



# VESTA-850B/1050B

Box Way Gear Driven Vertical Machining Centers



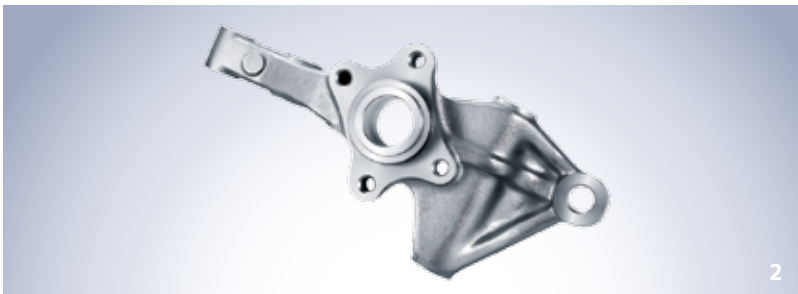


# BOX WAY GEAR DRIVEN VERTICAL MACHINING CENTER

**Hard Machining Results Every Time VESTA vertical machining center is the answer.**

The VESTA Vertical Machining Centers are built with highly rigid double boxed ways for consistent work results. The gear driven spindle delivers high torque at low RPM's for heavy duty machining in addition to a highly efficient cutting process at faster speeds.

1 Front Knuckle / Automobile / FCD-450    2 Carrier / Automobile / FCD-450    3 Valve Body / Plant Industry-Flow control Valve / CF-8M  
4 Pump Housing / Plant Industry / GC-250    5 Frame / Refrigerator-Compressor / GC-250    6 Caliper Housing / Automobile / FCD-550



# HEAVY DUTY MACHINING STABILITY

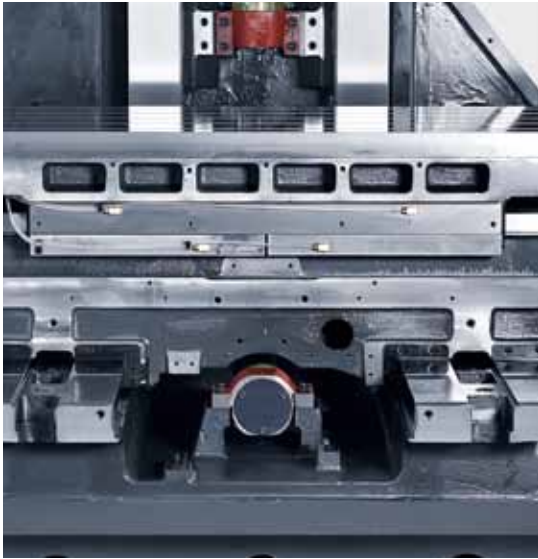
**In heavy duty cutting, stability is the key**

**Everything about VESTA-850B/1050B is detail. These machining centers don't miss even the smallest detail to ensure top performance.**

The spindle is the heart of a machining center, and Hwacheon's technical know-how for the spindle is unrivaled. Hwacheon's high-performance spindle is designed using 3D simulations and FEM analysis, The motor is directly integrated into the spindle for stable, high speed cutting. To minimize thermal displacement and to increase the life of the spindle assembly, the unit is grease-lubricated and jacket cooled. The advanced feed drive complements the spindle for highly precise machining results every time.







**4-Guide box way**

The double boxed way design has been incorporated in the Y-axis to limit friction and increase feed rates. These slide ways have been widened for additional bearing support and decrease the surface friction.



**Precision scraping**

With Hwacheon's 60 years of workmanship, the VESTA boxed ways are scraped to perfection. Precision scraping helps absorb vibration during turning and provide smooth movement to ensure highly precise machining results.

