



SIRIUS-UX

High Speed Vertical Machining Center for
Die and Mold with Y-Axis of 750mm





HIGH SPEED 750mm Y-AXIS VERTICAL MACHINING CENTER FOR DIE AND MOLD APPLICATION

The winning choice for your Die and Mold application

Ideal for high-quality die and mold manufacturing, SIRIUS-UX vertical machining center gives you a total solution from tool selection to product completion.

1 Automobile transmission cover (AL) 2 Wheel cavity for a washing machine (KP4M)
3 Automotive wheel (NAK80) 4 43-inch LCD TV Back cover (KP4M)

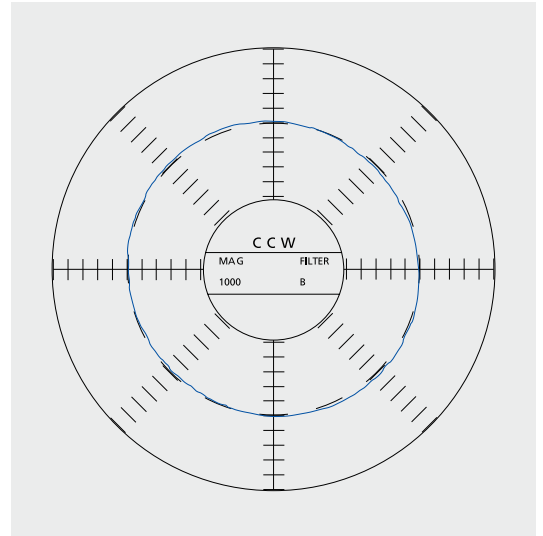
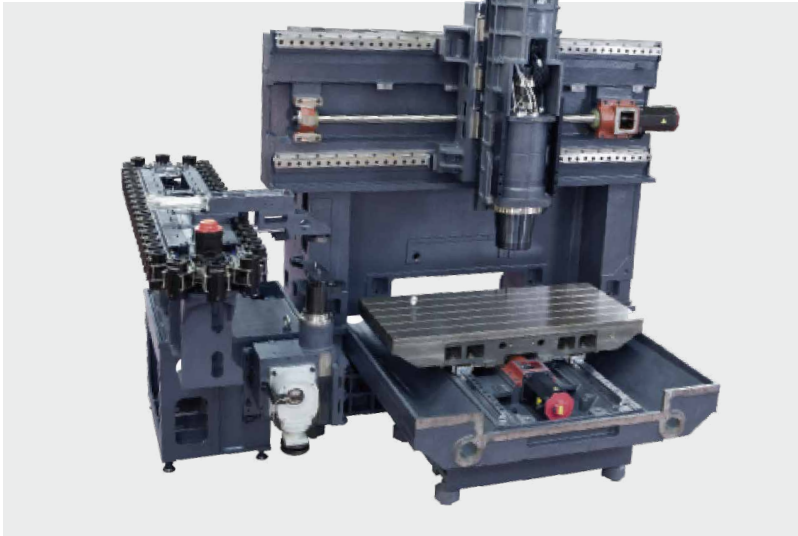


PRECISION 3-AXIS MACHINING CENTER FOR LARGE-SIZE DIE AND MOLD

Equipped with Hwacheon's advanced technology and craftsmanship, SIRIUS-UX is the class-leading machining center that will guarantee you the quality you seek for any product you need to manufacture.

The Hwacheon made spindle used in SIRIUS-UX incorporates Oil-Jet cooling system to ensure best and highest quality result even after hours of operation, Hwacheon's total solution provides everything from tool selection to product completion. SIRIUS-UX employs FEM analysis and 3D design to provide the most stable and accurate vertical machining center in the market. Hwacheon's machining software components and a wide selection of options and convenient features will help you to be highly productive and efficient.





Symmetrical Designed Structure For Extra High Stability

The symmetrical designed structure is the ideal design for distributing vibration, the upper weight and the heat evenly throughout the entire frame. This characteristic helps the machine to maintain its feed precision after hours of machining; the distance between the X-axis feed system and the contact point of the tool has been minimized to enhance the overall rigidity and machining precision.

