High Productivity Vertical Machining Center

VESTA 1050B

Machining Center

NEW 2010 New Product

Main Features

1. High-Performance
✓ High-rigid Box way design for whole axes
✓ Hwacheon's Handmade Gear driven Spindle
  - Std.(BT-40) / Opt.(BT-50): 18.5/15kW (481 N.m)

2. High-Productivity
✓ Max. spindle speed: 8,000rpm (Opt.: 6,000rpm)
✓ Tool changing time (Tool to Tool): 1.5sec

3. High-Dignity
✓ Compact machine design
✓ Full Splash Guard (Perfect protection of leaking)
✓ Easy access & Maintenance design
✓ Environment friendly oil separation system

4. Multi Function
✓ Hwacheon's Original Technology
  - Std.: HAI(20block)/HTLD/OPTIMA/HTDC
  - Opt.: HECC/HAI(40/200block)
✓ Spindle through coolant (Opt.): 30bar, 70bar

HWACHEON

*M*achine Line-up

WORLD-CLASS QUALITY   HWACHEON

VESTA-1050B

VESTA-1050B / BT-40   *VESTA-1050B / BT-50*

Std. ▶ BT-40   BT-50 ◀ Opt.

8,000rpm   *6,000 rpm*

Grease Lub. + Jacket Cooling

Std. ▶ *Tool storage capacity 24ea*   *Tool storage capacity 30ea* ◀ Opt.

※ The CAT type tool is available instead of BT type tool.

Machine Specification 【VESTA-1050B】

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ITEM		VESTA-1050B BT-40	VESTA-1050B BT-50
● Travel			
X-axis Stroke (Longitudinal movement of Table)	mm(inch)	**1,050** (41.34")	←
Y-axis Stroke (Cross movement of Table)	mm(inch)	**600** (23.62")	←
Z-axis Stroke (Vertical movement of Spindle)	mm(inch)	**600** (23.62")	←
Distance from table surface to spindle gauge plane	mm(inch)	**125** (4.92") **~ 725** (28.54")	←
Distance between columns to spindle Center	mm(inch)	**675** (26.58")	←
● Table			
Working surface	mm(inch)	**1,150** (45.28") **x 600** (23.62")	←
Table loading capacity	kgf(lbf)	**1,000** (2,205)	←
Table surface configuration (T slots WxP –No. of slots)	mm(inch)	**18** (0.71") **x120** (4.72") **– 5ea**	←
● Spindle			
Max. spindle speed	rpm	**8,000**	**6,000**
Spindle Motor	kW(HP)	**18.5/15** (25/20)	←
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")
Method of Spindle lubrication & cooling	-	**Grease Lub. + Jacket Cooling**	←
● Feedrate			
Rapid Speed (X/Y/Z)	m/min(ipm)	**24** (945) **/ 24** (945) **/ 18** (709)	←
Feedrate (X/Y/Z)	mm/min(ipm)	**1~10,000** (394)	←

Machine Specification 【VESTA-1050B】

ⅠⅡⅠ WORLD-CLASS QUALITY　HWACHEON

ITEM		VESTA-1050B BT-40	VESTA-1050B BT-50
● 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	**24** (Opt.: 30)	←
Max. tool diameter [without adjacent tools]	mm(inch)	**24Tools: Ø80** (3.15”) **/ Ø150** (5.91”) **30Tools: Ø90** (3.54”) **/ Ø150** (5.91”)	**24Tools: Ø125** (4.92”) **/ Ø245** (9.65”) **30Tools: Ø110** (4.33”) **/ Ø200** (7.87”)
Max. tool length	mm(inch)	**300** (11.81”)	**350** (13.78”)
Max. tool weight	kgf(lbf)	**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 (Tool to Tool)	sec	**1.5**	**2.5**
Tool changing time (Chip to Chip)	sec	**4**	**5**
● Motor			
Feed motor (X/Y/Z)	kW(HP)	**3** (4) **/ 3** (4) **/ 4** (5.4)	←
Coolant motor (Spindle)	kW(HP)	**0.4** (0.54)	←
Coolant motor (chip brushing)	kW(HP)	**0.9** (1.2)	←
Spindle cooler (50/60Hz) – Inverter type	kW(HP)	**0.4** (0.54)	←
● Power Source			
Electric power supply	kVA	**40**	←
Compressed air supply (Pressure x Consumption)	-	**5~7**Kgf/㎠ **x 690**Nℓ/min	**5~7**Kgf/㎠ **x 760**Nℓ/min

