VESTA-1300B

Box Way Vertical Machining Center

HWACHEON

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.

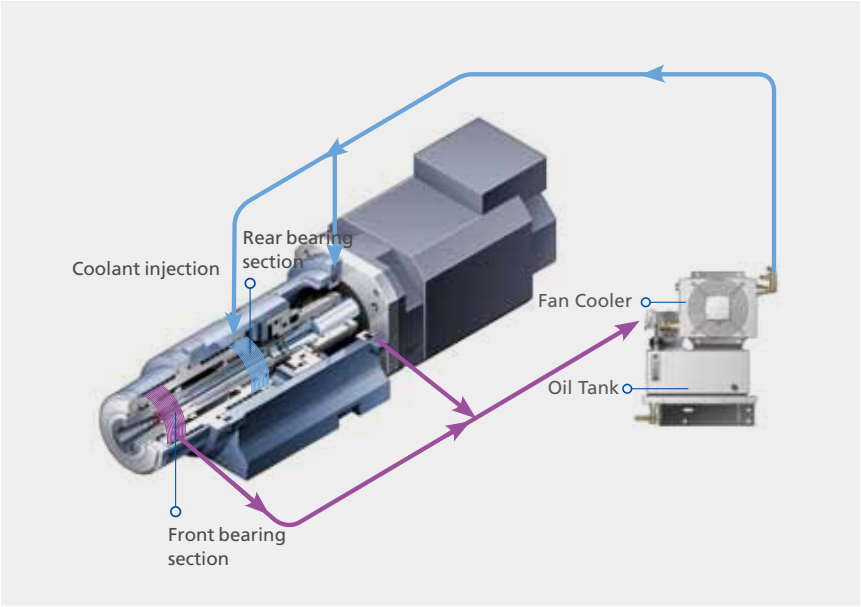
1 Engine Block / Automobile / Aluminum **2** Carrier / Automobile / FCD-450 **3** Frame / Refrigerator-Compressor / GC-250
4 Caliper Housing / Automobile / FCD-550 **5** Valve Body / Plant Industry-Flow control Valve / CF-8M

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.



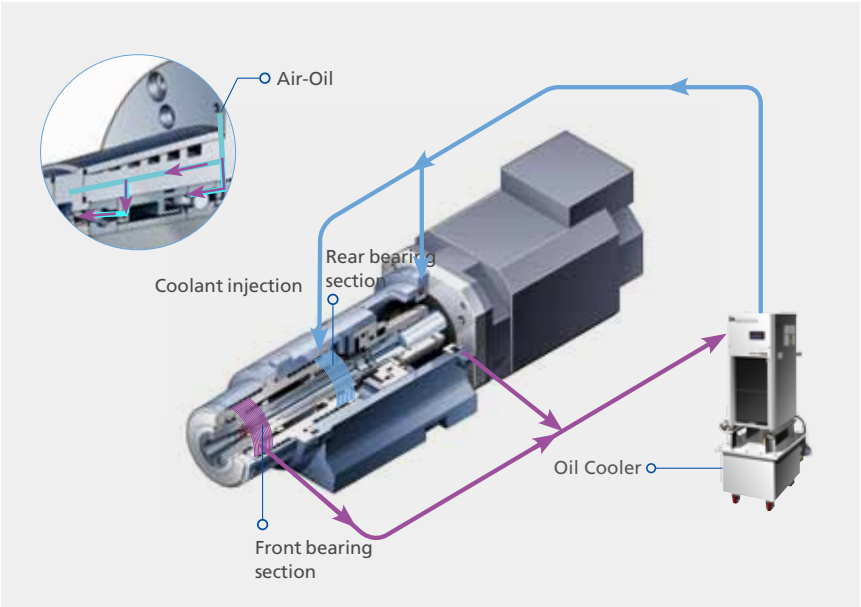
Built-Out Spindle

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.