Roundness: $5\mu\text{m}$ (DBB measured)

Positioning accuracy: $4\mu\text{m}$

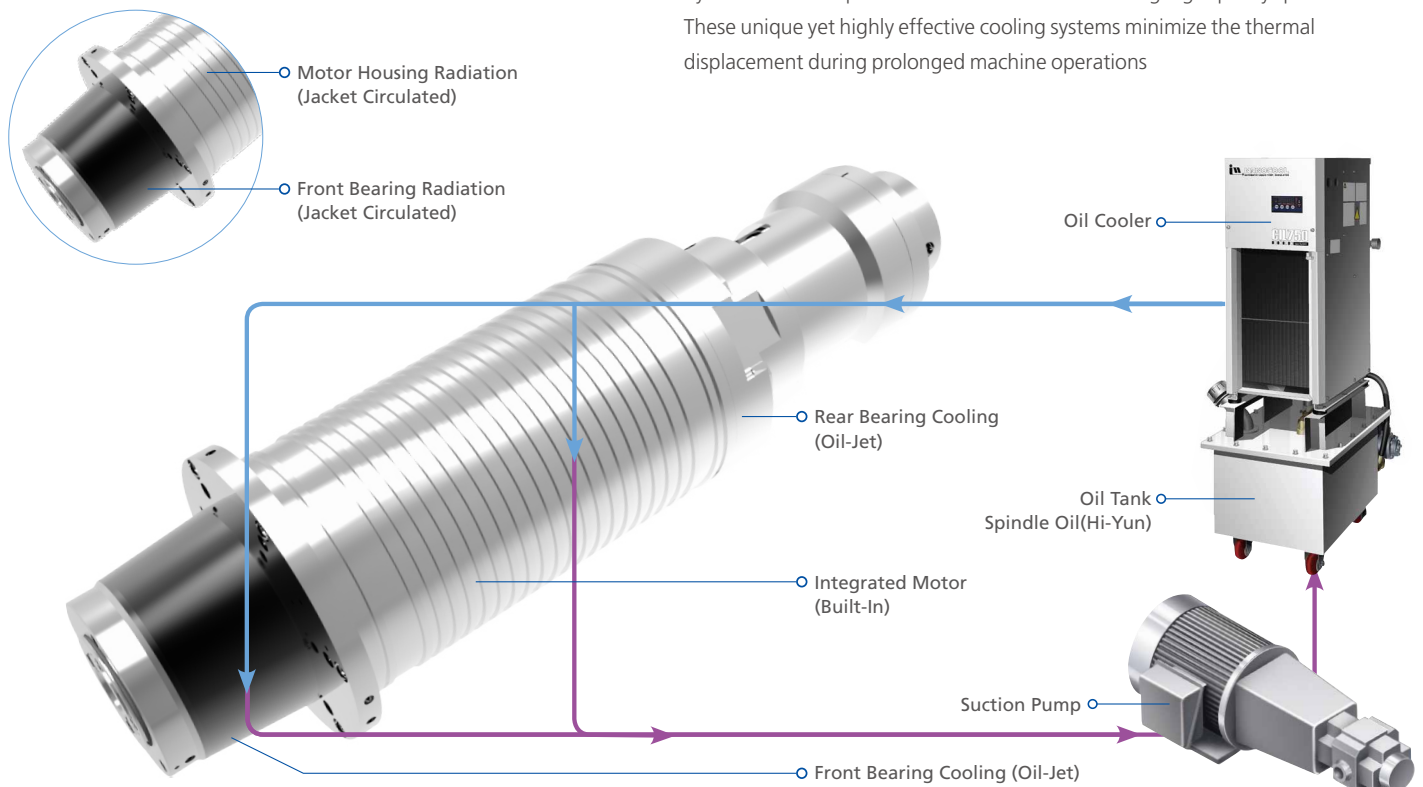
Repeatability: $3\mu\text{m}$

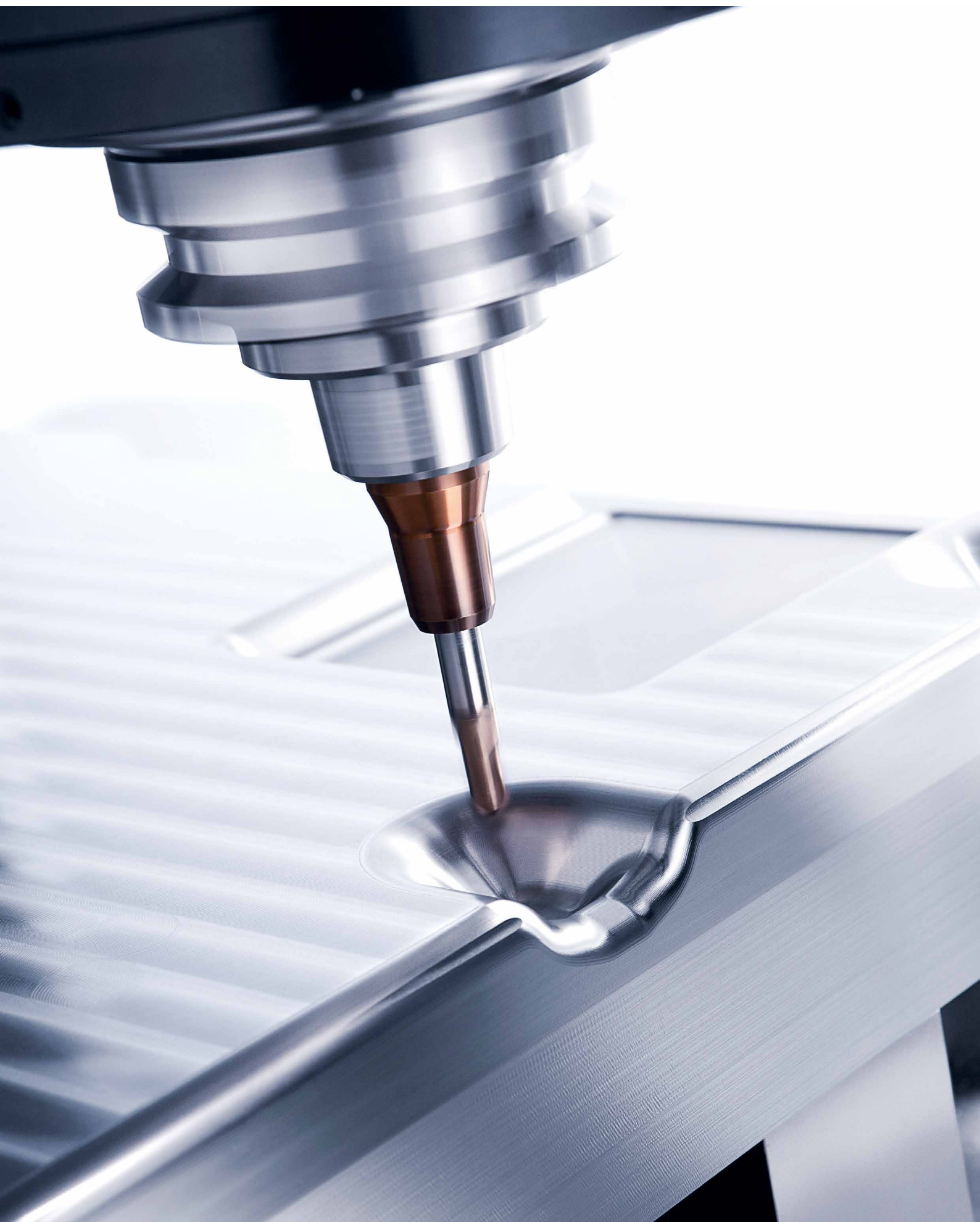
Integrated Motor Spindle

In Hwacheon temperature controlled clean room facilities, where this Super Precision High Speed Spindles are assembled, only the most experienced and skilled engineers are allowed to produce at highest industry and quality standards a spindle worth to be named Made by Hwacheon.

Oil-Jet Cooling

The Oil-Jet cooling and the Jacket Cooling designs have been perfected by Hwacheon's experience and know how in building high quality spindles. These unique yet highly effective cooling systems minimize the thermal displacement during prolonged machine operations







MACHINING SOFTWARE

The Hwacheon Machining Software Components

The Hwacheon's developed machining software monitors different variables related to the work environment and machining conditions automatically 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.

