OKUMA

OPEN POSSIBILITIES

5-Axis Vertical Multitasking Machines

VTM-1200YB
VTM-2000YB

5-Axis Vertical Multitasking Machines

VTM-1200YB
VTM-2000YB

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi | 5-Axis Auto Tuning System | SERVONAVI

Real process-intensive machining—

a breakthrough for highly accurate 5-axis cutting of large components

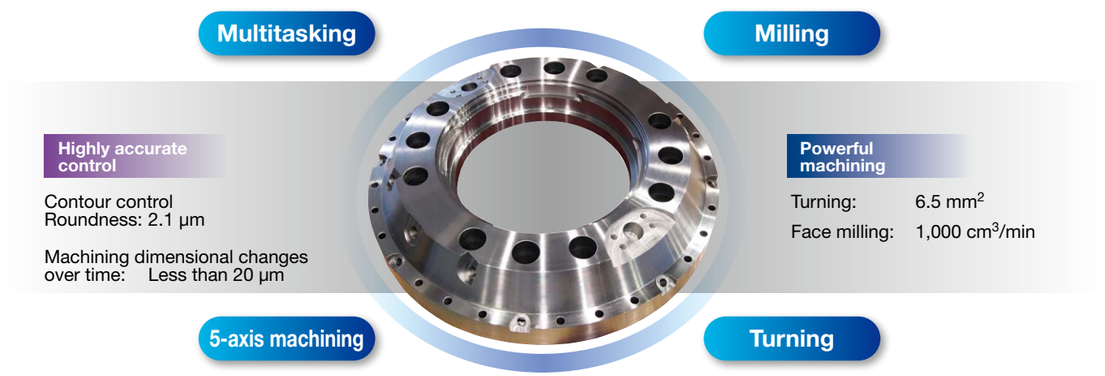
From turning to angled surface machining, our VTMs handle vertical, horizontal, and angular applications efficiently in one operation. With the latest Okuma Intelligent Technologies, these turn/mills are changing the way aerospace, energy, and other industries produce large, complex components.

VTM-1200YB

VTM-2000YB

Photographs used in this brochure may show optional equipment.

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

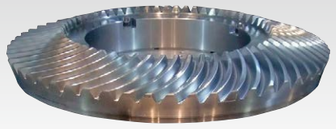


Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, and cutting conditions.

Offering highly efficient applications for large diameters, complex parts, the “new materials,” and the difficult-to cut metals

- Effective use of shop space (No waiting blanks, no workpiece movement between operations, just 1 machine space)
- Shorter cycle times with improved cutting conditions (rigidity improved by optimizing tool length at non-interfering angles)
- 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: NC B-axis control (Optional)



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

Process-intensive machining of large spiral bevel gears

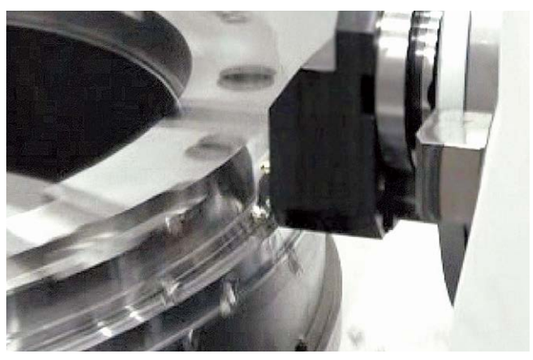
Process-intensive machining on one multitasking machine normally done on three different machines, including expensive special purpose machines, is possible. Not only are equipment costs and installation space greatly reduced; lead times are also a significantly shortened. High-accuracy machining is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

Single pitch deviation: **JIS Class 5 (former JIS grade 1)**
Total cumulative pitch deviation: **JIS Class 2 (former JIS grade 0)**

- Major specs: NC B-axis control
  High-accuracy C-axis
  Super-NURBS (high-speed contouring)

Tooth surface finishing (HRC 60 after quenching)
Cycle time: 17 hr 42 min

With greater machining capacity for lathe and machining center operations, increased power for difficult-to-cut material applications



Turning

6.5 mm² (S45C)

