

5-Axis Vertical Multitasking Machines

***VTM-1200YB***

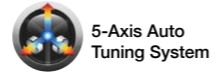
***VTM-2000YB***



5-Axis Vertical Multitasking Machines

**VTM-1200YB**

**VTM-2000YB**



## Real process-intensive machining—

opening up new markets in large-  
component, highly accurate 5-axis applications

5-axis control and machining capacity that cuts shapes of  
all kinds, going instantly from turning to slope multitasking.

Packaged with advanced, high-accuracy 5-axis machining technology,  
the VTM-YB machines will change the way large, complex components for the aerospace,  
energy and other industries are produced.



**VTM-1200YB**



**VTM-2000YB**

Photos shown in this brochure may include optional specifications.

# Machines for real process-intensive machining— powerful multitasking to accurate, simultaneous 5-axis applications

**Highly accurate control**

Contour control  
Roundness: 2.1  $\mu\text{m}$

Machining dimensional changes over time: 20  $\mu\text{m}$

**Multitasking**

**Milling**

**Turning**

**Powerful machining**

Turning	6.5 mm <sup>2</sup>
Face milling	1,000 cm <sup>3</sup> /min

Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, and cutting conditions.

## Higher efficiency in large-diameter, complex part machining Higher efficiency in machining new and difficult-to-machine materials

- Effective use of shop space (No materials in progress; no transporting materials between processes; machine space for one machine only)
  - Shorter cycle times with improved cutting conditions (rigidity improved by optimizing tool length for non-interfering angle)
- Higher machining accuracies (no mounting error with single chucking)
  - Reduced setup time
  - Reduced costs (fewer setup parts, reduced tooling costs, multiple machines, higher utilization)

## Simultaneous 5-axis machining: B-axis NC control (optional)



Highly accurate bevel gear tooth face machining with B-axis NC control

## Process-intensive machining of large spiral bevel gears

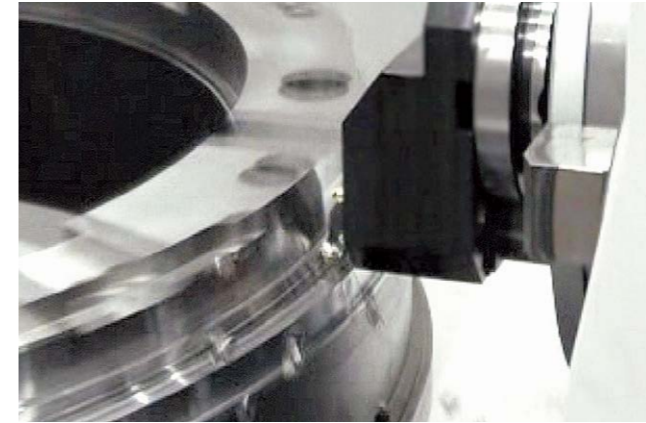
Process-intensive machining on one multitasking machine of processes normally done on three different machine types, including expensive special purpose machines. Not only are equipment costs and installation space greatly reduced; lead times are also significantly shortened. High-accuracy machining is achieved with simultaneous 5-axis control (B-axis NC) and a highly accurate C axis.

Single pitch accuracy	JIS Class 5 (former JIS grade 1)
Accumulated pitch accuracy	JIS Class 2 (former JIS grade 0)

- Main specifications B-axis NC control  
High-accuracy C-axis  
Super-NURBS (high-speed contouring)

<b>Tooth surface finishing (HRC 60 after quenching)</b> Cycle time: 17 hr 42 min
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# Powerful, large-capacity machining of difficult-to-machine materials even more effective than lathes or machining centers



## Turning

6.5 mm<sup>2</sup> (S45C)

### VTM-1200YB

- Output: 30/22 kW (30 min/cont)
- Spindle torque: 6,093/4,062 N-m (20 min/cont)
- Grinding diameter:  $\phi$ 490 mm
- Cutting speed: 150 m/min (spindle speed 97 min<sup>-1</sup>)
- Cutting depth: 10 mm
- Feedrate: 0.65 mm/rev

### VTM-2000YB

- Output: VAC 30/22 kW (30 min/cont)
- Spindle torque: 8,415/5,610 N-m (20 min/cont)
- Grinding diameter:  $\phi$ 650 mm
- Cutting speed: 150 m/min (spindle speed 73 min<sup>-1</sup>)
- Cutting depth: 8 mm
- Feedrate: 0.82 mm/rev

## Milling

1,000 cm<sup>3</sup>/mm (S45C)

### VTM-1200YB / VTM-2000YB

- Output: VAC 37/30/22 kW (3 min/30 min/cont)
- Spindle torque: 505/300/205 N-m (3 min/30 min/cont)

### Face milling

Stock removal: 1,000 cm<sup>3</sup>/min (S45C)

- Tool:  $\phi$ 100 mm face mill (10-flute)
- Cutting speed: 300 m/min (tool spindle speed 955 min<sup>-1</sup>)
- Cutting depth  $\times$  width: 5  $\times$  70 mm
- Feedrate: 3 mm/rev (2,865 mm/min)

### End milling

Stock removal: 645 cm<sup>3</sup>/min (S45C)

- Tool:  $\phi$ 50 mm 2-flute carbide end mill
- Cutting speed: 180 m/min (tool spindle speed 1,146 min<sup>-1</sup>)
- Cutting depth  $\times$  width: 50  $\times$  25 mm
- Feedrate: 0.45 mm/rev (516 mm/min)

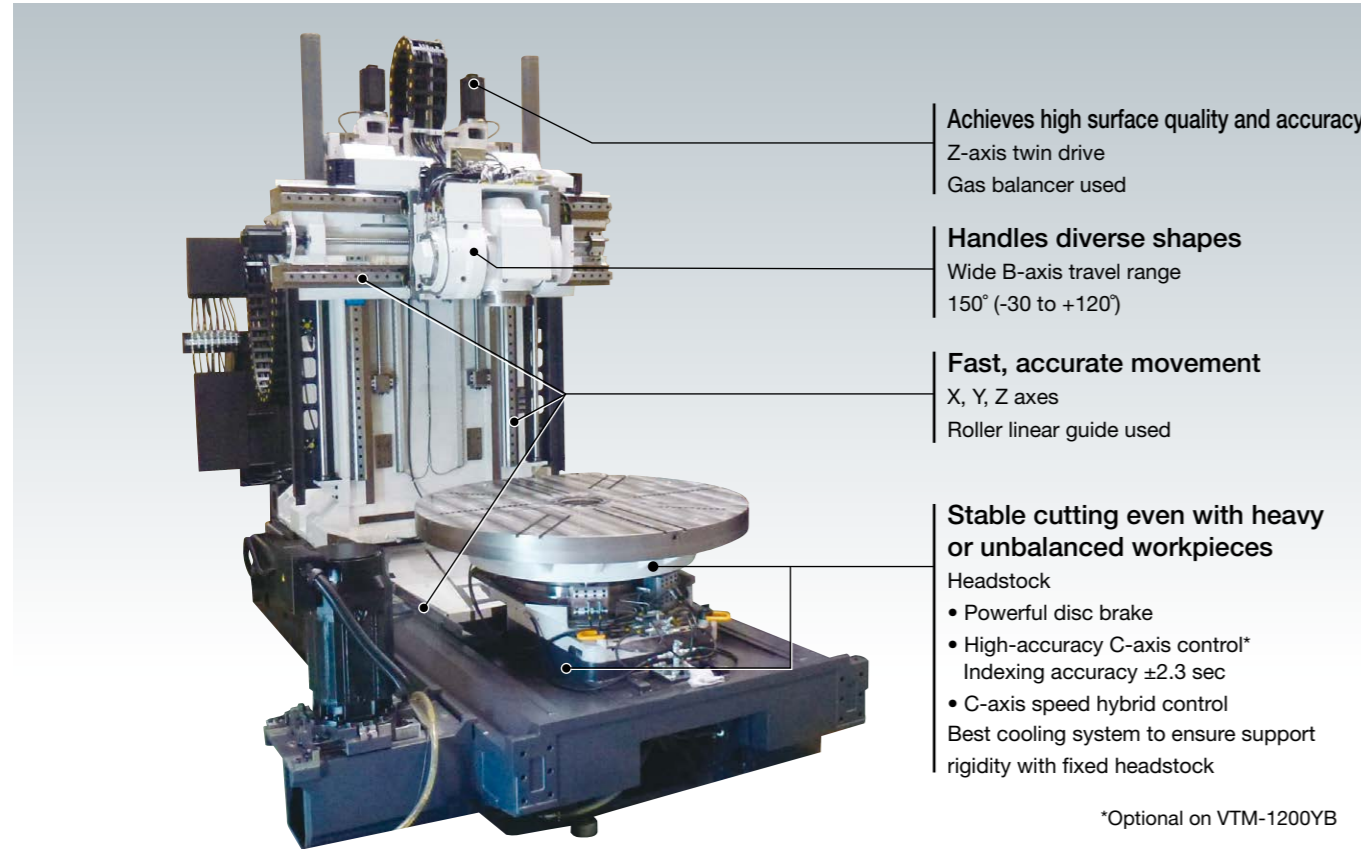
### Drilling

Stock removal: 707 cm<sup>3</sup>/min (S45C)

