



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)

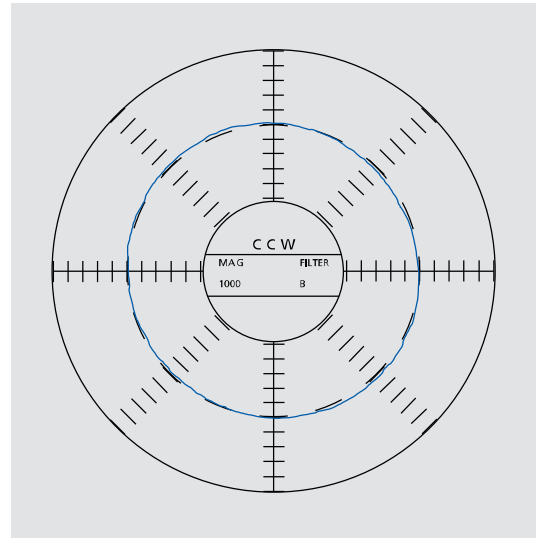
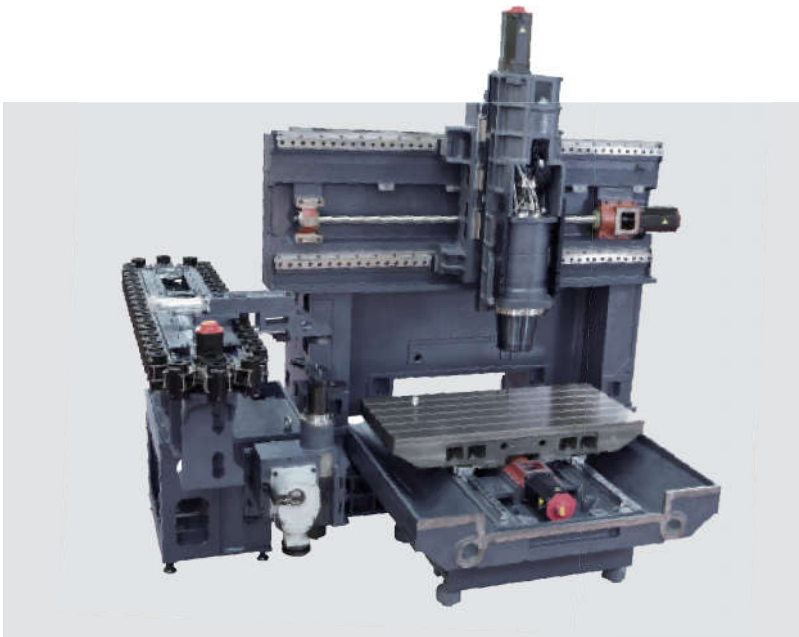


PRECISION 3-AXIS MACHINING CENTER FOR LARGE-SIZE DIE AND MOLD

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.