VTM-1200YB

Output:	30/22 kW (30 min/cont)
Spindle torque:	6,093/4,062 N-m (20 min/cont)
Turning diameter:	ø490 mm
Cutting speed:	150 m/min (spindle speed: 97 min⁻¹)
Cutting depth:	10 mm
Feed rate:	0.65 mm/rev

VTM-2000YB

Output:	30/22 kW (30 min/cont)
Spindle torque:	8,415/5,610 N-m (20 min/cont)
Turning diameter:	ø650 mm
Cutting speed:	150 m/min (spindle speed: 73 min⁻¹)
Cutting depth:	8 mm
Feed rate:	0.82 mm/rev

Milling

1,000 cm³/min (S45C)

VTM-1200YB / VTM-2000YB

Output:	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 cm³/min (S45C)

Tool:	ø100 mm face mill (10-flute)
Cutting speed:	300 m/min (tool spindle speed: 955 min⁻¹)
Cutting depth × width:	5 × 70 mm
Feed rate:	3 mm/rev (2,865 mm/min)

End milling
Stock removal: 645 cm³/min (S45C)

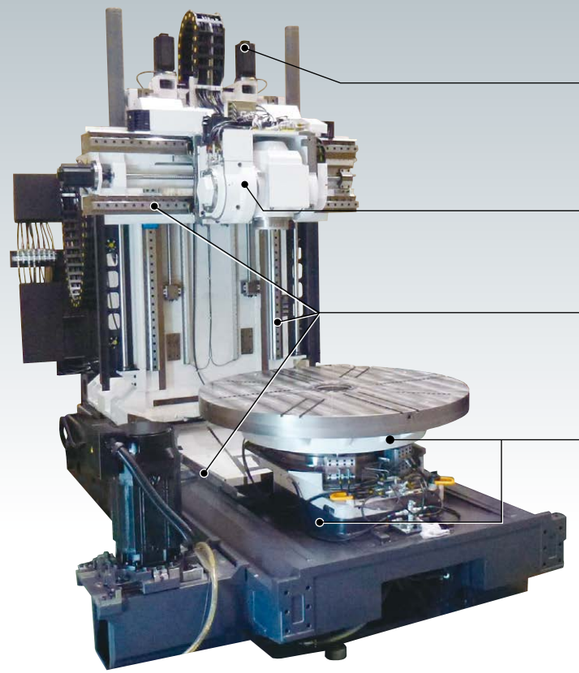
Tool:	ø50 mm 2-flute carbide end mill
Cutting speed:	180 m/min (tool spindle speed: 1,146 min⁻¹)
Cutting depth × width:	50 × 25 mm
Feed rate:	0.45 mm/rev (516 mm/min)

Drilling
Stock removal: 707 cm³/min (S45C)

Tool:	ø63 mm carbide drill
Cutting speed:	180 m/min (tool spindle speed: 909 min⁻¹)
Feed rate:	0.25 mm/rev (227 mm/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.

Superior machine structure delivers higher 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 guides 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 designs provide stable accuracies

Integrated structure column resists twisting and bending

Fixed headstock for higher rigidity

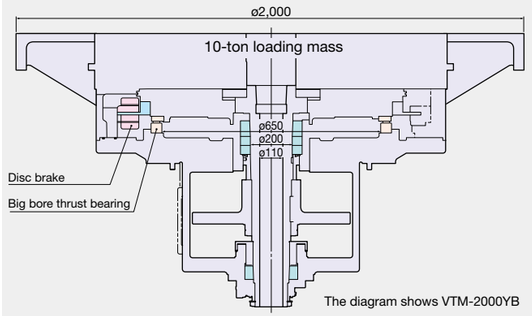
- Spindle design also handles unbalanced workpieces
- Spindle bearing: VTM-1200YB ... ø260 mm
  VTM-2000YB ... ø200 mm + ø650 mm thrust bearing
- Loading mass: VTM-1200YB ... 3,000 kg (chuck included) 5,000 kg (Optional)
  VTM-2000YB ... 10,000 kg

Powerful C-axis clamp for full-capacity milling

A powerful disc brake near the spindle keeps the workpiece firmly mounted during milling

