



# 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





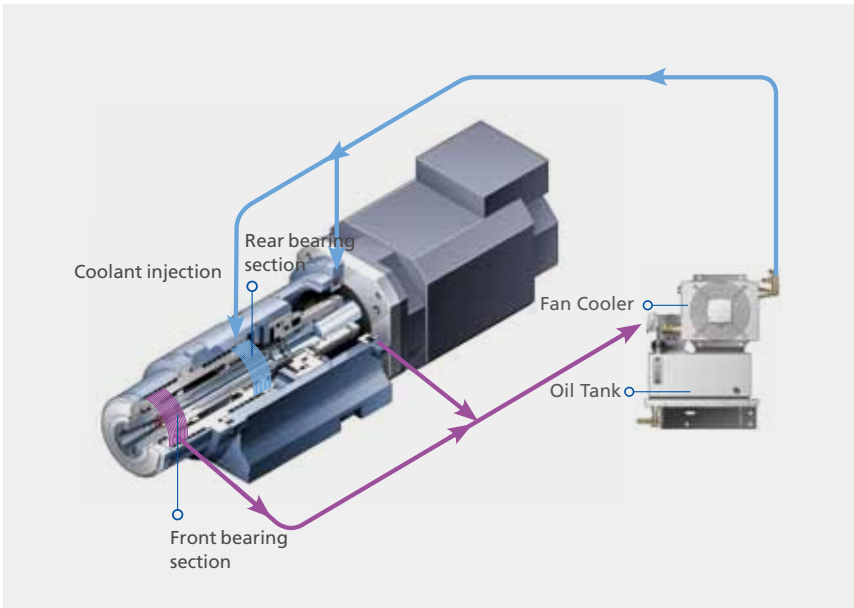
# PRECISION HEAVY-DUTY MACHINING

**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.





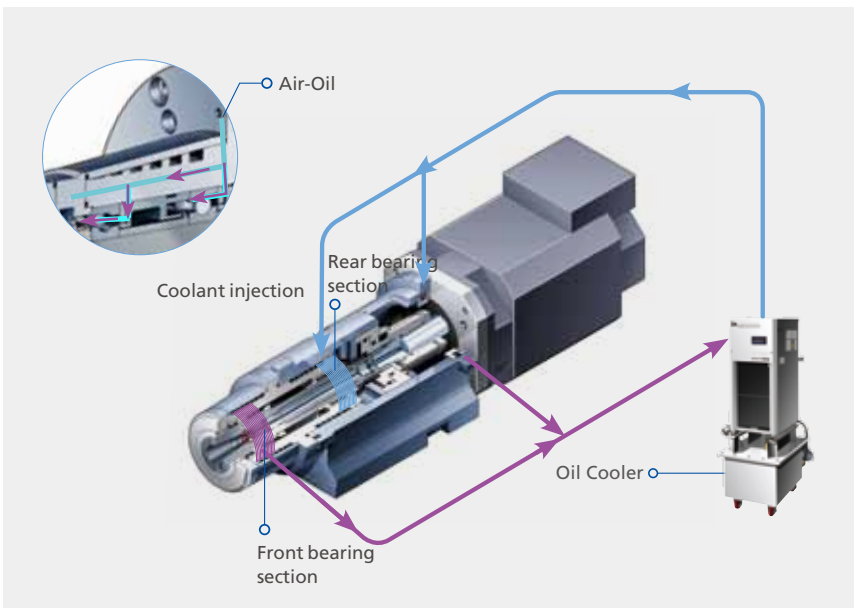
**Built-Out Spindle**

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.