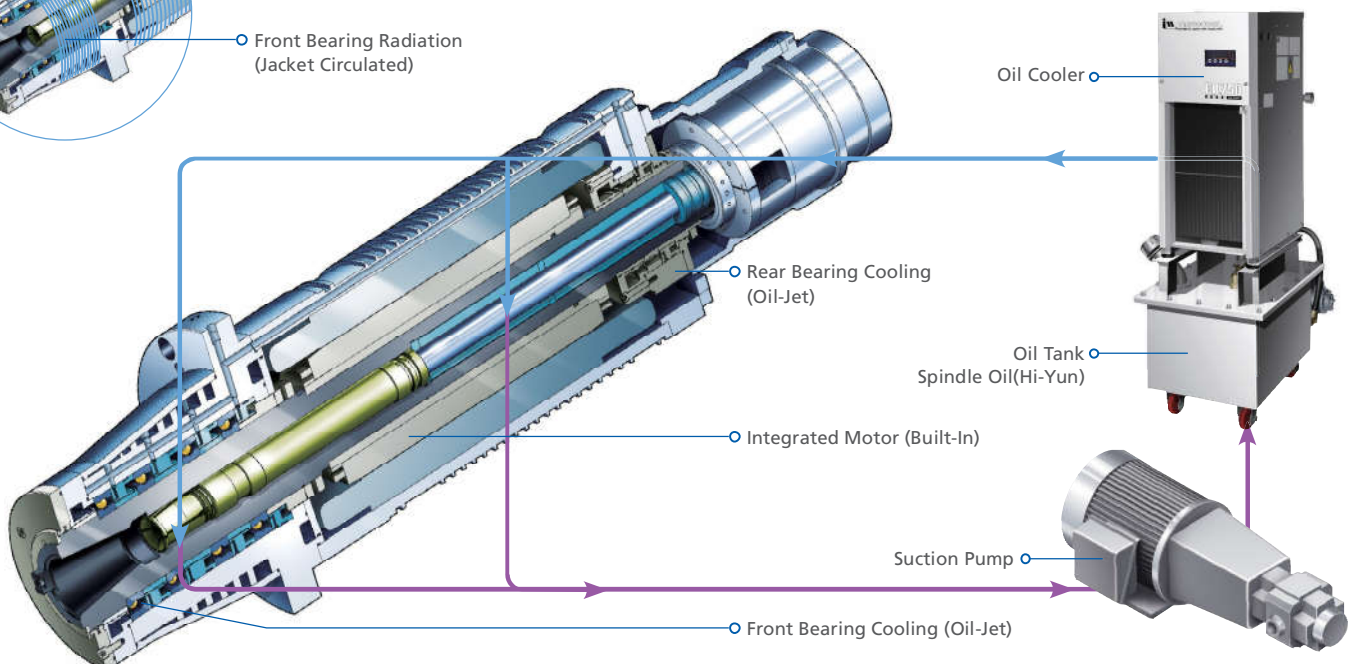
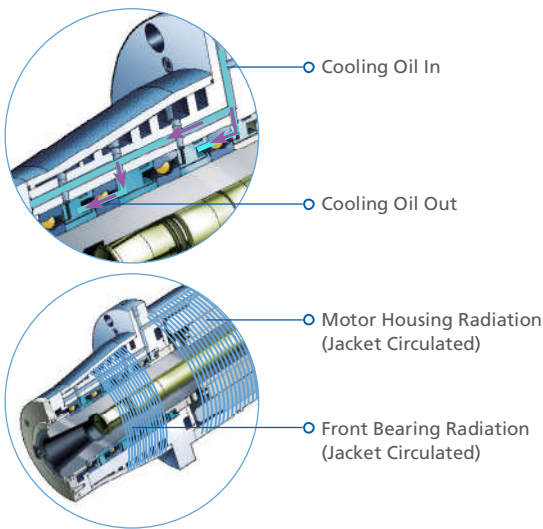
Roundness: 5 μ m (DBB measured)
 Positioning accuracy: 4 μ m
 Repeatability: 3 μ m

