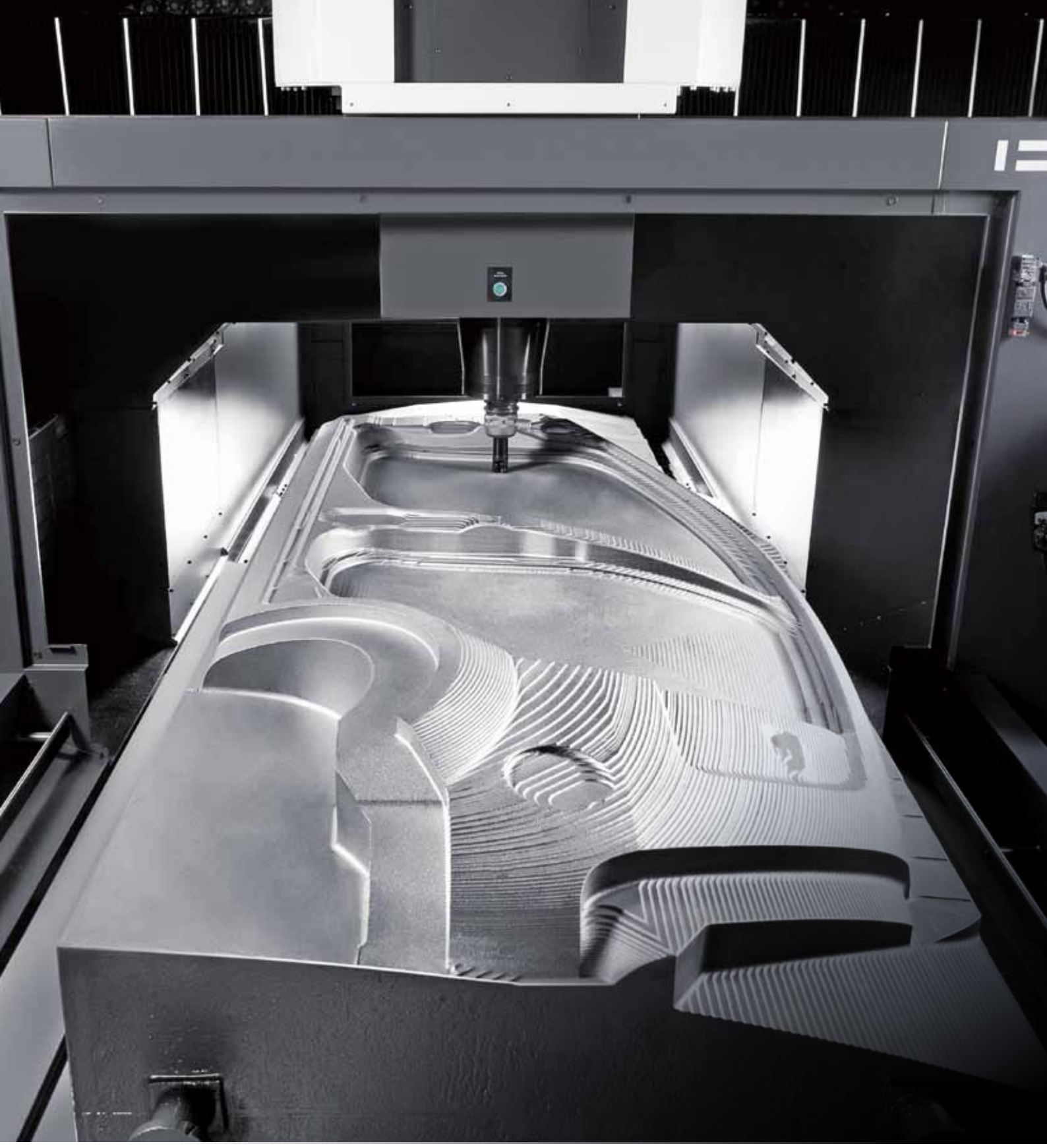


SIRIUS-1250/1750/2500

Large-Size Vertical Machining Center in Bridge Type Design

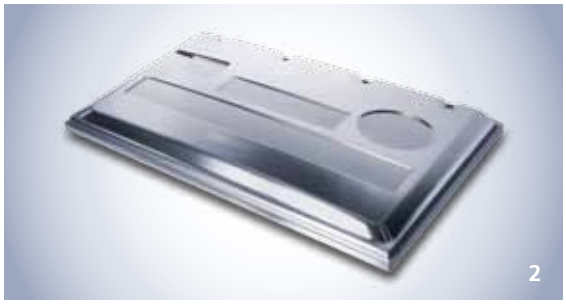
HWACHEON

LARGE-SIZE VERTICAL MACHINING CENTER IN BRIDGE TYPE DESIGN

SIRIUS-1250/1750/2500 with Bridge Type Design

SIRIUS-1250/1750/2500 are large bridge-type vertical machining centers with precision feed drive and high-performance spindle. These machining centers provide a total solution from tool selection to product completion-making them ideal for your extra-size mold applications where quality is essential.

1 Auto Mobile Top Cover / Auto Driving / GC-250 **2** 63" LCD TV Back Cover / Home Appliances / KP4M
3 Auto Mobile Bumper Part / Auto Driving / KP4M **4** Auto Mobile Back Door Cover / Auto Driving / KP4M