Machine Specification 【VESTA-1050B】

WORLD-CLASS QUALITY HWACHEON

ITEM		VESTA-1050B BT-40	VESTA-1050B BT-50
● Tank capacity			
Lubrication	ℓ(gal)	**6** (1.59)	←
Spindle cooling	ℓ(gal)	**20** (5.28)	←
Coolant	ℓ(gal)	**270** (71.33)	←
● Machine size			
Height	mm(inch)	**2,695** (106.1")	←
Floor space (length × width)	mm(inch)	**3,990** (157.09") **x 2,185** (86.02")	←
Weight	Kgf(lbf)	**7,200** (15,873)	**7,500** (16,535)
● NC controller		**Fanuc 0i-MD**	←

NC Specification【Fanuc 0i-MD】

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※ 一 : Not available   **S**: Standard   **O**: Option

Item	Specification	
● Controlled axis		
✓Controlled axis	2-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
✓Stored stroke check 1		S
✓Stored stroke check 2		S
✓Mirror Image		S
✓Stored pitch error compensation		S
● Operation		
✓Automatic & MDI operation		S
✓DNC operation by memory card	PCMCIA card is required	
✓Program number search		S
✓Sequence number search		S
✓Dry run, single block		S
✓Manual handle feed	1unit	S
✓Manual handle feed rate	x1, x10, x100	S
● Interpolation function		
✓Positioning	G00	S
✓Linear interpolation	G01	S
✓Circular interpolation	G02, G03	S
✓Dwell (Per seconds)	G04	S

Item	Specification	
● Interpolation function		
✓Cylindrical interpolation	4-axis interface option is required	S
✓Helical interpolation	Circular interpolation plus max.2axes linear interpolation	S
✓Reference position return check	G27	S
✓Reference position return	G28 , G29	S
✓2nd,3rd,4th reference position return	G30	S
✓Skip	G31	S
● Feed function		
✓Rapid traverse override	F0, F25, F50, F100	S
✓Feedrate (mm/min)		S
✓Feedrate override	0-150%	S
✓Jog feed override	0-4000 mm/min	S
✓Override cancel	M48, M49%	S
● Program input		
✓Tape code	EIA RS244/ ISO840	S
✓Optional block skip	1ea	S
✓Program number	O4-digit	S
✓Sequence number	N5-digit	S
✓Decimal point programming		S
✓Coordinate system setting	G92	S
✓Workpiece coordinate system	G54-G59	S
✓Work piece coordinate system preset		S
✓Addition of work piece coordinate pair 48ea		**O**

NC Specification【Fanuc 0i-MD】

HWACHEON WORLD-CLASS QUALITY

※ ー : Not available **S**: Standard **O**: Option

Item	Specification	
● Program input		
✓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
✓Small-hole peck drilling cycle		S
✓Automatic corner override		S
✓Feedrate control with acceleration in circular interpolation		S
✓Scaling		S
✓Coordinate system rotation		S
✓Programmable mirror image		S
✓Tape format for Fanuc series 10/114		S
✓Manual guide i		**O**
● Spindle speed function		
✓Spindle serial output		S
✓Spindle override	50-120%	S
✓Spindle orientation		S
✓Rigid tapping		S