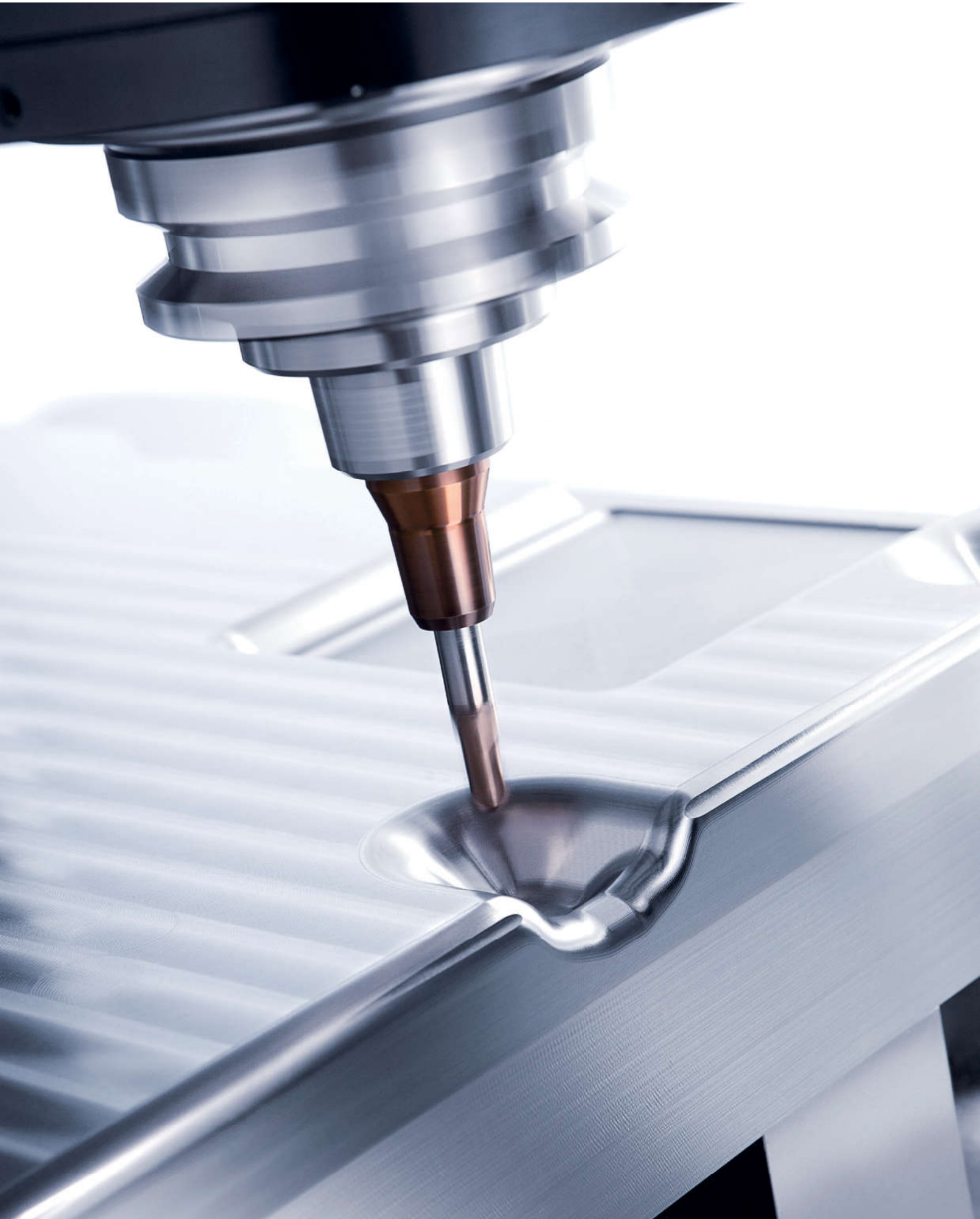
Integrated Motor Spindle

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.



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.



HSDC

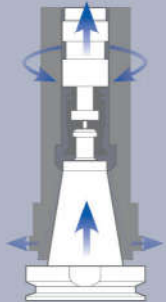
Hwacheon Spindle Displacement Control System

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

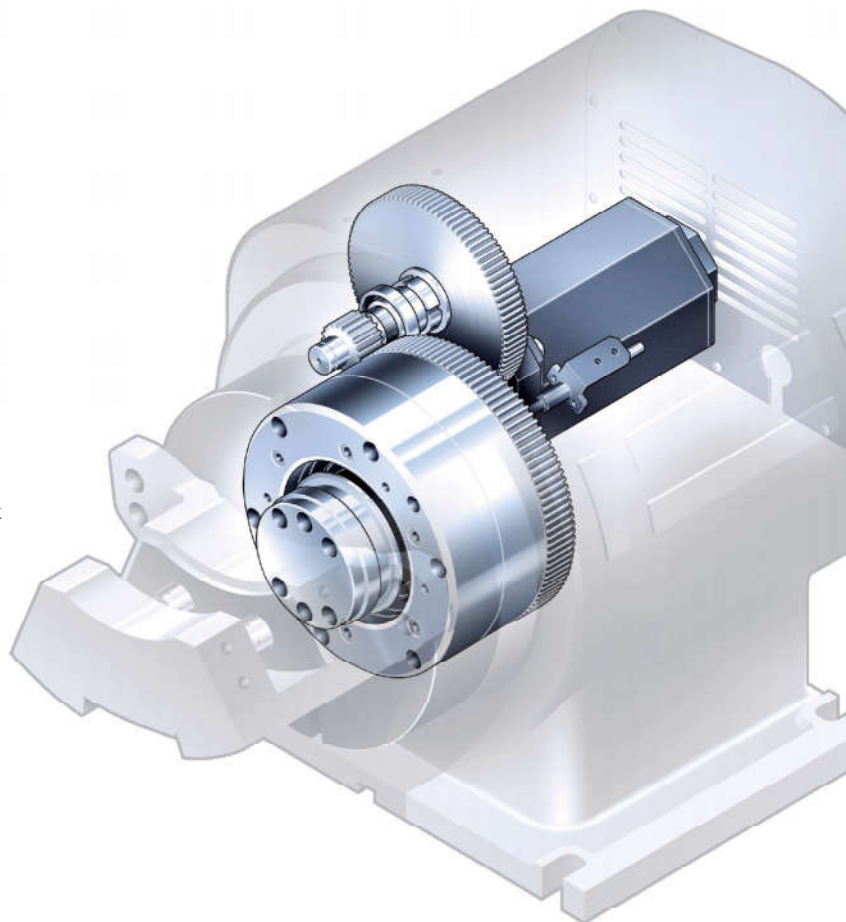
SIRIUS-UX vertical machining center offers user friendly design and a wide variety of useful options for practical applications, so you can concentrate on what you do best: creating quality products-without losing your valuable time to the worries of machine failure and safety. A wide variety of performance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

