

VESTA-850B/1050B

Box Way Gear Driven Vertical Machining Centers





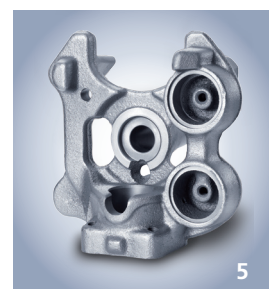
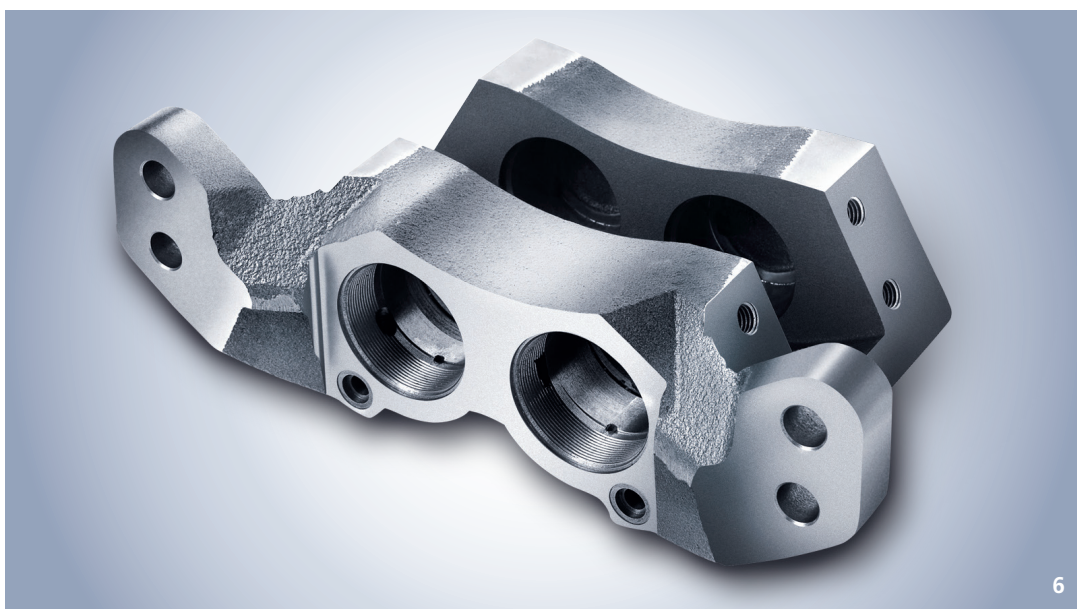
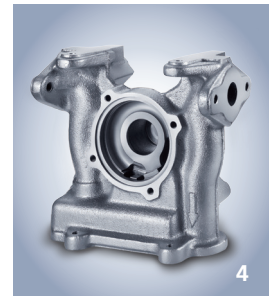
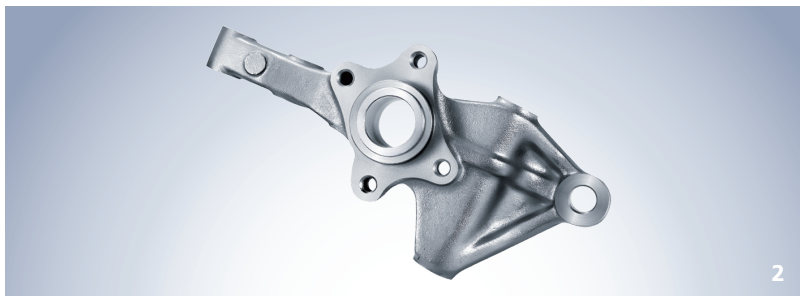