Item	Specification	
● Tool function / compensation		
✓Tool function	T4-digits	S
✓Tool offset pairs	±6-digits/ 400ea	S
✓Tool offset memory C		S
✓Tool length compensation		S
✓Cutter compensation C		S
✓Tool life management		**O**
✓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		S
✓Play back		S
● Setting and display		
✓Clock function		S
✓Self-diagnosis function		S
✓Alarm history display		S
✓Help function		S
✓Run hour and parts count display		S
✓Graphic function		S
✓Multi-language display (English, German, French, Italian, Chinese, Spanish, Korean, Portuguese, Polish, Hungarian, Swedish)		S

NC Specification 【Fanuc 0i-MD】

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※ ─ : Not available **S**: Standard **O**: Option

Item	Specification	
● **Data input/output**		
✓Reader/Puncher interface CH1	RS232C	S
✓Reader/Puncher interface CH2	RS232C	S
✓Data server	256MB / 1,024MB	**O**
✓Ethernet Interface		S
✓Memory card interface		S
● **Others**		
✓Display unit	10.4" color LCD	S

Item	Specification	
● **HWACHEON Artificial Intelligence**		
✓HAI function [AI Nano contour control (G5.1 Q1)] - 20 Block Buffer		S
✓HAI function [AI Nano contour control (G5.1 Q1)] - 40/200 Block Buffer		**O**
✓HECC (Hwacheon Efficient Contour Control System)		**O**
✓HTLD (Hwacheon Tool Load Detect)		S
✓OPTIMA (Cutting Feed Optimization System)		S
✓HTDC (Hwacheon Thermal Displacement Control System) = HSDC (Hwacheon Spindle Displacement Control System) + HFDC (Hwacheon Frame Displacement Control System)		S
● **4-Axis interface function Option**		
✓Controlled axes	included 4-axis interface option	**O**
✓Simultaneously controlled axes	included 4-axis interface option	**O**
✓Control axis detach	included 4-axis interface option	**O**

NC Instruction 【Fanuc 0i-MD】

Item	Explanation
✓ **Control axes**	3 Axes (X,Y,Z), 4axis/5axis(Opt. A/B)
✓ **Increment system**	Least input increment X, Y, Z-Axes : 0.001 mm
	Least command increment X, Y, Z-Axes : 0.001 mm
✓ **Maximum command value**	± 9999.999 mm
✓ **Program memory capacity**	1,280M(512kb)
✓ **Part program edit**	Part program editing as follows is possible by MDI operation. 1) Insert, Alter, Delete of word. 2) Delete of block or until the block designated. 3) Register, delete of program.
✓ **Input format**	Block, word, address, format, can be altered (Inch format) N4 G90 G2 X4.3 R4.3
✓ **Decimal point edit**	The following addresses can be used with a decimal point: X,Y,Z,R,C,I,J,K,A,B
✓ **Cutting federate**	Feed per minute and feed per spindle revolution is possible. G94 : Feed per minute. (mm/min) G95 : Feed per revolution. (mm/rev) Feed rate range (Feed override 0 - 150% every 10%) Feed per minute 0 - 1,260 (mm/min)
✓ **Auto acceleration /deceleration**	Rapid Feed : Linear type acceleration/deceleration Cutting Feed : Exponential acceleration/deceleration
✓ **Coordinate system setting**	By means of this command, a certain position of the tool for example, a coordinate system whereby the tip of the cutting edge becomes (X,Y,Z) of the coordinate system. This coordinate is called as work coordinates.
✓ **Command method**	G90: Absolute command G91: Incremental command
✓ **Work coordinate system shift**	When the coordinate system actually set by the G92 command or the automatic coordinate system setting deviate from the programmed work coordinate system, the set coordinate system can be shifted