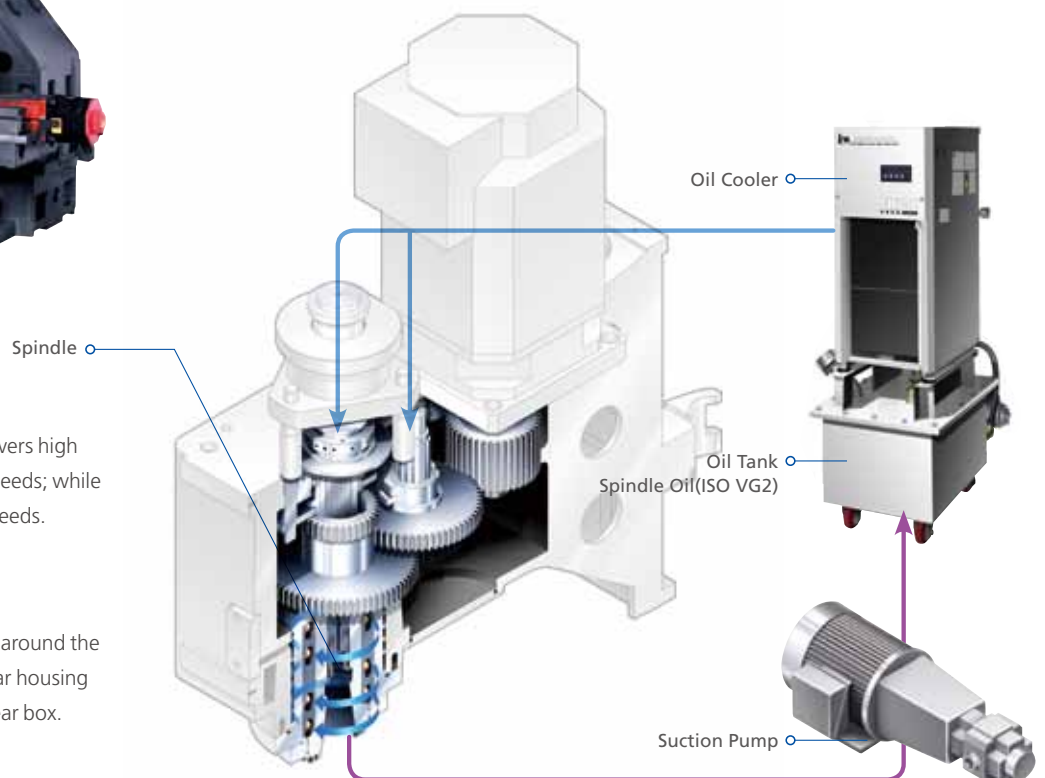


**Gear driven**

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

**Spindle cooling system**

Semi-permanent grease lubrication is used around the bearings. the bearing assembly and the gear housing are cooled with circulating oil within the gear box.









# MACHINING SOFTWARE

## The Hwacheon Machining Software Components

The 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.

**HTDC™**

Hwacheon Thermal Displacement Control

### 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.

**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)



## 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-850B/1050B 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.