BOX WAY GEAR DRIVEN VERTICAL MACHINING CENTER

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





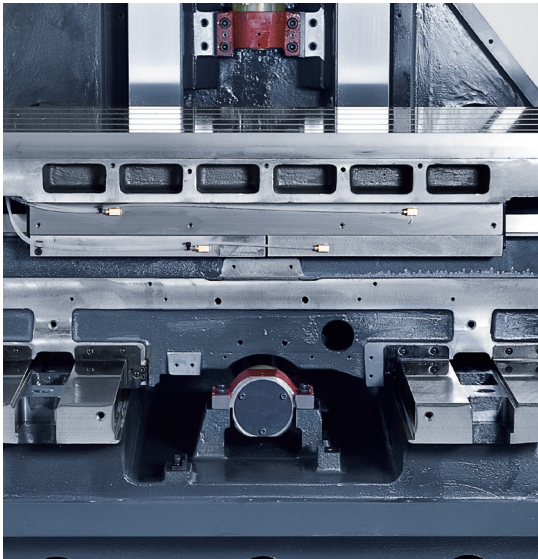
HEAVY DUTY MACHINING STABILITY

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.





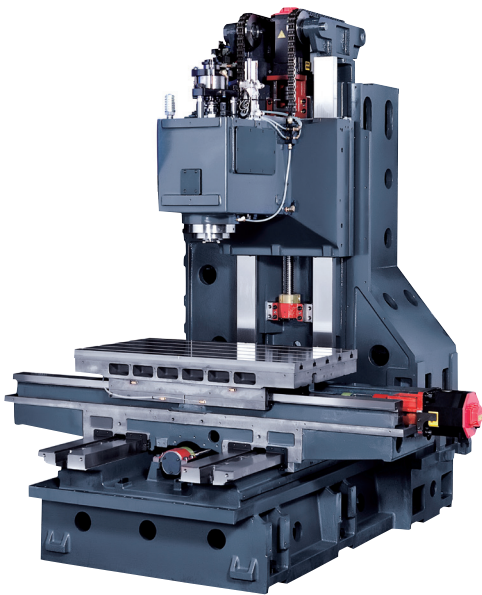
4-Guide Box Way

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.