HTDC™

Hwacheon Thermal Displacement Control

HFDC

Hwacheon Frame Displacement Control System

HFDC is equipped with highly sensitive thermal sensors located at various locations where thermal activity is suspected; monitoring and correcting displacement.

HFDC™

Hwacheon Frame Displacement Control

HSDC

Hwacheon Spindle Displacement Control System

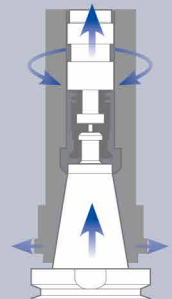
When the spindle rotates at high speed, the centrifugal force drives the taper to expand, causing errors in Z axis. HSDC constantly monitors the temperature at each spindle region and makes optimal prediction for thermal displacement. The system then makes necessary adjustments and effectively minimizing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

HSDC™

Hwacheon Spindle Displacement Control

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)

HTLD™
Hwacheon
Tool Load Detect

**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.

HECC®
Hwacheon Efficiency
Contour Control

**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.

OPTIMA™
Cutting Feed
Optimization

SPEED +

USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

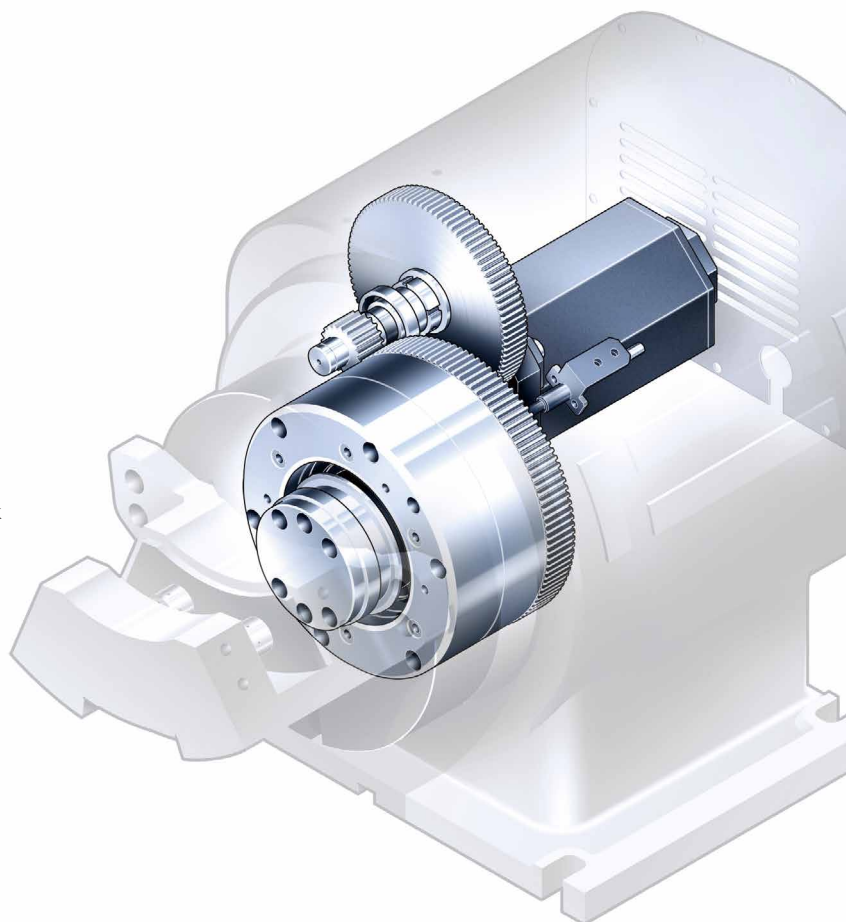
SIRIUS-UX vertical machining center offers user friendly design and a wide variety of useful options for practical applications, so you can concentrate on what you do best: creating quality products-without losing your valuable time to the worries of machine failure and safety. A wide variety of performance enhancing options are available for faster, more precise machining.

Index Table (Option)

Hwacheon's index table can be operated with ease without the need for additional 4-axis interface, and its 4.3 tons of clamping force and 5 degrees of division angle are ideal for hard turning.