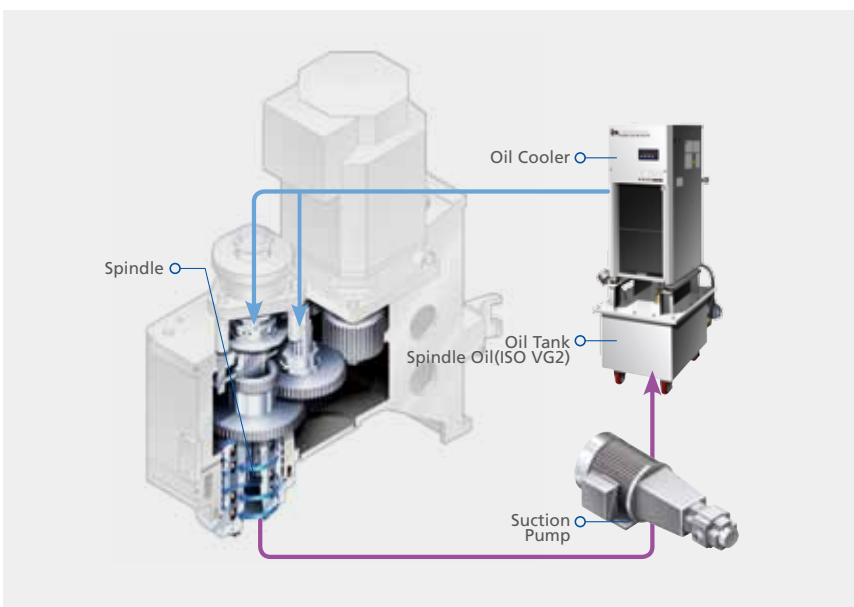


**Built-Out Spindle**

- 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.



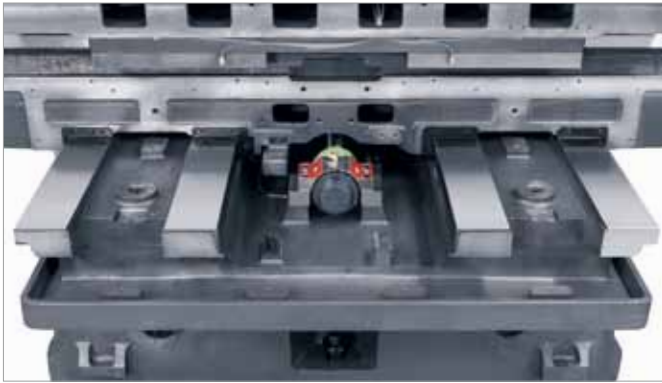
**Gear driven Spindle**

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.



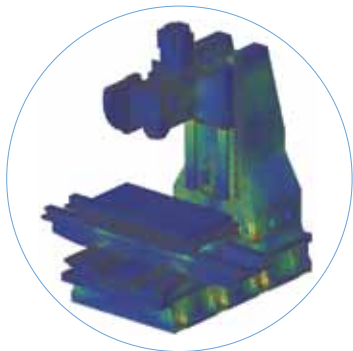
#### 4-Guide Box Way

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.