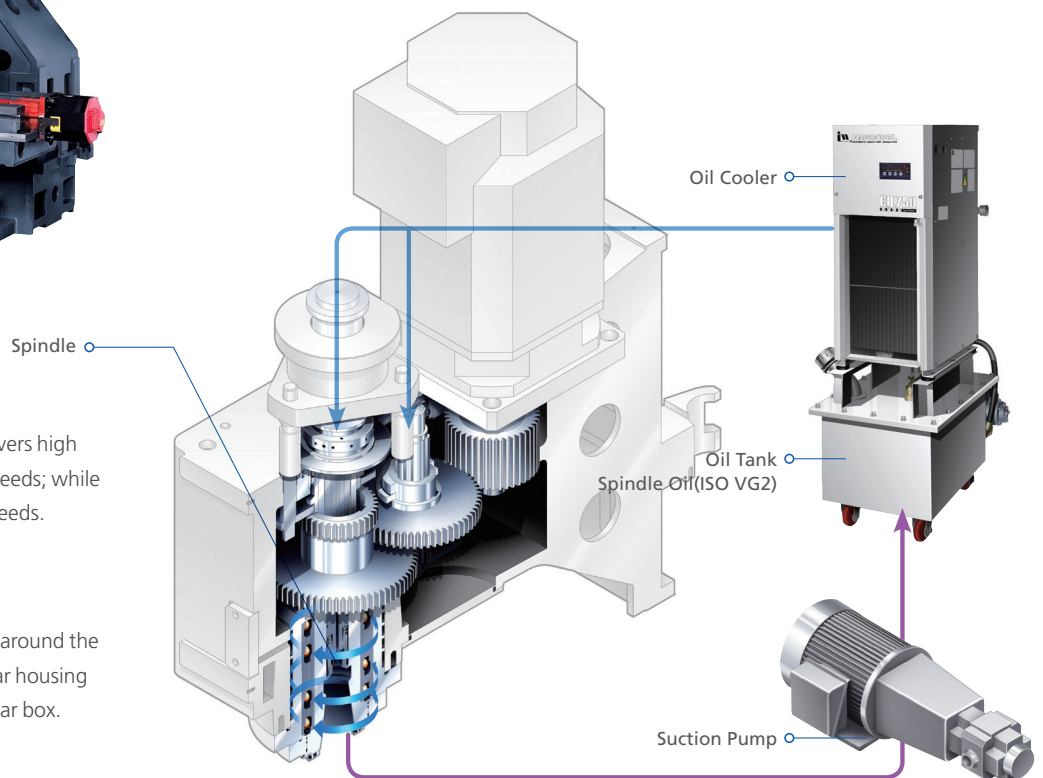


Gear Driven

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.



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.



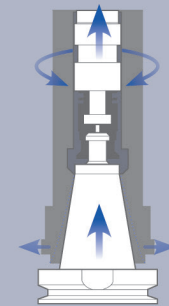
HSDC Hwacheon Spindle Displacement Control System

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.



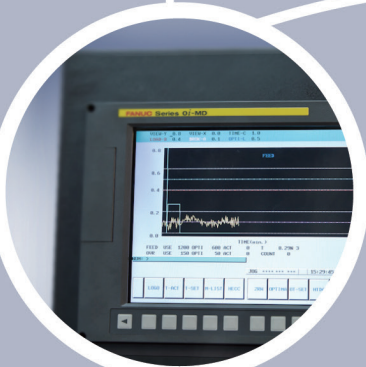
Static displacement compensation

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.

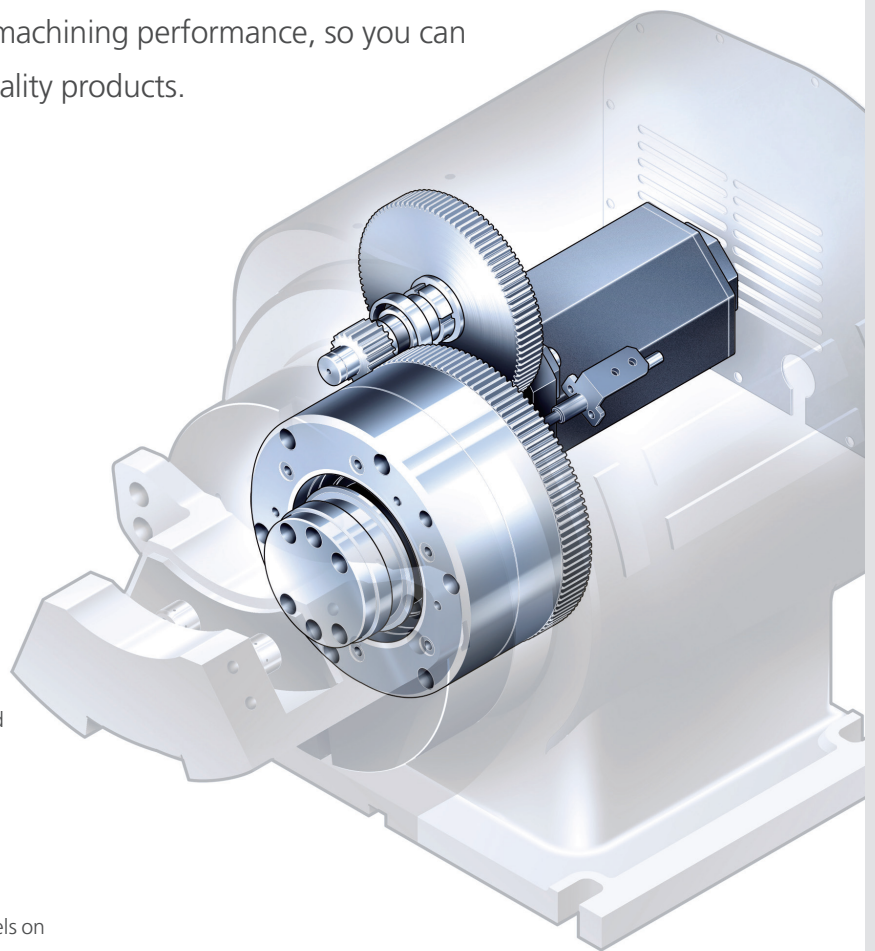


SPEED +



USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

The VESTA-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.