HIGH-QUALITY MACHINING FOR EXTRA-SIZE MOLD APPLICATIONS

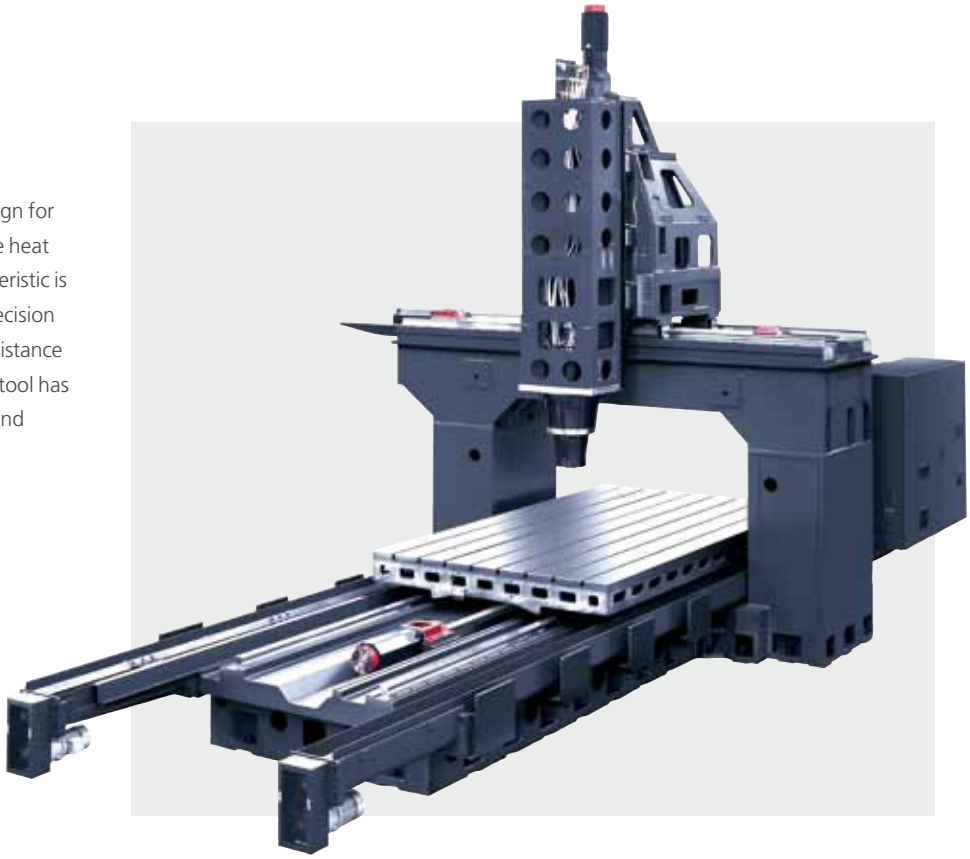
Large-Size Mold Machining

Hwacheon's extra-size bridge type vertical machining centers guarantee to enhance the quality of your large mold applications, such as large display frame, automotive and aerospace parts.

The SIRIUS series of large size vertical machining centers use powerful built-in motor spindles and high-speed, high precision milling heads complemented by Hwacheon's proprietary Oil-Jet cooling system-to guarantee consistent strong roughing performance and provide high quality product result hours after hours of high speed machining. Each SIRIUS vertical center is designed using 3D simulation FEM analysis to achieve structural rigidity which can translate to quality product results; while the Hwacheon designed machining software components enhance safety and work efficiency in your factory. The machines are configurable with many different options so that they can integrate perfectly to your work environment and application.

Symmetrical portal structure for extra stability

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

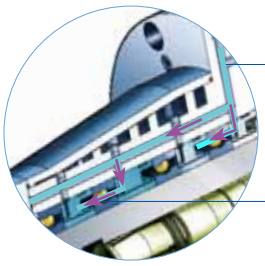


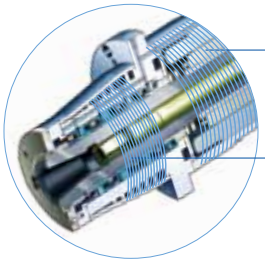
Integrated Motor Spindle

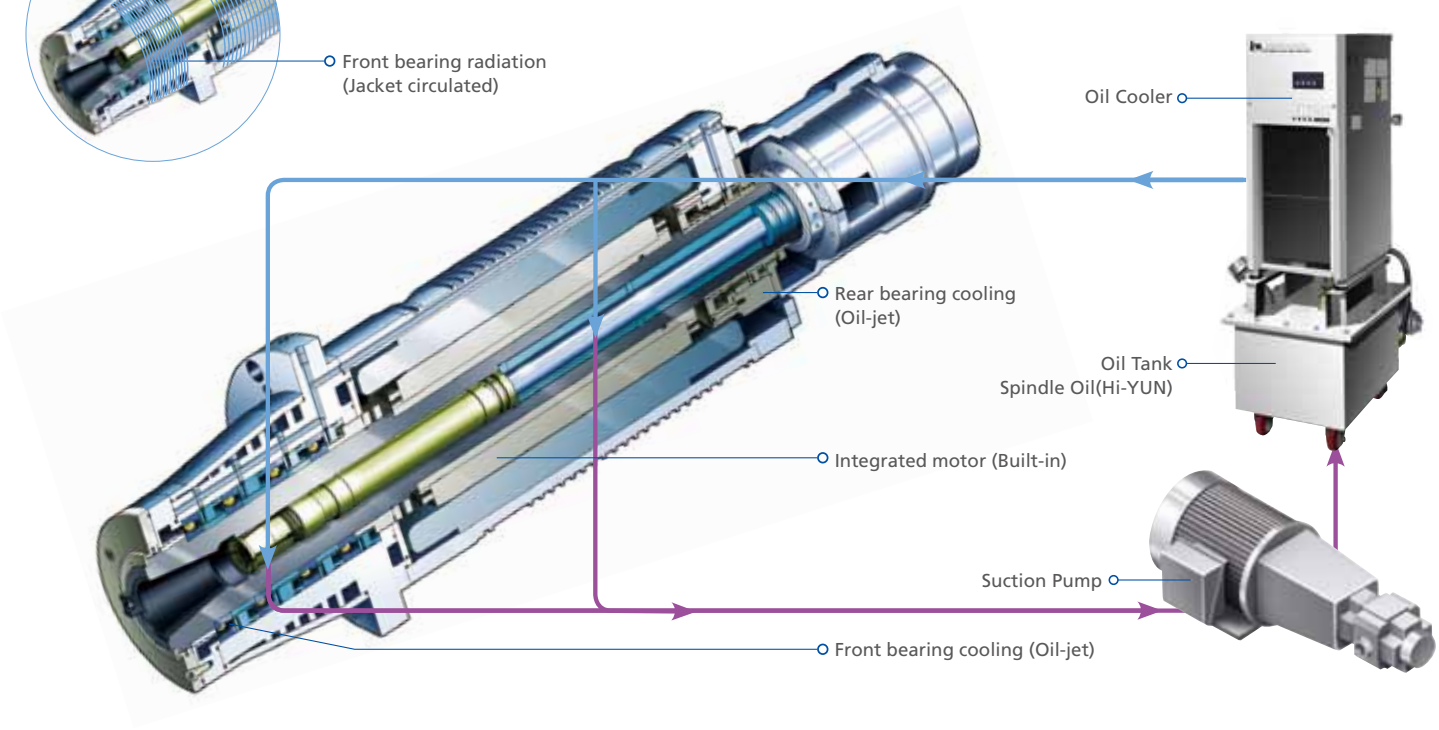
In Hwacheon temperature controlled clean room facilities, where this Super Precision High Speed Spindles are assembled, only the most experienced and skilled engineers are allowed to produce at highest industry and quality standards a spindle worth to be named Made by Hwacheon.