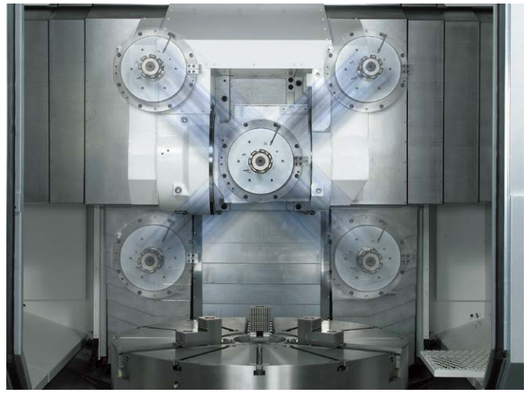
VTM-1200YB
- Clamp torque: 9,000 N-m

VTM-2000YB
- Clamp torque: 13,000 N-m



The diagram shows VTM-2000YB

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˚

Axis drive technologies that provide higher speed and accuracy

Roller linear guides used on X, Y, and Z axes

- Faster feed rates
- Minimal following error
- Improved 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

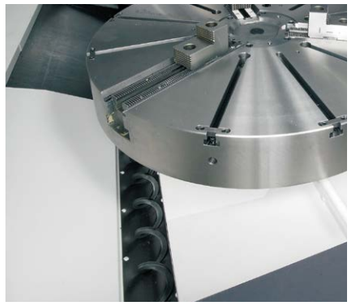
Operator friendly—achieving higher work efficiency

In-machine chutes

- Optimally designed chutes and slope angles
- High-volume chip flusher provides efficient chip flushing

Chip conveyor (Optional)

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



Ceiling and front door

- This full enclosure allows the machine to use high-pressure coolant.
- It also opens directly above the spindle for easy part load/unload access by crane.

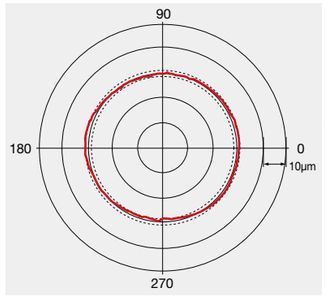
Hydraulic power chuck (VTM-1200YB, Optional)

In-machine grate steps

Stable, high accuracies even for 5-axis machining

Circular cutting (X-Y planes)

Roundness: 2.1 µm (actual data)



VTM-1200YB

Material:	Al
Machining dia:	ø115 mm
Machining width:	25 mm
Tool:	Carbide end mill
	ø13 mm (4-flute)
Cutting:	326 m/min
	(8,000 min^{-1})
Feed rate:	1,000 mm/min
	(0.03125 mm/flute)

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.

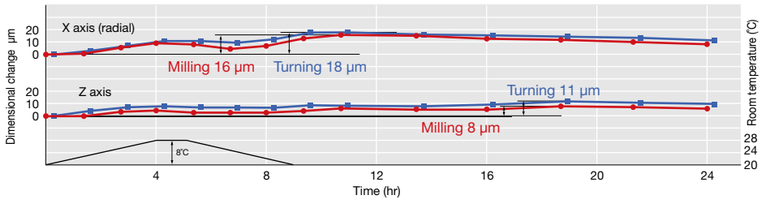
Machining dimensional change over time

Less than 20µm

(Per 8°C room temp change. VTM-1200YB actual data)

Turning + milling | Cold start | Coolant

Dimensional change: 18 µm (X), 11 µm (Z)



TAS-S

[Thermo Active Stabilizer – Spindle (milling tool)]

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^{-1}) :	15 min
Milling (1,200 min^{-1}) :	40 min
Turning (finishing) (130-200 min^{-1}) :	15 min
Stationary :	10 min