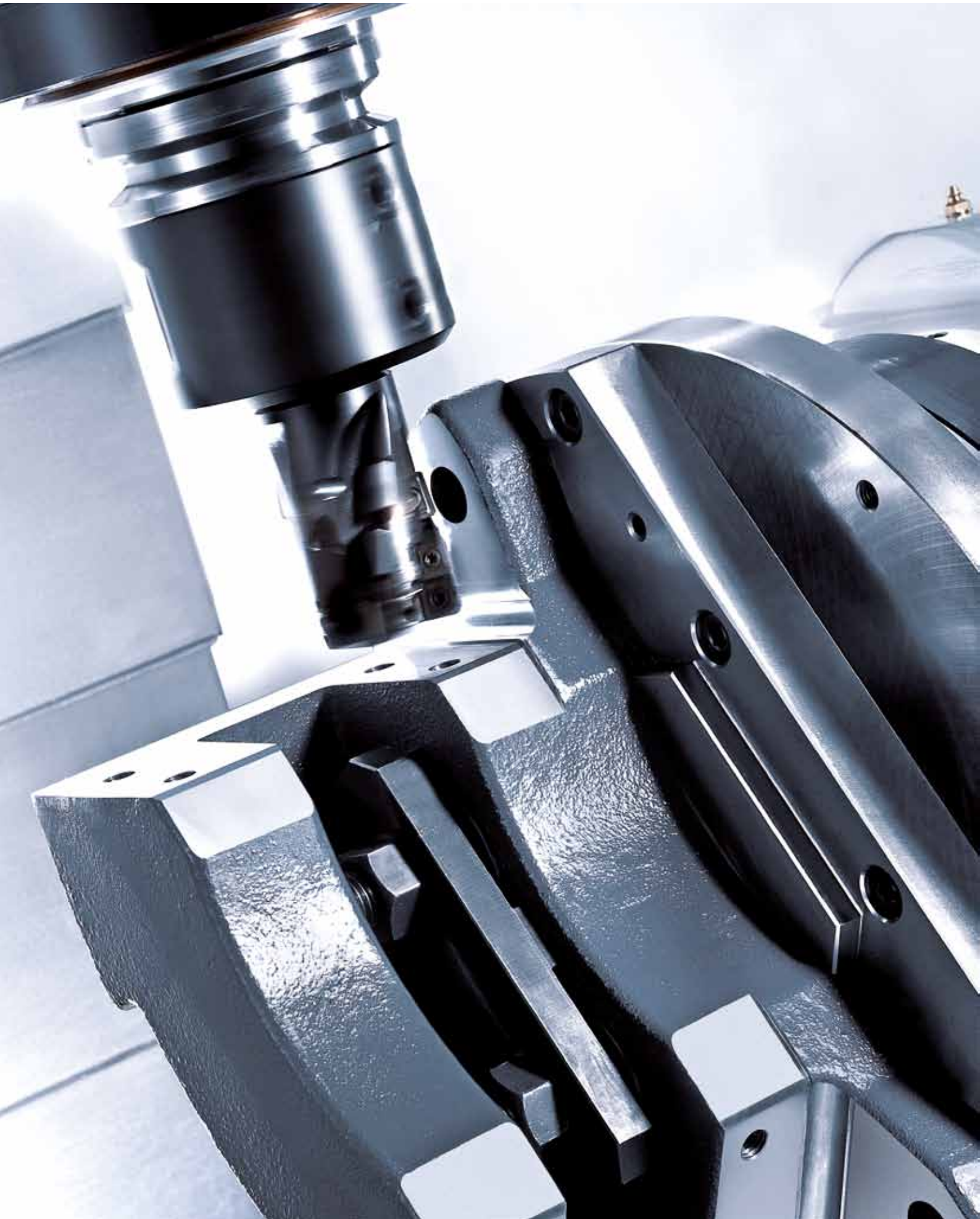


#### Tough, Rigid Frame Structure

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.