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 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)

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 Efficency 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.

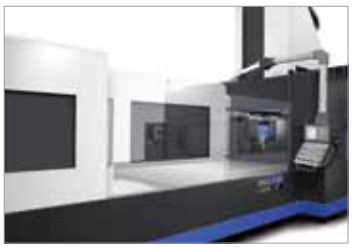
OPTIMA™ Cutting Feed Optimization

SPEED +

USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

SIRIUS-1250/1750/2500 vertical machining centers offer 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.

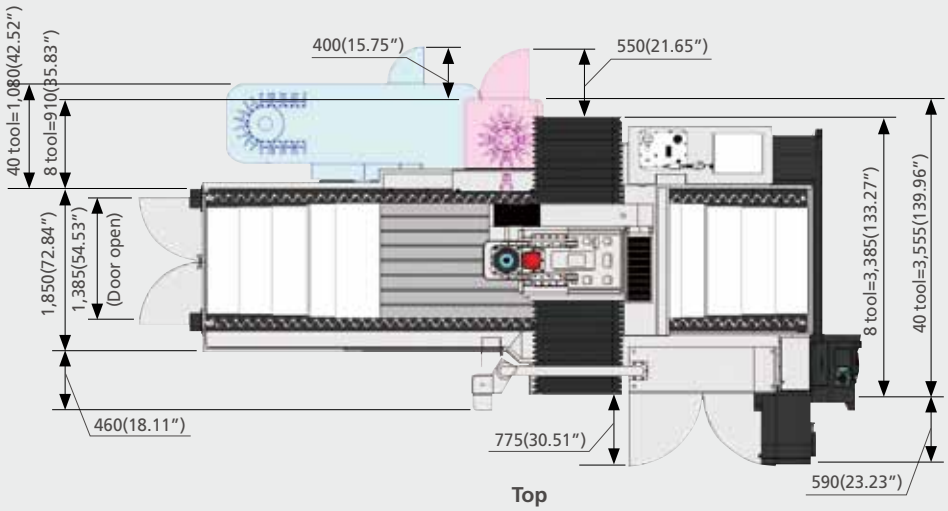
Auto measurement system (Option)
When the machine begins to work, the measurement system automatically measures the work -piece and the tool, and makes necessary adjustment. This system saves machining time and guarantees high quality result every time regardless of the machinist's skill and because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



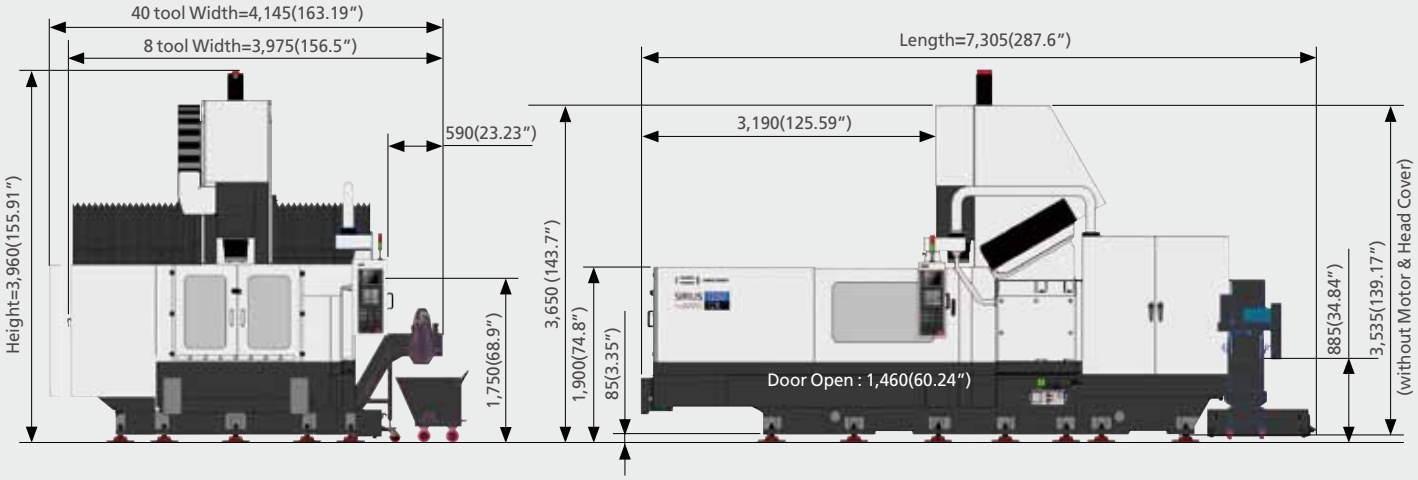
Full-enclosure exterior cover (Option for SIRIUS-1750 only)
The exterior cover envelops the machine to keep the operator safe from chips, lubricant, dust and helps to maintain clean work environment. The smooth-operating slide door is easily accessible even from the opposite side when setting up a large workpiece.