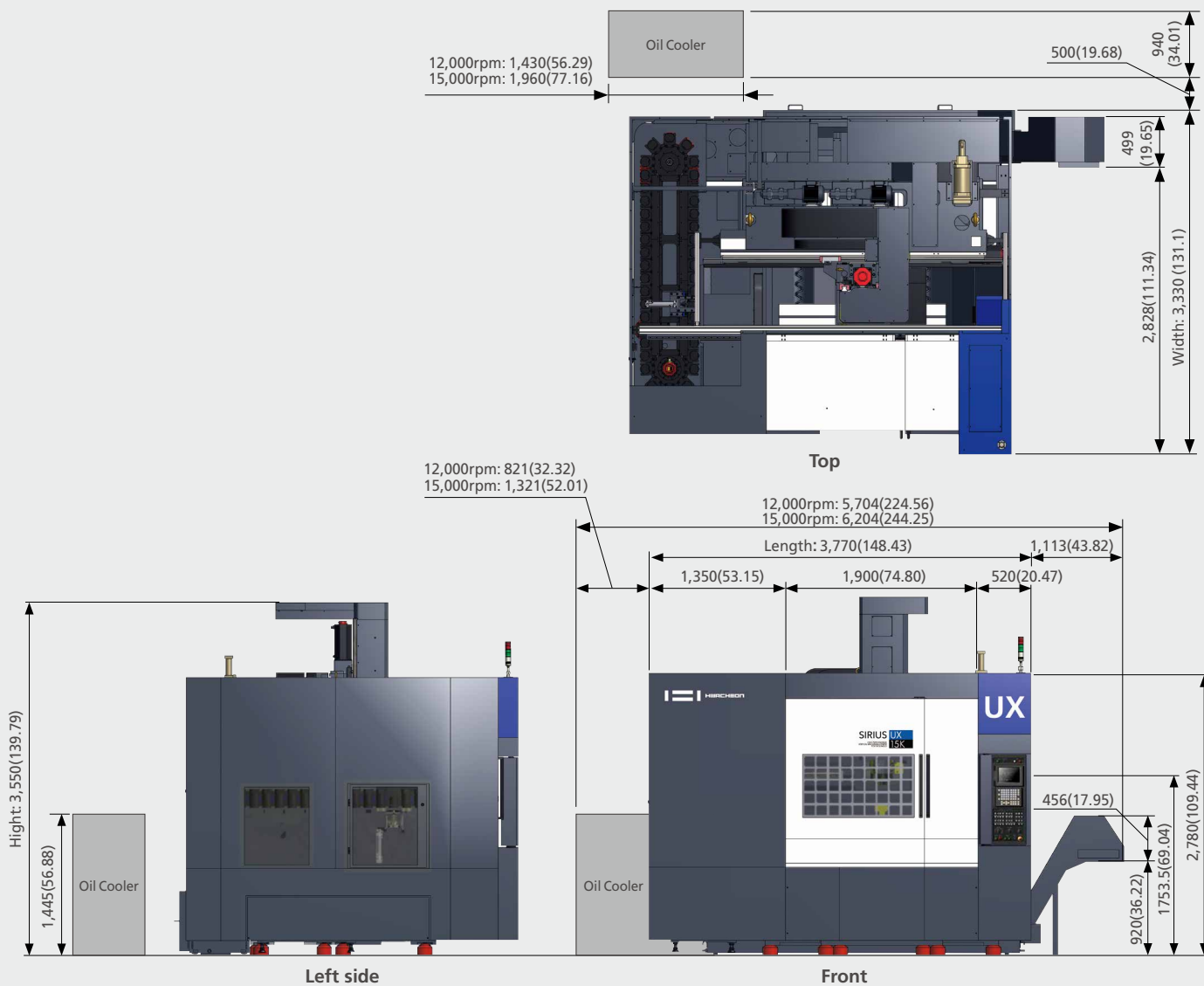
Auto Measurement System (Option)

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.