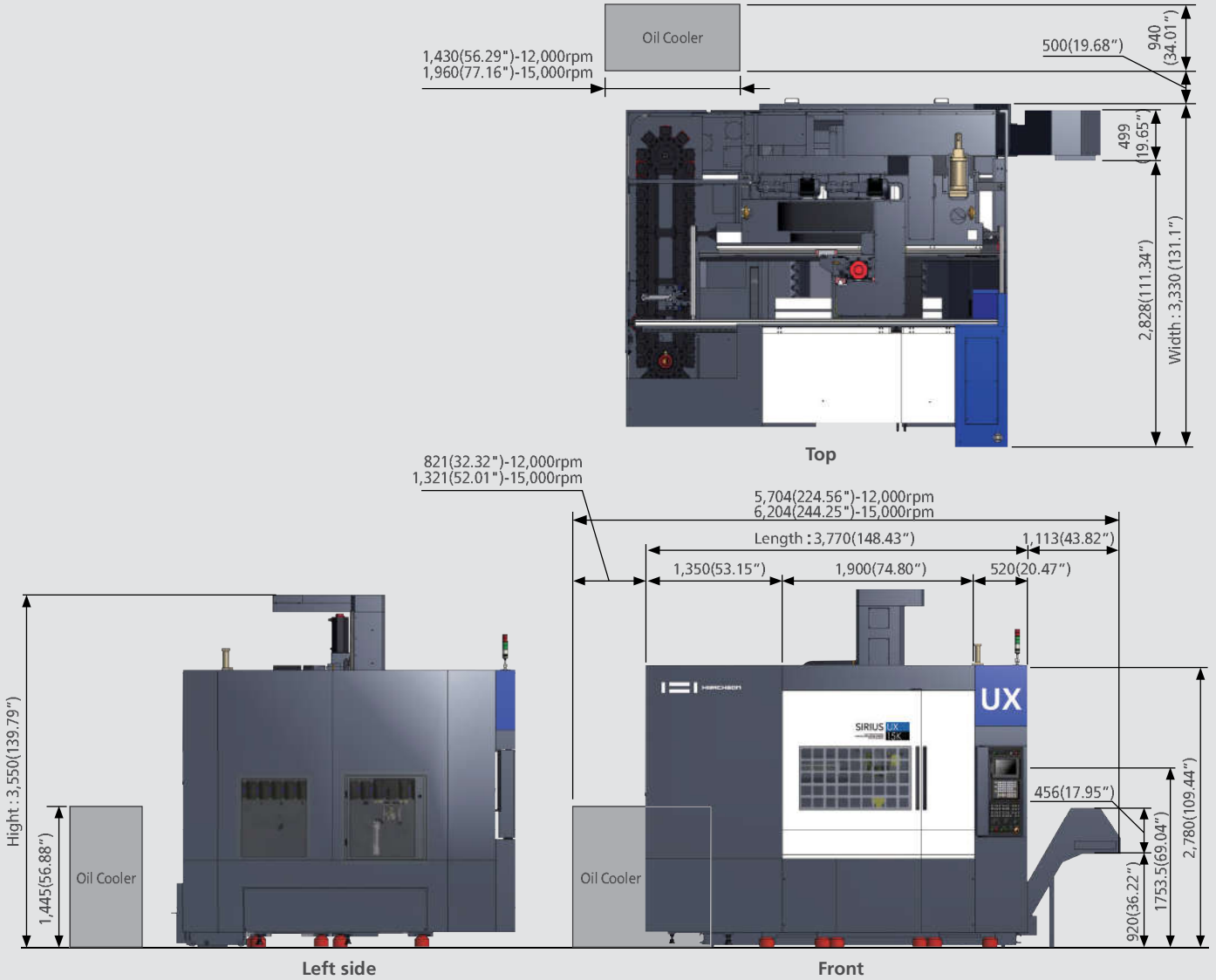
Auto Measurement System (Option)