Product Data : SIRIUS-1250

* Unit: mm(inch)



Top

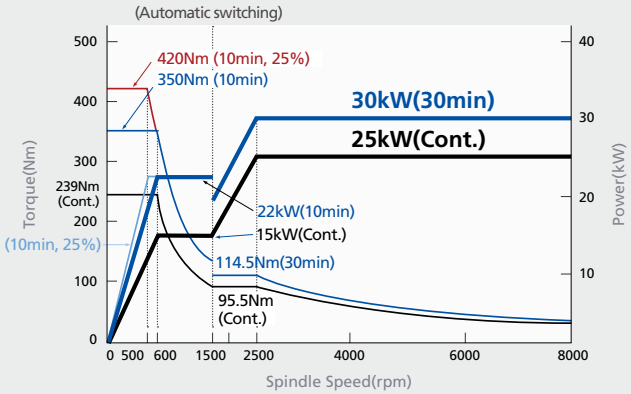


Left side

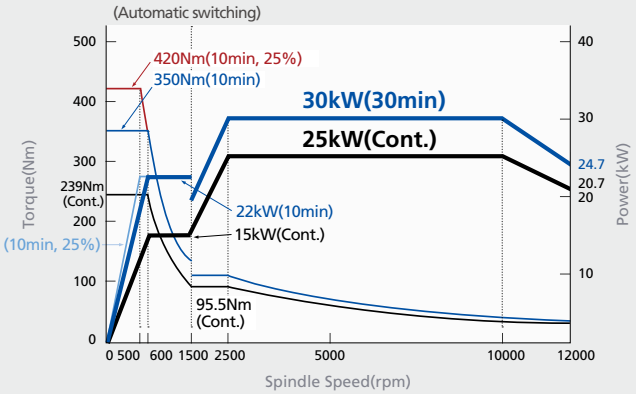
Front

Spindle Power – Torque Diagram

Standard (8,000rpm)



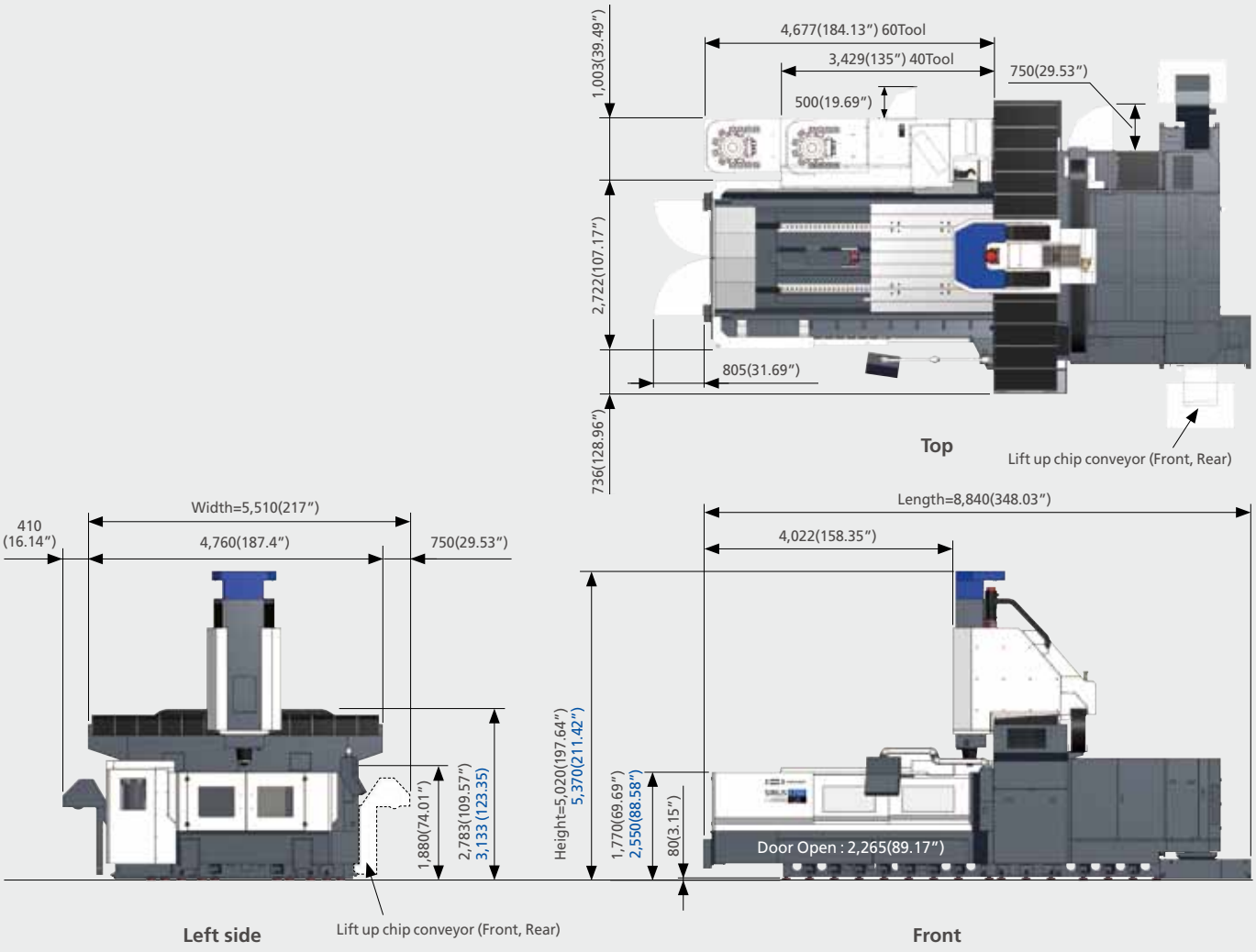
Option (12,000rpm)



Product Data : SIRIUS-1750

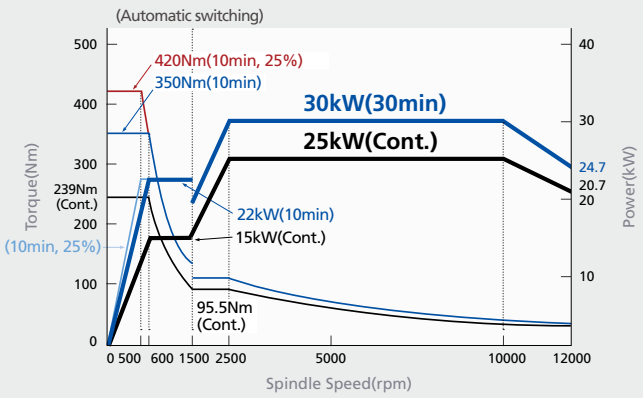
* Unit: mm(inch)