- Tool:  $\phi$ 63 mm U drill
- Cutting speed: 180 m/min (tool spindle speed 909 min<sup>-1</sup>)
- Feedrate: 0.25 mm/rev (227 mm/min)

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# Superior machine structure delivers high performance



Achieves high surface quality and accuracy  
Z-axis twin drive  
Gas balancer used

Handles diverse shapes  
Wide B-axis travel range  
150° (-30 to +120°)

Fast, accurate movement  
X, Y, Z axes  
Roller linear guide used

Stable cutting even with heavy or unbalanced workpieces

Headstock  
• Powerful disc brake  
• High-accuracy C-axis control\*  
Indexing accuracy ±2.3 sec  
• C-axis speed hybrid control  
Best cooling system to ensure support rigidity with fixed headstock

\*Optional on VTM-1200YB

## Highly rigid structure that gives stable accuracies

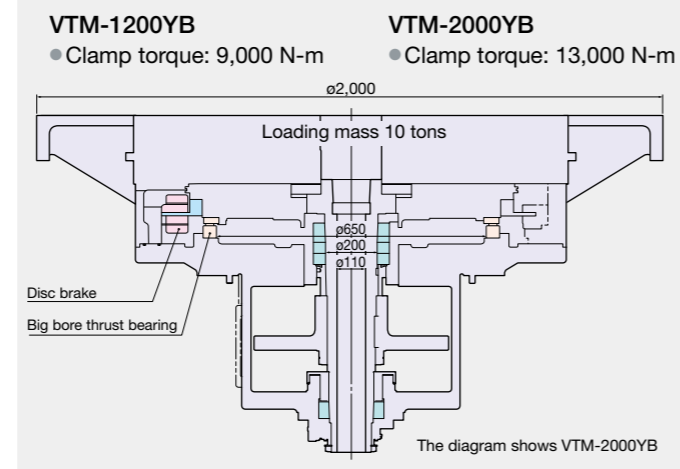
■ Integrated structure column resists twisting and bending

■ Fixed headstock for high rigidity

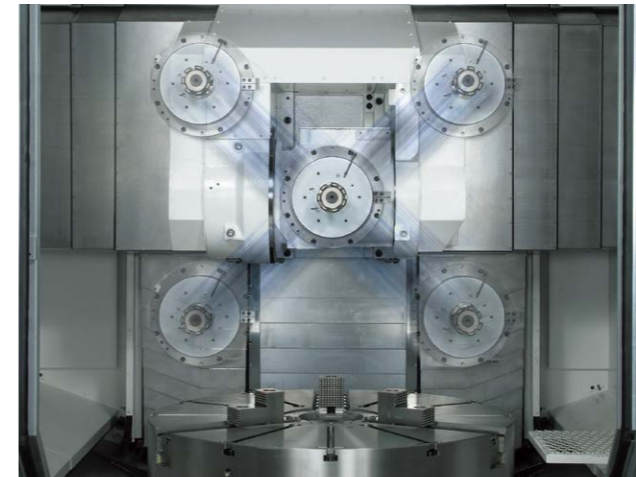
- Spindle structure also handles unbalanced workpieces
- Spindle bearing: VTM-1200YB ø260  
VTM-2000YB ø200 + thrust bearing ø650
- Loading mass: VTM-1200YB 3,000 kg (chuck included)  
Optional 5,000 kg  
VTM-2000YB 10,000 kg (chuck not included)

## High-rigidity C-axis clamp draws out full milling capacity

■ A powerful disc brake is set near the spindle, powerfully fixing the workpiece in place during milling



## High speed operation



■ Faster axis feeds 32 m/min (X-Y-Z axes)

■ Shorter ATC time (C-C) 12.5 sec

■ Shorter B axis indexing 2.4 sec/90°

## Spindle drive technology that gives high speed and high accuracy

■ Roller linear guide used on X, Y, and Z axes

- Faster feedrates
- Better follow-up accuracy
- Better positioning accuracy
- Suppressed heat generation

■ Twin drive system

- Twin drive with 2 ball screws used on Z axis
- Control of turret inclination with smooth Z-axis movement
- VTM-2000YB also uses twin drive system on X axis

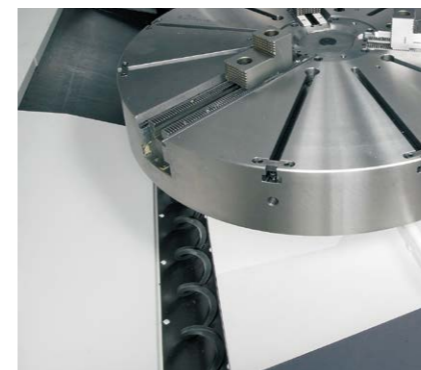
## Ease of use—high operator/machine performance

■ In-machine chutes

- Best design for chute shape and inclination angle
- Chips efficiently flushed out with large capacity chip flush coolant

■ Chip conveyor (optional)

- Forced discharge of chips  
Automation (APC, etc.) makes long-time untended operation possible



■ In-machine ceiling cover

- Ultra-high pressure coolant available with complete separation from cutting area
- Opens directly above spindle; easy workpiece mounting/dismounting



■ Hydraulic power chuck (VTM-1200YB, optional)

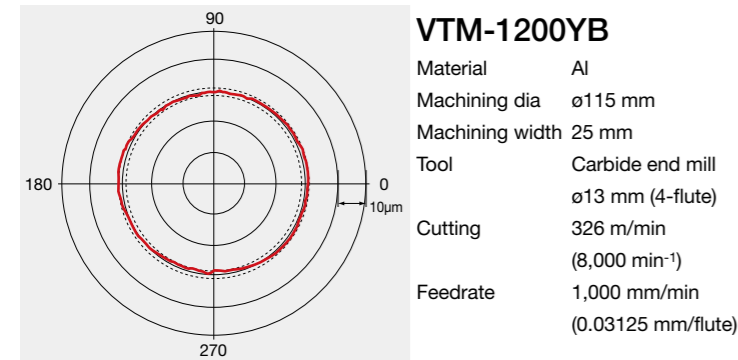


■ In-machine work step



# Stable, high accuracies even for 5-axis machining

## ■ Circular cutting (X-Y planes) Roundness: 2.1 μm (actual data)



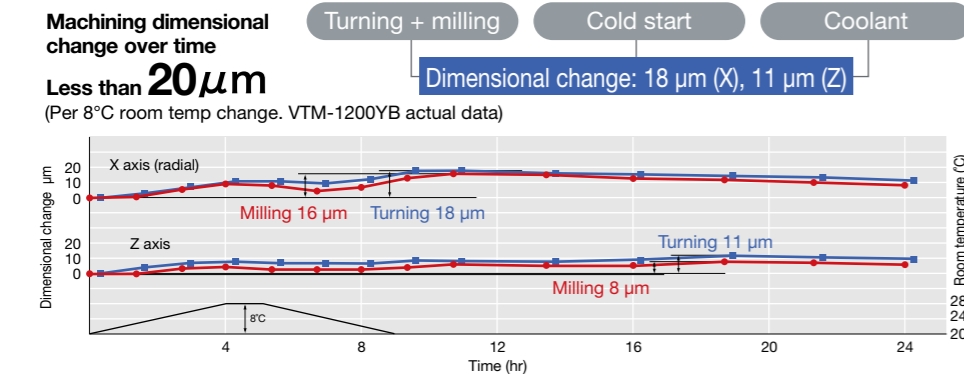
## ■ B-axis control Standard: 0.001° indexing Optional: NC-B axis (simultaneous 5-axis control)



Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, and cutting conditions.

## Manageable Deformation— Accurately Controlled Thermo-Friendly Concept

The Thermo-Friendly Concept promises stable machining accuracies even with large 5-axis multitasking machines. Changes in machining accuracy are minimized even with repeated turning and milling operations, reducing dimensional control time and costs.



