



# VESTA-1300B

Box Way Vertical Machining Center





# HIGH RIGID BOX WAY VERTICAL MACHINING CENTER

**Hard Machining Results Every Time VESTA-1300B is the answer.**

Hwacheon's vertical machining center employ highly tough, highly rigid box way design on all axes for ultimate precision. These machines can be configured with a wide choice of spindle models to satisfy your production needs.

1 Engine Block / Automobile / Aluminum    2 Carrier / Automobile / FCD-450    3 Frame / Refrigerator-Compressor / GC-250  
4 Caliper Housing / Automobile / FCD-550    5 Valve Body / Plant Industry-Flow control Valve / CF-8M



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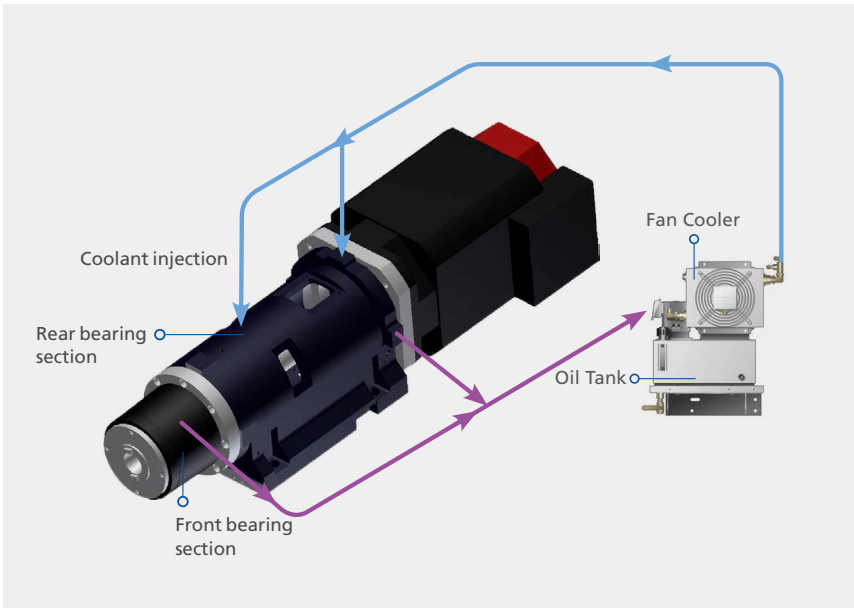
# PRECISION HEAVY-DUTY MACHINING

**In heavy duty cutting, stability is the key**

**Everything about VESTA-1300B is detail. These machining centers don't miss even the smallest detail to ensure top performance.**

Built with Hwacheon's advanced technology and craftsmanship, VESTA-1300B is the class-leading vertical machining center that will guarantee to give you the quality you seek for your manufacture requirements. The 1300B's feed drive employs all-axis box way design for precision and performance; while the structure is 3D FEM analyzed to make it tough yet efficient.





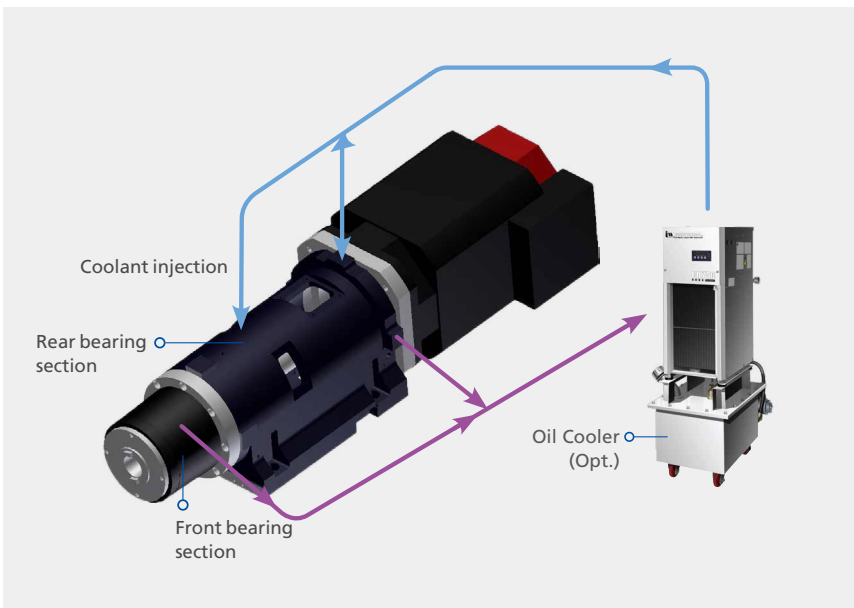
**Built-Out Spindle**

Hwacheon's spindles are the best in the class. The high-performance spindle incorporated in VESTA-1300B is motor-integrated for stability and precision at high speed; and the temperature around the spindle assembly is efficiently regulated with Hwacheon's unique oil-jet lubrication system, to limit heat distortion.