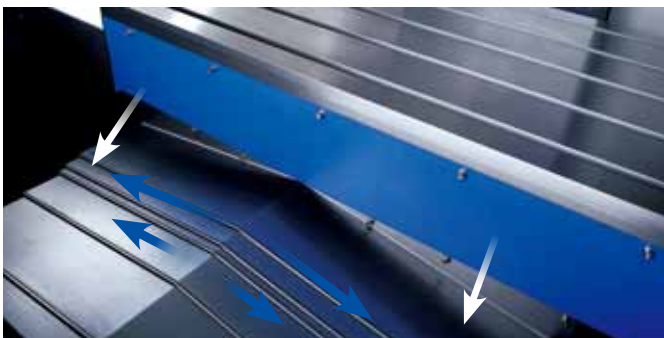


## Index Table (Option)

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

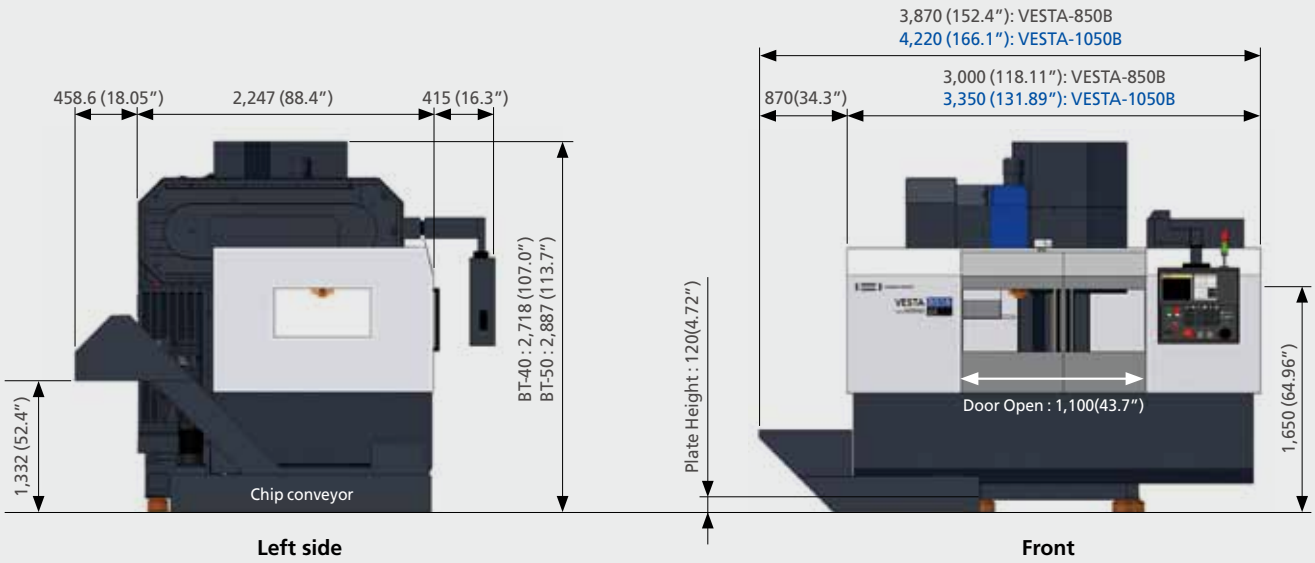
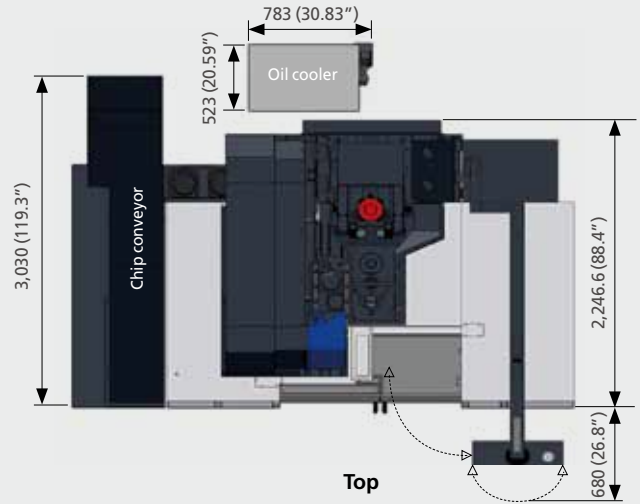
The chip removal system in VESTA series of machining centers are designed with a wide-angle sliding cover and the chip flushing nozzels on each side of the table; and the coil conveyor in front removes the chips quickly and effectively, to make your work more efficient.