- **TAS-S**  
[Thermo Active Stabilizer – Spindle]  
X-Y-Z axes control thermal deformation of the milling spindle
- **TAS-C**  
[Thermo Active Stabilizer – Construction]  
Overall control of thermal deformation on headstock, bed, column, and turret

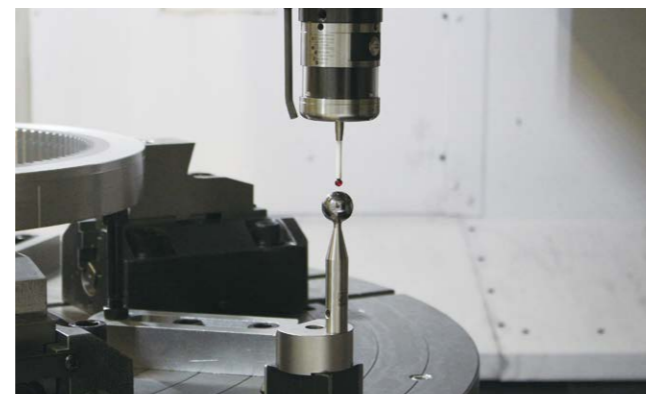
[Cutting conditions]  
Cycle time: 80 min  
Repeat

- Turning (roughing) (80-120 min<sup>-1</sup>): 15 min
- Milling (1,200 min<sup>-1</sup>): 40 min
- Turning (finishing) (130-200 min<sup>-1</sup>): 15 min
- Stationary: 10 min

## Gauging and compensation of geometric error 5-Axis Auto Tuning System (Optional)

In 5-axis machining accuracy, there are 13 types of "geometric error," such as misalignment of a rotary axis, that greatly affect machining accuracy. The 5-Axis Auto Tuning System measures geometric error using a touch probe and datum sphere. Tuning is done for motion accuracy of 5-axis machines by compensation using measurement results. This enables 5-axis machining accuracy to achieve the next level.

Note: May not be available for certain specifications.



## ■ Machine specifications

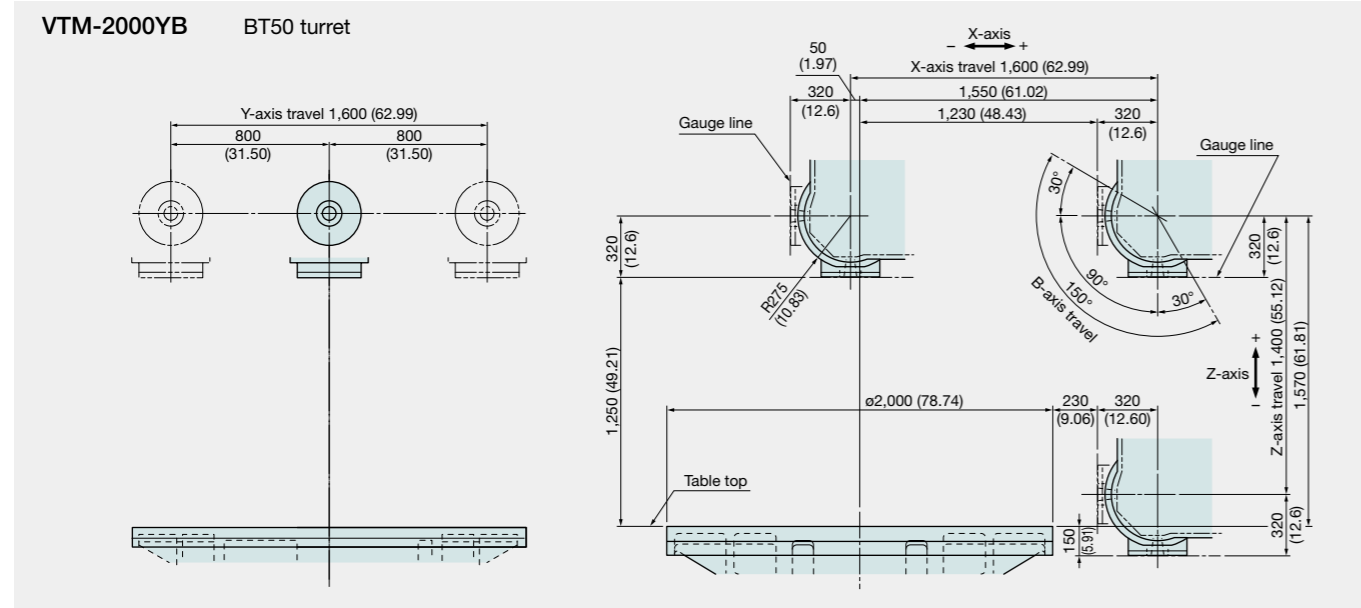
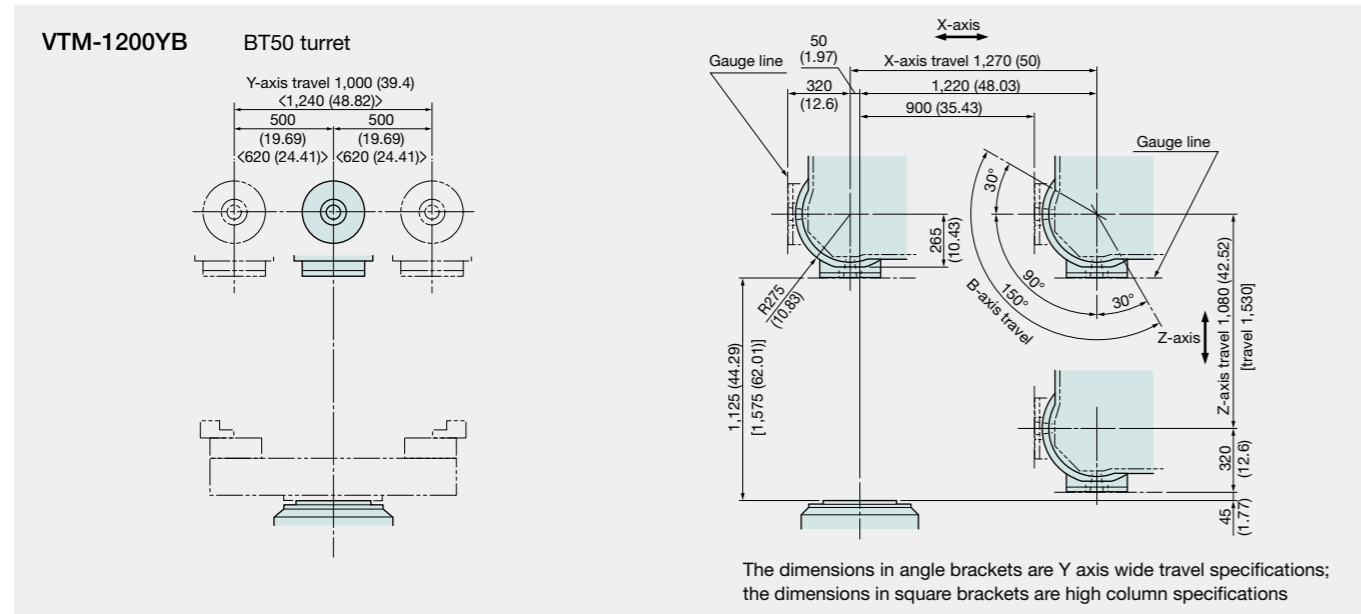
Item	Unit	VTM-1200YB	VTM-2000YB	
Capacity	Maximum chuck size	mm (in.)	ø1,250 (49.21)	ø2,000 (78.74)
	Max machining diameter	mm (in.)	ø1,200 (47.24)	ø2,000 (78.74)
	Max swing diameter	mm (in.)	ø1,500 (59.06)	ø2,400 (94.49)
	Max turning length (height)	mm (in.)	1,080 (42.52)	1,400 (55.12)
	Max workpiece load	kg (lb)	3,000 [5,000] [with chuck] (6,600 [11,000])	10,000 (22,000)
Travel	X-axis travel	mm (in.)	1,270 (50)	1,600 (62.99)
	Y-axis travel	mm (in.)	1,000 (-500 to +500) [1,240 (-620 to +620)] (39.37 (-19.69 to +19.69) [-24.4 to +24.4])	1,600 (-800 to +800) (62.99 (-31.50 to +31.50))
	Z-axis travel	mm (in.)	1,080 [1,530] (42.52 [60.24])	1,400 (55.12)
	C-axis travel	deg	360 (minimum control angle 0.001)	
	B-axis travel	deg	150 (-30 to +120) (minimum control angle 0.001)	
Turning spindle	Spindle speed	min <sup>-1</sup>	5 to 500 [4 to 400]	4 to 300 [4 to 200]
	Spindle speed ranges		2 auto ranges	
	Max spindle torque	N-m	6,093/4,062 (20 min/cont)	8,415/5,610 (20 min/cont)
	Spindle nose type	mm (in.)	ø380 (14.96) flat	ø1,400 [2,000] (55.12 [78.74]) table
	Spindle bearing ID	mm (in.)	ø260 (10.24)	ø650/ø200 (25.59/7.87)
	Through-hole diameter	mm (in.)	ø160 (6.30)	ø110 (4.33)
Turret (tool spindle)	Turret type		H1, ATC	
	Number of tools mounted in turret		1 (L/M)	
Milling tool spindle	Tool shank/boring bar shank diameter	mm (in.)	□25 (0.98), □32 (1.26)/ø40 (1.57), ø50 (1.97)	
	Maximum spindle speed	min <sup>-1</sup>	40 to 10,000	
	Max spindle torque	N-m	505/300/205 (3 min/30 min/cont)	
	Spindle bore dia	mm (in.)	ø90 (3.54)	
ATC	Tool Shank/Pull stud		MAS BT50 [CAPTO C8, HSK-A100]	
	Max tools (magazine capacity)	tool	36 [60, 120]*1	36 [60, 120]
	Max tool diameter	mm (in.)	w/o adjacent tool: ø290 (11.42) [ø250 (9.84)*2], with adjacent tool: ø170 (6.69)	
	Max tool length (from gauge line)	mm (in.)	500 [600] (19.69 [0.78])*3	500 [600] (19.69 [0.78])
	Max tool mass	kg (lb)	30 [40] [66 [88])*3	30 [40] [66 [88])
Feed axis	Feedrate command range	mm/rev	0.001 to 1,000.000	
	Rapid feedrate	m/min	X/Y/Z: 32 (105)	
		min <sup>-1</sup>	B: 19.5, C: 20	
Motor	Motor spindle	kW (hp)	OSP: 30/22 (40/30) (30 min/cont), FANUC: 30/22 (40/30) (30 min/cont)	
	Milling tool spindle motor	kW (hp)	OSP: 37/30/22 (50/40/30) (3 min/30 min/cont), FANUC: 37/30/22 (50/40/30) (3 min/30 min/cont)	
	Axis drive motors	kW (hp)	OSP: X: 5.2 (6.9), Y: 4.6 (6.1), Z: 4.6 (6.1) x 2 FANUC: X: 5.0 (6.7), Y: 5.5 (7.5), Z: 5.5 (7.5) x 2	X: 4.6 (6.1) x 2, Y: 4.6 (6.1), Z: 5.2 (6.9) x 2
	B-axis drive motors	kW (hp)	OSP: 4.6 (6.1), FANUC: 5.5 (7.5)	
Machine size	Required floor space (L x W)	mm (in.)	4,273 (168.23) [4,990 (196.46)]	4,967 (195.55)
	Height	mm (in.)	5,512 x 5,471 (217.01 x 215.39)	5,970 x 6,973 (235.04 x 274.53)
	Weight	kg (lb)	28,000 (61,600) [29,500 (64,900)]*4	43,000 (94,600)*4
Control		OSP-P300SA, FANUC 31i-B		