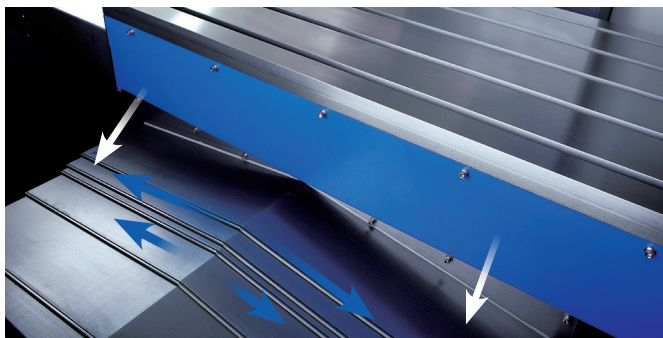


Index Table (Option)

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

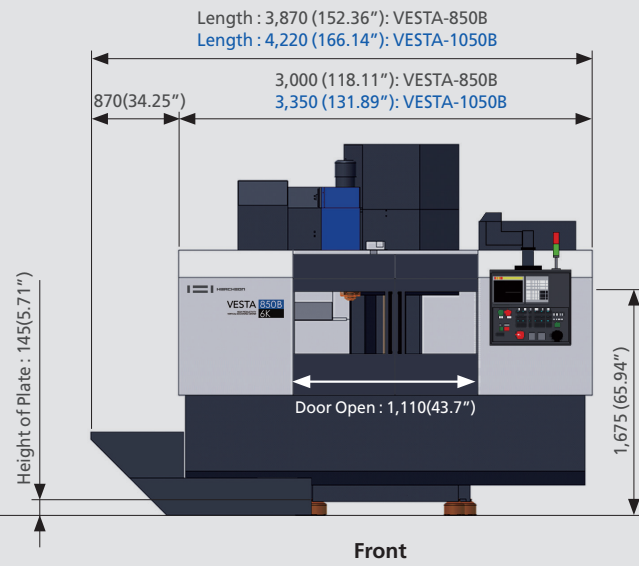
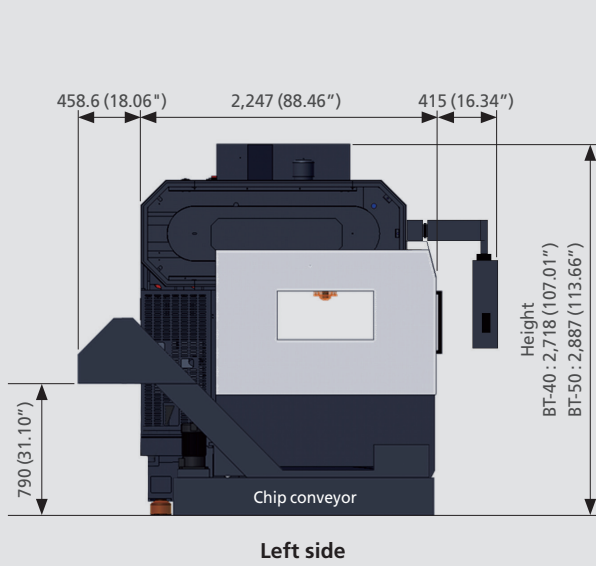
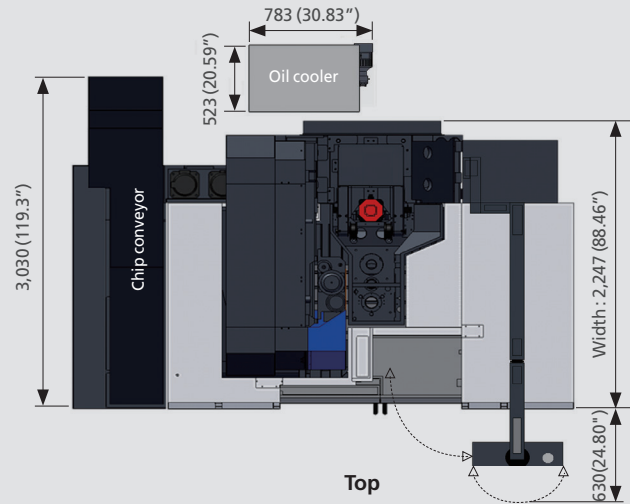
The chip removal system in VESTA series of machining centers are designed with a wide-angle sliding cover and the chip flushing nozzels on each side of the table; and the coil conveyor in front removes the chips quickly and effectively, to make your work more efficient.