Gap Type(High Column)

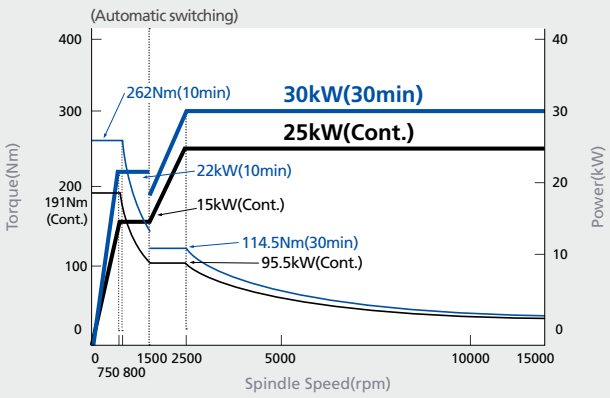


Spindle Power – Torque Diagram

Standard (12,000rpm)



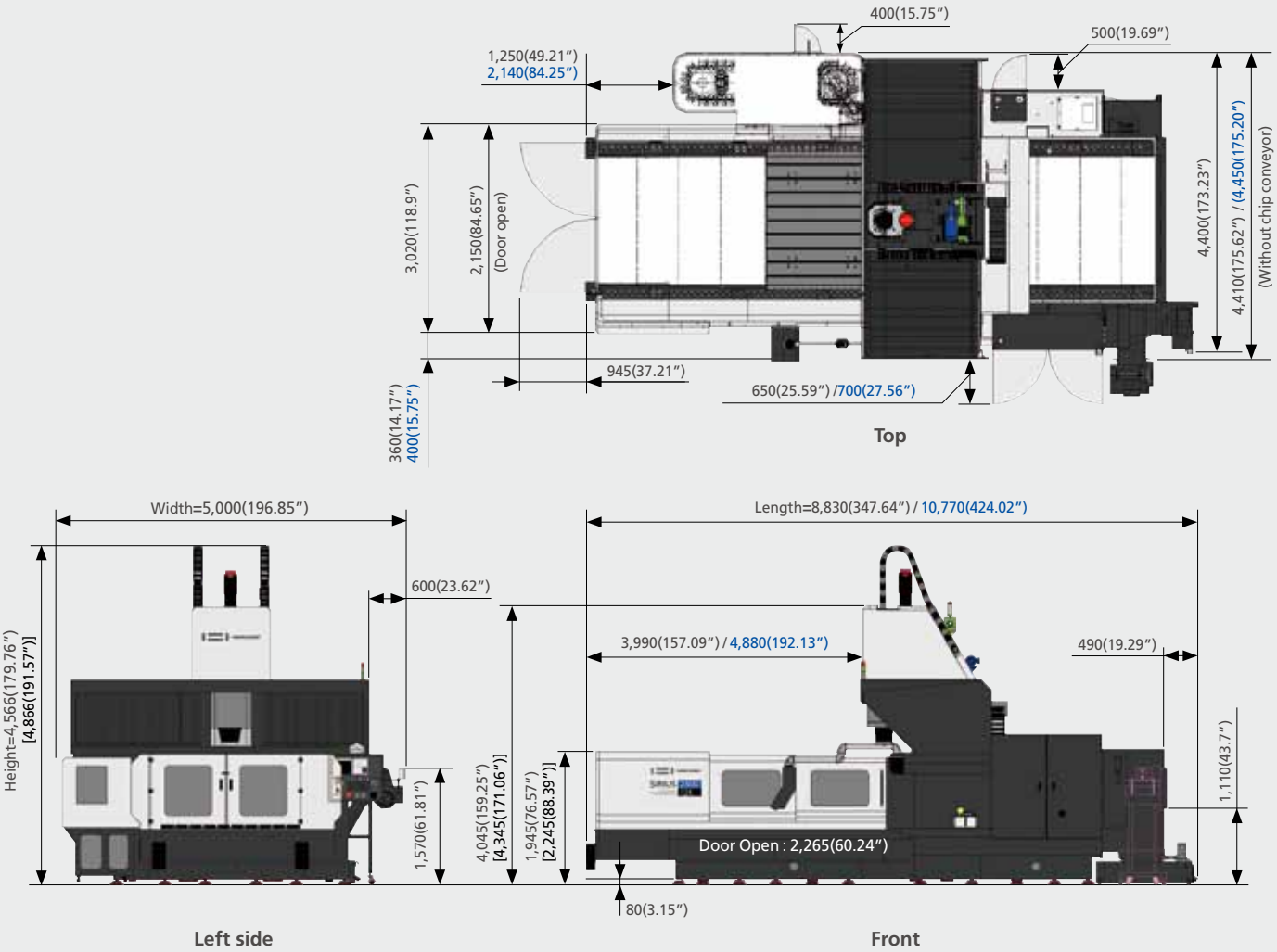
Option (15,000rpm)



Product Data : SIRIUS-2500 (Short Bed) / SIRIUS-2500L [Long Bed(4m)]

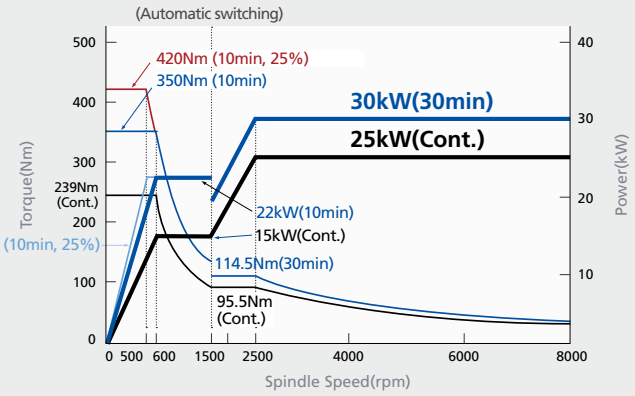
* Unit: mm(inch)