\*1: With 120 tool magazine (matrix) specifications, maximum tool length becomes 600 mm x mass 40 kg \*2: With 120 tool magazine [ ]: Options  
\*3: With maximum tool length 600 mm x mass 40 kg specifications, the machine has high column specifications  
\*4: Machine only (includes ATC magazine mass)

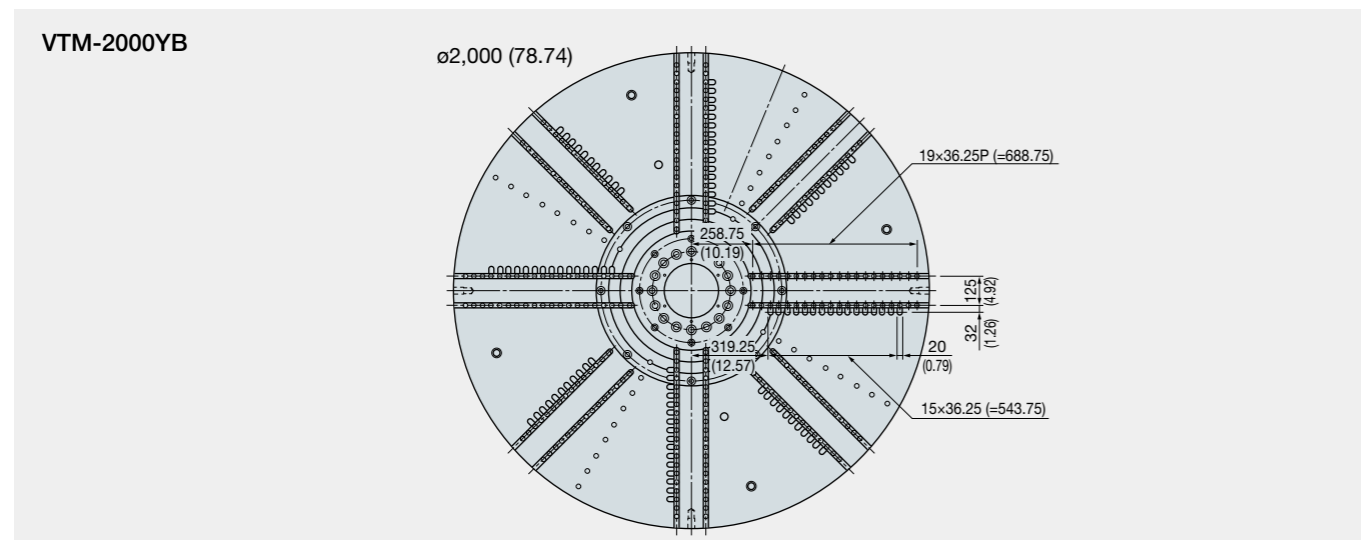
## ■ Standard specifications

Turning spindle	VTM-1200YB	Automatic tool changer	36-tool magazine, Fixed address type
	ø380 flat 500 min <sup>-1</sup> 30/22 kW (30 min/cont)	Tool shank shape	MAS BT50 BIG PLUS®
Spindle cooler	VTM-2000YB	In-machine work lamp	
	Table for ø1400 boring mill jaw (4T)	Highly accurate C axis	VTM-1200YB optional specification
	300 min <sup>-1</sup> 30/22 kW (30 min/cont)	CNC	OSP-P300SA/FANUC 31i-B
Turret		Full-enclosure shielding	
	H1, ATC LM common	Door interlock	
Milling tool spindle	0.001° indexing	Foundation pads, leveling screws	
	10,000 min <sup>-1</sup> 37/30/22 kW (3 min/30 min/cont)	Work tools, tool box	
	Tapered bore 7/24 taper No. 50 M-axis thru spindle coolant	Lube monitor A-1	
Coolant system	Detachable coolant tank	Thermo Active Stabilizer	(OSP: TAS)
	Tool spindle coolant	Thermal growth compensation	(FANUC)
	Chip flusher		