Product Data

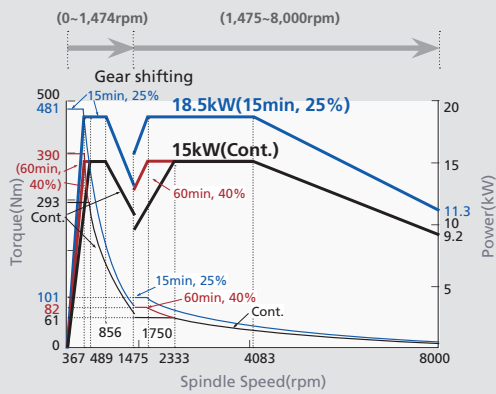
■ VESTA-850B ■ VESTA-1050B

* Unit: mm(inch)

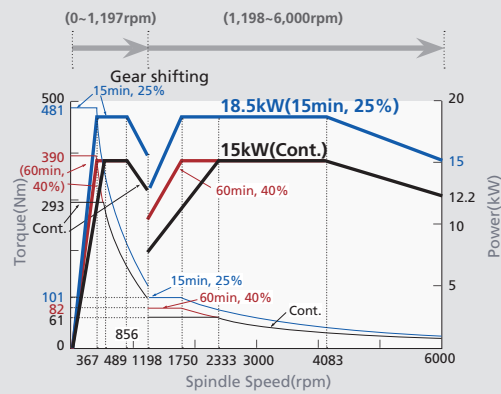


Spindle Power – Torque Diagram

Standard (8,000rpm)