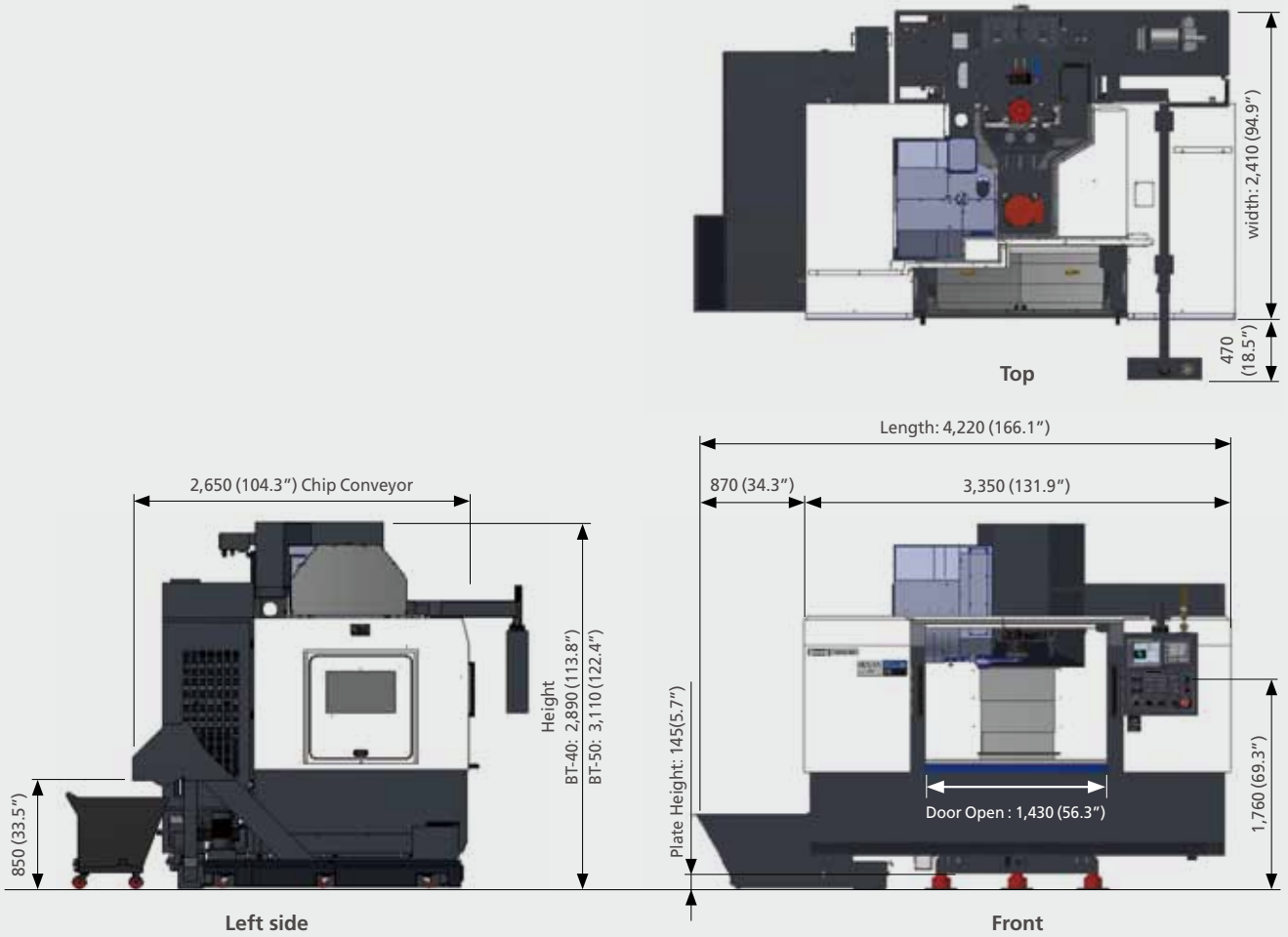
## Fast chip removal performance

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.



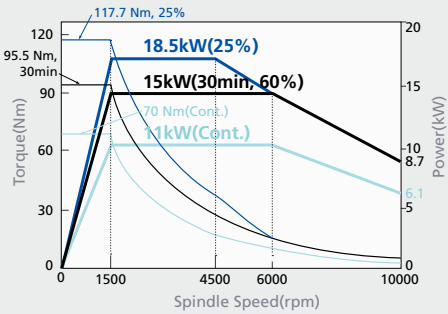
Product Data

\* Unit: mm(inch)

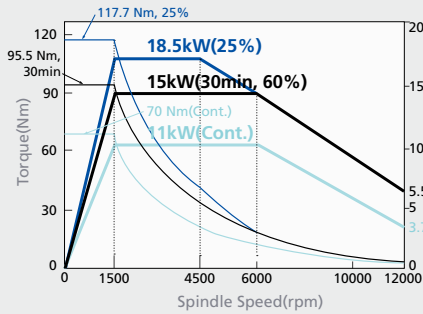


Spindle Power – Torque Diagram

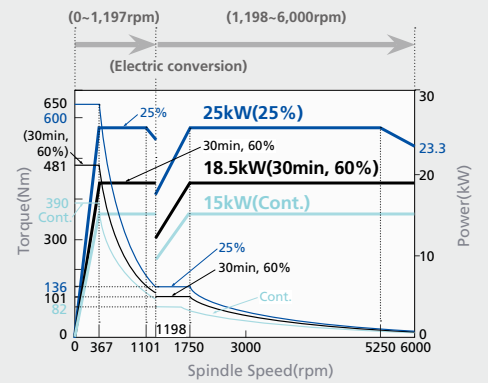
Standard (BT-40, 10,000rpm)



Option (BT-40, 12,000rpm)