**Product Data**

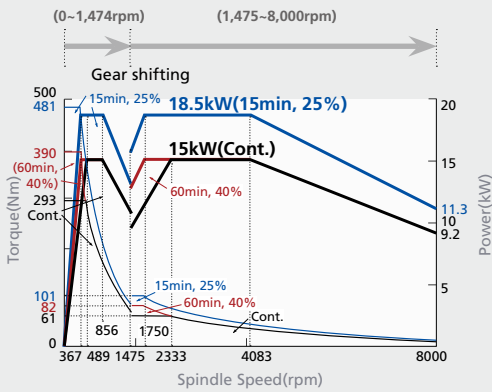
■ VESTA-850B ■ VESTA-1050B

\* Unit: mm(inch)

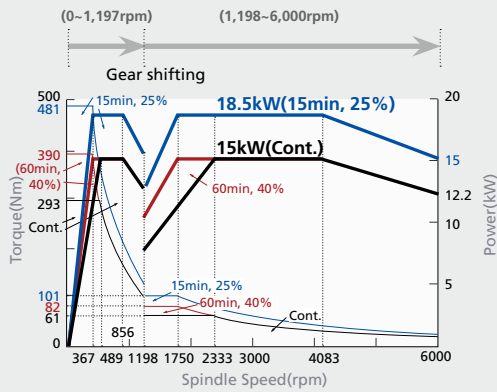


**Spindle Power – Torque Diagram**

**Standard (8,000rpm)**



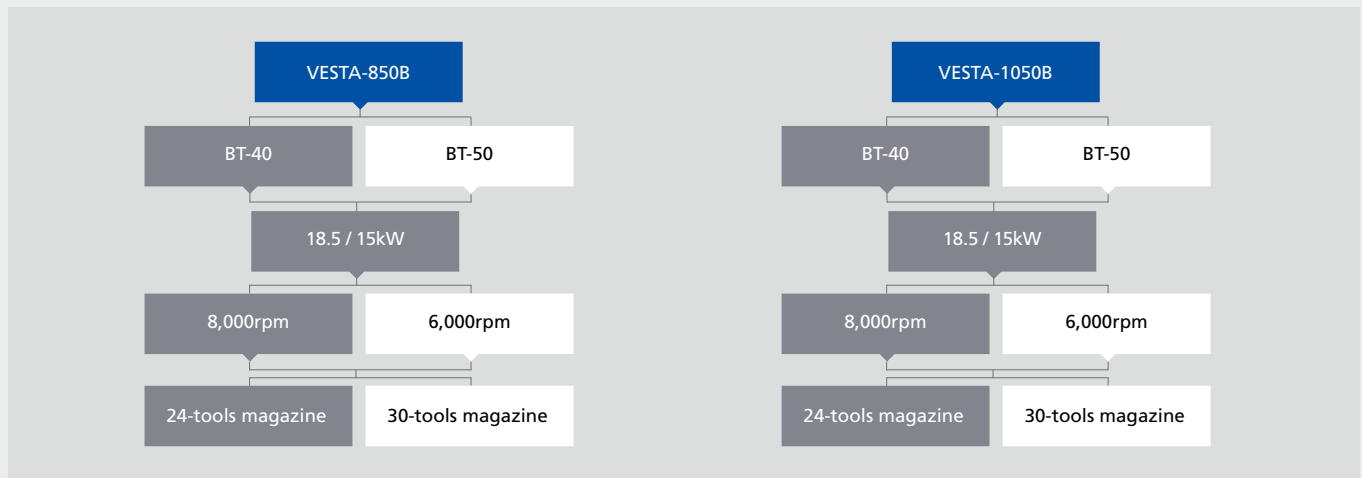
**Option (6,000rpm)**





## Product Configuration

Each product can be configured to fit your application.



