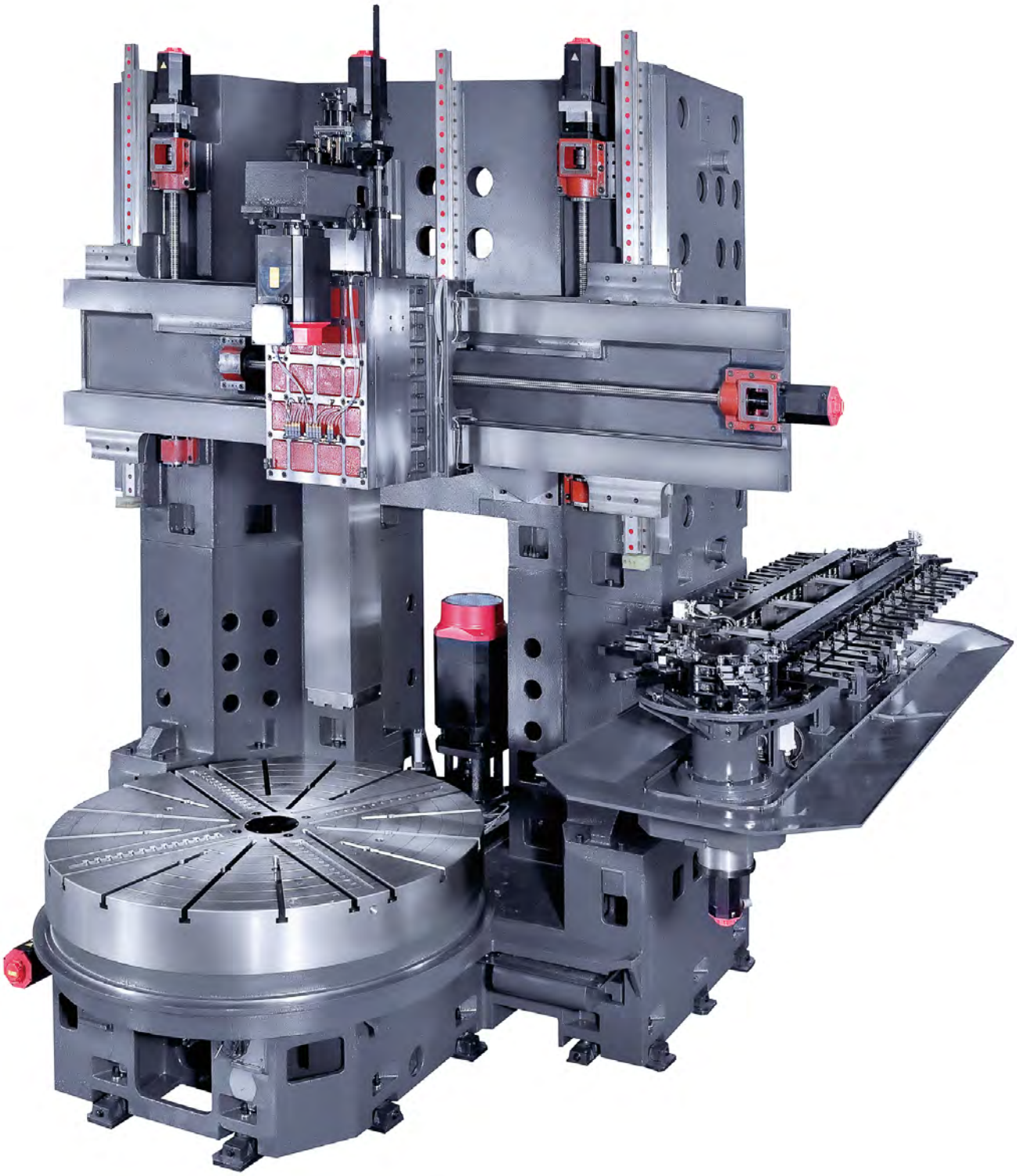
VT-2000

Ram type Vertical Turning Center

HWACHEON

VERTICAL TURNING CENTER FOR EXTRA LARGE & EXTRA HEAVY PARTS

VT-2000 is build on a one piece basic machine bed to ensure best rigidity and minimizes thermal deformation, its extra wide precision hand scraped and polished guide ways and the unique overall machine design providing exceptional vibration absorption and rigidity. Combined with the exceptional performance to deliver a quality product surface and a high degree of precision. The solid and rigid table with a two-speed automatic transmission turns out very high torque at low speed. The W-axis with integrated twin servo motor and the high torque output of the table drive using a build-in gear system are ideal for handling extra large and heavy vertical turning operations for shipbuilding, wind power, power plants and mining industry.



Highly Durable One Piece Frame Structure

Basically machine bed is designed by using FEM analysis for optimum vibration absorption and for highest degree of precision and surface quality at high speed turning. All main guide ways are designed in solid box Guide way design. The W-axis use large size Roller LM guides. The box way design ensures frame robustness and stability during operation.