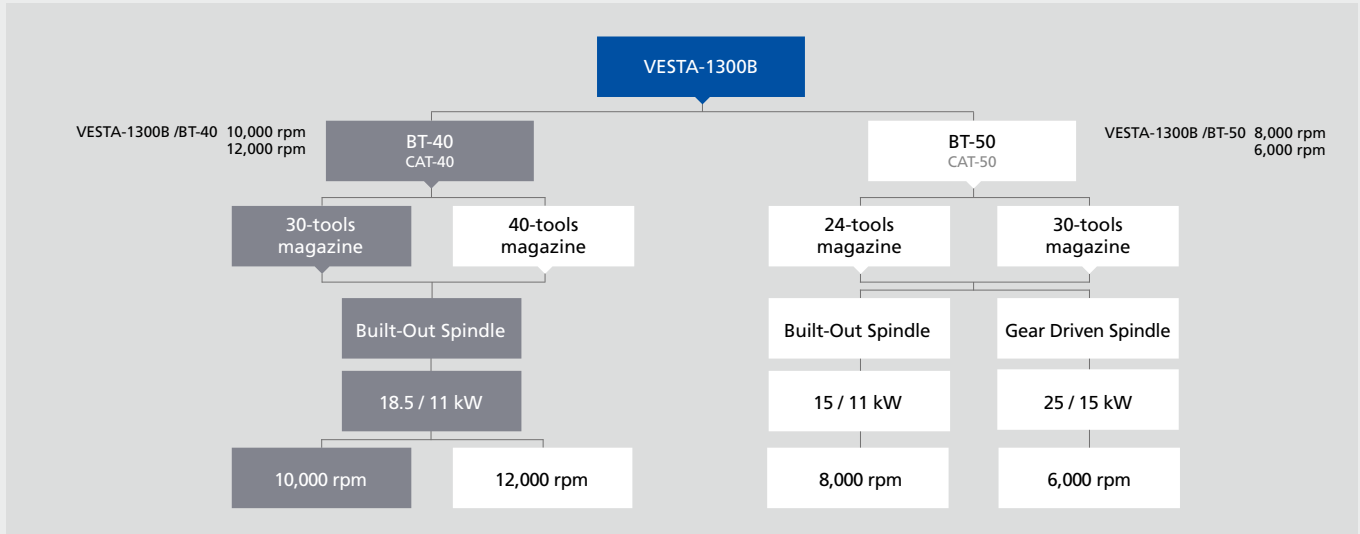
Option (BT-50, 6,000rpm)





**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 (51.18") / 670 (26.38") / 650 (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 (0.71") x125 (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)	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)	0.4 (0.54)			
<b>ATC</b>					
Type of Tool Shank	-	BT-40 (Opt.: CAT-40)		BT-50 (Opt.: CAT-50)	
Type of Pull Stud	-	MAS P40T-1 (45°)		BT-50 (90°)	
Tool Storage Capacity	ea	30 (Opt.: 40)		24 (Opt.: 30)	
Max. Tool Diameter [without Adjacent Tools]	mm(inch)	30/40 Tools: Ø75 (3.15") / Ø150 (5.91")		24 Tools: Ø125 (4.92") / Ø245 (9.65") 30 Tools: Ø110 (4.33") / Ø200 (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			
Tool Changing Time (T to T / C to C)	sec	2.5 / 8		3.5 / 9	
<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>					
Lubrication / Spindle Cooling / Coolant	ℓ (gal)	20 / 6 / 340 (5.28 / 1.59 / 89.81)			
<b>Machine Size</b>					
Height	-	2,890 (113.8")		3,110 (122.4")	
Floor Space (Length x Width)	mm(inch)	4,220 (166.1") x 2,410 (94.9")			
Weight	kg(lb)	9,000 (19,842)	9,200 (20,282)	10,000 (22,046)	10,200 (22,487)
NC Controller		Fanuc-0i MD			

## Standard and Optional product components

Standard Accessories		Optional Accessories	
• Adjust Bolt, Block & Plate	• Signal Lamp with 2 Colors (R, G)	• Air Dryer	• Oil Skimmer
• Air Blower	• Spindle Cooler (Jacket Cooling)	• Air Gun	• Signal Lamp with 3 Colors (R, G, Y)
• Base Around Splash Guard	- Fan Cooler Type (Built-Out)	• Auto Door	• Spindle Cooler (Jacket Cooling)
• Coil Conveyor, 1ea	- Oil Cooler Type (Air-Oil, Gear Driven)	• Coolant Gun	- Oil Cooler Type (Built-Out)
• Coolant System	• Tool Kit & Box	• Data Server, 256MB/ 1,024MB	• Spindle Through Coolant, 30bar/ 70bar
• Door Interlock	• Work Light	• Data Server Interface	• Tool Life Management
• Ethernet Interface	• Workpiece Coordinate System, 48 pairs	• Lift up Chip Conveyor,	• Tool Measuring System
• Lubrication Oil Separation Tank	• Hwacheon AI Nano Contour Control System (HAI): 40Block	- Hinge type/ scraper type	- Renishaw/Blum (Touch type, Laser type)
• Lubrication System	• Hwacheon Efficient Contour Control system (HECC)	• Linear Scale (X/ Y/ Z)	• Transformer
• Magazine	• Hwacheon Tool Load Detect system (HTLD)	• Magazine	• Workpiece Measuring System
- BT-40: 30Tools	• Hwacheon Thermal Displacement Control system (HTDC)	- BT-40: 40Tools	- Renishaw/Blum (Touch type)
- BT-50: 24Tools	- Hwacheon Spindle Displacement Control system (HSDC)+	- BT-50: 30Tools	• 4-Axis Interface
• MPG Handle, 1ea	- Hwacheon Frame Displacement Control system (HFDC)	• Manual Guide i	• Hwacheon AI Nano Contour
• Operation Manual & Parts List	• Cutting Feed Optimization System (OPTIMA)	• Mist Collector	- Control System (HAI): 200Block
• Part Program Storage Length 1,280m(512kB)		• MPG Handle, 3ea	
• Pneumatics System		• NC Cooler	
• Rigid Tapping		• Oil Mist (Semi Dry Cutting System, Eco Booster)	