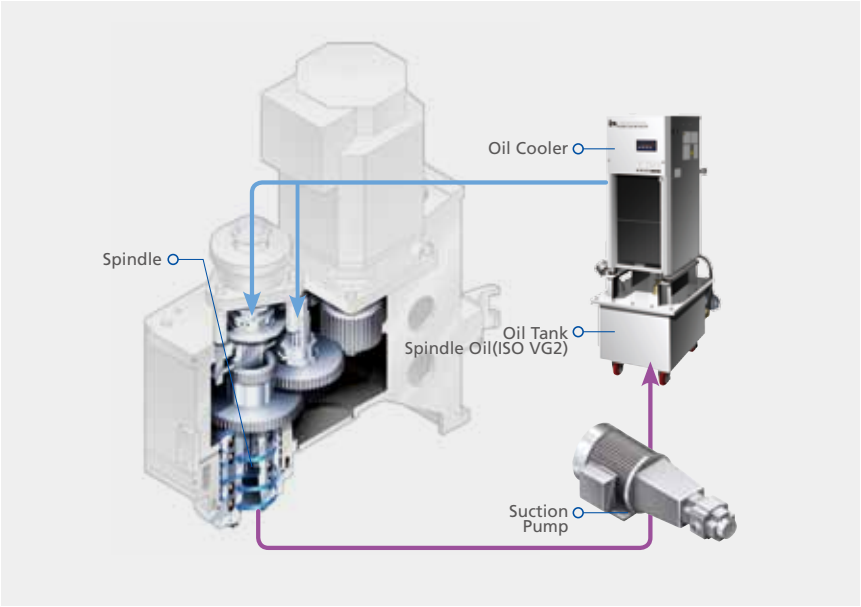


Built-Out Spindle

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 machinie is used for prolonged operation.



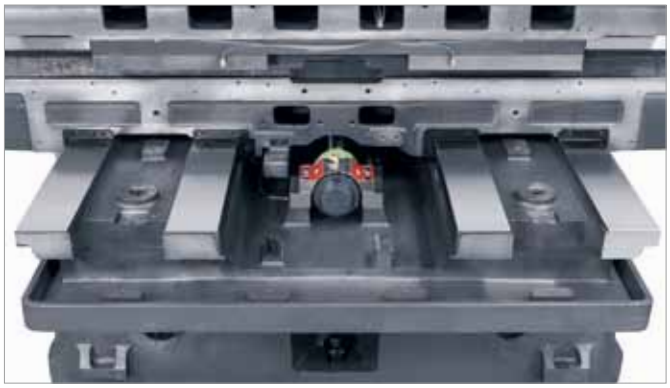
Gear driven Spindle

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.

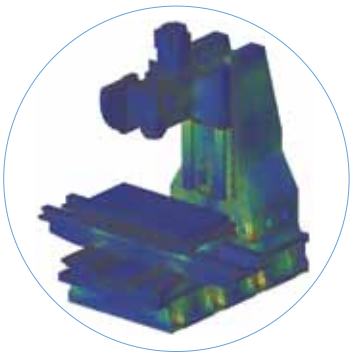


4-Guide Box Way

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 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

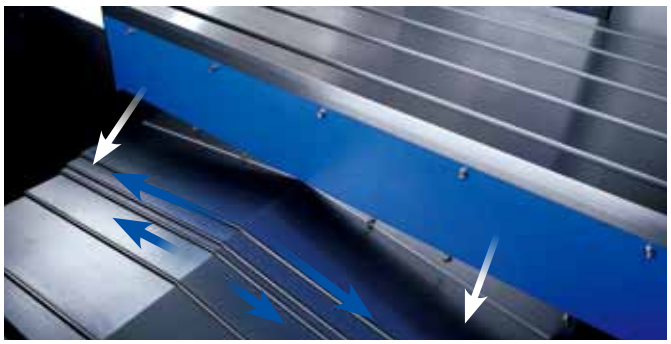
The VESTA-1300B system offers a user friendly design and a wide variety of upgrade options for a faster, more precise machining performance, so you can concentrate on what you do best: creating quality products.

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.