## Working ranges

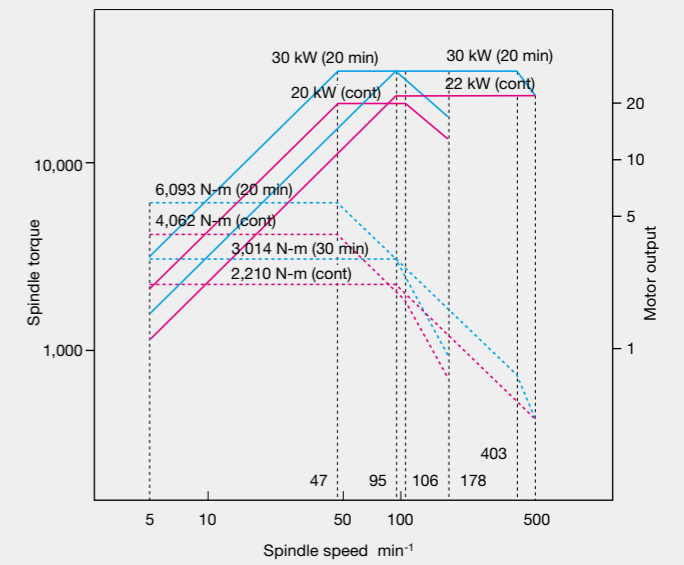


## Table dimensions

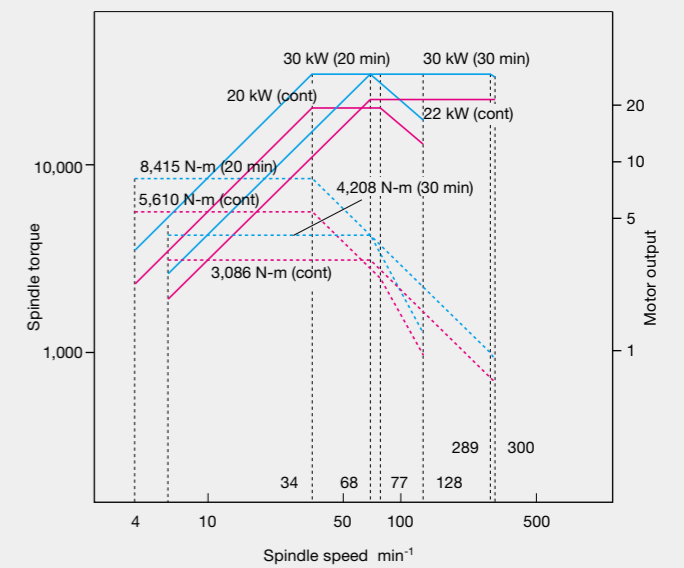


## Turning spindle output torque diagram

- VTM-1200YB (OSP)**
- Turning spindle 500 min<sup>-1</sup>
  - Max output 30/22 kW (30 min/cont)
  - Max torque 6,093/4,062 N-m (10 min/cont)

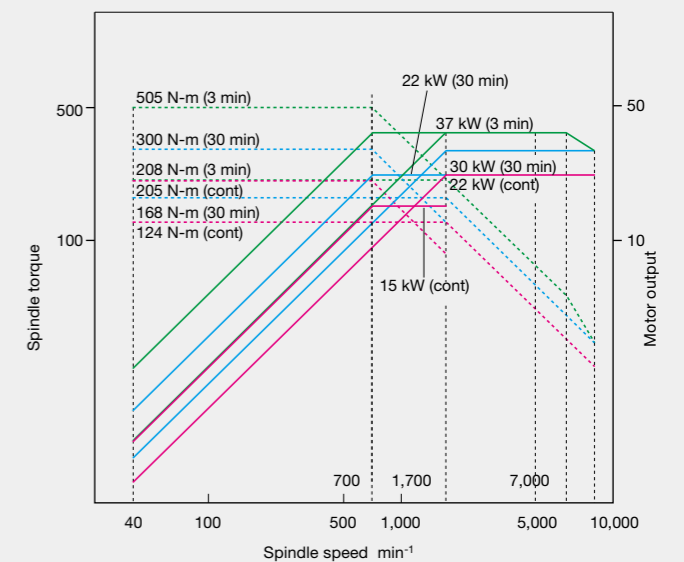


- VTM-2000YB (OSP)**
- Turning spindle 300 min<sup>-1</sup>
  - Max output 30/22 kW (30 min/cont)
  - Max torque 8,415/5,610 N-m (20 min/cont)



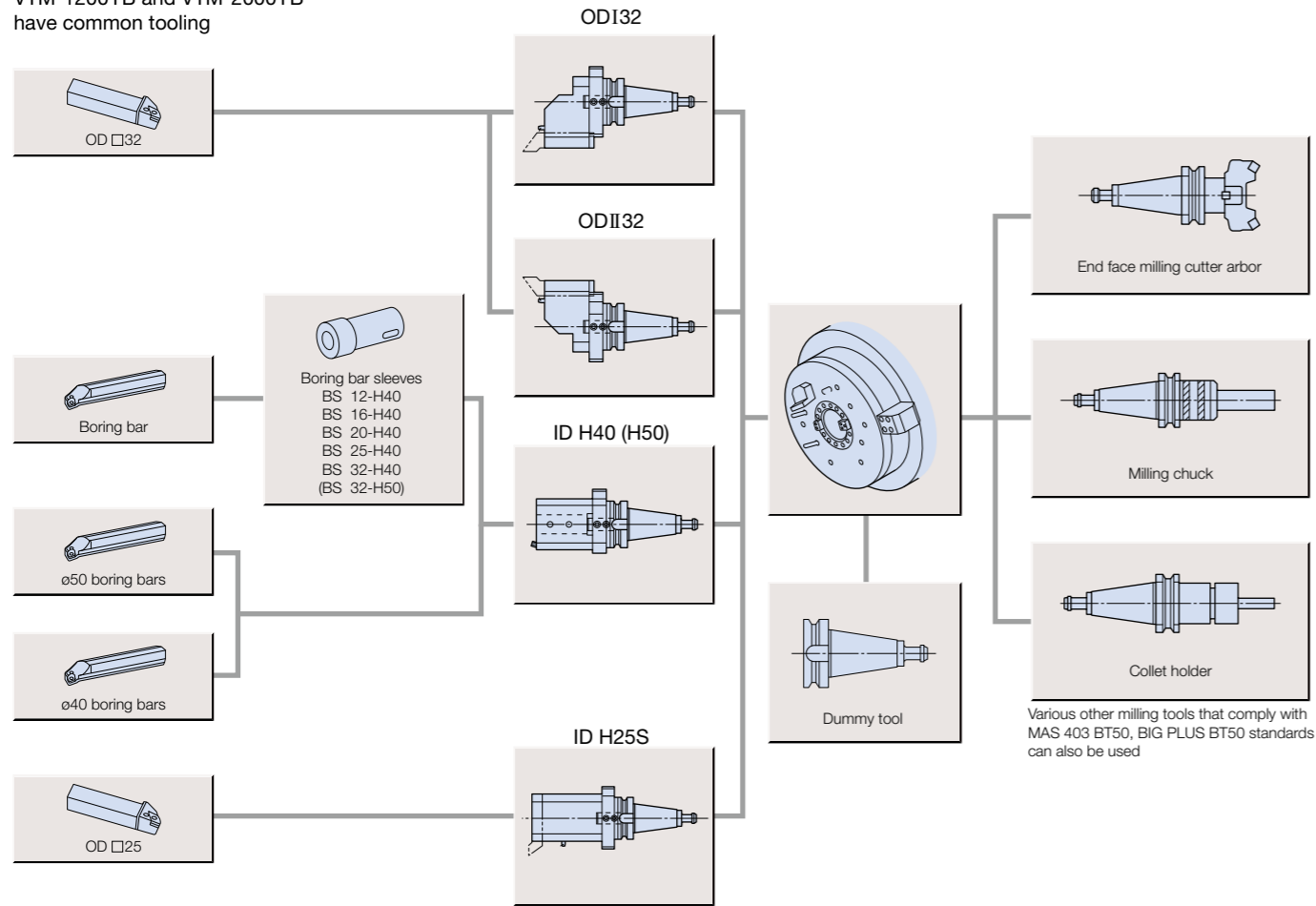
## Milling tool spindle output torque diagram

- VTM-1200YB/VTM-2000YB (OSP)**
- Milling tool spindle 10,000 min<sup>-1</sup>
  - Max output 37/30/22 kW (3 min/30 min/cont)
  - Max torque 505/300/205 N-m (3 min/30 min/cont)



## Tooling system (MAS BT50)

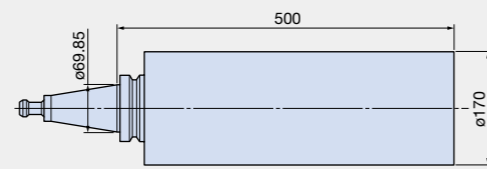
VTM-1200YB and VTM-2000YB have common tooling



## ATC tool dimensions

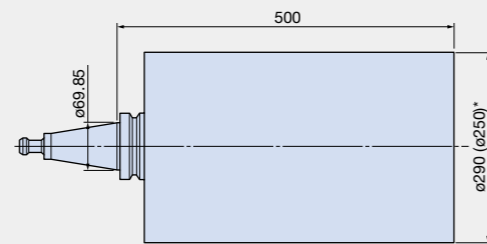
### Maximum adjacent tool size

Maximum tool size that can be used together with adjacent tool magazine



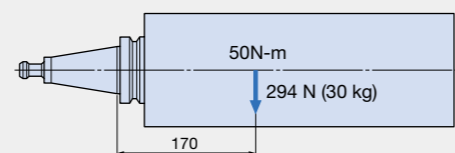
### Maximum non-adjacent tool size

Maximum tool size that can be used when there are no adjacent tools on either side in the ATC magazine



### Maximum tool mass moment

Mass including shank may be up to 294 N (30 kg), and the center of gravity position at that time up to 170 mm from gauge line.