- BT-40: 10,000rpm
- BT-50: 8,000rpm

**Spindle Cooling System**

The motor bearings are lubricated with the semi-permanent grease, and the coolant travels around the motor housing jacket.

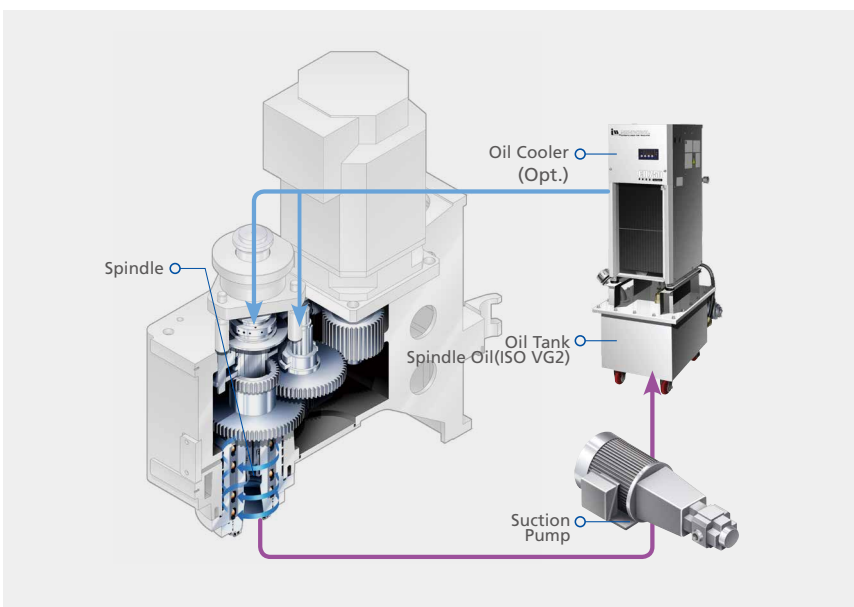


**Built-Out Spindle**

- BT-40: 12,000rpm(Air-Oil Type)

**Air-Oil Cooling System**

Hwacheon's unique air-oil cooling technology, combined with conventional jacket cooling, limits heat distortion even after the machine is used for prolonged operation.



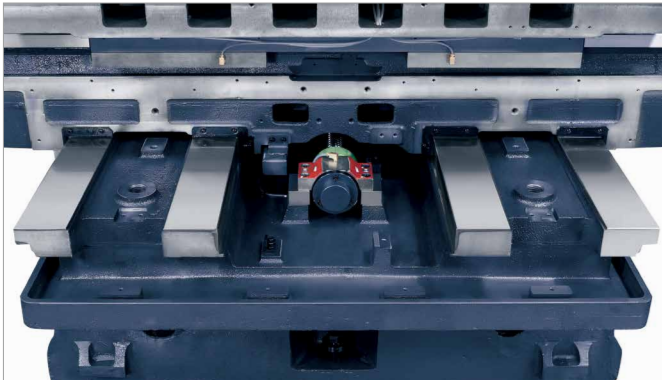
**Gear Driven Spindle**

The 2-speed auto-shifting gear spindle delivers high torque cutting performance at extra low speeds; while providing excellent performance at high speeds.

- BT-50: 6,000rpm

**Spindle Cooling System**

The motor bearings are lubricated with the semi-permanent grease, and the coolant travel around the motor housing jacket.



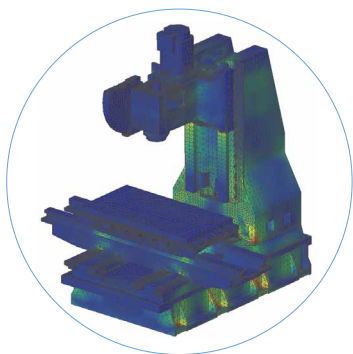
**4-Guide Box Way**

To limit friction and to increase accurate table feed, the 4-guide box way has been incorporated to the axes. The Y-axis slide way has been widened to enhance the bearing capacity and decrease the area of friction.