▦ Short Bed ▦ Long Bed(4m) [ ] Gap Type

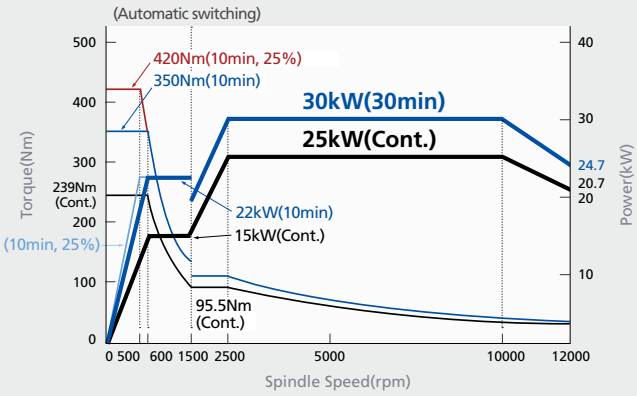


Spindle Power – Torque diagram

Standard (8,000rpm)

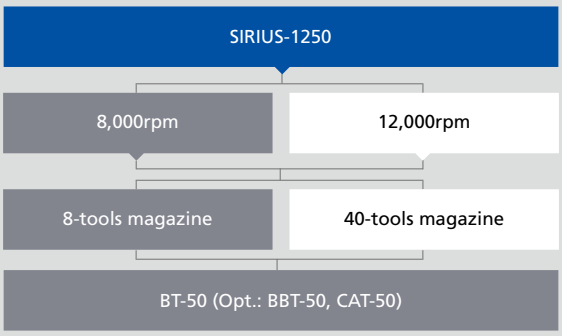


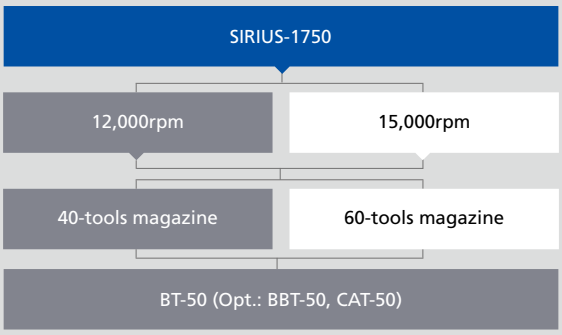
Option (12,000rpm)

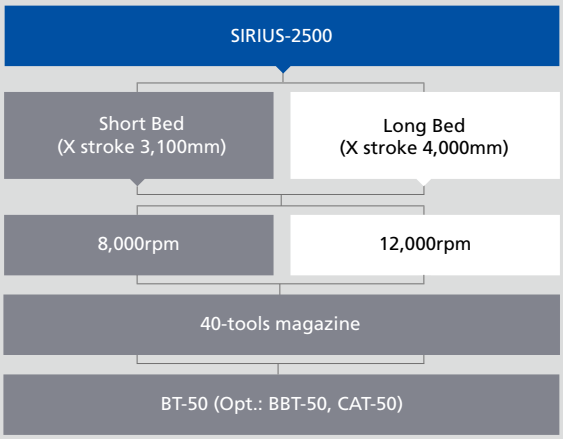


Product Configuration

Each product can be configured to fit your application.







Standard and Optional product components : SIRIUS-1250

Standard Accessories		Optional Accessories	
• Adjust bolt, block & plate	• Cutting Feed Optimization System (OPTIMA)	• Air dryer	• Tool measuring system-Renishaw / Blum
• Air blower	• Hwacheon Efficient Contour Control System (HECC)	• Air gun	• Transformer (Touch type, Laser type)
• Base around splash guard (Semi cover)	• Hwacheon Tool Load Detect System(HTLD)	• BBT spindle	• Workpiece measuring system -Renishaw / Blum (Touch type)
• Coil conveyor (2ea)	• Hwacheon Thermal Displacement Control System (HTDC)	• Coolant gun	• Additional Y-axis stroke (90mm)
• Coolant system	- Hwacheon Spindle Displacement Control System (HSDC)	• Data server interface	• 4-axis interface
• Linear scale (X / Y / Z)	- Hwacheon Frame Displacement Control System (HFDC)	• Data server (256MB / 1,024MB)	• Hwacheon AI Nano Contour Control System (HAI) 600/1,000 block buffer
• Lubrication system	• Hwacheon AI Nano Contour Control System (HAI) 200 block buffer	• Gap 225mm (High column)	
• MPG handle (1ea)		• Lift up chip conveyor (Hinge type, Scraper type)	
• Operation manual & parts list		• Manual guide i	
• Pneumatics system		• MPG handle (3ea)	
• Rigid tapping		• Nano smoothing interpolation	
• Signal lamp (R / G, 2 color)		• NC cooler	
• Spindle cooler		• NURBS interpolation	
• Tool kit & box		• Oil mist (Semi dry cutting system)	
• Work light		• Oil skimmer	
• Workpiece coordinate system(48ea)		• Signal lamp (R / G / Y, 3 color)	
• 8.4" Color LCD display		• Tool life management	

Standard and Optional product components: SIRIUS-1750

Standard Accessories		Optional Accessories	
• Adjust bolt, block & plate	• Cutting Feed Optimization System (OPTIMA)	• Air dryer	• Spindle through coolant (30bar, 70bar) -In case of Full cover applicable
• Air blower	• Hwacheon Efficient Contour Control System (HECC)	• Air gun	• Tool life management
• Base around splash guard (Semi cover)	• Hwacheon Tool Load Detect System (HTLD)	• Auto door	• Tool measuring system-Renishaw / Blum
• Coil conveyor (2ea)	• Hwacheon Thermal Displacement Control System (HTDC)	• Base around splash guard (Full cover)	• Transformer (Touch type, Laser type)
• Coolant system	- Hwacheon Spindle Displacement Control System (HSDC)	• Coolant gun	• Workpiece measuring system-Renishaw / Blum (Touch type)
• Data server (256 MB)	- Hwacheon Frame Displacement Control System (HFDC)	• Data server interface	• 4-axis interface
• Linear scale (X / Y / Z)	• Hwacheon AI Nano Contour Control System (HAI) 200 block buffer	• Data server (1,024MB)	• Hwacheon AI Nano Contour Control System (HAI) 600/1,000 block buffer
• Lubrication system	• 10.4" Color LCD display	• Gap 350 mm (High column)	• Additional Tool Storage Capacity - 60ea
• MPG handle (1ea)		• Lift up chip conveyor (Hinge type, Scraper type)	
• Operation manual & parts list		• Manual guide i	
• Pneumatics system		• Mist collecter	
• Rigid tapping		• MPG Handle (3ea)	
• Signal lamp (R / G, 2 Color)		• Nano Smoothing Interpolation	
• Spindle cooler		• NURBS Interpolation	
• Tool kit & box		• Oil mist (Semi dry cutting system)	
• Work light		• Signal lamp (R / G / Y, 3 color)	
• Workpiece coordinate system (48ea)			