## Optional specifications and accessories

Auto pallet changer	Shuttle-type 2-pallet APC with setup station
High power spindle	VTM-1200YB Load capacity: 5,000 kg (with chuck) Spindle speed: 400 min <sup>-1</sup>
ø2,000 boring mill jaw table	VTM-2000YB Spindle speed: 200 min <sup>-1</sup> Boring mill jaw
B-axis NC control	
Wide Y-axis travel specs	VTM-1200YB Y-axis travel 1240 mm (620+620)
High column specs	VTM-1200YB Z-axis travel 450 mm
Tool shank	HSK-A100, CAPTO C8
ATC magazine tool capacity	60 tools (chain-type) 120 tools (matrix type)
APC installation	Inquire for details
High pressure coolant	High pressure coolant unit 4.0 MPa, 7.0 MPa
Hydraulic chuck, cylinder	VTM-1200YB H01MA-36, H01MA-40-HH960C150 Auto chuck open/close Chuck operating buttons
Tooling types	See separate tooling system diagram
Chip discharge (required)	Hinged conveyor Drum filter-type conveyor Scraper-type conveyor Coil conveyor
In-machine chip discharge	
Chip bucket	
Front door auto open-close	Required
Oil skimmer	
Coolant gun	
Coolant level detection	Lower limit detection
Air gun	
Turret air blower	
Mist collector	
In-process work gauging	Radio
Touch setter A	
AbsoScale	OSP
Scale feedback	FANUC
Highly accurate C-axis control	Standard specifications for VTM-2000YB
Automatic power shutoff	
Circuit breaker	
Hour meters	
Electric buzzer	



60-tool magazine



Chip conveyor

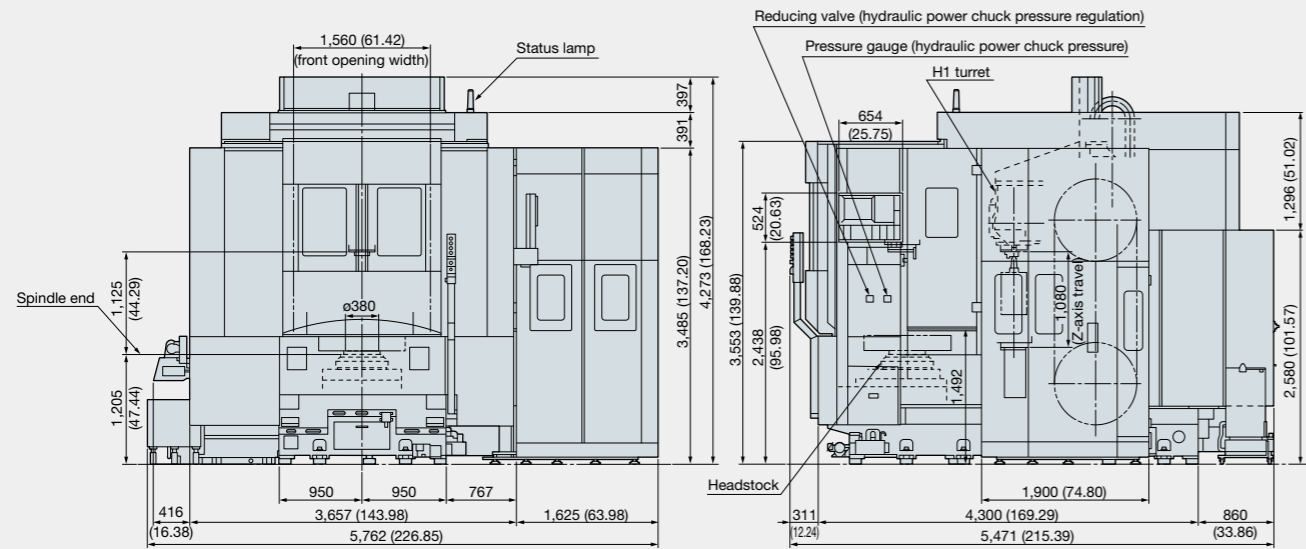
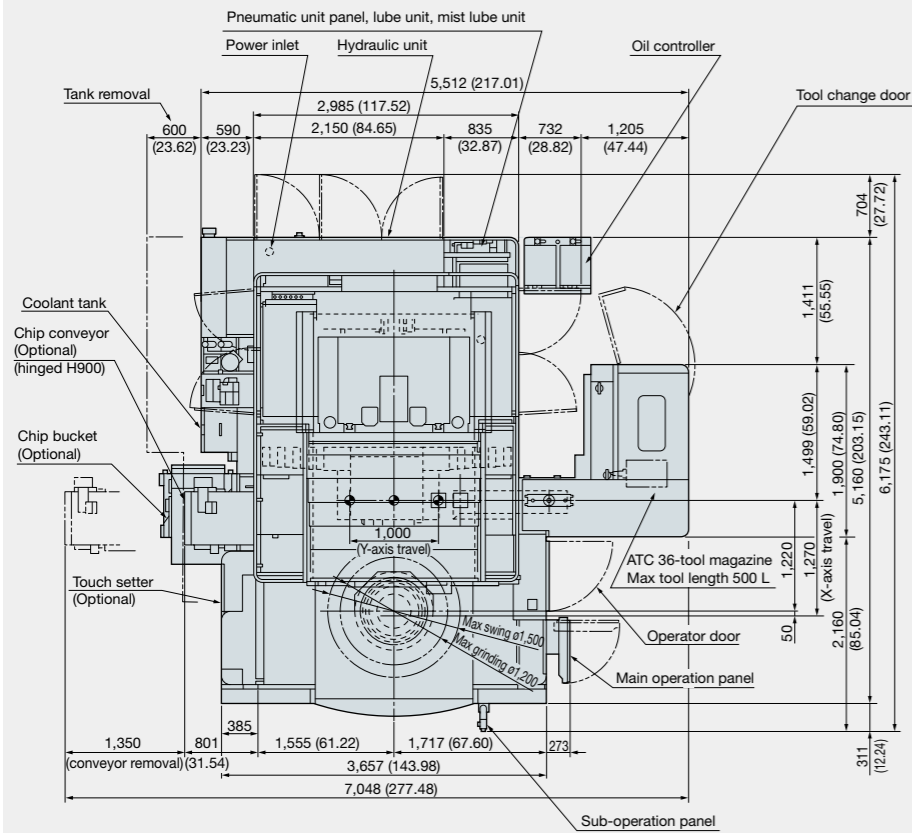
## Various chip conveyors

### Chip conveyor types and applications

Type	Hinge	Scraper	Magnet scraper	Hinge scraper
Application	● For steel	● For cast iron	● For cast iron	● For steel, cast iron nonferrous metal
Features	● General use	● Magnet scraper for sludge processing ● Easy for maintenance ● Blade scraper	● Suitable with sludge ● Not suitable for nonferrous metals	● Long/short chips and coolant sludge
Shape				