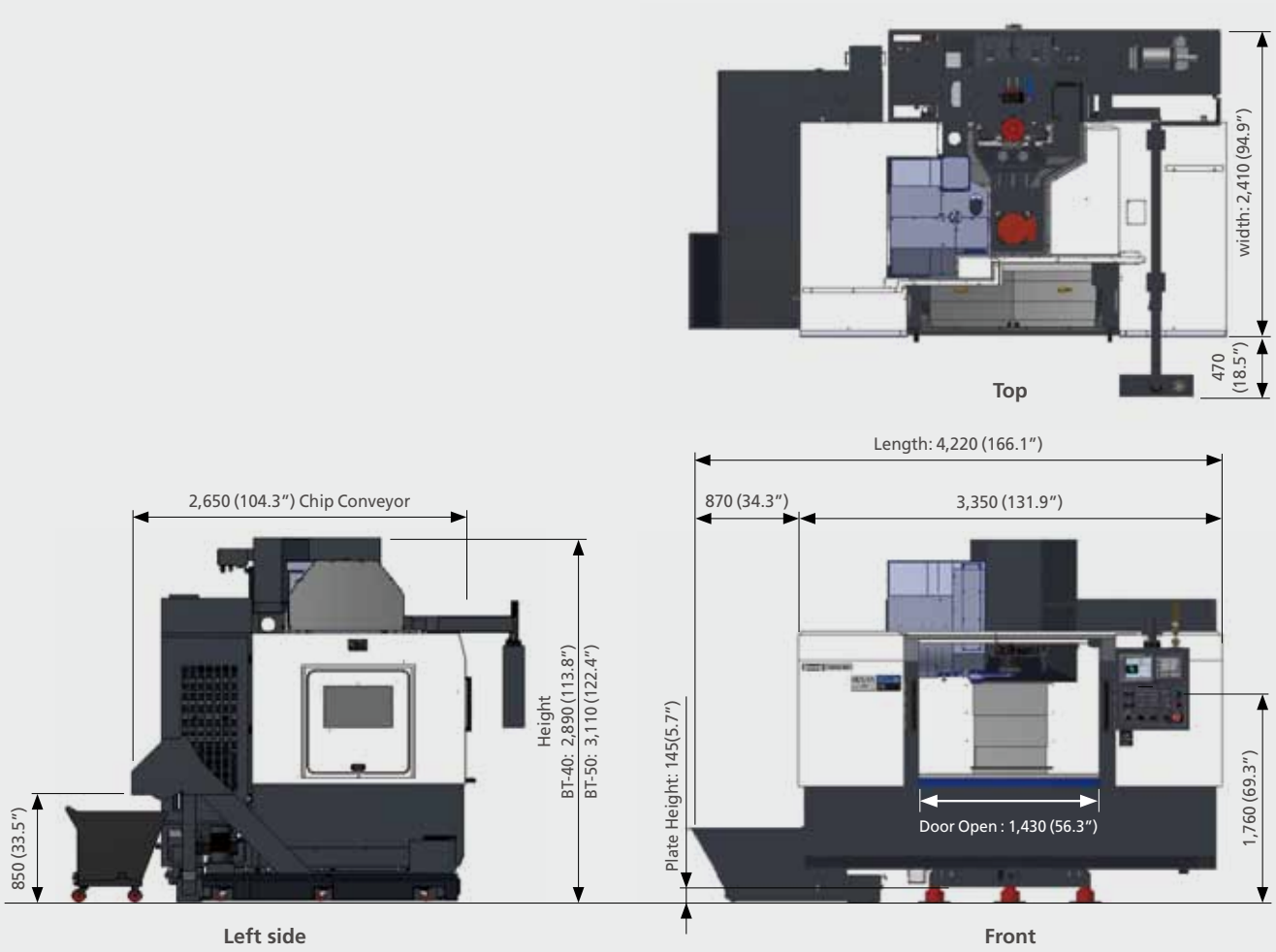
Fast chip removal performance

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.



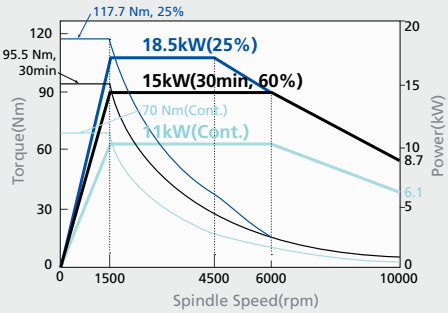
Product Data

* Unit: mm(inch)