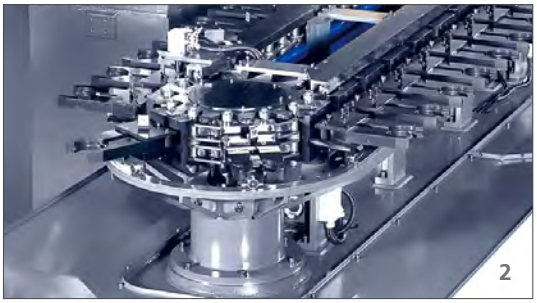
Rotation Ranges	Low Speed : 1 ~ 55rpm High Speed : 56 ~ 240 rpm
Programmed Gear Shift	Low Speed : M41 High Speed : M42
Maximum Torque	49,863Nm (14rpm)

VERTICAL TURNING CENTER RAM TYPE WITH 80" CHUCK

VT-2000 is a ram type vertical lathe with 80” chuck which provides the best machining conditions and performance for large size heavy duty workpieces commonly used in ships, wind turbines and many other large industrial components.

1 Ram **2** 14-Tool Magazine **3** X-Axis : Box Way Design, W-Axis : LM Guide **4** 80” Chuck (Table)


1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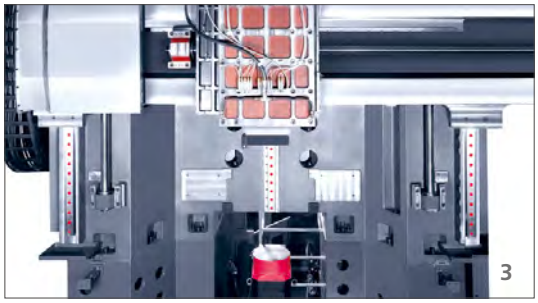
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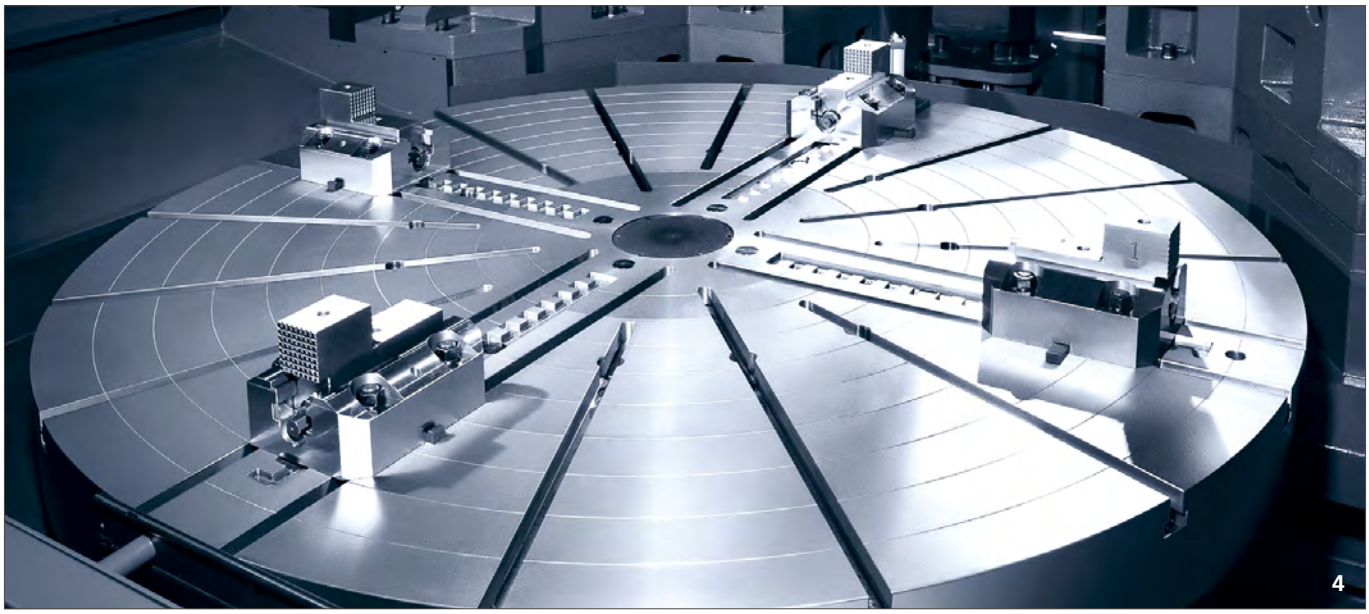
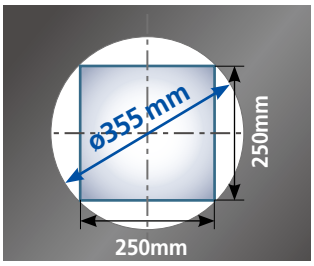

4

High Performance Milling Ram

The high performance ram used in the VT-2000 provides extra powerful and stable milling performance, aslo ideal for deep hole Drilling. The machine offers best class feed range and power, various milling functions to save turning time and increase your productivity.

Milling Ram Size	□250mm
Ram Travel	1,000 mm *
Milling Spindle Power Output*	26 / 22kW, 331Nm
Milling Tool Type	7 / 24taper BT-50 (std.)
Maximum Milling Spindle RPM	3,000rpm *
Through-Spindle Coolant (Option)	30bar

*Best Performance In Its Class



◂Min. Inner Turning Diameter

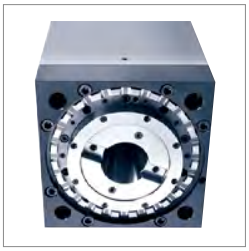
90°Angle Head Attachment

Compact structure of economic type for vertical lathe machining head attachement.