Item	Explanation
✓ **Reference point return**	1) Manual reference point return. 2) Automatic reference point return (G27, G28).
✓ **Positioning**	Each axis can independently feed rapidly and position by G00 command
✓ **Interpolation function**	Linear interpolation : Done by G01 command at feed rate code designated. Circular interpolation : Any circular arc is interpolated by G02 or G03, at feed rate F code designated. G02 : Clockwise. G03 : Counter Clockwise. When circular radius is command as R, any circular arc of 0°- 180°is interpolated, and when circular radius is command as address I, K., any circular interpolation of 0°- 360°can be command
✓ **Dwell**	Dwell is executed by the P, X commands. Setting Range 0 - 999.999 sec. Decimal point be used with P address
✓ **Back lash compensation**	This function compensations for lost motion of the machine. Compensation value (0-2,550 mm) is set by parameter, for each axis (by least command increment).
✓ **MDI & LCD**	All kinds of data information is input and displayed such as LCD character display, program alarm, diagnosis program, etc.,
✓ **Program No. search**	Program number of 4 digit continuous to 0 is searched by MDI & LCD Panel
✓ **Miscellaneous function (M function)**	By the command of 3 digit figure after the address M, ON/OFF control from the machine is possible. Only one M code can be command per block
✓ **Spindle function (S function)**	Spindle speed is commanded by the 4-digit figure to address S.
✓ **Tool function (T function)**	Tool position can be selected by the command of 4 digits after the address T

Item	Explanation
✓ **Tool offset**	The Tool length & diameter compensation offset are operated by G code. Each function has 400 pairs. G40: Cutter compensation cancel G41: Cutter compensation Left G41: Cutter compensation Right G49: Tool length compensation cancel G43: Tool length compensation "+" direction G44: Tool length compensation "-" direction
✓ **Dry run**	Feed rate becomes jog speed (for both cutting feed and for rapid moves).
✓ **Single block**	Program can be executed one step at a time
✓ **Optional block skip**	Turning on the optional block skip switch ignores the block including "/" code at the beginning.
✓ **Machine lock**	When the switch is set to the Machine Lock position, move command pulses are suppressed. Consequently the display is updated as specified by the program, but the tool does not move. The M, S, T and 2nd auxiliary function are executed. This function is used to check a program
✓ **Feed hold**	Temporally, machine can stop during the operation by Feed hold S/W.
✓ **Canned Cycle**	G73: Pack Drilling Cycle G74: Counter Tapping Cycle G76: Fine Boring G80: Canned cycle cancel G81: Drill cycle G82: Counter Boring cycle G83: Pack Drilling cycle G84: Tapping cycle G85,G86: Boring cycle G87: Pack Boring cycle G88,G89: Boring cycle

Item	Explanation
✓ **Run hour display**	2 items, moving time and the number of parts are displays on the position screen. Part counter : The total number of parts are displayed . . . counted by either M02, M30. Run hour : Accumulated running to hour display . . . accumulated running to hour of automatic operation. Cycle time : Cycle time display . . . Running hour display of one automatic cycle.
✓ **Plane Selection**	G17 : XY Plane G18 : XZ Plane G19 : YZ Plane
✓ **Portable tape reader**	Program, Parameter and etc., are used for reading out of NC
✓ **Diagnostic function**	Input/Output of alarm display can be signaled by pressing alarm, DGNOS key of MDI panel
✓ **Stored stroke limit 1**	An area inside the area set by parameter is deemed as prohibited area, when stroke is commanded into this area, this function makes the axis decelerate and stop than OT alarm displayed
✓ **Inch / Metric conversion**	Inch system and Metric system are selected to input by G code cutting G20 : Inch input. G21 : Metric input
✓ **Changing of tool offset amount**	Offset value can be set program command (G10).
✓ **Custom macro**	Having registered macro commands as sub program, in memory. This function is able to recall at anytime the NC command program by this simple procedure
✓ **External tool compensation**	This is the function to offset the tool offset value from out side the CNC. Offset value is automatically added to the input data of NC
✓ **No of tool offset**	This number of tool offsets compensation is max. 400 pairs available as standard.