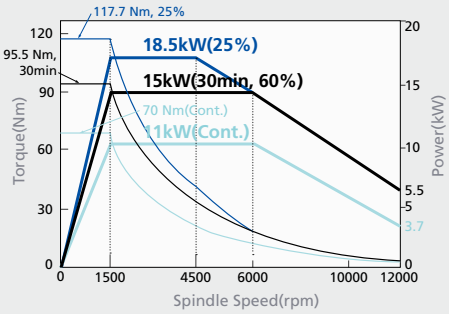


Spindle Power – Torque Diagram

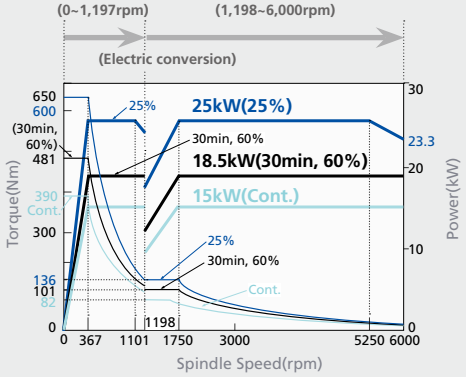
Standard (BT-40, 10,000rpm)



Option (BT-40, 12,000rpm)

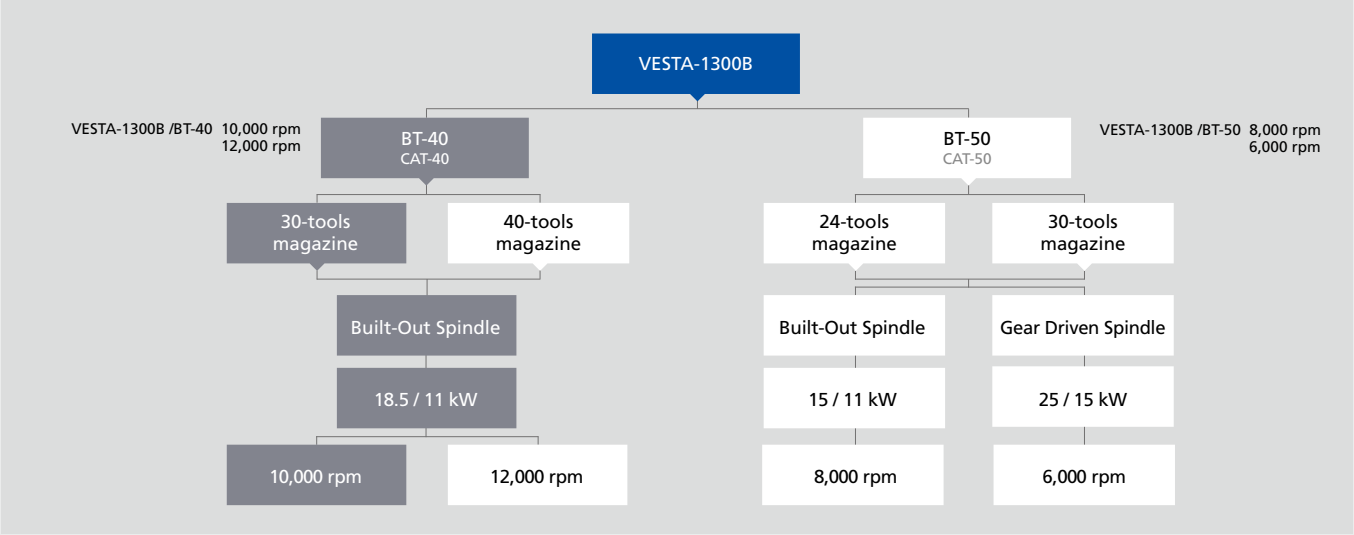


Option (BT-50, 6,000rpm)



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
Travel					
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")			
Table					
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			
Spindle					
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	
Feedrate					
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)			
Motor					
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)			
ATC					
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	
Power Source					
Electric Power Supply	kVA	50			
Compressed Air supply (Pressure x Consumption)	-	0.5~0.7MPa x 690N ℓ/min			
Tank Capacity					
Lubrication / Spindle Cooling / Coolant	ℓ(gal)	20 / 6 / 340 (5.28 / 1.59 / 89.81)			
Machine Size					
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 (44,487)
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	- Hinge type/ scraper type	- Renishaw/Blum (Touch type, Laser type)
• Lubrication System	System (HAI): 40Block	• Linear Scale (X/ Y/ Z)	• Transformer
• Magazine	• Hwacheon Efficient Contour Control system (HECC)	• Magazine	• Workpiece Measuring System
- BT-40: 30Tools	• Hwacheon Tool Load Detect system (HTLD)	- BT-40: 40Tools	- Renishaw/Blum (Touch type)
- BT-50: 24Tools	• Hwacheon Thermal Displacement Control system (HTDC)	- BT-50: 30Tools	• 4-Axis Interface
• MPG Handle, 1ea	- Hwacheon Spindle Displacement	• Manual Guide i	• Hwacheon AI Nano Contour
• Operation Manual & Parts List	Control system (HSDC)+	• Mist Collector	- Control System (HAI): 200Block
• Part Program Storage Length	- Hwacheon Frame Displacement	• MPG Handle, 3ea	
1,280m(512kB)	Control system (HFDC)	• NC Cooler	
• Pneumatics System	• Cutting Feed Optimization System (OPTIMA)	• Oil Mist (Semi Dry Cutting	
• Rigid Tapping		System, Eco Booster)	