Max. Speed	2,000 rpm
Max. Power	12 kW
Tool Shank	7 / 24 Taper BT-50 / BBT-50
Tool Clamp	Pull-Stud
Indexing to Spindle Head	Manual

Pull-stud, Curvic Coupling Type Tool Clamping System

All turning tools are clamped with curvic couplings and 4-sets of pull-stud for extra clamping force to provide highest stability and deliver maximum power for turning.



Turning Holder


(Turning)


(Long type Turning)


(Boring)

Milling Holder


(Milling)


(Face Milling)


(Drilling)


(Tapping)


(Boring)

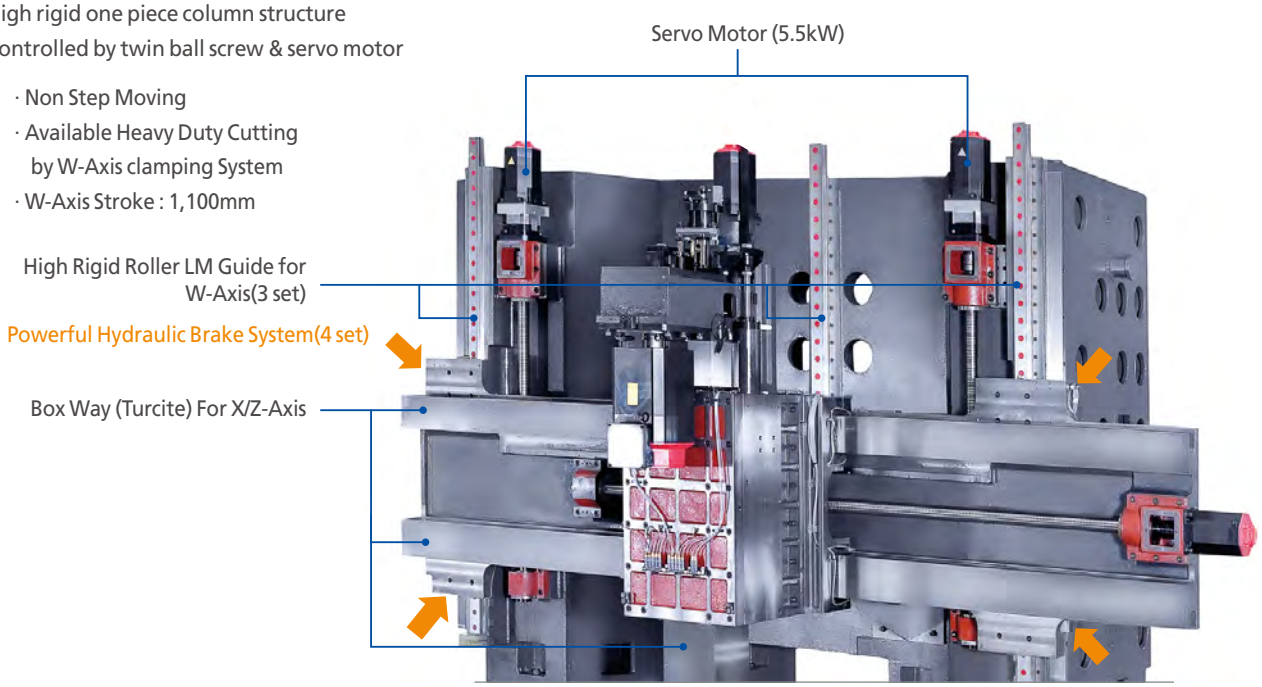

(Angle Head)

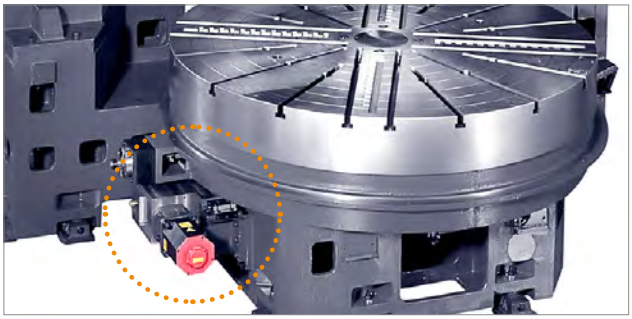

(Grinding Head)

W-axis Clamping System

High rigid one piece column structure
Controlled by twin ball screw & servo motor

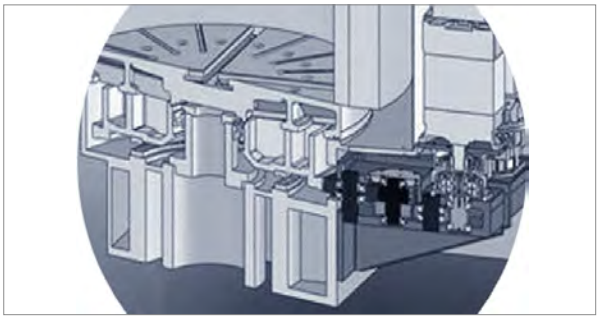
· Non Step Moving
· Available Heavy Duty Cutting
by W-Axis clamping System
· W-Axis Stroke : 1,100mm





C-Axis Gear Box

Table indexing(0.001) by the servo motor.
C-axis has been developed for precise table indexing. Technical discussion with R&D is required for X-C axis contouring/ pocketing.