Gauging and compensatiom 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)
Travels	X axis	mm (in)	1,270 (50)	1,600 (62.99)
	Y axis	mm (in)	1,000 (-500 to +500) [1,240 (-620 to +620)] (39.37 (-19.69 to +19.69) [-24.4 to +24.41])	1,600 (-800 to +800) (62.99 (-31.50 to +31.50))
	Z axis	mm (in)	1,080 [1,530] (42.52 [60.24])	1,400 (55.12)
	C axis	deg	360 (minimum control angle 0.001)	
	B axis	deg	150 (-30 to +120) (minimum control angle 0.001)	
Turning Spindle	Speed	min^{-1}	5 to 500 [4 to 400]	4 to 300 [4 to 200]
	Speed ranges		2 auto ranges	
	Max torque	N-m	6,093/4,062 (20 min/cont)	8,415/5,610 (20 min/cont)
	Nose type	mm (in)	ø380 (14.96) flat	ø1,400 [2,000] (55.12 [78.74]) table
	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)	
	Tool boring bar shank diameter	mm (in)	□25 (1), □32 (1-1/4)/ø40 (1-1/2), ø50 (2)	
Milling Tool Spindle	Maximum speed	min^{-1}	40 to 10,000	
	Max torque	N-m	505/300/205 (3 min/30 min/cont)	
	Spindle diameter	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 [23.62])*3	500 [600] (19.69 [23.62])
	Max tool mass	kg (lb)	30 [40] (66 [88])*3	30 [40] (66 [88])
Feed Axes	Rapid traverse	m/min (fpm)	X/Y/Z: 32 (105)	
		min^{-1}	B: 19.5, C: 20	
Motors	Turning spindle	kW (hp)	30/22 (40/30) (30 min/cont)	
	Milling tool spindle	kW (hp)	37/30/22 (50/40/30) (3 min/30 min/cont)	
	Axis drive	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) ×2, Y: 4.6 (6.1), Z: 5.2 (6.9)×2
	B-axis drive	kW (hp)	OSP: 4.6 (6.1), FANUC: 5.5 (7.5)	
Machine Size	Required floor space (L × W)	mm (in)	4,273 (168.23) [4,990 (196.46)]	4,967 (195.55)
	Height	mm (in)	5,512 × 5,471 (217.01 × 215.39)	5,970 × 6,973 (235.04 × 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. 120 tool magazine (matrix), max tool: 600 mm × 40 kg
*2. 120 tool magazine
*3. Max tool: 600 mm × 40 kg; machine with high column
*4. Machine only (w/o ATC magazine mass)

[ ] : Options

Standard Specifications

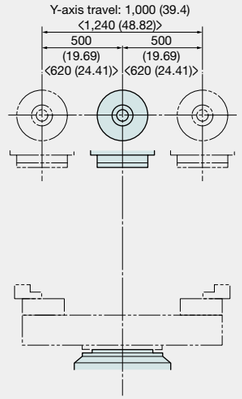
Turning spindle	VTM-1200YB	Automatic tool changer	36-tool magazine, fixed address type
	ø380 flat	Took shank shape	MAS BT50 BIG-PLUS®
	500 min^{-1} 30/22 kW (30 min/cont)	In-machine work lamp	
	VTM-2000YB	Highly accurate C axis	Optional for VTM-1200YB
	Table for ø1400 boring mill jaw (4T)	CNC	OSP-P300SA/FANUC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

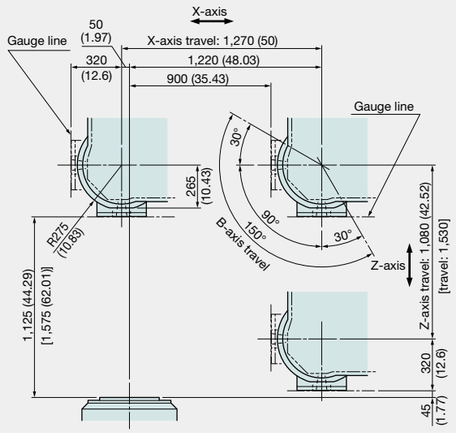
Pull studs for thru-spindle applications

Working Ranges

Unit: mm (in)

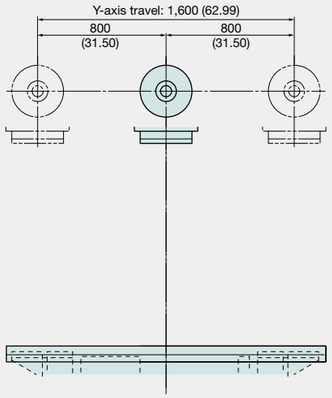
VTM-1200YB BT50 turret





The dimensions in angle brackets are Y-axis wide travel specifications; the dimensions in square brackets are high column specifications