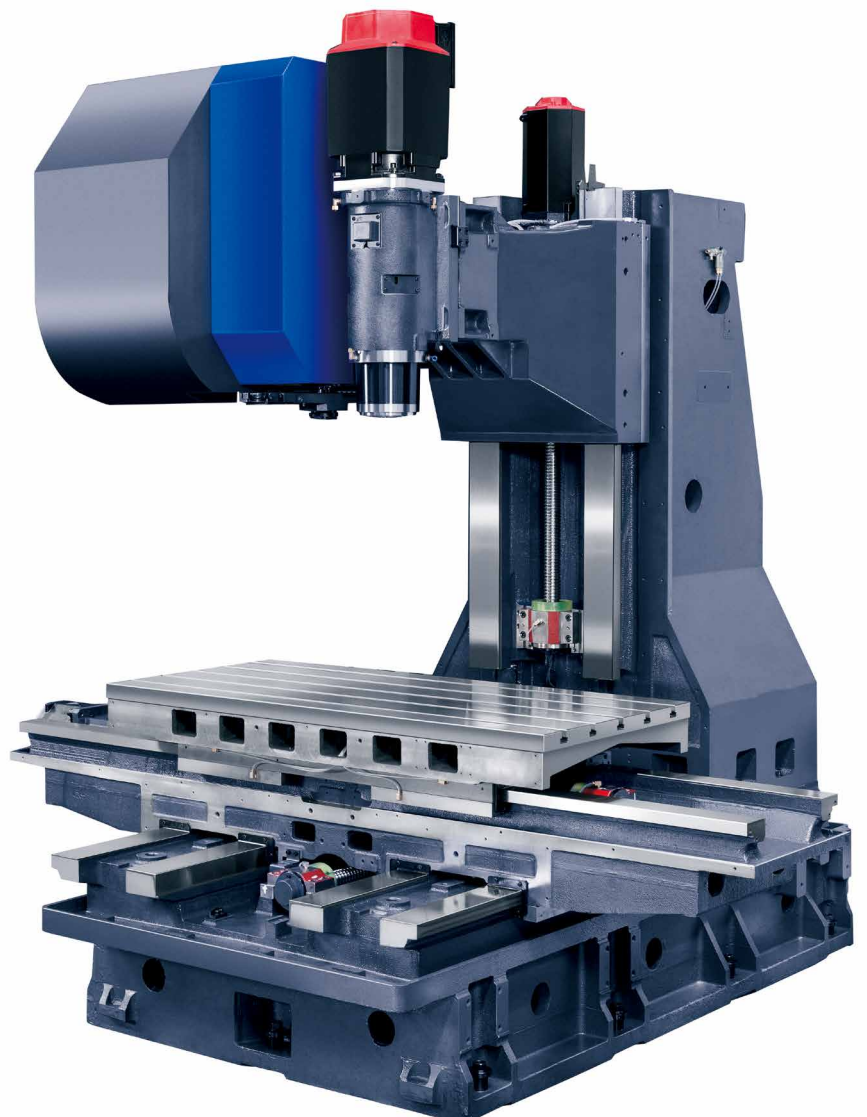
**Precision Scraping**

Each scraper has been manufactured to perfection with Hwacheon's 60-year workmanship. The scraper helps to absorb vibration during hard turning and to provide fine feed, and to ensure highly precise machining results.



**Tough, Rigid Frame Structure**

Hwacheon machines are designed from 3D simulation and FEM analysis to achieve structural rigidity and quality machining.





# MACHINING SOFTWARE

## The Hwacheon Machining Software Components

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

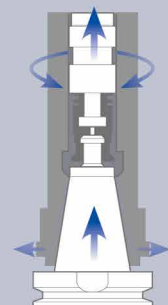
Hwacheon Spindle Displacement Control System