Gear Built-In Table

· The powerful 2 step transmission offers the heavy duty cutting on the low speed and single frame offers stable machining during heavy duty cutting.
· The table is manufactured in a temperature controlled environment then assembled and tested in a clean room.

L-HTLD: Hwacheon Lathe Tool Load Detection System (OPT)

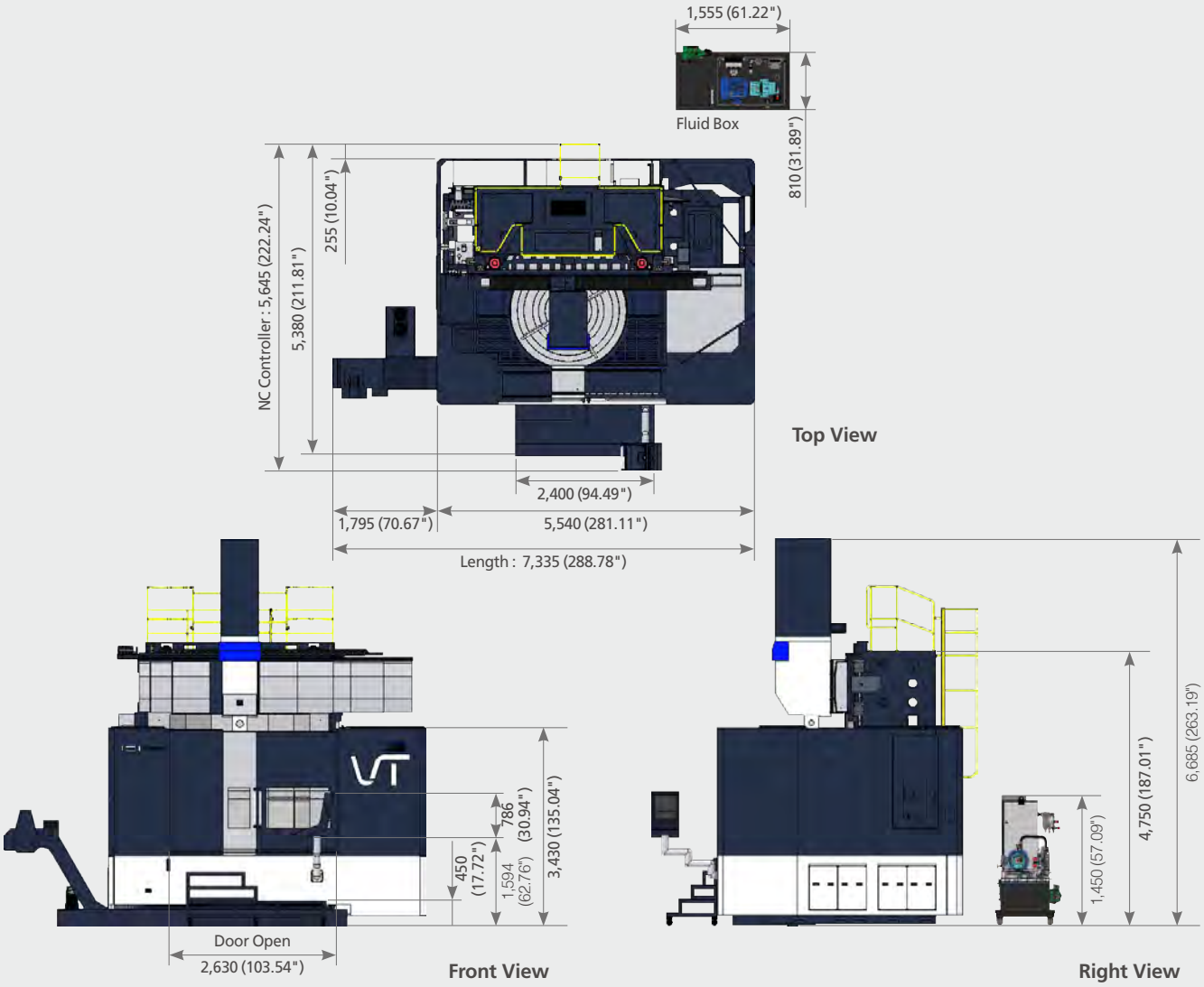
L-HTLD™ Lathe Hwacheon Tool Load Detect

The Hwacheon Lathe Tool Load Detection System constantly detects and diagnoses the tool load under process to prevent tool wear and damage, and to keep your machine and tools in optimal shape.

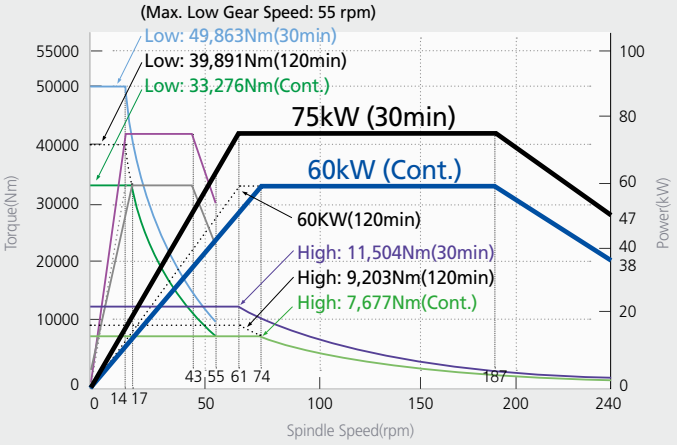
Load Detection Limit 1	Load Detection Limit 2
Alarm + Feed Hold	Alarm + Machine Stop
> When the LIMIT 1 Alarm detect, the system holds the feed and the machine goes into standby.	> When the LIMIT 2 Alarm detect, the system stops the machine, and must be reset to operate it.