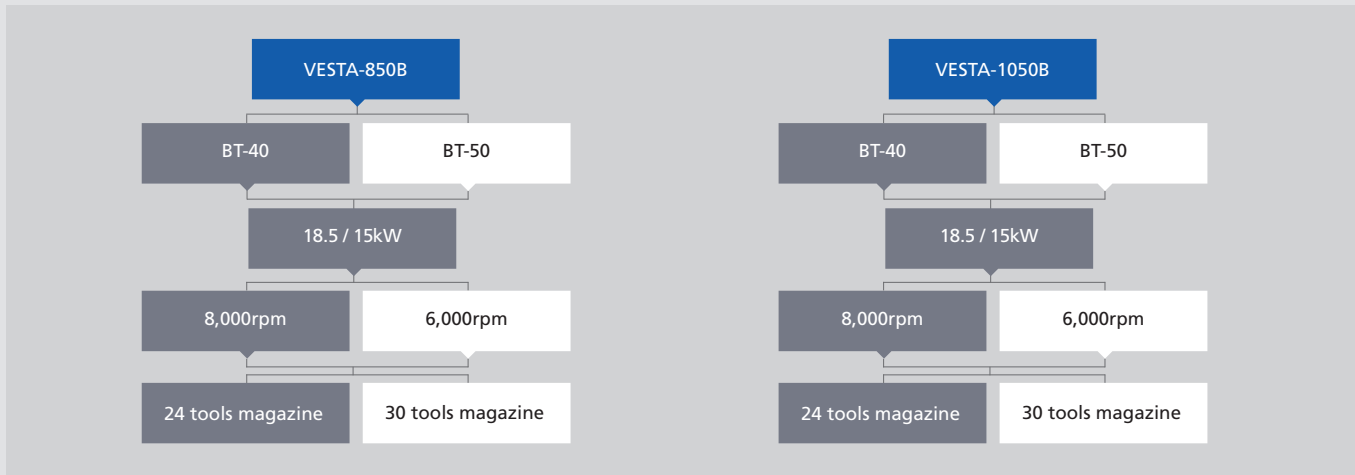


Option (6,000rpm)



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		
Travel						
Stroke (X / Y / Z)	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	125 (4.92") ~ 725 (28.54")		125 (4.92") ~ 725 (28.54")			
Distance Between Columns to Spindle Center	675 (26.58")		675 (26.58")			
Table						
Working Surface	1,050 (41.34") x 600 (23.62")		1,150 (45.28") x 600 (23.62")			
Table Loading Capacity	800 (1,764)		1,000 (2,205)			
Table Surface Configuration (T slots WxP - No. of slots)	18 (0.71") x 120 (4.72") - 5ea		18 (0.71") x 120 (4.72") - 5ea			
Spindle						
Max. Spindle Speed	8,000	6,000	8,000	6,000		
Spindle Motor	18.5 / 15 (25 / 20)					
Type of Spindle Taper Hole	ISO#40, 7 / 24 Taper(BT-40)	ISO#50, 7 / 24 Taper(BT-50)	ISO#40, 7 / 24 Taper(BT-40)	ISO#50, 7 / 24 Taper(BT-50)		
Spindle Bearing Inner Diameter	Ø70 (2.76")	Ø90 (3.54")	Ø70 (2.76")	Ø90 (3.54")		
Method of Spindle Lubrication & Cooling	Grease Lub. + Jacket Cooling					
Feedrate						
Rapid Speed (X / Y / Z)	24 (945) / 24 (945) / 18 (709)		24 (945) / 24 (945) / 18 (709)			
Feedrate (X / Y / Z)	1 (0.04) ~ 10,000 (394)		1 (0.04) ~ 10,000 (394)			
ATC						
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 P40T-1 (45°)	BT-50 (90°)	MAS P40T-1 (45°) (45°)	BT-50 (90°)	
Tool Storage Capacity	ea	24 (Opt.: 30)		24 (Opt.: 30)		
Max. Tool Diameter [Without Adjacent Tools]	24Tools 30Tools	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")
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		
Motor						
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) / 0.9 (1.2)		0.4 (0.54) / 0.9 (1.2)		
Spindle Cooler	kW(HP)	0.4 (0.54)		0.4 (0.54)		
Power Source						
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	
Tank Capacity						
Lubrication / Spindle Cooling / Coolant	ℓ (gal)	20 (5.28) / 6 (1.59) / 340 (89.81)		20 (5.28) / 6 (1.59) / 340 (89.81)		
Machine Size						
Height	-	2,718 (107.01")	2,887 (113.66")	2,718 (107.01")	2,887 (113.66")	
Floor Space (Length x Width)	mm(inch)	3,870 (152.36") x 2,247 (88.46")		4,220 (166.14") x 2,247 (88.46")		
Weight	kg,(lb.)	6,500 (14,330)	6,800 (14,992)	7,200 (15,873)	7,500 (16,535)	
NC Controller	Fanuc-0i MF					