## Machine Specifications

ITEM	VESTA-850B		VESTA-1050B		
	BT-40	BT-50	BT-40	BT-50	
<b>Travel</b>					
Stroke (X / Y / Z)	mm(inch) 850 (33.47") / 600 (23.62") / 600 (23.62")		1,050 (41.34") / 600 (23.62") / 600 (23.62")		
Distance from table surface to spindle gauge plane	mm(inch) 125 (4.92") ~ 725 (28.54")		125 (4.92") ~ 725 (28.54")		
Distance between columns to spindle Center	mm(inch) 675 (26.58")		675 (26.58")		
<b>Table</b>					
Working surface	mm(inch) 1,050 (41.34") x 600 (23.62")		1,150 (45.28") x 600 (23.62")		
Table loading capacity	kg(lb) 800 (1,763.7)		1,000 (2,205)		
Table surface configuration (T slots WxP -No. of slots)	mm(inch) 18 (0.71") x120 (4.72") - 5ea		18 (0.71") x 120 (4.72") - 5ea		
<b>Spindle</b>					
Max. Spindle speed	rpm	8,000	6,000	8,000	6,000
Spindle Motor	kW(HP)	18.5 / 15 (25 / 20)		18.5 / 15 (25 / 20)	
Type of spindle taper hole	-	ISO#40, 7 / 24 Taper	ISO#50, 7 / 24 Taper	ISO#40, 7 / 24 Taper	ISO#50, 7 / 24 Taper
Spindle bearing inner diameter	mm(inch)	Ø70 (2.76")	Ø90 (3.54")	Ø70 (2.76")	Ø90 (3.54")
Method of Spindle lubrication & cooling	-	Grease Lub. + Jacket Cooling		Grease Lub. + Jacket Cooling	
<b>Feedrate</b>					
Rapid Speed (X / Y / Z)	m/min(ipm)	24 (945) / 24 (945) / 18 (709)		24 (945) / 24 (945) / 18 (709)	
Feedrate (X / Y / Z)	mm/min(ipm)	1 (0.04) ~ 10,000 (394)		1 (0.04) ~ 10,000 (394)	
<b>ATC</b>					
Type of tool shank	-	BT-40 (Opt.:CAT-40)	BT-50 (Opt.:CAT-50)	BT-40 (Opt.:CAT-40)	BT-50 (Opt.:CAT-50)
Type of pull stud	-	MAS-403 BT-40 (45°)	BT-50 (90°)	MAS-403 BT-40 (45°)	BT-50 (90°)
Tool storage capacity	ea	24 (Opt.: 30)		24 (Opt.: 30)	
Max. Tool diameter [Without adjacent tools]	24Tools	mm(inch) Ø80 (3.15") / Ø150 (5.91")	Ø125 (4.92") / Ø245 (9.65")	Ø80 (3.15") / Ø150 (5.91")	Ø125 (4.92") / Ø245 (9.65")
	30Tools	Ø90 (3.54") / Ø150 (5.91")	Ø110 (4.33") / Ø200 (7.87")	Ø90 (3.54") / Ø150 (5.91")	Ø110 (4.33") / Ø200 (7.87")
Max. Tool length	mm(inch)	300 (11.81")	350 (13.78")	300 (11.81")	350 (13.78")
Max. Tool weight	kg(lb)	8 (17.64)	20 (44.09)	8 (17.64)	20 (44.09)
Method of tool selection	-	Memory Random		Memory Random	
Method of operation (Magazine / Swing arm)	-	Geared Motor / Geared Motor		Geared Motor / Geared Motor	
Tool changing time (T to T / C to C)	sec	2.5 / 7	3.5 / 8	2.5 / 7	3.5 / 8
<b>Motor</b>					
Feed motor (X / Y / Z)	kW(HP)	3 (4) / 3 (4) / 3 (4)		3 (4) / 3 (4) / 3 (4)	
Coolant motor (Spindle / Chip flushing)	kW(HP)	0.4 (0.54) / 0.4 (0.54)		0.4 (0.54) / 0.9 (1.2)	
<b>Power Source</b>					
Electric power supply	kVA	50		50	
Compressed air supply (Pressure x Consumption)	-	0.5~0.7MPa x 690Nℓ/min	0.5~0.7MPa x 760Nℓ/min	0.5~0.7MPa x 690Nℓ/min	0.5~0.7MPa x 760Nℓ/min
<b>Tank Capacity</b>					
Lubrication / Spindle cooling / Coolant	ℓ (gal)	20 (5.28) / 6 (1.59) / 270 (71.33)		20 (5.28) / 6 (1.59) / 270 (71.33)	
<b>Machine Size</b>					
Height	-	2,718 (107")	2,887 (113.7")	2,718 (107")	2,887 (113.7")
Floor space (Length x Width)	mm(inch)	3,870 (152.4") x 2,247 (88.4")		4,220 (166.1") x 2,247 (88.4")	
Weight	kg(lb)	6,500 (14,330)	6,800 (14,992)	7,200 (15,873)	7,500 (16,535)
NC Controller	Fanuc-0i MD				