Machine Size

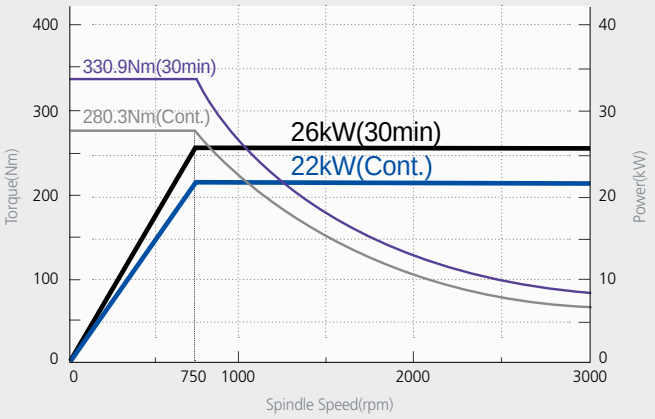
* Unit: mm(inch)



Spindle Torque / Spindle Speed



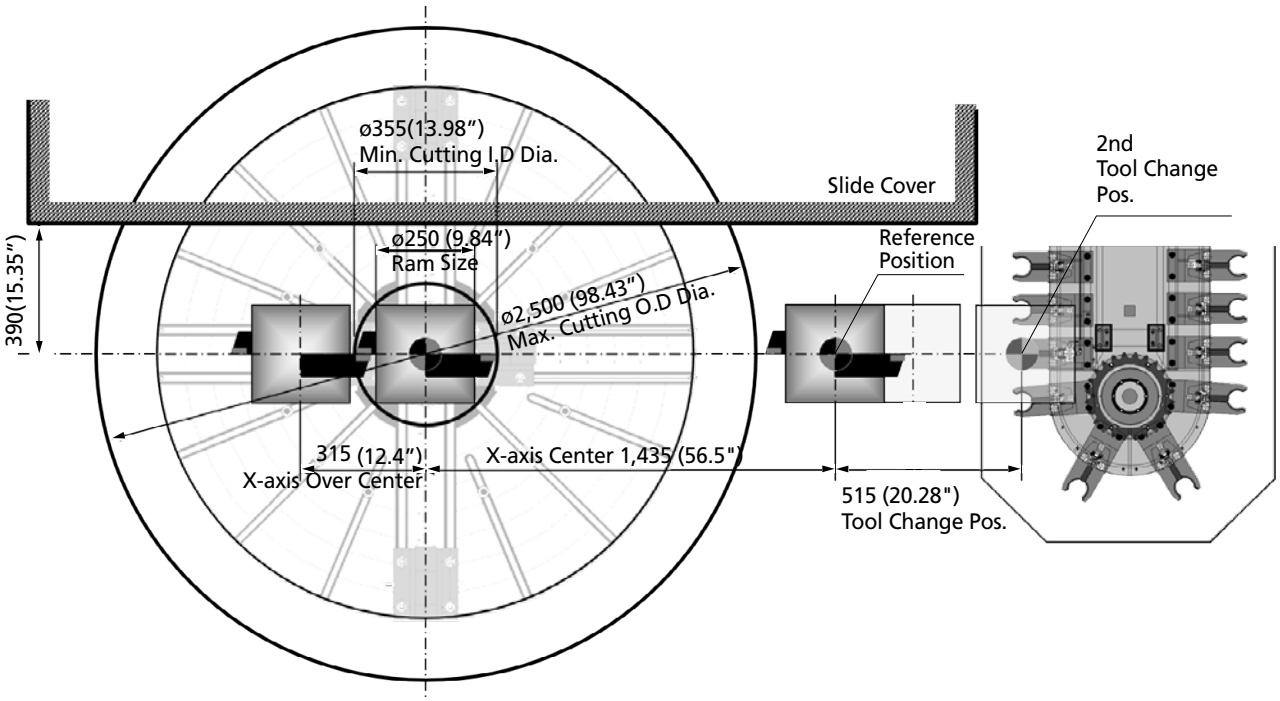
• Table **[1~240 rpm]**

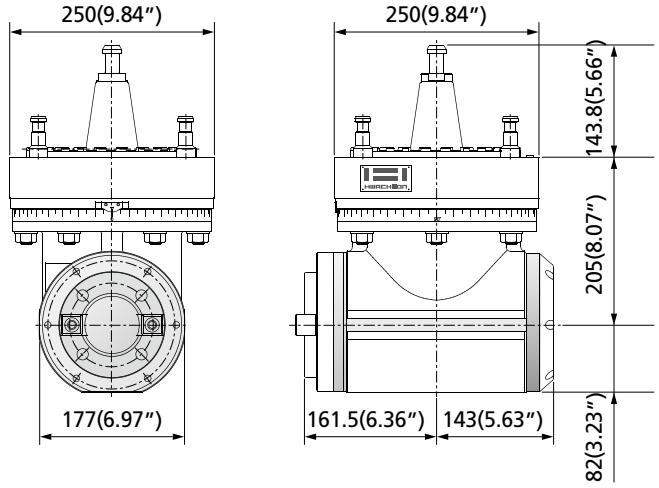


• Ram Spindle **[3,000 rpm]**

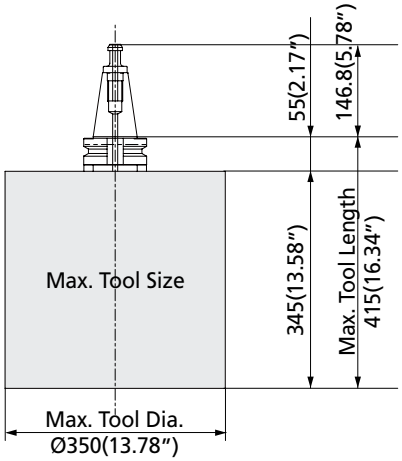