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

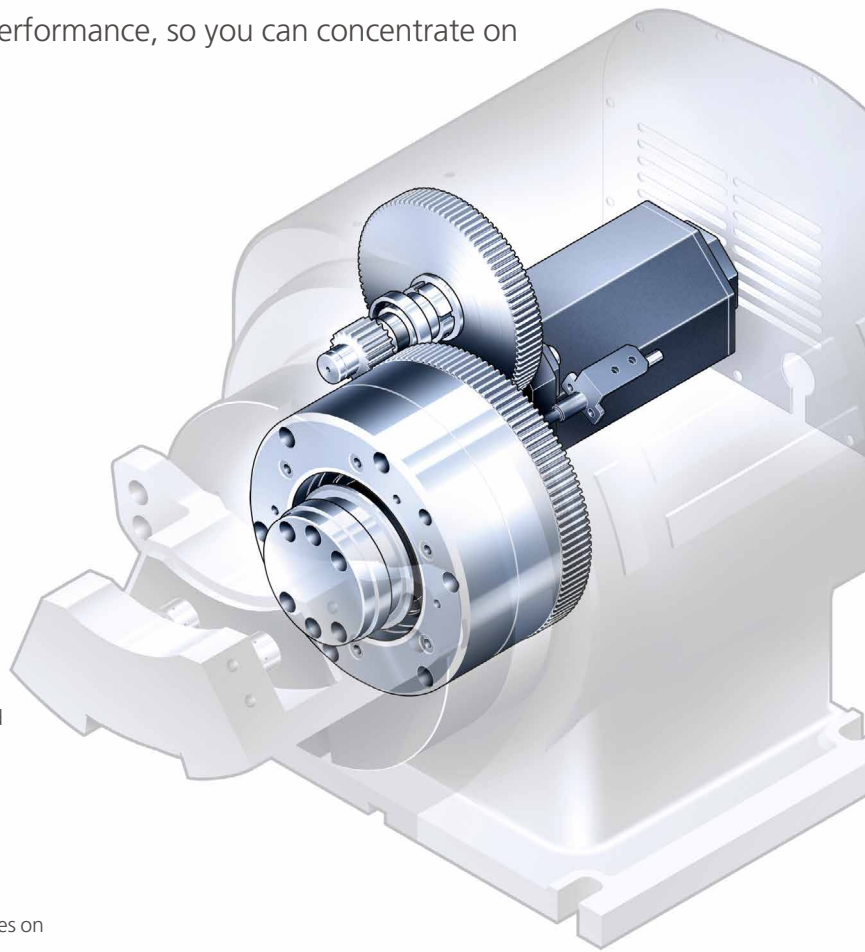
OPTIMA utilizes an adaptive control method to regulate the feed rate in real time, to sustain the cutting load during a machining process. As a result the tools are less prone to damage and the machining time is reduced.



# SPEED +

# USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

The VESTA-1300B system offers a user friendly design and a wide variety of upgrade options for a faster, more precise machining performance, so you can concentrate on what you do best: creating quality products.