Standard and Optional product components : SIRIUS-2500

Standard Accessories		Optional Accessories	
• Adjust bolt, block & plate	• Work light	• Air dryer	• Workpiece measuring system-Renishaw / Blum (Touch type)
• Air blower	• Workpiece cordinate system (48ea)	• Air gun	• 4-axis interface
• Base around splash guard (Semi cover)	• 10.4" Color LCD display	• BBT spindle	• Hwacheon AI Nano Contour Control System (HAI) 600/1,000 block buffer
• Coil conveyor (2ea)	• Cutting Feed Optimization System (OPTIMA)	• Data server (1,024MB)	
• Coolant gun	• Hwacheon Efficient Contour Control System (HECC)	• Gap 300mm (High column)	
• Coolant system	• Hwacheon Tool Load Detect System (HTLD)	• Lift up chip conveyor (Hinge type, Scraper type)	
• Data server interface	• Hwacheon Thermal Displacement Control System (HTDC)	• Manual guide i	
• Data server (256MB)	- Hwacheon Spindle Displacement Control System (HSDC)	• Nano smoothing interpolation	
• Linear scale (X / Y / Z)	- Hwacheon Frame Displacement Control System (HFDC)	• NC cooler	
• Lubrication system	• Hwacheon AI Nano Contour Control System (HAI) 200 block buffer	• NURBS interpolation	
• MPG handle (3ea)		• Oil mist (Semi dry cutting system)	
• Operation manual & parts list		• Oil skimmer	
• Pneumatics system		• Signal lamp (R / G / Y, 3 color)	
• Rigid tapping		• Tool life management	
• Signal lamp (R / G, 2 color)		• Tool measuring system-Renishaw / Blum (Touch type, Laser type)	
• Spindle cooler		• Transformer	
• Tool kit & box			

Machine Specifications

ITEM		SIRIUS-1250				SIIRUS-1750				SIRIUS-2500			
		8 tool		40 tool		40 tool		60 tool		Short Bed		Long Bed	
		8,000	12,000	8,000	12,000	12,000	15,000	12,000	15,000	8,000	12,000	8,000	12,000
Travel													
Stroke (X / Y / Z)	mm(inch)	2,500 (98.43") / 1,250 (49.21") / 750 (29.53")				3,000 (118.11") / 1,750 (68.90") / 800 (31.50")				3,100 (122.05") / 2,300 (90.55") / 900 (35.43")		4,000 (157.48") / 2,300 (90.55") / 900 (35.43")	
Distance from table surface to spindle gauge plane	mm(inch)	250 (9.84") ~ 1,000 (39.37")				200 (7.87") ~ 1,000 (39.37")				250 (9.84") ~ 1,150 (45.28")			
Distance between columns to spindle Center	mm(inch)	180 (7.09")				435 (17.13")				200 (7.87")			
Distance between columns	mm(inch)	1,520 (59.84")				2,000 (78.74")				2,300 (90.55")		2,400 (94.49")	
Table													
Working surface	mm(inch)	2,800 (110.24") x 1,250 (49.21")				3,200 (126.00") x 1,750 (68.90")				3,300 (129.92") x 2,000 (78.74")		4,200 (165.35") x 2,000 (78.74")	
Table loading capacity	kg(lb)	5,000 (11,023)				10,000 (22,046)				10,000 (22,046)		15,000 (33,069)	
Table surface configuration (T slots WxP – No. of slots)	mm(inch)	22 (0.87") x 160 (6.3") -7개				22 (0.87") x 200 (7.87") -8개				22 (0.87") x 200 (7.87") -9개			
Spindle													
Max. Spindle speed	rpm	8,000	12,000	8,000	12,000	12,000	15,000	12,000	15,000	8,000	12,000	8,000	12,000
Spindle motor	kW(HP)	30 (40.23) / 25 (33.53)				30 (40.23) / 25 (33.53)				30 (40.23) / 25 (33.53)			
Type of spindle taper hole	-	ISO#50, 7/24 Taper (BT-50)				ISO#50, 7/24 Taper (BT-50)				ISO#50, 7/24 Taper (BT-50)			
Spindle bearing inner diameter	mm(inch)	Ø100 (3.94")				Ø100 (3.94")				Ø100 (3.94")			
Method of spindle lubrication & cooling	-	Jet Lub. + Jacket Cooling				Jet Lub. + Jacket Cooling				Jet Lub. + Jacket Cooling			
Feedrate													
Rapid speed (X / Y / Z)	m/min(ipm)	16 (630) / 16 (630) / 16 (630)				16 (630) / 16 (630) / 16 (630)				16 (630) / 16 (630) / 16 (630)		10 (394) / 16 (630) / 16 (630)	
Feedrate (X / Y / Z)	mm/min(ipm)	1 (0.04) ~ 8,000 (315)				1 (0.04) ~ 8,000 (315)				1 (0.04) ~ 8,000 (315)			
ATC													
Type of tool shank	-	BT-50 (Opt.:BBT-50, CAT-50)				BT-50 (Opt.:BBT-50, CAT-50)				BT-50 (Opt.:BBT-50, CAT-50)			
Type of pull stud	-	90° Type (BT-50)				90° Type (BT-50)				90° Type (BT-50)			
Tool storage capacity	ea	8		40		40		60		40			
Max. Tool diameter [Without adjacent tools]	mm(inch)	Ø200 (7.87") / Ø200 (7.87")		Ø120 (4.72") / Ø200 (7.87")		Ø120 (4.72") / Ø200 (7.87")				Ø120 (4.72") / Ø200 (7.87")			
Max. Tool length	mm(inch)	350 (13.78")				400 (15.75")				450 (17.72")			
Max. Tool weight	kg(lb)	20 (44.09)				20 (44.09)				20 (44.09)			
Method of Tool selection	-	Fixed Address		Random memory		Random memory				Random memory			
Method of operation (Magazine / Swing arm)	-	Servo Motor / Armless		Servo Motor / Servo Motor		Servo Motor / Servo Motor				Servo Motor / Servo Motor			
Tool changing time (T to T / C to C)	sec	10 / 15		5 / 10		5 / 11				3.5 / 10			
Motor													
Feed motor (X / Y / Z)	kW(HP)	7.0 (9.39) / 7.0 (9.39) / 7.0 (9.39)				9.0 (12.07) / 6.0 (8.05) / 9.0 (12.07)				9.0 (12.07) / 9.0 (12.07) / 9.0 (12.07)			
Coolant motor (Spindle)	kW(HP)	0.4 (0.55)				0.4 (0.55)				0.4 (0.55)			
Spindle cooler (50 / 60Hz) – inverter type	kW(HP)	5.0 (6.71) / 5.6 (7.51)	8.0 (10.73)/ 8.9 (11.94)	5.0 (6.71) / 5.6 (7.51)	8.0 (10.73)/ 8.9 (11.94)	8.0 (10.73) / 8.9 (11.94)	5.0 / 5.6 & 8.0 / 8.9 (6.71 / 7.51 & 10.73 / 11.94)	8.0 (10.73) / 8.9 (11.94)	5.0 / 5.6 & 8.0 / 8.9 (6.71 / 7.51 & 10.73 / 11.94)	5.0(6.17) / 5.6(7.51)	8.0(10.73) / 8.9(11.94)	5.0 (6.17) / 5.6 (7.51)	8.0 (10.73) / 8.9 (11.94)
Power Source													
Electric power supply	kVA	75				75				75			
Compressed air supply (Pressure x Consumption)	-	0.5 ~ 0.7MPa x 1,870N ℓ/min				0.5 ~ 0.7MPa x 1,870N ℓ/min				0.5 ~ 0.7MPa x 1,870N ℓ/min			
Tank Capacity													
Spindle cooling / Lubrication	ℓ (gal)	60 (15.85) / 12(3.17)				60 (15.85) / 12(3.17)				60 (15.85) / 12(3.17)			
Coolant	ℓ (gal)	450 (118.88)				850 (224.55)				850 (224.55)			
Machine Size													
Height	mm(inch)	3,960 (155.9")				5,020 (197.64")				4,566 (179.76")			
Floor space (Length × Width)	mm(inch)	7,305x3,975 (287.6"x 156.5")		7,305x4,145 (287.6"x 163.2")		8,840 x 5,510 (348.03" x 217.00")				8,830 x 5,000 (347.64" x 196.85")		10,770 x 5,000 (424.02" x 196.85")	
Weight	kg(lb)	24,000 (69,887)		25,900 (68,784)		39,000 (85,980)		39,650 (87,413)		41,350 (91,161)		45,350 (99,980)	
NC Controller		Fanuc 31i-A											