Tool Interference Diagram

* Unit: mm(inch)





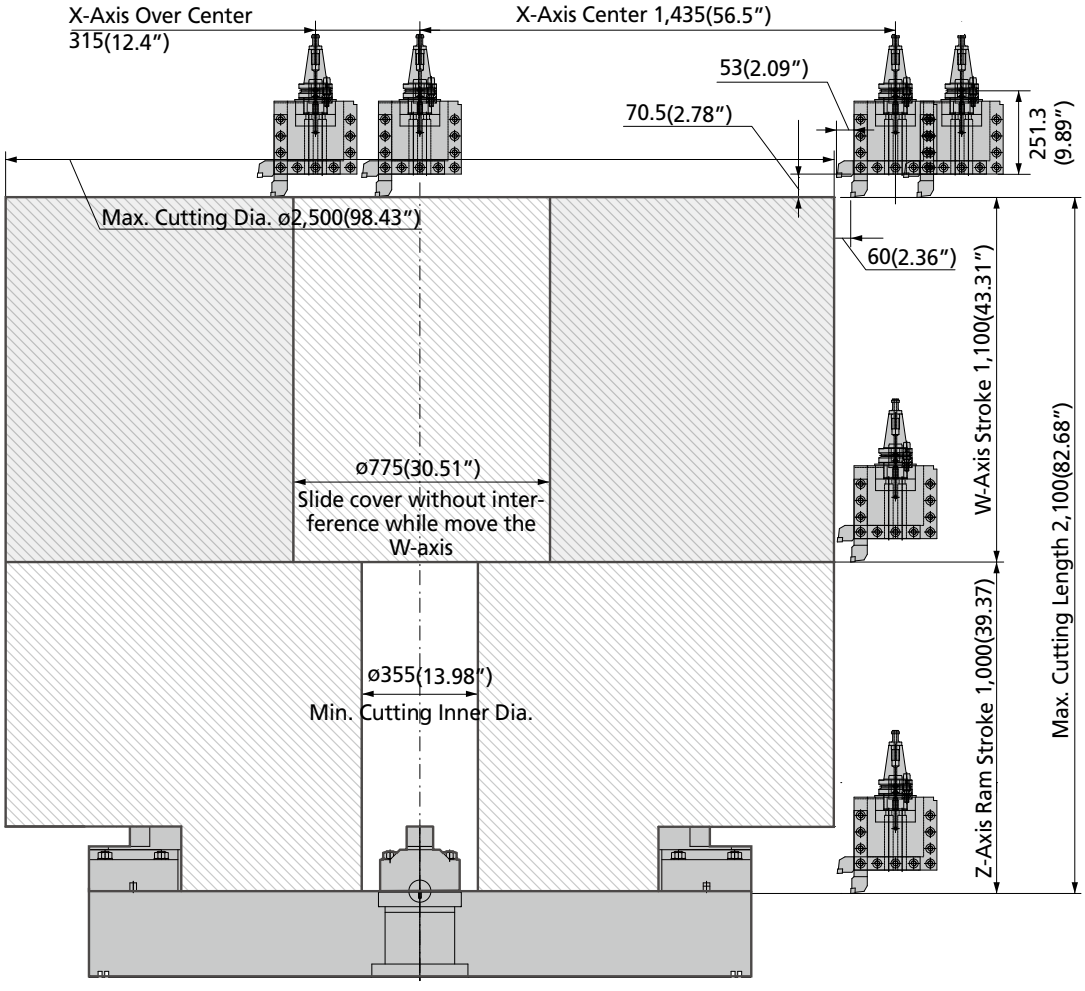
Angle Head



Max. Tool Size

Moving Range

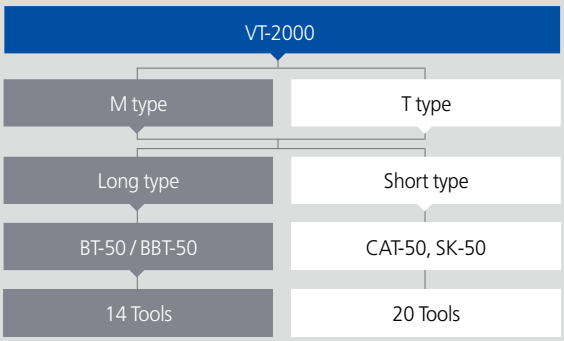
* Unit: mm(inch)



80 Inch Table (Chuck)

Product Configuration

Each product can be configured to fit your application.