## Index Table (Option)

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

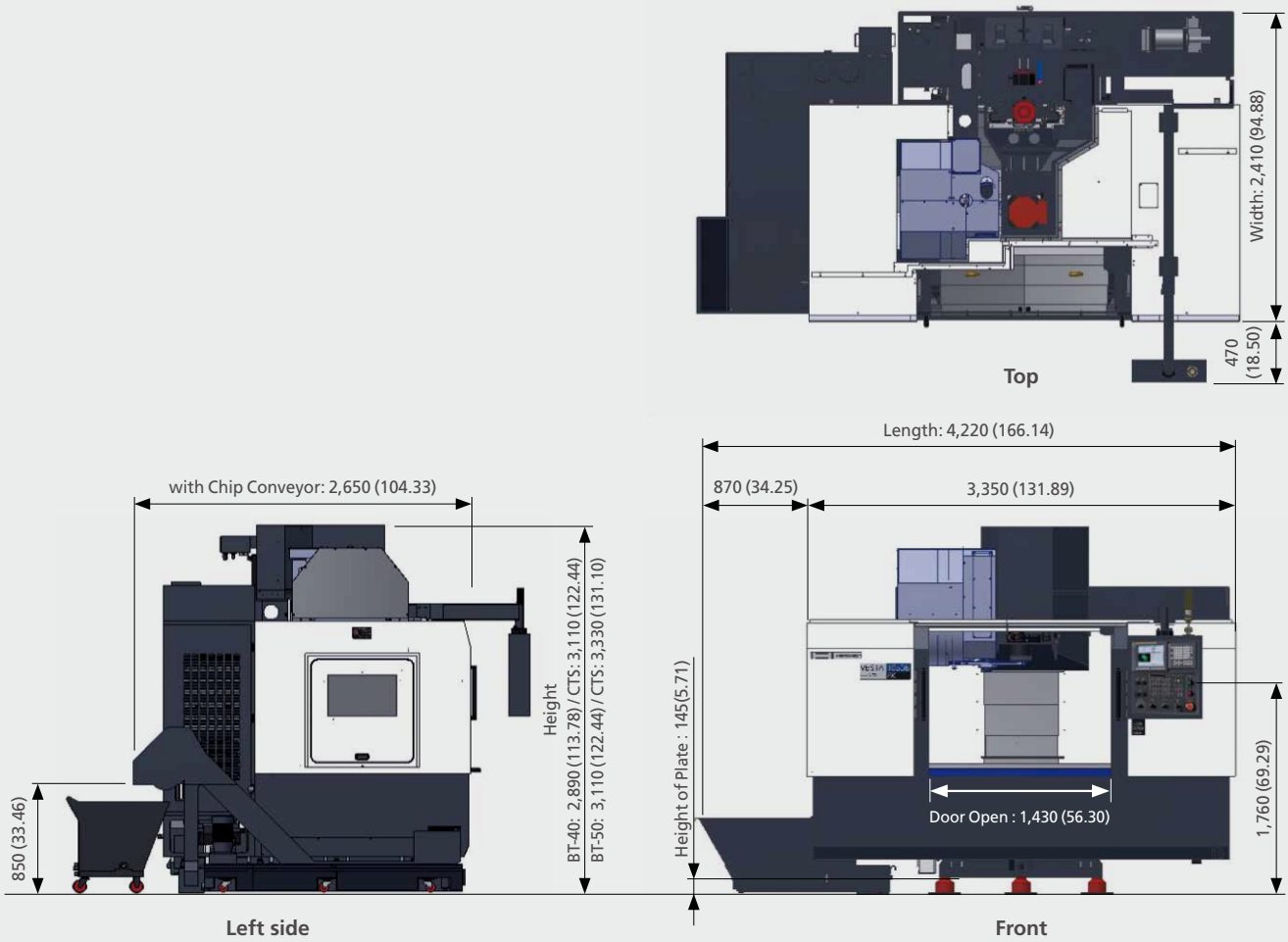
## Fast Chip Removal Performance

The chip removal system in VESTA series of machining centers are designed with a wide-angle sliding cover and the chip flushing nozzles on each side of the table; and the coil conveyor in front removes the chips quickly and effectively, to make your work more efficient.



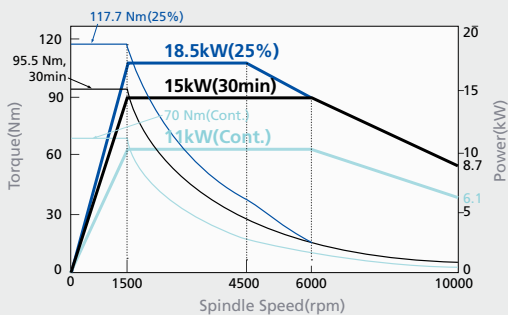
Product Data

\* Unit: mm(inch)

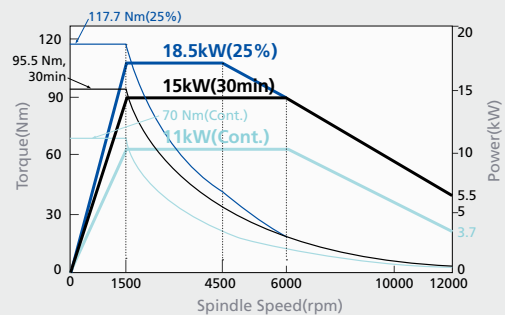


Spindle Power – Torque Diagram

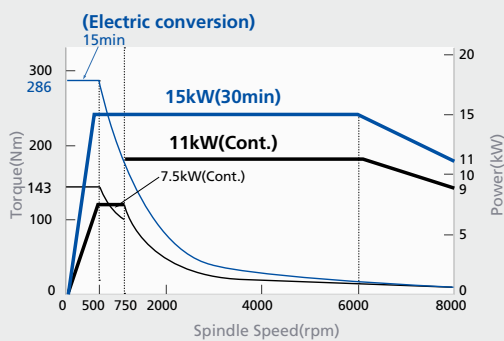
Standard (BT-40, 10,000rpm)



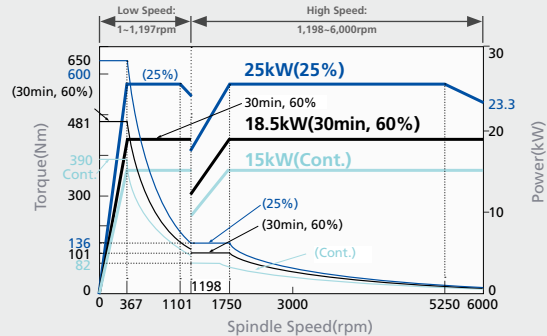
Option (BT-40, 12,000rpm)