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

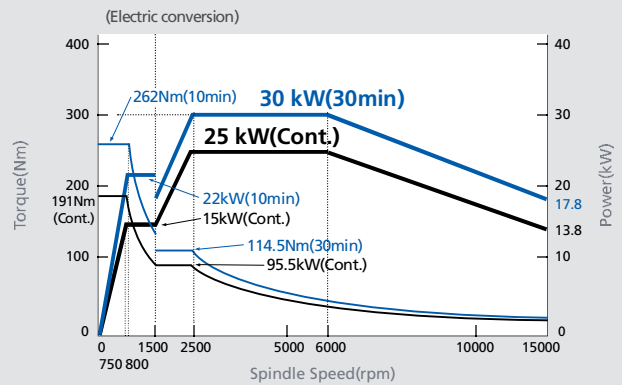
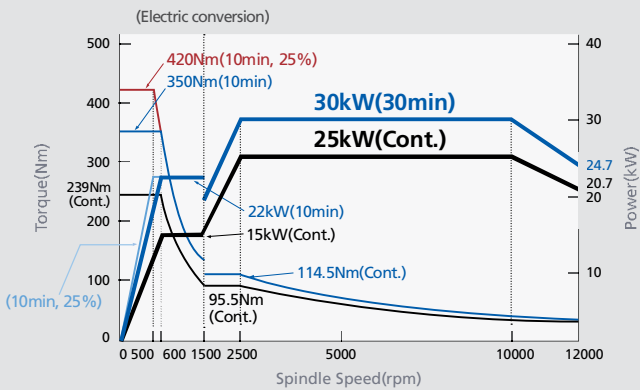
* Unit: mm(inch)



Spindle Power – Torque Diagram

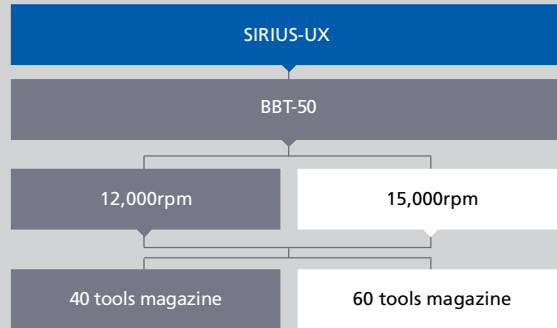
Standard (12,000rpm)