VTM-2000YB BT50 turret



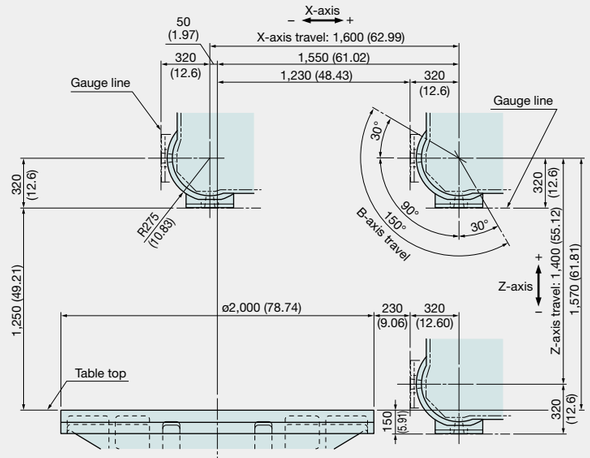
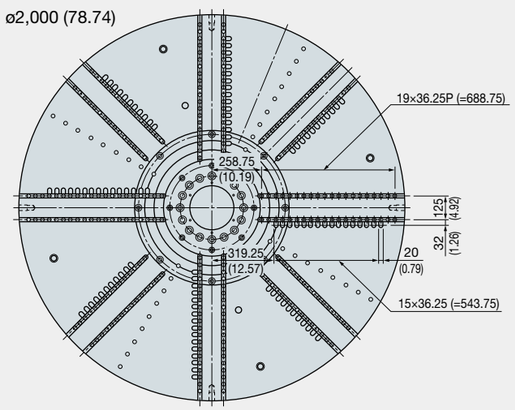


Table Dimensions

Unit: mm (in)

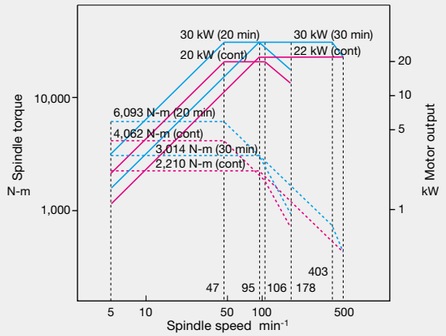
VTM-2000YB



Turning spindle output/torque diagram

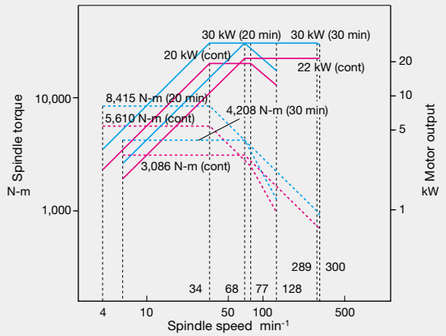
VTM-1200YB (OSP)

- Turning spindle: 500 min^{-1}
- Max output: 30/22 kW (30 min/cont)
- Max torque: 6,093/4,062 N-m (20 min/cont)



VTM-2000YB (OSP)

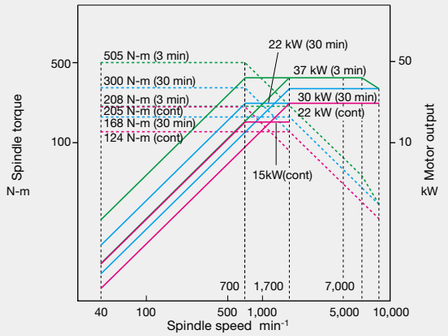
- Turning spindle: 300 min^{-1}
- Max output: 30/22 kW (30 min/cont)
- Max torque: 8,415/5,610 N-m (20 min/cont)



Milling tool spindle output/torque diagram

VTM-1200YB/VTM-2000YB (OSP)

- Milling tool spindle: 10,000 min^{-1}
- Max output: 37/30/22 kW (3 min/30 min/cont)
- Max torque: 505/300/205 N-m (3 min/30 min/cont)