Option (BT-50, 8,000rpm)

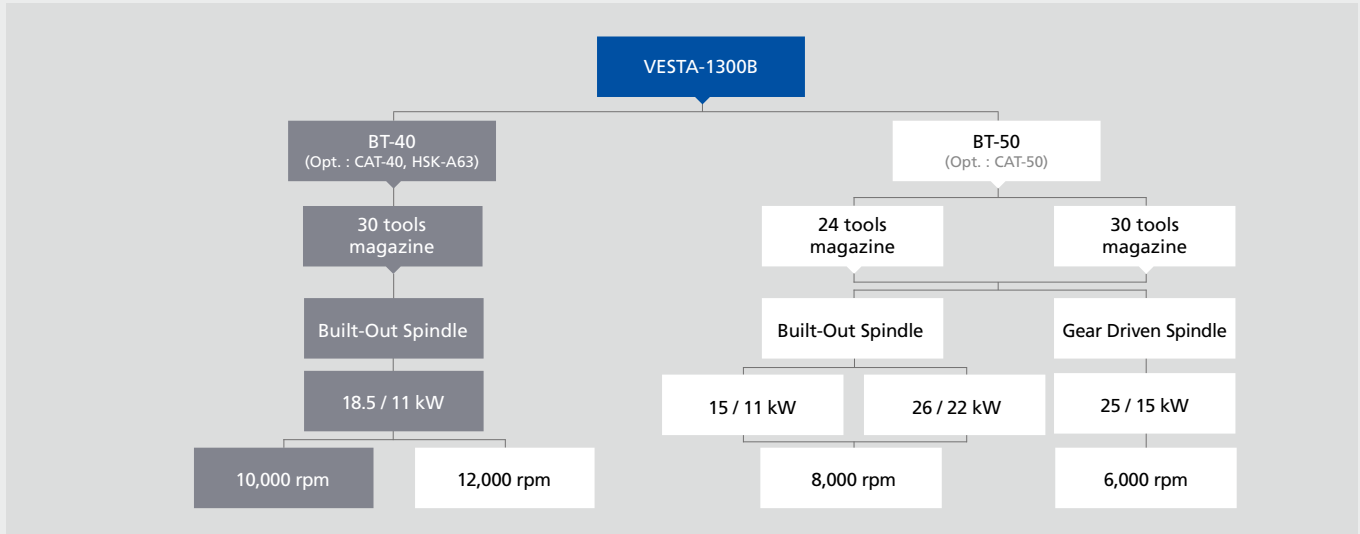


Option (BT-50, 6,000rpm)



**Product Configuration**

Each product can be configured to fit your application.