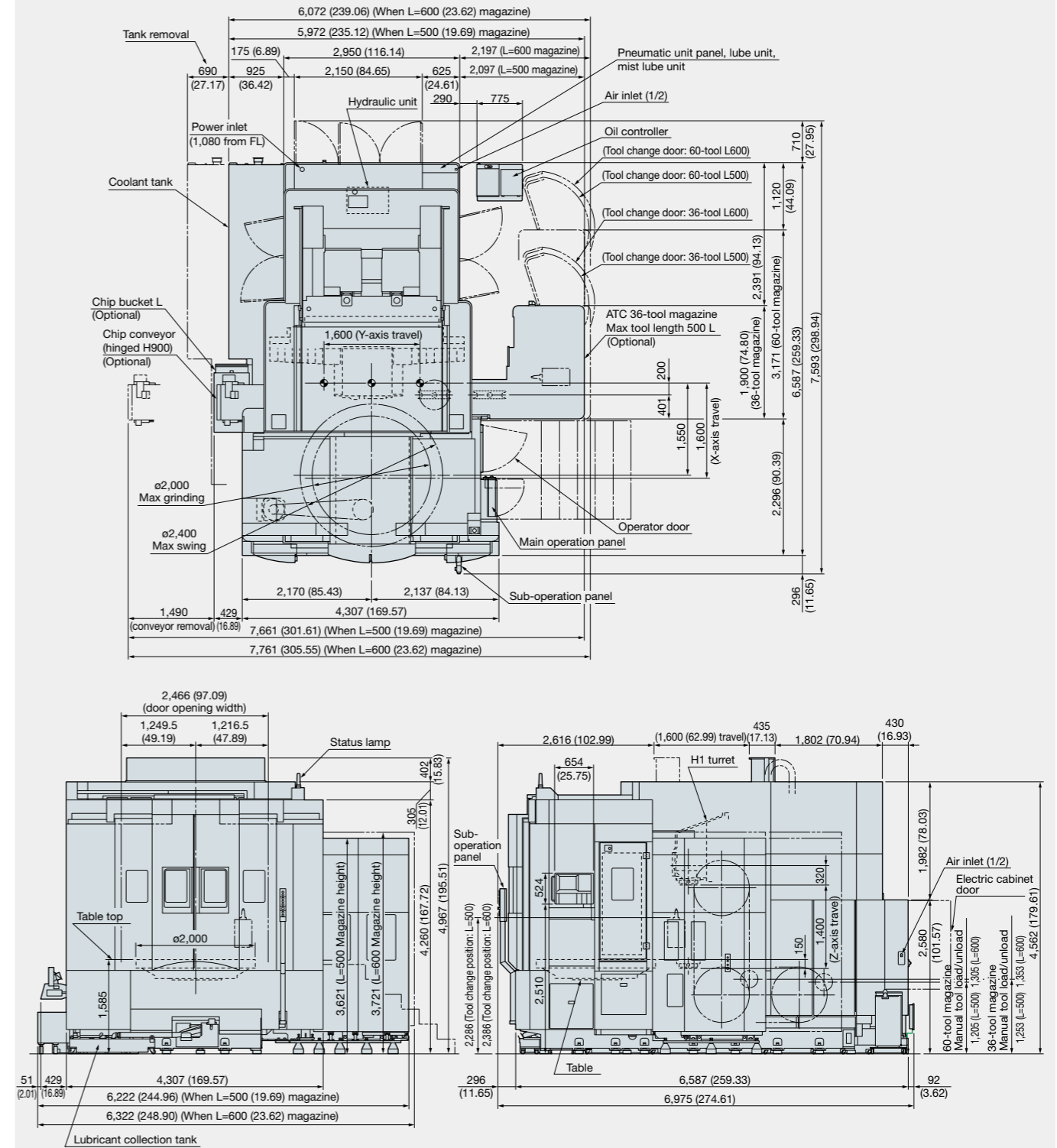
Note: Machine platform may be necessary depending on the type of conveyor.

**VTM-1200YB**  
Dimensional drawing · Installation drawing



**VTM-2000YB**  
Dimensional drawing · Installation drawing

\*  $\phi 2,000$  table, ATC 36, ATC 60 tool magazine specifications

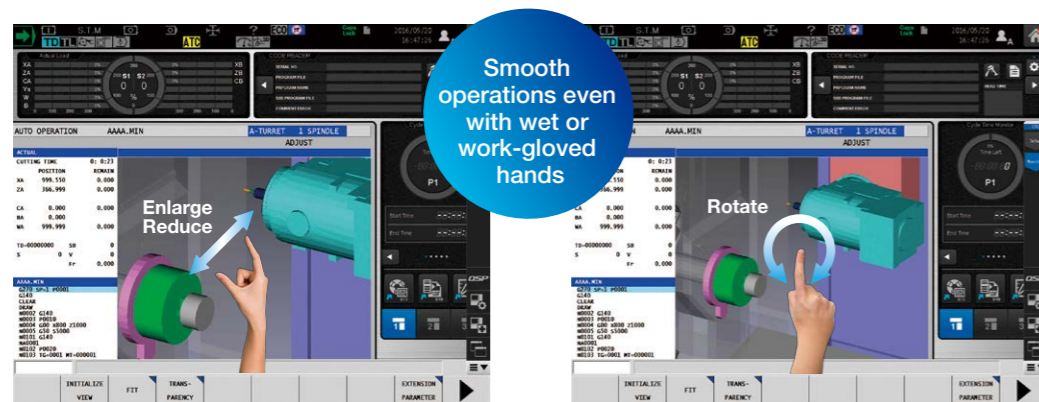


## With revamped operation and responsiveness—ease of use for machine shops first!

Smart factories implement advanced digitization and networking (IoT) in "Monozukuri," (manufacturing) achieving enhanced productivity and added value. The OSP has evolved tremendously as CNC control suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed. The OSP Suite also features a full range of useful apps that could only come from a machine-tool manufacturer, making smart manufacturing a reality.

## Smooth, comfortable operation with the feeling of using a smart phone

Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Moving, enlarging, reducing, and rotating 3D models, as well as list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smart phone.



## Features you wanted – loaded with new OSP suite apps!

We made these real through the addition of Okuma's machining expertise based on requests we heard from customers in the machine shop. These are filled with intelligence that enhances the "strength in the field" that CNC control can accomplish because it's created by a machine-tool manufacturer.

### Increased productivity through visualization of motor power reserve Spindle Output Monitor

The specified spindle output (red line: short time rating, green line: continuous rating) and the spindle output in current cutting (blue circle) are simultaneously displayed on the screen, for real-time view of power reserve during cutting. This allows speeding up cutting by increasing the spindle speed or feed rate while monitoring the graph to ensure that the blue circle does not cross the lines.



### Easy programing without keying in code Scheduled Program Editor

### Monitoring utilization status even when away from the machine E-mail Notification

## Maximizing machine tool performance



### Cutting condition search function: Machining Navi (Optional) With optimal cutting conditions: longer tool life, shorter cycle time

Machining Navi, with clear visuals of complex cutting conditions, is a breakthrough tool that enables the machine operator to navigate the machine and tool capabilities to their best performance levels.

#### For turning

### Chatter-free applications for lathes "Machining Navi" L-g (guidance)

Chatter in a lathe can be suppressed by changing spindle speeds to the ideal amplitude and wave cycle.

### Threading chatter can be easily controlled by anyone Machining Navi T-g (threading)

In the threading cycle, chatter during threading is controlled through appropriate change of the spindle speed in each pass.

### High accuracy gear cutting with a multitasking machine Gear Machining Package (Optional)

Gear cutting that previously required complex programming can now be done with ease. With easy programming, simply input the tool type, gear data, and cutting conditions to achieve highly accurate machining, reducing programming time to about one-tenth that of manual input. Process-intensive machining is achieved, including the gear cutting that used to be done on expensive special-purpose machines.



Skiving (OD/ID splines)



Input screen

#### For milling

### Adjust cutting conditions while monitoring the data "Machining Navi" M-g II + (Optimum spindle speed/harmonic spindle speed control)

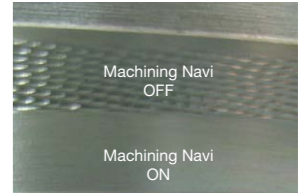
From chatter noise picked up by the microphone, Machining Navi will display the best options for chatter-free spindle speed. The operator can select a recommended speed and immediately confirm the result.

### Simple, auto-mode—leave it to the machine Finding optimum cutting conditions quickly Machining Navi M-i (intelligently optimized spindle speed control)

Chatter vibration is measured by built-in sensors, and spindle speed is automatically changed to the optimum speed. In addition, advanced graphics of the optimal cutting conditions represent effective alternatives to suppress various chatter characteristics throughout the low to high speed zones.

### 3D measuring for multitasking machines NC Gage (Optional)

Twenty types of geometrical accuracy, such as hole position and flatness, can be measured on the machine, greatly reducing lead time. A program to measure the positional relationship between geometric tolerance and workpiece shape is automatically produced by teaching. Data storage of the measurement results is possible.



## Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 2-axis, Multitasking: X, Y, Z, C simultaneous 4-axis
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Min / Max inputs	8-digit decimal, ±99999.999 -0.001 mm, 0.001" Decimals as: 1 µm, 10 µm, 1 mm (1", 0.01", 0.001")
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands (S5) override 50-200% Constant cutting speed, max turning speed designate, Spindle orientation (electric)
	Tool commands	2-digit tool no. + 4-digit tool no. (max tool registration: 1000 sets)
	Tool compensation	Tool offset, Tool wear compensation, Nose R comp: 20 sets per tool
	Display	15-inch color display operational panel, multi touch panel operations
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
	Program capacity	Program storage: 2 GB, operation buffer: 2 MB
Operations	suite apps	Applications to graphically visualize and digitize information needed on the shop floor
	suite operation	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	"Single-mode operation" for a series of operations from a single screen. Easy-to-use operation panel supports complete machine control.
	Collision Avoidance System	Prevents interference during manual, automatic operation Easy modeling of shape data (there are limits in interference prevention unit, unit movement)
	Programming	Program management, edit, multitasking, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, slope machining, M-spindle synchronized tapping, fixed drilling cycles, arithmetic operations, logic operations, math functions, variables, branch statements, auto programming (LAP4), programming help, slope machining
	Machine operations	MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operations help, alarm help, sequence return, manual interrupt & auto return, threading slide hold, data I/O
High speed/accuracy	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
	Com / Net	USB ports, Ethernet
	TAS-C	Thermo Active Stabilizer-Construction. Corrects thermal deformation error generated during shop temperature changes affecting machine construction
Energy-saving	TAS-S	Milling tool Thermo Active Stabilizer-Spindle. Corrects thermal deformation error during spindle rotation of the milling tool spindle
	ECO suite	Hi-G control, B-axis rotation compensation, X, Y, Z, B, C axis pitch error compensation, 0.1 µm control

## Optional Specifications

Optional specs	NML		3D		AOT-M	
	E	D	E	D	E	D
<b>New operation functions</b>						
Advanced L One-Touch IGF (Multitasking)					●	●
<b>Programming</b>						
Coordinate system selection	10 sets	●	●	●	●	●
	50 sets					
	100 sets					
Circular threading		●	●	●	●	●
Program notes (MSG)		●	●	●	●	●
User task 2 Input/output variables 8 each						
Y axis center height correction						
Common variables: 1000 (Std: 200)						
Thread matching (spindle orientation required)						
Threading slide hold (G34, G35)						
Variable spindle speed threading (VSST)						
Inverse time feed						
Manual cutting feed						
Spindle dead-slow cut						
Maximum M tool spindle speed limit for each tool						
Helical cutting						
Coordinate change	●	●	●	●	●	●
Profile generation	●	●	●	●	●	●
Coordinate calculate (NCYL commands)	●	●	●	●	●	●
Moving, rotating and copying coordinates	●	●	●	●	●	●
3D coordinate convert						
<b>Monitoring</b>						
One-Touch Spreadsheet						
Real 3-D simulation*2			●	●	●	●
Cycle time over check	●	●	●	●	●	●
Load monitor (spindle, feed axis)			●	●	●	●
Load monitor no-load detection (load monitor ordered)						
Tool life management		●		●		●
Tool life alert						
Operation end buzzer (electric)						
Hour meters	Power ON					
	Spindle run-time					
	NC operating					
NC operation monitor (counter, totaling)		●	●	●	●	●
Status indicator (triple lamp) Type C		●	●	●	●	●
<b>Measuring</b>						
Z-axis automatic zero offset by touch sensor						
C-axis automatic zero offset by touch sensor						
Gauging data printout, file output						
Y-axis gauging						
NC Gage						

Optional specs	NML		3D		AOT-M	
	E	D	E	D	E	D
<b>External I/O, communication functions</b>						
Additional RS-232-C channel						
Additional USB	2 additional ports possible					
DNC link	DNC-T3					
	DNC-C / Ethernet*2					
	DNC-DT					
	FL-net*2					
<b>Automation / untended operation</b>						
Harmonic spindle speed control (HSSC)	●	●	●	●	●	●
Power shutoff, M02, Alarm						
Warm-up function (by calendar timer)						
Tool shelter cycle						
External program selection	Button, rotary switch, digital switch, BCD (2-digit, 4-digit)					
Cycle time reduction* (ignores certain commands)	●	●	●	●	●	●
<b>High-speed / high-accuracy functions</b>						
Simultaneous 5-axis kit	Super-NURBS 5-axis specifications					
	Tool center point control II (TCP-II) (including tool tilt compensation)					
	Inverse time feed					
	DNC-DT					
	Tool tilt comand					
	Helical cutting					
	3-D coordinate change					
AbsoScale (X-Y-Z axes)						
5-Axis Auto Tuning System	Standard, high spec					
Super-NURBS*2						
Hi-Cut Pro		●	●	●	●	●
Tool center point control II (TCP-II)						
Tool tilt comand						
<b>ECO suite (energy saving functions)</b>						
ECO Operation						
<b>Other functions</b>						
Machining Navi L-g, M-gII+, M-i, T-g (threading)						
Mobile pulse handle (required)						
Spindle power peak cutting function						
Circuit breaker						
External M signals [(2, 4, 8 sets ( ))]						
Edit interlock						
Multi-insert tool function						
OSP-VPS (virus protection system)						
19-inch operation panel with adjustable angle						

Note: NML: Normal, 3D: Real 3D simulation, E: Economy, D: Deluxe  
 \*1. Collision Avoidance System and Super-NURBS cannot function simultaneously.  
 \*2. Technical consultations required.

## Basic Control Functions

Item	Specifications	Item	Specifications
Controlled axes	5: X, Y, Z, B, C, (3 simultaneously excluding B-axis)	Least input increment	X-, Y-, Z-axes all 0.001 mm (X-axis is diameter command)
Interpolation	Positioning, linear, taper, circular, threading	Max program dimension	8-digit (decimal point input allowed)
Command system	Absolute / incremental		

## Standard Specifications

Item	Specifications
Program protection key switch	
Program input	MDI key input
	ISO/EIA input
	RS-232-C input/output interface
Display	LCD Display 10.4" color
	Language: English
	Graphics function, dynamic graphics display
Work spindle control	S4-digit direct command
	Constant surface speed control
	Spindle override, 50 to 150% (10% each)
Zero return	Spindle orientation (1 point)
	Manual and auto zero return
Tool functions	Auto second zero return (ATC)
	Tool selection A code (fixed address)
	Tool offset 6 digits, T code, 999 pairs
	Tool geometry/wear compensation
	Incremental offset
	Tool offset value counter input
Feed functions	Direct input of tool offset value measured A
	Threading range, lead command, 0.001-500.0 mm/rev
	Feedrate override 0 to 200% (10% each)
Automatic operations	Rapid traverse override: 0, 10, 25, 50, 100%
	Single block
	Feed hold
	Dry run
	Machine lock
Manual operations	Optional stop
	Jog feed
	Spindle: CW, CCW, inching, stop
Programming	Coolant: On, Off, Auto
	Circuit interpolation by R programming
	Tool nose radius compensation
	Dwell
	Canned cycles
	Coordinate system shift

## Optional Specifications

Item	Specifications	
Programming	Canned cycles for multitasking	
	Optional block skip 9 pcs	
	Chamfering/corner R	
	Helical interpolation	
	Part program storage length	320 m (128 KB)
		640 m (256 KB)
		1,280 m (512 KB)
		2,560 m (1 MB)
		5,120 m (2 MB)
	No. of registerable programs	10,240 m (4 MB)
20,480 m (8 MB)		
125		
250		
500		
	1,000	
	2,000	
	4,000	

Item	Specifications
Programming	Auto coordinate system setting
	Optional block skip
	Canned cycles for drilling
	Part program storage length 160 m (64 KB)
	No. of registerable programs: 63
	M code multiple commands (same block max 3 commands)
	Manual guide i
	Work coordinate system (G54~G59)
	Flat surface selection
	Extension program editing
	3-dimensional coordinate conversion
	Input/output interface (RS-232-C)
	Programmable data input
Other functions	Cs contouring control
	Simultaneous control axis expansion
	Polar coordinate interpolation
	Cylindrical interpolation
	Memory pitch error compensation
	Tool life management for multitasking machine
	Background editing
	Sequence No. search
	Program No. search
	Buffer register
Backlash compensation	
Stored stroke check 1	
Y-axis offset	
Run hour and parts count display	
Rigid tapping (M spindle)	
Continuous threading	
Macro executor	
AI contour control I	
Advanced preview control	
Custom macro B	
Thermo growth compensation	

Item	Specifications
Other functions	Mobile pulse handle (0.001, 0.01, 0.1 mm)
	External program number selection
	High speed skip function
	Load detection, abnormal load detection
	Addition of custom macro common variables Total 600
	Program restart
	RS-232-C 1 ch additional
	Spare M codes (4, 8)
	Status lamp
	Electric buzzer
	Circuit breaker
	Auto power shutoff
	3-D tool compensation
	Spindle orientation (4 points)
Status lamp	
Contour control II for VTM-YB	
Inverse time feed	

When using Okuma products, always read the safety precautions mentioned in the instruction manual and attached to the product.

● The specifications, illustrations, and descriptions in this brochure vary in different markets and are subject to change without notice.  
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**OKUMA Corporation**

Oguchi-cho, Niwa-gun,  
Aichi 480-0193, Japan  
TEL: +81-587-95-7825 FAX: +81-587-95-6074

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