NC Specifications [Fanuc0i-TD]

※ — : 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		S
Sequence number search		S
Dry Run, Single Block		S
Manual handle feed / feed rate	1Unit / x1, x10, x100	S
Interpolation function		
Positioning / Linear interpolation / Circular interpolation / Dwell (Per seconds)	G00 / G01 / G02, G03 / G04	S
Interpolation function		
Cylindrical interpolation	4-axis interface option is required	O
Helical interpolation	Circular interpolation plus max.2axes linear interpolation	S
Reference position return check / return	G27 / G28,G29	S
2nd,3rd,4th reference position return / Skip	G30 / G31	S
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	N5 - Digits	S
Decimal point programming		S
Coordinate system setting	G92	S
Workpiece coordinate system	G54 - G59	S
Workpiece coordinate system preset		S
Addition of workpiece coordinate pair	48ea	S
Manual absolute on and off		S
Chamfering / corner R		S
Programmable data input	G10	S
Sub program call	10 folds nested	S
Custom Macro B		S
Addition of custom macro common variables	#100-#199, #500-#999	S
Canned Cycles for Drilling		S

ITEM	SPECIFICATION	
Program input		
Small-hole peck drilling cycle		S
Automatic corner override		S
Feedrate control with acceleration in circular interpolation		S
Scaling / Coordinate system rotation		S
Programmable Mirror Image		S
Tape format for Fanuc series 10 / 11		S
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 / 400ea	S
Tool offset memory C		S
Cutter compensation C		S
Tool life management		O
Tool length compensation / Tool length measurement		S
Editing operation		
Part program storage length	1,280m (512kB)	S
Number of register able programs	400ea	S
Background editing		S
Extended part program editing / Play Back		S
Setting and display		
Clock function		S
Self-diagnosis function / Alarm history display		S
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
Reader / Puncher interface CH2	RS232C	S
Data server	256MB / 1,024MB	O
Ethernet Interface / Memory card interface		S
Others		
Display unit	10.4" Color LCD	S
HWACHEON Artificial Intelligence		
Hwacheon AI Nano Contour Control System (HAI) 40 Block Buffer		S
Hwacheon AI Nano Contour Control Syste (HAI) 200 Block Buffer		O
Hwacheon Efficient Contour Control System (HECC)		S
Hwacheon Tool Load Detect System (HTLD)		S
Hwacheon Thermal Displacement Control System (HTDC)		S
Cutting Feed Optimization System (OPTIMA)		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

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.

HEAD OFFICE
HWACHEON MACHINE TOOL CO., LTD
976-1, JANGDEOK-DONG GWANGSAN-GU, GWANGJU, KOREA
TEL: +82-62-951-5111 FAX: +82-62-951-0086

SEOUL OFFICE
1022-7, BANGBAE-DONG, SEOCHO, SEOUL, KOREA
TEL: +82-2-523-7766 FAX: +82-2-523-2867

USA
HWACHEON MACHINERY AMERICA, INC.
50, LAKEVIEW PARKWAY VERNON HILLS, IL60061, USA
TEL: +1-847-573-0100 FAX: +1-847-573-9900

SINGAPORE
HWACHEON ASIA PACIFIC PTE. LTD.
21 BUKIT BATOK CRESCENT, #08-79 WCEGA TOWER SINGAPORE 658065
TEL: +65-6515-4357 FAX: +65-6515-4358

GERMANY
HWACHEON MACHINERY EUROPE GMBH
JOSEF-BAUMANN STR. 25, 44805, BOCHUM, GERMANY
TEL: +49-2349-128160 FAX: +49-2349-128166

HC-M244-R1.0-201310