NC Specifications [Fanuc 31i-A]

※ — : 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	S
Least input increment 1 / 10	0.0001mm, 0.0001deg, 0.00001inch	O
inch / metric conversion	G20, G21	S
Store stroke check 1 / 2		S
Mirror image		S
Store pitch error compensation		S
Backlash compensation		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
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 RS244 / ISO840	S
Optional block skip	1ea	S
Program number	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
Extend program edit function	Copy / move/..	S
Manual absolute on and off		S
Chamfering / Corner R		S
Sub program call	10 folds nested	S
Custom macro B		S
Addition of custom macro common variables	#100 ~ #199, #500 ~ #999	O
Canned cycle for drilling		S
Small-hole peck drilling cycle		O
Automatic corner override		O
Feedrate clamp based on arc radius		S
Scaling		O
Programmable data input	G10	S
Coordinate system rotation		S

ITEM	SPECIFICATION	
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		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		S
Cutter compensation C		S
Tool life management		O
Tool length measurement		S
Editing operation		
Part program storage length / Number of register able programs	128kB / 250ea	S
Part program storage length / Number of register able programs	256kB / 500ea, 512kB / 1,000ea 1MB / 1,000ea, 2MB / 1,000ea	O
Background editing		S
Extended editing functions		S
Play Back		O
Setting and display		
Clock function		S
Self-diagnosis function / Alarm history display Help function / Graphic function		S
Run hour and parts count display		S
Multi-language display	English, German, French, Italian, Chinese, Spanish, Korean, Portuguese, Polish, Hungarian, Swedish, Russian	S
Data input / output		
Reader / Puncher interface CH1	RS232C	S
Data server	SIRIUS-1250 : 256MB	O
Data server	SIRIUS-1750 : 256MB SIRIUS-2500 : 256MB	S
Data server	1,024MB	O
Ethernet interface / Memory card interface		S
Others		
Display unit	SIRIUS-1250 : 8.4" Color LCD SIRIUS-1750 : 10.4" Color LCD SIRIUS-2500 : 10.4" Color LCD	S
HWACHEON Artificial Intelligence		
AI Nano Contour Control System (HAI) 200 Block Buffer		S
AI Nano Contour Control System (HAI) 600/1000 Block Buffer		O
Hwacheon Efficient Contour Control System (HECC)		S
Hwacheon Tool Load Detect (HTLD)		S
Cutting Feed Optimization System (OPTIMA)		S
Hwacheon Thermal Displacement Control System (HTDC) = - Hwacheon Spindle Displacement Control System (HSDC) - Hwacheon Frame Displacement Control System (HFDC)		S
4- Axis interface function Option		
Controlled axes / Simultaneously Controlled axes / Control axis detach	included 4-axis interface option	O

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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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