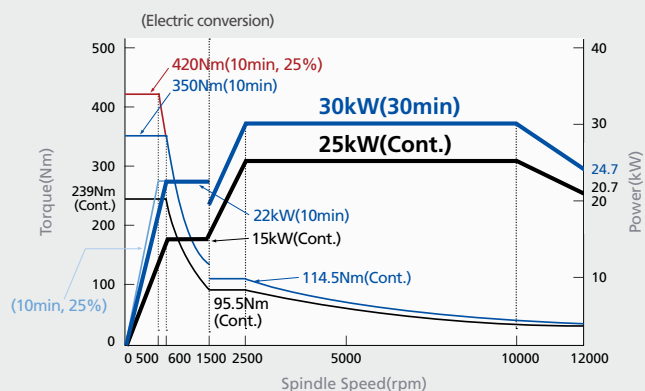
Product Data

* Unit: mm(inch)

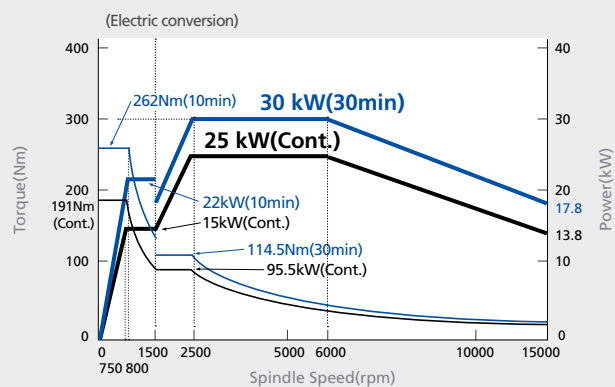


Spindle Power – Torque Diagram

Standard (12,000rpm)

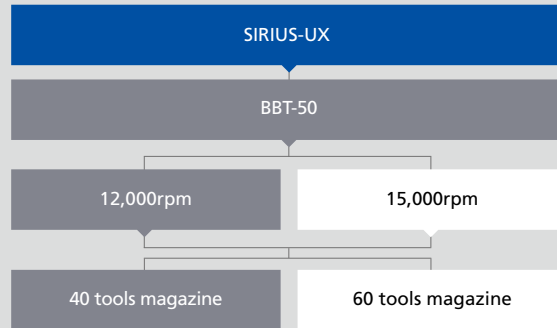


Option (15,000rpm)



Product Configuration

Each product can be configured to fit your application.



Machine Specifications

ITEM		SIRIUS-UX	
		12,000	15,000
Travel			
Stroke (X / Y / Z)	mm(inch)	1,500 / 750 / 650 (59.06 / 29.53 / 25.59)	
Distance from Table Surface to Spindle Gauge Plane	mm(inch)	175 ~ 825 (6.89 ~ 32.48)	
Distance between Columns to Spindle Center	mm(inch)	437 (17.21)	
Distance between Columns	mm(inch)	1,800 (70.87)	
Table			
Working Surface	mm(inch)	1,650 x 750 (64.96 x 29.53)	
Table Loading Capacity	kg,(lb.)	2,500 (5.512)	
Table Surface Configuration (T slots WxP / No. of slots)	mm(inch)	18 x 125 (0.71 x 4.92) / 5ea	
Spindle			
Max. Spindle Speed	rpm	12,000	15,000
Spindle Motor	kW(HP)	30 / 25 (40 / 34)	
Type of Spindle Taper Hole	-	ISO#50, 7/24 Taper (BBT-50)	
Spindle Bearing Inner Diameter	mm(inch)	Ø100 (Ø3.94)	
Method of Spindle Lubrication & Cooling	-	Oil-Jet Lub. + Jacket Cooling	
Feedrate			
Rapid Speed (X / Y / Z)	m/min(ipm)	20 / 20 / 20 (787.4 / 787.4 / 787.4)	
Feedrate (X / Y / Z)	mm/min(ipm)	10,000 (393.7)	
ATC			
Type of Tool Shank	-	BBT-50 (OPT: CAT-50)	
Type of Pull Stud	-	90° Type	
Tool Storage Capacity	ea	40 (OPT: 60)	
Max. Tool Diameter (With / Without Adjacent Tools)	mm(inch)	Ø120 / Ø200 (4.72 / 7.87)	
Max. Tool Length	mm(inch)	400 (15.75)	
Max. Tool Weight	kg,(lb.)	20 (44.09)	
Method of Tool Selection	-	Fixed Address	
Method of Operation (Magazine / Swing Arm)	-	Servo Motor / Servo Motor	
Motor			
Feed Motor (X / Y / Z)	kW(HP)	7.0 / 7.0 / 7.0 (9.38 / 9.38 / 9.38)	
Coolant Motor (Spindle / Chip Flushing)	kW(HP)	0.4 / 0.4 (0.54 / 0.54)	
Spindle Cooler (50 / 60Hz): Inverter type	kW(HP)	8.0 / 8.9 (10.7 / 11.9)	5.0 / 5.6 + 8.0 / 8.9 (6.7 / 7.5 + 10.7 / 11.9)
Power Source			
Electric Power Supply	kVA	70	
Compressed Air Supply (Pressure X Consumption)	-	0.5 ~ 0.7MPa x 690N ℓ/min	
Tank Capacity			
Spindle Cooling / Lubrication	ℓ (gal)	40 / 12 (10.57 / 3.17)	
Coolant	ℓ (gal)	290 (76.61)	
Machine Size			
Height	mm(inch)	3,550 (139.76)	
Floor Space (Length x Width)	mm(inch)	3,770 x 3,330 (148.43 x 131.10)	
Weight	kg,(lb.)	13,860 (30,556)	
NC Controller		Fanuc 31i-B	