Machine Specifications

S : Siemens F : Fanuc

ITEM		VT-2000 (M)		VT-2000 (T)	
		Long Type	Short Type	Long Type	Short Type
Capacity					
Swing Over Bed	mm(inch)	Ø2,650 (Ø104.33")			
Max. Cutting Diameter	mm(inch)	Ø2,500 (Ø98.43")			
Max. Cutting Length	mm(inch)	2,100 (82.68")	1,100 (43.31")	2,100 (82.68")	1,100 (43.31")
Travel					
X-axis Stroke (Horizontal Movement of Ram)	mm(inch)	-315~ +1,435 (-12.4"~ +56.5")			
Z-axis Stroke (Vertical Movement of Ram)	mm(inch)	1,000 (39.37")			
W-axis Stroke (Vertical Movement of Cross Rail)	mm(inch)	1,100 (43.31")	600 (23.62")	1,100 (43.31")	600 (23.62")
Table					
Max. Table Speed	rpm	1 ~ 55 (Low Speed) / 56 ~ 240 (High Speed)			
Table Motor	kW(HP)	F : 75 / 60 (100 / 80), S : 74 / 58 (99 / 77)			
Max. Table torque	N-m(kg_f-m)	F : 49,863 (5,085), S : 49,212 (5,018)			
Max. Loading Capacity	kg_f(lb_f)	15,000 (33,069)			
Table Indexing Angle (C-axis)	°(deg)	0.001°		-	
C-axis Max Speed	rpm	2.5		-	
Ram					
Milling Motor	kW(HP)	F : 26 / 22 (35 / 29.5), S : 30 / 22 (40 / 29.5)		-	
Max. Milling Speed	rpm	3,000		-	
Feedrate					
Rapid Speed (X / Z / W)	m/min(ipm)	10 / 10 / 7.5 (394" / 394" / 295")			
Feedrate (X / Z / W)	mm/min(ipm)	1 ~ 2,000 (0.04" ~ 78.74")			
Feedrate (C)	deg/min	0 ~ 900		-	
ATC					
Tool Storage Capacity (Magazine)	ea	14 (Including 1 Dummy Cover)		14	
Tool Size (O.D Tool)	-	mm type : □40 mm / inch type : □1.5"			
Type of Milling Tool	-	7 / 24 Taper BT-50		-	
Max. Tool Dia. (With / Without Adjacent Tools Dia.)	mm(inch)	Ø180 / Ø350 (Ø7.09" / Ø13.78")			
Max. Tool Length	mm(inch)	415 (16.34")			
Max. Tool Weight	kg(lb)	60 (132)			
Motor					
Feed Motor (X / Z / W / C)	kW(HP)	5.5 / 5.5 / 5.5 / 5.5 (7.5 / 7.5 / 7.5 / 7.5)		5.5 / 5.5 / 5.5 / - (7.5 / 7.5 / 7.5 / -)	
Coolant Motor (Ram)	kW(HP)	2.5 (3.4)			
Tank Capacity					
Spindle Cooling	ℓ (gal)	100 (26)			
Lubrication	ℓ (gal)	12 (3) x 2ea			
Coolant (Ram)	ℓ (gal)	770 (203) [Opt. 820 (217)]			
Hydraulic	ℓ (gal)	200 (53)			
Power Source					
Power Capacity	kVA	160			
Power Specification	-	380V (3phase), 60Hz (Std.)			
Compress Air (Pressure x Consumption)	-	5~7 kg_f/cm2 x 690 N ℓ /min			
Machine Size					
Machine Height	mm(inch)	6,685 (263.19")	5,585 (219.88")	6,685 (263.19")	5,585 (219.88")
Main Body Size (W x L)	mm(inch)	5,540 x 5,645 (218.11" x 222.24")			
Weight	kg(lb)	60,500 (133,380)	54,000 (119,050)	60,500 (133,380)	54,000 (119,050)
NC Controller		FANUC 31i-B (Opt. SIEMENS-840D sl)			

*C-axis has been developed for precise table indexing. Technical discussion with R&D is required for X-C axis contouring/pocketing