## Standard and Optional product components

Standard Accessories		Optional Accessories	
• Adjust bolt, block & plate	• Tool kit & box	• Air dryer	• Oil mist (Semi dry cutting system, Eco booster)
• Air blower	• Work light	• Air gun	• Signal lamp (R / G / Y, 3 color)
• Base around splash guard	• 10.4" LCD Color screen	• Auto door	• Transformer
• Coolant system	• Hwacheon AI Nano Contour Control System (HAI) 40 block buffer	• Coolant through spindle (30bar, 70bar)	• Tool life management
• Coil conveyor (1ea)	• Hwacheon Efficient Contour Control System (HECC)	• Data server (256MB / 1,024MB)	• Tool measuring system-Renishaw / Blum (Touch type, Laser type)
• Door interlock	• Hwacheon Tool Load Detect System (HTLD)	• Data server interface	• Workpiece measuring system-Renishaw / Blum (Touch type)
• Ethernet Interface	• Hwacheon Thermal Displacement Control System (HTDC)	• High pressure coolant 6bar	• 4-axis interface
• Lubrication system	- Hwacheon Spindle Displacement Control System (HSDC) +	• Lift up chip conveyor (Hinge type, Scraper type)	• Hwacheon AI Nano Contour Control System (HAI) 200 Block Buffer
• Lub. Oil separation tank	- Hwacheon Frame Displacement Control System (HFDC)	• Linear scale (X / Y / Z)	
• MPG Handle (1ea)	• Cutting Feed Optimization System (OPTIMA)	• Manual Guide i	
• Operation manual & parts list		• Mist collector	
• Part program storage length 1,280m (512kB)		• MPG Handle (3ea)	
• Pneumatics system		• NC Cooler	
• Rigid tapping		• Oil skimmer	
• Signal lamp (R / G, 2 color)			
• Spindle cooler (Jacket Cooling)			

## NC Specifications [Fanuc 0i-MD]

※ — : 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, Mirror Image	S	Spindle speed function	
Store Pitch Error Compensation	S	Spindle serial output	S
Backlash compensation	S	Spindle override	50 - 120% S
Operation		Spindle orientation	S
Automatic & MDI operation	S	Rigid tapping	S
DNC operation by memory card	PCMCIA card is required S	Tool function / compensation	
Program number search	S	Tool function	T4 - digits S
Sequence number search	S	Tool offset pairs	±6 - digits / 400ea S
Dry Run, Single Block	S	Tool offset memory C	S
Manual handle feed / feed rate	1Unit / x1, x10, x100 S	Cutter compensation C	S
Interpolation function		Tool life management	O
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02, G03 / G04 S	Tool length compensation / Tool length measurement	S
Interpolation function		Editing operation	
Cylindrical interpolation	4-axis interface option is required O	Part program storage length	1,280m (512kB) S
Helical interpolation	Circular interpolation plus max.2axes linear interpolation S	Number of register able programs	400ea S
Reference position return check / return	G27 / G28, G29 S	Background editing	S
2nd,3rd,4th reference position return	G30 S	Extended part program editing / Play Back	S
Skip	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	RS232C S
Tape code	EIA RS244 / ISO840 S	Reader / Puncher interface CH2	RS232C 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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