Standard and Optional product components

Standard Accessories		Optional Accessories	
• Adjust Bolt, Block & Plate	• Work Light	• Additional Tool Storage Capacity - 60ea	• NURBS Interpolation
• Air Blower	• 10.4" Color LCD	• Air Dryer	• Oil Skimmer
• Base Around Splash Guard	• Workpiece Coordinate System (48ea)	• Air Gun	• Oil Mist (Semi Dry Cutting System)
• Coil Conveyor (2ea)	• Cutting Feed Optimization System (OPTIMA)	• Auto Door	• Spindle Through Coolant (3MPa / 7MPa)
• Coolant System	• Hwacheon Efficient Contour Control System (HECC)	• Coolant Gun	• Tool Life Management
• Data Server (256MB)	• Hwacheon Tool Load Detect System (HTLD)	• Data Server Interface	• Tool Measuring System-Renishaw / Blum (Touch Type, Laser Type)
• Door Interlock	• Hwacheon Thermal Displacement Control System (HTDC)	• Data Server (1,024MB)	• Transformer
• Lubrication System	- Hwacheon Spindle Displacement Control System (HSDC) +	• Lift Up Chip Conveyor (Hinge, Scraper, Mesh-drum)	• Workpiece Measuring System-Renishaw / Blum (Touch type)
• MPG Handle (1ea)	- Hwacheon Frame Displacement Control System (HFDC)	• Linear Scale (X / Y / Z)	• 4-axis Interface
• Operation Manual & Parts List	• Hwacheon Artificial Intelligence Control System(HAI): 200 Block	• Manual Guide i	• Hwacheon Artificial Intelligence Control System(HAI): 600/1000 Block
• Pneumatics System		• Magnetic Table	
• Rigid Tapping		• Mist Collector	
• Signal Lamp (R / G / Y, 3 Color)		• MPG Handle (3ea)	
• Spindle Cooler		• Nano Smoothing Interpolation	
• Tool Kit & Box			

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
Program number search / Sequence number search		S
Dry run, single block		S
Manual handle feed / feed rate	1 Unit / 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.2axes linear interpolation	S
Nano smoothing		O
Reference position return check / return	G27 / G28, G29	S
2nd reference position return	G30	S
Skip	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		
Tape code	EIA / ISO	S
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
Automatic corner override		O
Polar Coordinate System		O

ITEM	SPECIFICATION	
Program input		
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 serial output		S
Spindle override	50 - 120%	S
Spindle orientation / 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 , Tool length compensation		S
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 & display		
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
Others		
Display unit	10.4" color LCD	S
Data input / output		
Reader / Puncher interface CH1	RS232C	S
Data server	256MB	S
Data server	1,024MB	O
Ethernet Interface		S
Memory card / 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 Efficient Contour Control System (HECC)		S
Hwacheon Tool Load Detect System(HTLD)		S
Cutting Feed Optimization System (OPTIMA)		S
Hwacheon Thermal Displacement Control System (HTDC)		S
4- Axis interface function Option		
Controlled axes / Simultaneously controlled axes / Control axis detach	included 4-axis interface option	O

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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