Accessories 【VESTA-1050B】

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Standard Accessories

1) Air blower
2) Adjust bolt, block & plate
3) Base around splash guard
4) Coil conveyor (1EA)
5) Coolant system
6) Cutting Feed Optimization system (OPTIMA)
7) Door interlock
8) Ethernet Interface
9) Hwacheon AI Nano contour control (HAI) -20 block buffer
10) Hwacheon Tool Load Detect system (HTLD)
11) Hwacheon Thermal Displacement Control System (HTDC)
   = Hwacheon Spindle Displacement Control System (HSDC)
      + Hwacheon Frame Displacement Control System (HFDC)
12) Lubrication system
13) Lub. Oil separation tank
14) MPG Handle (1EA)
15) Operation manual & parts list
16) Pneumatics system
17) Part program storage length 1,280M(512kb)
18) Rigid tapping
19) Signal lamp (R/G, 2 color)
20) Spindle cooler (Jacket Cooling)
21) Tool kit & box
22) Work light
23) 10.4 inch LCD screen

Optional Accessories

1) Air dryer
2) Air gun
3) Automatic Door
4) CE specification
5) Coolant gun
6) Data server (256MB / 1,024MB)
7) Data server interface
8) Lift up chip conveyor (Hinge type, Scraper type)
9) Linear scale (X/Y/Z)
10) Manual Guide i
11) Mist collector
12) MPG Handle (3EA)
13) NC Cooler
14) Oil skimmer
15) Semi dry cutting system (Oil mist, Eco booster)
16) Signal lamp (R/G/Y, 3 color)
17) Spindle through coolant (30 bar, 70 bar)
18) High pressure coolant 6bar
19) Hwacheon AI Nano contour control (HAI) - **40/200** block buffer
20) Hwacheon Efficient Contour Control system (HECC)
21) Tool life management
22) **Tool measuring system-Renishaw/Blum (Touch or Laser type)**
23) **Tool storage capacity 30ea**
24) Transformer 40kVA
25) **Work piece measuring system- Renishaw/Blum (Touch type)**
26) 4-axis interface

Machine Size 【VESTA-1050B】

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※ Unit: mm(inch)

700 (27.56")

Width: 2,715 (106.89") (With Chip conveyor)

Chip conveyor

Width: 2,185 (86.02")

【Top view】

Length: 3,990 (157.09")

3,350 (131.89")

365 (14.37")

530 (20.87")   **2,185** (86.02")

640 (25.2")

630 (24.8")

Height: 2,695 (106.1")

(106.1")

Chip conveyor

1,290 (50.79")

794 (31.26")

110 (4.33") (Plate Height)

Door Open: 1,110 (43.7")