Accessories

Standard Accessories		Optional Accessories	
• ATC : 14ea	• Signal Lamp (R/Y/G, 3-Color)	• Air Gun	• Manual Guide i (for FANUC System)
• Automatic Coolant System	• Tool Box & Kits	• Angle Head	• NC Cooler
• Automatic Lubrication Equipment	• Tool Calamp Monitoring System	• ATC : 20ea	• Oil Skimmer
• Auto Transmission (2-steps)	• Tooling System : BT-50 & BBT-50 ATC	• Boring Holder (C.T.S available)	• Soft Jaw (4 set)
• Cabinet Fan	• Work Light	• Boring Holder, inch (C.T.S available)	• Tooling System : CAT-50 ATC
• CNC System : FANUC 31i-B	• 15" LCD Monitor	• CF Memory Card (2GB, FANUC)	• Tooling System : SK-50 ATC
• Door Interlock		• CF Memory Card (16GB, SIEMENS)	• Tool Life Management (FANUC System)
• Dummy Cover		• Chip Conveyor (Hinge Type)	• Tool presetter
• Foundation Tooling Set		• CNC System : SIEMENS-840D sl	• Transformer (160kVA)
• Hard Jaw (1 Set)		• Coolant Gun	• Turning holder (C.T.S available)
• High Pressure Coolant Pump (6bar)		• Coolant Through Spindle (30bar)	• Turning holder, inch (C.T.S available)
• Hydraulic Unit		• Grind Head (M type)	• Turning holder long type, inch
• Jacket Cooling		• Grind Head (T type)	(C.T.S available)
• Manual Table (Chuck) : 80"		• High Pressure Coolant Pump (15bar)	• Turning holder long type (standard)
• Milling Function (C-Axis, 0.001˚)		• Hwacheon Software System	• Turning holder long type (for C.T.S)
• Operation Manual & Part List		- Hwacheon Tool Load Detect system(HTLD)	• Work Probe
• Safety Cover		• Linear Scale (X/Z/W)	

NC Specifications [FANUC 31i-B]

- : Not Available S : Standard O : Option

ITEM	SPECIFICATION	
Controlled Axis		
Controlled Axis (C, WM, WS Axis Inclution)	4-Axes	S
Simultaneously Controlled Axes	3-Axes	S
Least Input Increment	0.001mm, 0.001deg, 0.0001inch	S
Inch / Metric Conversion	G20, G21	S
Stored Stroke Check 1		S
Stored Stroke Check 1 Area Expansion		O
Chamfering On / Off		S
Backlash Compensation		S
Pitch Error Compensation		S
Operation		
Automatic & MDI Operation		S
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
Polar Coordinate Interpolation	G12.1 / G13.1	S
Cylindrical Interpolation	G7.1	S
Threading	G33	S
Multiple Threading		S
Continuous Threading		S
Threading Retract		S
Helical Interpolation		O
Veriable Lead Threading	G34	S
Reference Position Return	G28	S
Reference Position Return Check	G27	S
2nd Reference Position Return	G30	S
3rd / 4th Reference Position Return	G30	O
Feed Function		
Rapid Traverse Override	F0, F25, F50, F100	S
Feed Per Minute (mm/min)	G94	S
Feed Per Revolution (mm/rev)	G95	S
Rapid Traverse Bell-Shaped Acceleration/ Deceleration		S
Feedrate Override	0 - 150%	S
Jog Feed Override	0 - 1,260 mm/min	S
Program Input		
Programmable Data Input	G10	S
Sub Program Call	10 folds nested	S
Custom Macro		S
Addition Of Custom Macro - Common Variables	#100 - #199, #500 - #999	O
Canned Cycles		S
Multiple Repetitive Cycle		S
Multiple Repetitive Cycle II		S
Canned Cycles For Drilling		S
Small-Hole Peck Drilling Cycle		O

ITEM	SPECIFICATION	
Program Input		
Manual Guide i		O
Tape Code	EIA RS244 / ISO840	S
Optional Block Skip	1ea	S
Program Number	O4-digits	S
Sequence Number	N8-digits	S
Decimal Point Programming		S
Coordinate System Setting	G92	S
Coordinate System Shift		S
Workpiece Coordinate System	G54 - G59	S
Addition of Work Piece - Coordinate System Pair	48pairs	O
Workpiece Coordinate System Preset	G92.1	O
Direct Drawing Dimension Programming		S
G Code System	B	S
3-Dimensional Coordinate System Conversion		O
Spindle Speed Function		
Constant Surface Speed Control	G96 / G97	S
Spindle Override	50 - 120%	S
Spindle Orientation		S
Rigid Tapping		S
Tool Function / Compensation		
Tool Function	T4-digits	S
Tool Offset Pairs	32pairs	S
Tool Nose Radius Compensation		S
Tool Geometry / Wear Compensation		S
Tool Life Management		O
Automatic Tool Offset	Tool Presetter Option is Required	S
Direct Input Tool Offset Value Measured B	Tool Presetter Option is Required	S
Editing Operation		
Part Program Storage Length / Number of Register Able Programs	256kB (669M) / 500ea	S
Part Program Storage Length / Number of Register Able Programs	512kB / 1,000ea, 1MB / 1,000ea, 2MB / 1,000ea	O
Background Dditing		S
Extended Part Program Editing		S
Operation / 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
Dynamic Graphic Display		O
Multi-Language Display	English, German, Japanese, Chinese, Korean	S
Data Input / Output		
Reader / Puncher Interface	RS232C	S
Ethernet Interface	Embeded Ethernet	S
Auto Data Backup	SRAM + Part Program	S
Memory Card Interface	PCMCIA CARD	S
DNC Operation By Memory Card		S
Other		
Display Unit	15" Color LCD	S

Hwacheon Global Network

Hwacheon Headquarters Hwacheon Europe Hwacheon Asia Hwacheon America

HWACHEON

Please contact us for product inquiries.

www.hwacheon.com

The product design and specifications may change without prior notice.
The specifications in this catalogue are based on standard voltage requirements.
Read the operation manual carefully and thoroughly before operating the product,
and always follow the safety instructions and warnings labels attahed on the surfaces of the machines.

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