**Machine Specifications**

ITEM	VESTA-1300B					
	BT-40 10,000 rpm	BT-40 12,000 rpm	BT-50 8,000 rpm	BT-50 6,000 rpm		
<b>Travel</b>						
Stroke (X / Y / Z)	mm(inch)	1,300 / 670 / 650 (51.18 / 26.38 / 25.59)				
Distance From Table Surface to Spindle Gauge Plane	mm(inch)	150 ~ 800 (5.91 ~ 31.50)				
Distance Between Columns to Spindle Center	mm(inch)	720 (28.35)				
<b>Table</b>						
Working Surface	mm(inch)	1,450 x 670 (57.09 x 26.38)				
Table Loading Capacity	kg (lb)	1,200 (2,646)				
Table Surface Configuration (T slots WxP / No. of Slots)	mm(inch)	18 x125 (0.71 x 4.92) / 5ea				
<b>Spindle</b>						
Max. Spindle Speed	rpm	10,000	12,000	8,000	6,000	
Spindle Motor	kW(HP)	18.5/11 (25/15)		15/11(20/15), CTS: 26/22(35/30)		25/15 (34/20)
Type of Spindle Taper Hole	-	ISO#40, 7/24 Taper (BT-40)		ISO#50, 7/24 Taper (BT-50)		
Spindle Bearing Inner Diameter	mm(inch)	Ø70 (2.76)		Ø90 (3.54)		
Type of Spindle	-	Built-out		Built-out	Gear Driven	
Method of Spindle Lubrication & Cooling	-	Grease Lub. + Jacket Cooling	Air-Oil Lub. + Jacket Cooling	Grease Lub. + Jacket Cooling		
<b>Feedrate</b>						
Rapid Speed (X / Y / Z)	m/min(ipm)	30 / 30 / 24 (1,181 / 1,181 / 945)				
Feedrate (X / Y / Z)	mm/min(ipm)	1 ~ 12,000 (0.04 ~ 472)				
<b>Motor</b>						
Feed Motor (X / Y / Z)	kW(HP)	3 / 4 / 7 (4 / 5.4 / 9.4)				
Coolant Motor (Spindle / Chip Flushing)	kW(HP)	0.4 / 0.9 (0.54 / 1.2)				
Spindle Cooler	kW(HP)	0.18 (0.24)	2.8 / 3.2 (3.8 / 4.4)	0.18 (0.24)	2.8 / 3.2 (3.8 / 4.4)	
<b>ATC</b>						
Type of Tool Shank	-	BT-40 (OPT: CAT-40, HSK-A63)		BT-50 (OPT: CAT-50)		
Type of Pull Stud	-	MAS P40T-1 (45°)		BT-50 (90°)		
Tool Storage Capacity	ea	30		24 (OPT: 30)		
Max. Tool Diameter [with / without Adjacent Tools]	mm(inch)	30 Tools: Ø75 / Ø150 (3.15 / 5.91)		24 Tools: Ø125 / Ø245 (4.92 / 9.65) 30 Tools: Ø110 / Ø200 (4.33 / 7.87)		
Max. Tool Length	mm(inch)	300 (11.81)		350 (13.78)		
Max. Tool Weight	kg (lb)	8 (17.64)		20 (44.09)		
Method of Tool Selection	-	Memory Random				
Method of Operation (Magazine / Swing Arm)	-	Geared Motor / Geared Motor				
<b>Power Source</b>						
Electric Power Supply	kVA	50				
Compressed Air Supply (Pressure X Consumption)	-	0.5~0.7MPa x 690N ℓ/min				
<b>Tank Capacity</b>						
Spindle Cooling / Lubrication / Coolant	ℓ (gal)	20 / 6 / 340 (5.28 / 1.59 / 89.81)				
<b>Machine Size</b>						
Height	mm(inch)	2,890 (113.78) / CTS: 3,110 (122.44)		3,110 (122.44) / CTS: 3,330 (131.10)		
Floor Space (Length x Width)	mm(inch)	4,220 x 2,410 (166.14 x 94.88)				
Weight	kg (lb)	7,830 (17,262)		9,600 (21,164)		
NC Controller		Fanuc 0i-MF				

## Standard and Optional Product Components

Standard Accessories		Optional Accessories	
• Adjust Bolt, Block & Plate	- Oil Cooler Type (Air-Oil, Gear Driven)	• Air Dryer	• Spindle Through Coolant (3MPa / 7MPa)
• Air Blower	• Spindle 10,000rpm (Built-Out)	• Air Gun	• Tool Life Management
• Base Around Splash Guard	• Tool Kit & Box	• Auto Door	• Tool Measuring System
• Coil Conveyor, 1ea	• Work Light	• Coolant Gun	- Renishaw/Blum (Touch Type, Laser Type)
• Coolant System	• Workpiece Coordinate System 48 pairs	• Data Server, 256MB/ 1,024MB	• Transformer
• Door Interlock	• 10.4" Color LCD	• Data Server Interface	• Workpiece Measuring System
• Ethernet Interface	• 24 Tools Magazine (BT-50)	• Lift Up Chip Conveyor, (Hinge / Scraper / Mesh-drum)	- Renishaw/Blum (Touch Type)
• Lubrication Oil Separation Tank	• 30 Tools Magazine (BT-40)	• Linear Scale (X/ Y/ Z)	• 15" Color LCD (only FANUC)
• Lubrication System	• Hwacheon Artificial Intelligence Control System(HAI): 40 block	• Manual Guide i	• 30 Tools Magazine (BT-50)
• MPG Handle, 1ea	• Hwacheon Efficient Contour Control System (HECC)	• Mist Collector	• 4-Axis Interface
• Operation Manual & Parts List	• Hwacheon Tool Load Detect System (HTLD)	• MPG Handle (3ea)	• Hwacheon Artificial Intelligence Control System(HAI): 200/400 block
• Part Program Storage Length 1,280m(512kB)	• Hwacheon Thermal Displacement Control System (HTDC)	• NC Cooler	
• Pneumatics System	- Hwacheon Spindle Displacement Control System (HSDC)+	• Oil Mist (Semi Dry Cutting System)	
• Rigid Tapping	- Hwacheon Frame Displacement Control System (HFDC)	• Oil Skimmer	
• Signal Lamp (R / G / Y, 3 Color)	- Hwacheon Spindle Displacement Control System (HSDC)+	• Spindle Cooler (Jacket Cooling)	
• Spindle Cooler (Jacket Cooling)	- Hwacheon Frame Displacement Control System (HFDC)	• Oil Cooler Type (Built-Out)	
- Fan Cooler Type (Built-Out)	• Cutting Feed Optimization system (OPTIMA)		