1,650 (64.96")
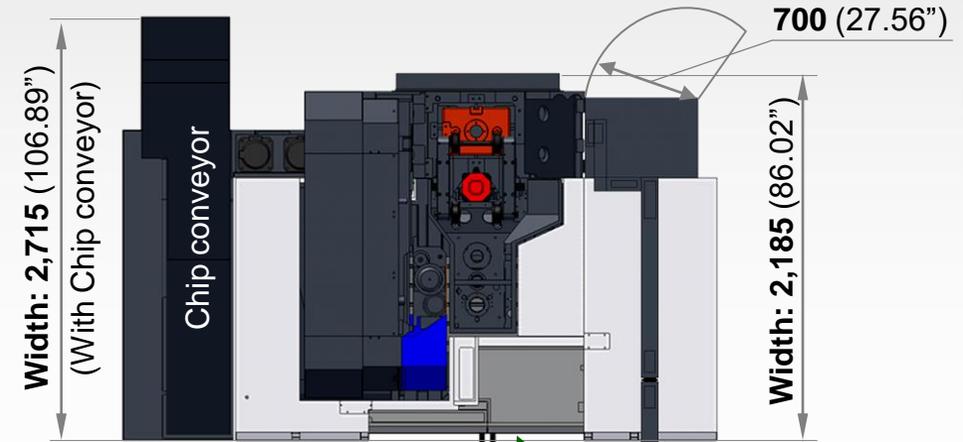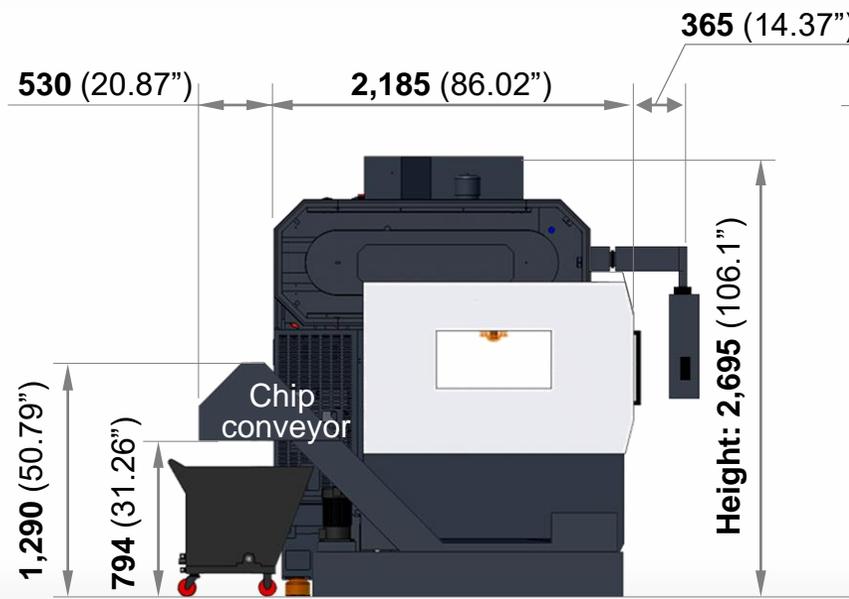
【Side View】

【Front view】

초도 【VESTA-1050B】

WORLD-CLASS QUALITY HWACHEON
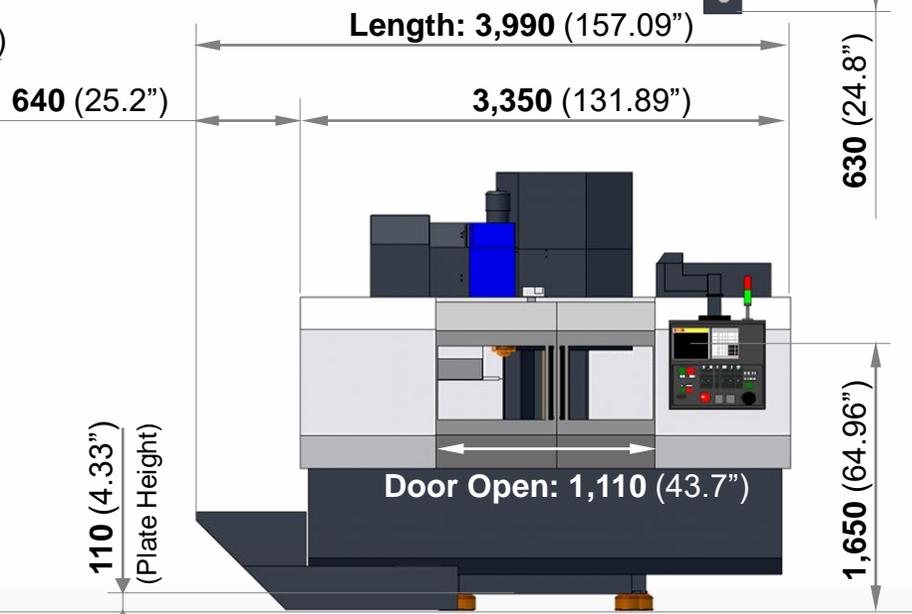
※ Unit: mm

설치 면적 (LxW)
3,990 x 2,185 mm
기계 높이 (H)
2,695 mm
기계 중량
BT-40: 7,200 kgf / BT-50: 7,500 kgf
전 원
40kVA (32kW)
트랜스 포머
40 kVA
전원 케이블 규격
22 SQ
필요 압축 공기 압력
5~7 bar