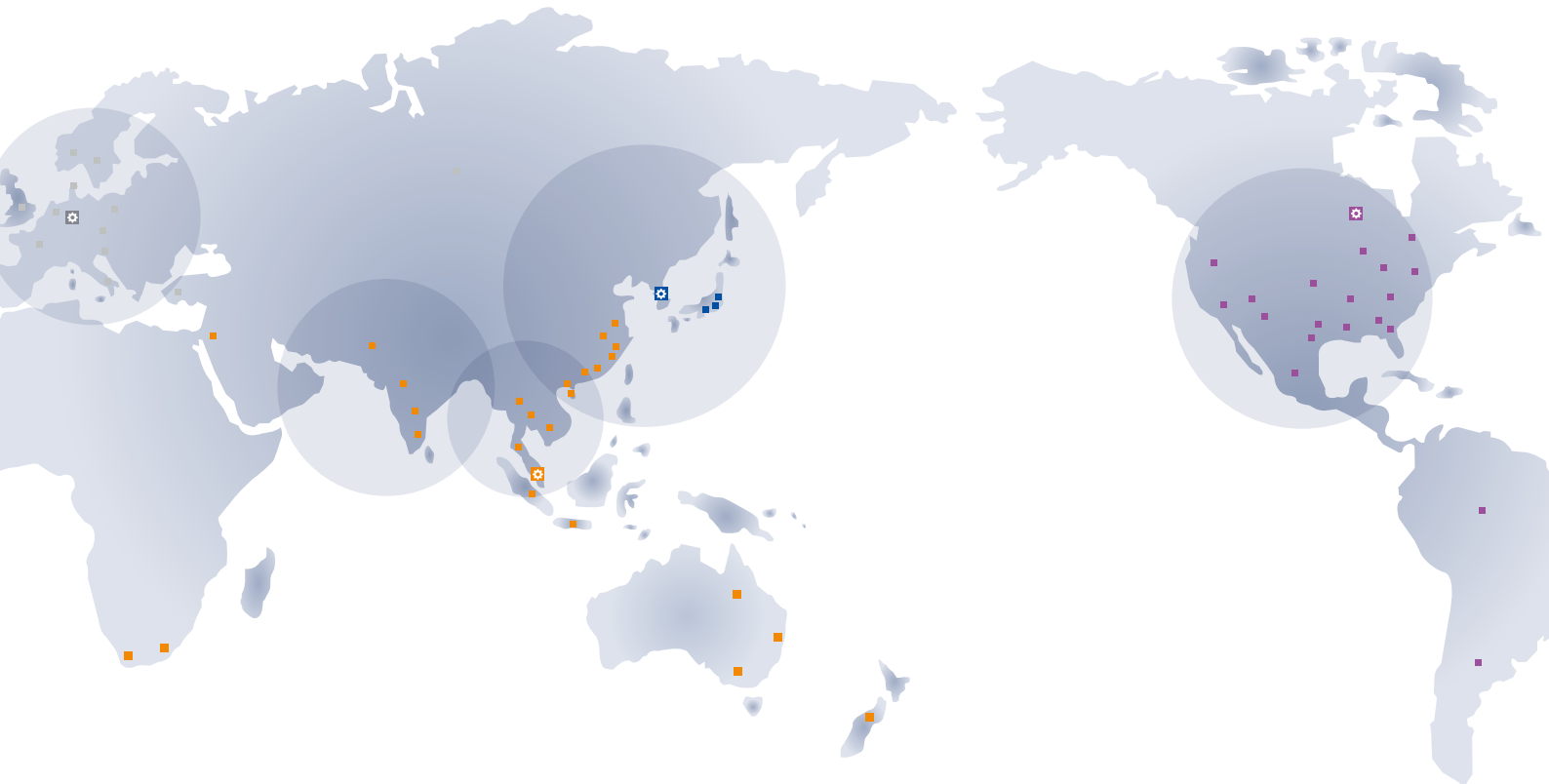
## NC Specifications [Fanuc0i-TD]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Controlled axis		Program input	
Controlled axis	3 - Axes S	Small-hole peck drilling cycle	S
Controlled axis	5 - Axes (Max.) O	Automatic corner override	S
Simultaneously controlled axes	3 - Axes S	Feedrate control with acceleration in circular interpolation	S
Simultaneously controlled axes	4 - Axes (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	S	Spindle speed function	
Mirror Image	S	Spindle serial output	S
Store Pitch Error Compensation	S	Spindle override	50 - 120% S
Backlash compensation	S	Spindle orientation	S
Operation		Rigid tapping	S
Automatic & MDI operation	S	Tool function / compensation	
DNC operation by memory card	PCMCIA card is required S	Tool function	T4 - digits S
Program number search	S	Tool offset pairs	±6 - digits / 400ea S
Sequence number search	S	Tool offset memory C	S
Dry Run, Single Block	S	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	
Interpolation function		Part program storage length	1,280m (512kB) S
Cylindrical interpolation	4-axis interface option is required O	Number of register able programs	400ea S
Helical interpolation	Circular interpolation plus max.2axes linear interpolation S	Background editing	S
Reference position return check / return	G27 / G28,G29 S	Extended part program editing / Play Back	S
2nd,3rd,4th reference position return / Skip	G30 / G31 S	Setting and display	
Feed function		Clock function	S
Rapid traverse override	F0, F25, F50, F100 S	Self-diagnosis function / Alarm history display	S
Feedrate (mm/min)	S	Help function / Graphic function	S
Feedrate override	0 ~ 150% S	Run hour and parts count display	S