Standard and Optional product components

Standard Accessories		Optional Accessories	
• Adjust Bolt, Block & Plate	• Tool Kit & Box	• Air Dryer	• Oil Mist (Semi Dry Cutting System)
• Air Blower	• Work Light	• Air Gun	• Signal Lamp (R / G / Y, 3 color)
• Base Around Splash Guard	• 10.4" Color LCD	• Auto Door	• Transformer
• Coolant System	• Hwacheon AI Nano Control System	• Spindle Through Coolant (30bar, 70bar)	• Tool Life Management
• Coil Conveyor (1ea)	(HAI) 40 block	• Data Server (256MB / 1,024MB)	• Tool Measuring System-Renishaw / Blum
• Door Interlock	• Hwacheon Efficient Contour Control	• Data Server Interface	(Touch Type, Laser Type)
• Ethernet Interface	System (HECC)	• High Pressure Coolant 6bar	• Workpiece Measuring System-
• Lubrication System	• Hwacheon Tool Load Detect System (HTLD)	• Lift Up Chip Conveyor	Renishaw / Blum (Touch Type)
• Lub. Oil Separation Tank	• Hwacheon Thermal Displacement	(Hinge Type, Scraper Type)	• 4-Axis Interface
• MPG Handle (1ea)	Control System (HTDC)	• Linear Scale (X / Y / Z)	• 15" Color LCD (only FANUC)
• Operation Manual & Parts List	- Hwacheon Spindle Displacement	• Manual Guide i	• 30 Tools Magazine
• Part Program Storage Length 1,280m (512kB)	Control System (HSDC) +	• Mist Collector	• Hwacheon Artificial Intelligence Control
• Pneumatics System	- Hwacheon Frame Displacement	• MPG Handle (3ea)	(HAI) 200/400 Block
• Rigid Tapping	Control System (HFDC)	• NC Cooler	
• Signal Lamp (R / G, 2 Color)	• Cutting Feed Optimization System (OPTIMA)	• Oil Skimmer	
• Spindle Cooler (Oil Cooler)			

NC Specifications [Fanuc 0i-MF]

※ — : 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	Polar Coordinate System	S
Store Pitch Error Compensation	S	Spindle speed function	
Backlash compensation	S	Spindle serial output	S
Operation		Spindle override	50 - 120% S
Automatic & MDI operation	S	Spindle orientation	S
DNC operation by memory card	PCMCIA card is required S	Rigid tapping	S
Program number search	S	Tool function / compensation	
Sequence number search	S	Tool function	T4 - digits S
Dry Run, Single Block	S	Tool offset pairs	±6 - digits / 400ea S
Manual handle feed / feed rate	1Unit / x1, x10, x100 S	Tool offset memory C	S
Interpolation function		Cutter compensation C	S
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02, G03 / G04 S	Tool life management	O
Interpolation function		Tool length compensation / Tool length measurement	S
Cylindrical interpolation	4-axis interface option is required S	Editing operation	
Helical interpolation	Circular interpolation plus max.2axes linear interpolation S	Part program storage length	1,280m (512kB) S
Reference position return check / return	G27 / G28, G29 S	Number of register able programs	400ea S
2nd,3rd,4th reference position return	G30 S	Background editing	S
Skip	G31 S	Extended part program editing / Play Back	S
Feed function		Setting and 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, Portuguese, Polish, Hungarian, Swedish, Russian S
Tape code	EIA / ISO S	Data input / output	
Optional block skip	9ea S	Reader / Puncher interface CH1	RS232C S
Program number	O4 - Digits S	Reader / Puncher interface CH2	RS232C S
Sequence number	N8 - Digits S	Data server	256MB / 1,024MB O
Decimal point programming	S	Ethernet Interface	S
Coordinate system setting	G92 S	Memory card / interface	
Workpiece coordinate system	G54 - G59 S	Others	
Workpiece coordinate system preset	S	Display unit	10.4" Color LCD S
Addition of workpiece coordinate pair	48ea S	HWACHEON Artificial Intelligence	
Manual absolute on and off	S	Hwacheon Artificial Intelligence Control System (HAI) 40 Block	S
Chamfering / corner R	S	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	S	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	S	4 - Axis interface function Option	
		Controlled axes / Simultaneously controlled axes / Control axis detach	Included 4-axis Interface option 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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HC-M241-R2.6-201510