SPINDLE CENTER

M/C FRONT

600 470 230 400

580 495
495
580 495 495

2900
855

855

100 750 600 470 630 850 100
3500

8-D130116 HEX. NUT, M16
8-D125116 PLAIN W. , M16
8-D126116 SPRING W. , M16

8-69A6024 BLOCK

Ø160

FL

8-621420A PLATE
(250 X 250 X 25t)

8-686054 기초 BOLT

75
40
132 120
25
500
450

200

DAMPER

Ø19

P=150

900
1200

300

GRAVEL
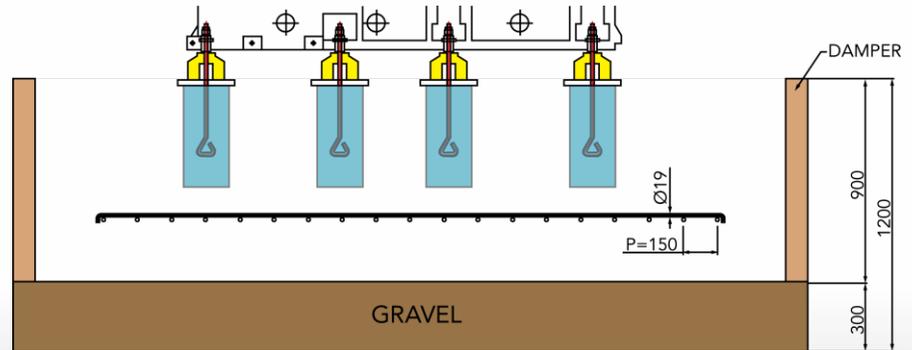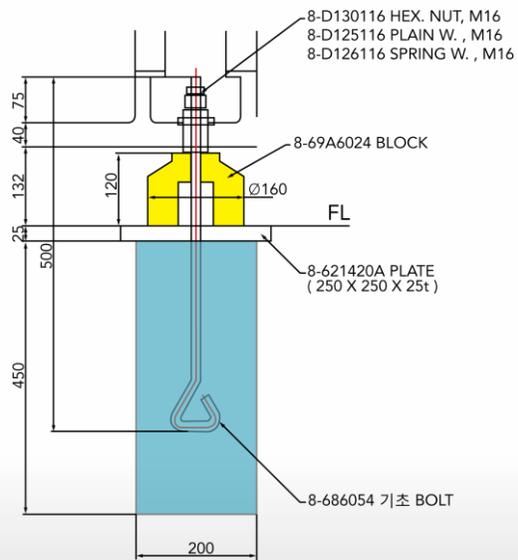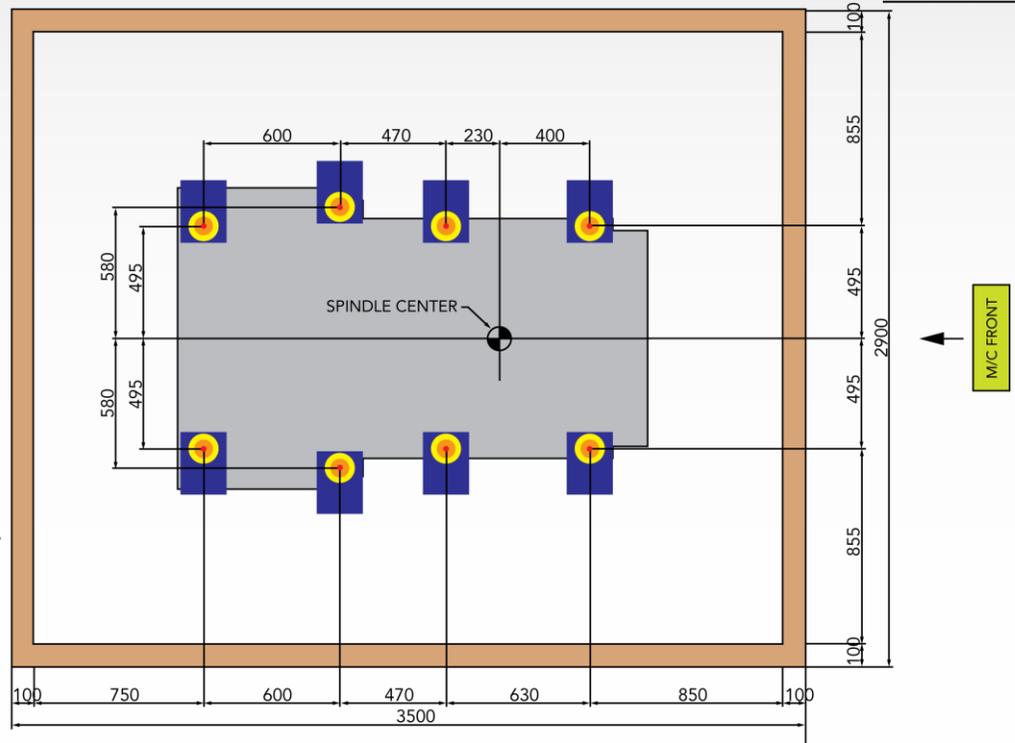
*T*able Dimension 【VESTA-1050B】