Jog feed override	0 ~ 4,000mm/min S	Multi-language display	English, German, French, Italian, Chinese, Spanish, Korean, Portuguese, Polish, Hungarian, Swedish, Russian S
Override cancel	M48, M49 S	Data input / output	
Program input		Reader / Puncher interface CH1	R5232C S
Tape code	EIA RS244 / ISO840 S	Reader / Puncher interface CH2	R5232C S
Optional block skip	1ea S	Data server	256MB / 1,024MB O
Program number	O4 - Digits S	Ethernet Interface / Memory card interface	S
Sequence number	N5 - Digits S	Others	
Decimal point programming	S	Display unit	10.4" Color LCD S
Coordinate system setting	G92 S	HWACHEON Artificial Intelligence	
Workpiece coordinate system	G54 - G59 S	Hwacheon AI Nano Contour Control System (HAI) 40 Block Buffer	S
Workpiece coordinate system preset	S	Hwacheon AI Nano Contour Control System (HAI) 200 Block Buffer	O
Addition of workpiece coordinate pair	48ea S	Hwacheon Efficient Contour Control System (HECC)	S
Manual absolute on and off	S	Hwacheon Tool Load Detect System (HTLD)	S
Chamfering / corner R	S	Hwacheon Thermal Displacement Control System (HTDC)	S
Programmable data input	G10 S	Cutting Feed Optimization System (OPTIMA)	S
Sub program call	10 folds nested S	4 - Axis interface function Option	
Custom Macro B	S	Controlled axes / Simultaneously controlled axes / Control axis detach	Included 4-axis Interface option O
Addition of custom macro common variables	#100-#199, #500-#999 S		
Canned Cycles for Drilling	S		

## Hwacheon Global Network

 Hwacheon Headquarters  Hwacheon Europe  Hwacheon Asia  Hwacheon America



**HWACHEON**

Please call 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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