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 (59.06") / 750 (29.53") / 650 (25.59")	
Distance from Table Surface to Spindle Gauge Plane	mm(inch) 175 (6.89") ~ 825 (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 (64.96") x 750 (29.53")	
Table Loading Capacity	kg _r (lb _r) 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 (40) / 25 (34)	
Type of Spindle Taper Hole	- BBT-50 (Opt.: CAT-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 (787.40) / 20 (787.40) / 20 (787.40)	
Feedrate (X / Y / Z)	mm/min(ipm) 10,000 (393.70)	
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 (4.72") / Ø200 (7.87")	
Max. Tool Length	mm(inch) 400 (15.75")	
Max. Tool Weight	kg _r (lb _r) 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 (9.38) / 7.0 (9.38) / 7.0 (9.38)	
Coolant Motor (Spindle / Chip Flushing)	kW(HP) 0.4 (0.54) / 0.4 (0.54)	
Spindle Cooler (50 / 60Hz) – Inverter type	kW(HP) 8.0 (10.7) / 8.9 (11.9) 5.0 (6.7) / 5.6 (7.5) + 8.0 (10.7) / 8.9 (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 (10.57) / 12 (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 (148.43") x 3,330 (131.10")	
Weight	kg _r (lb _r) 15,000 (33,069)	
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	• Oil Skimmer
• Air Blower	• 10.4" Color LCD	• Air Dryer	• Oil Mist (Semi Dry Cutting System)
• Base Around Splash Guard	• Workpiece Coordinate System (48ea)	• Air Gun	• Signal Lamp (R / G / Y, 3 Color)
• Coil Conveyor (2ea)	• Cutting Feed Optimization System (OPTIMA)	• Auto Door	• Spindle Through Coolant (30bar, 70bar)
• 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 Type, Scraper Type)	• 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		• Mist Collector	
• Rigid Tapping		• MPG Handle (3ea)	
• Signal Lamp (R / G, 2 Color)		• Nano Smoothing Interpolation	
• Spindle Cooler		• NURBS Interpolation	
• Tool Kit & Box			

NC Specifications [Fanuc 31i-B]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Controlled axis		Program input	
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 inch/metric conversion	0.0001mm, 0.0001deg, 0.00001inch S	Manual Guide i	O
Store stroke check 1/2	G20, G21 S	Spindle speed function	
Mirror image	S	Spindle serial output	S
Operation		Spindle override	50 - 120% S
Automatic & MDI operation	S	Spindle orientation / Rigid tapping	S
DNC operation by memory card	PCMCIA card is required S	Tool function / compensation	
Program number search / Sequence number search	S	Tool function	T4-digits S
Dry run, single block	S	Tool offset pairs	±6-digits 200ea S
Manual handle feed / feed rate	1 Unit / x1, x10, x100 S	Tool offset pairs	±6-digits 400ea, 999ea O
Interpolation function		Tool offset memory C, Tool length compensation	S
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02, G03 / G04 S	Cutter compensation C	S
Cylindrical interpolation	4-axis interface option is required O	Tool life management	O
Helical interpolation	Circular interpolation plus max. 2axes 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	G30 S	Part program storage length / Number of register able programs	512kB / 1,000ea O
Skip	G31 S	Background editing / Extended part program editing	S
NURBS interpolation	O	Play Back	O
Feed function		Setting & display	
Rapid traverse override	F0, F25, F50, F100 S	Clock function	S
Feedrate (mm / min)	S	Self-diagnosis function / Alarm history display	S
Feedrate override	0 ~ 150% S	Help function / Graphic function	S
Jog feed override	0 ~ 4,000mm/min S	Run hour and parts count display	S
Override cancel	M48, M49 S	Dynamic graphic display	O
Program input		Multi-language display	English, German, French, Italian, Chinese, Spanish, Korean, Russian Portuguese, Polish, Hungarian, Swedish S
Tape code	EIA / ISO S	Others	
Optional block skip	1ea S	Display unit	10.4" color LCD S
Program number search	O4-Digits S	Data input / output	
Sequence number	N8-Digits S	Reader / Puncher interface CH1	RS232C S
Decimal point programming	S	Data server	256MB S
Coordinate system setting	G92 S	Data server	1,024MB O
Workpiece coordinate system	G54 ~ G59 S	Ethernet Interface	S
Workpiece coordinate system preset	O	Memory card / interface	S
Addition of workpiece coordinate pair	48ea S	Auto data backup	SRAM + Part Program S
Addition of workpiece coordinate pair	300ea O	HWACHEON Artificial Intelligence	
Manual absolute on and off	S	Hwacheon Artificial Intelligence Control System (HAI) 200 Block	S
Chamfering / Corner R	S	Hwacheon Artificial Intelligence Control System (HAI) 600 / 1000 Block	O
Programmable data input	G10 S	Hwacheon Efficient Contour Control System (HECC)	S
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	4- Axis interface function Option	
Small-hole peck drilling cycle	O	Controlled axes / Simultaneously controlled axes / Control axis detach	included 4-axis interface option O
Automatic corner override	O		
Polar Coordinate System	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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