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※ Unit: mm(inch)

1,150 (45.28")

60 / 120 / 120 / 120 / 120 / 60

600 (23.62")

600 (23.62") -Y / +Y

-X / **1,050** (41.34") / **+X**

+Z / **600** (23.62") / **-Z**
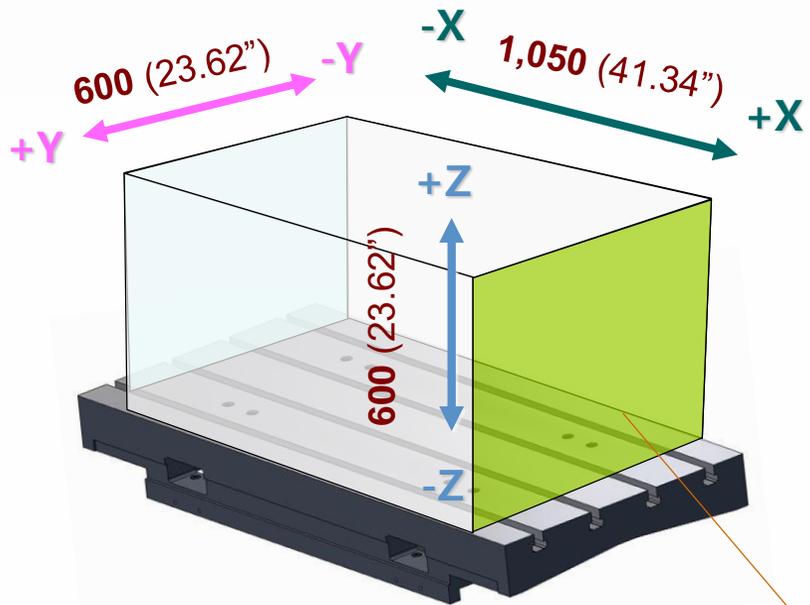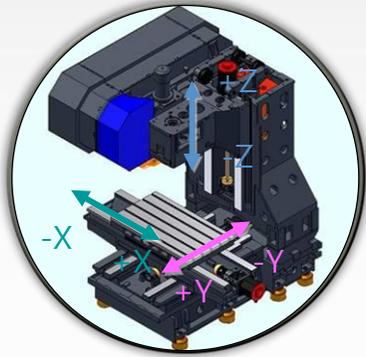
Max. Loading capacity
1,000 kgf (2,205lbf)

$18^{+0.027}_{0}$

30

12^{+2}_{0}

30^{+2}_{0}