## NC Specifications [Fanuc Oi-MF]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Controlled Axis		Program Input	
Controlled Axis	3-axis S	Small-hole Peck Drilling cCycle	S
Controlled Axis	5-axis (Max.) O	Automatic Corner Override	S
Simultaneously Controlled Axis	3-axis S	Feedrate Control with Acceleration in Circular Interpolation	S
Simultaneously Controlled Axis	4-axis (Max.) O	Scaling / Coordinate System Rotation	S
Least Input Increment	0.001mm,0.001deg,0.0001inch S	Programmable Mirror Image	S
Least Input Increment 1 / 10	0.0001mm,0.0001deg,0.00001inch O	Tape Format for Fanuc Series 10 / 11	S
inch / metric Conversion	G20, G21 S	Manual Guide i	O
Store Stroke Check 1 / 2		Spindle Speed Function	
Mirror Image		Spindle Serial Output	S
Store Pitch Error Compensation		Spindle Override	50 - 120% S
Backlash Compensation		Spindle Orientation	S
Operation		Rigid Tapping	S
Automatic & MDI Operation		Tool Function / Compensation	
DNC Operation by Memory Card	PCMCIA Card is Required S	Tool Function	T4-digits S
Program Number Search		Tool Offset Pairs	±6-digits / 400ea S
Sequence Number Search		Tool Offset Mmemory C	S
Dry Run, Single Block		Cutter Compensation C	S
Manual Handle Feed / Feed Rate	1Unit / x1, x10, x100 S	Tool Life Management	O
Interpolation Function		Tool Length Compensation / Tool Length Measurement	S
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02, G03 / G04 S	Editing Operation	
Cylindrical Interpolation	4-axis Interface Option is Required S	Part Program Storage Length	1,280m (512kB) S
Helical Interpolation	Circular interpolation plus max. 2-axis linear interpolation S	Number of Register Able Programs	400ea S
Reference Position Return Check / Return 2nd,3rd,4th Reference Position Return / Skip	G27 / G28,G29 S	Background Editing	S
Feed Function	G30 / G31 S	Extended Part Program Editing / Play Back	S
Rapid Traverse Override	F0, F25, F50, F100 S	Setting and Display	
Feedrate (mm/min)		Clock Function	S
Feedrate Override	0 ~ 150% S	Self-diagnosis Function / Alarm History Display	S
Jog Feed Override	0 ~ 4,000 mm/min S	Help Function / Graphic Function	S
Override Cancel	M48, M49 S	Run Hour and Parts Count Display	S
Program Input		Dynamic Garphic Display	O
Tape Code	EIA / ISO S	Multi-language Display	English, German, French, Italian, Chinese, Spanish, Korean, Portuguese, Polish, Hungarian, Swedish, Russian S
Optional Block Skip	9ea S	Data Input / Output	
Program Number	O4-digits S	Reader / Puncher Interface CH1	R5232C S
Sequence Number	N8-digits S	Reader / Puncher Interface CH2	R5232C S
Decimal Point Programming		Data Server	256MB / 1,024MB O
Coordinate System Setting	G8 S	Ethernet Interface / Memory Card Interface	S
Workpiece Coordinate System	G54 - G59 S	Others	
Workpiece Coordinate System Preset		Display Unit	10.4" Color LCD S
Addition of Workpiece Coordinate Pair	48ea S	HWACHEON Macining Software	
Manual Absolute ON and OFF		Hwacheon Artificial Intelligence Control System (HAI): 40 Block	S
Chamfering / Corner R		Hwacheon Artificial Intelligence Control System (HAI): 200 / 400 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		Hwacheon Thermal Displacement Control System (HTDC)	S
Addition of Custom Macro Common Variables	#100-#199, #500-#999 S	Cutting Feed Optimization System (OPTIMA)	S
Canned Cycles for Drilling		4-axis interface function Option	
Polar Coordinate System		Controlled Axis / Simultaneously Controlled Axis / Control Axis Detach	Included 4-axis Interface option O

## Hwacheon Global Network

 Hwacheon Headquarters  Hwacheon Europe  Hwacheon Asia  Hwacheon America



Please contact us for product inquiries.

[www.hwacheon.com](http://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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