	S
Spindle orientation		S
Rigid tapping		S
Tool function / compensation		
Tool function	T4 Digits	S
Tool offset pairs	±6 Digits 200ea	S
Tool offset pairs	±6 Digits 400ea, 999ea	O
Tool offset memory C		S
Tool length compensation / Cutter compensation C		S
Tool life management		O
Tool length measurement		S
Editing operation		
Part program storage length / Number of register able programs	256kB / 500ea	S
Part program storage length / Number of register able programs	512kB / 1,000ea 1MB / 1,000ea, 2MB / 1,000ea	O
Background editing / Extended part program editing		S
Play Back		O
Setting and display		
Display unit	10.4" Color LCD	S
Clock function		S
Self-diagnosis function / Alarm history display		S
Help function / Graphic function		S
Run hour and parts count display		S
Dynamic graphic display		O
Multi-language display	English, German, French, Italian, Chinese, Spanish, Korean, Russian Portuguese, Polish, Hungarian, Swedish	S
Data input / output		
Reader / Puncher interface CH1	RS232C	S
Data server	256MB	S
Data server	1,024MB	O
Ethernet Interface		S
Memory card / USB interface		S
Auto Data Backup	SRAM + Part Program	S
HWACHEON Machining Software		
Hwacheon Artificial Intelligence Control System (HAI) 200 Block		S
Hwacheon Artificial Intelligence Control System (HAI) 600 / 1000 Block		O
Hwacheon Tool Load Detect System (HTLD)		S
Cutting Feed Optimization System (OPTIMA)		S
Hwacheon Thermal Displacement Control System (HTDC)		S
Hwacheon Efficient Contour Control System(HECC)		S

Hwacheon Global Network

Hwacheon Headquarters Hwacheon Europe Hwacheon Asia Hwacheon America

HWACHEON

Please contact 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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HC-M294-R2.2-201711