ATC Tool Dimensions

Unit: mm

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

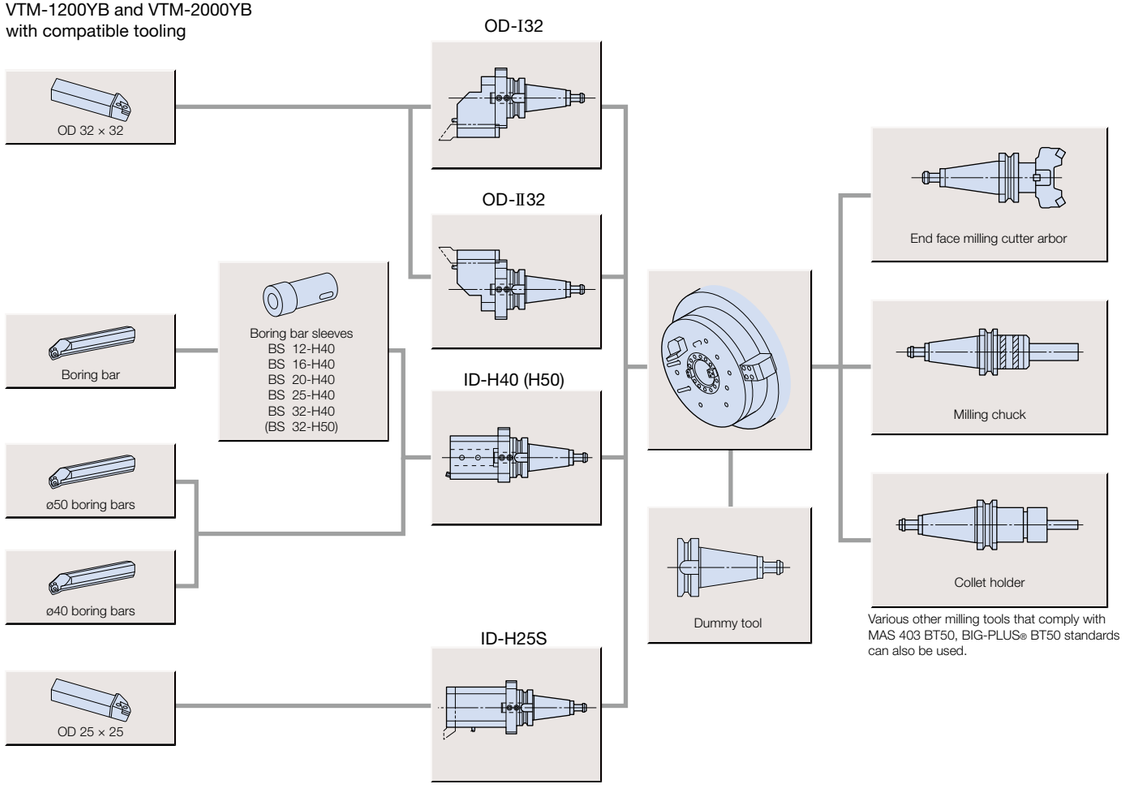
Maximum non-adjacent tool size
Maximum tool size that can be used when there are no adjacent tools on either side in the ATC magazine

Note: With 120 tool magazine (matrix)

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.

Tooling System (MAS BT50)

VTM-1200YB and VTM-2000YB
with compatible tooling



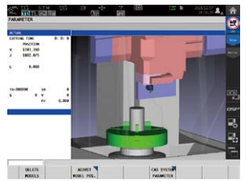
Various other milling tools that comply with MAS 403 BT50, BIG-PLUS® BT50 standards can also be used.

Collision prevention

Collision Avoidance System (Optional)

World's first "collision-free machine"

CAS prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.



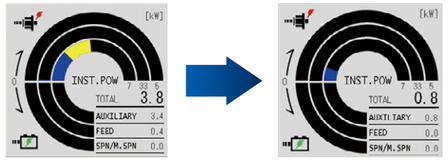
Virtual machine (collision check)

Next-Generation Energy-Saving System

ECO suite

- **ECO Idling Stop** for operation of necessary units only
- **ECO Power Monitor** for visual graphics of power consumption
- Intermittent/continuous operation of chip conveyor and mist collector during operation — **ECO Operation** (Optional)

- Example of a Power Monitor check



Before ECO Idling Stop

After ECO Idlling Stop

[data visualization examples]

Optional Specifications & Accessories

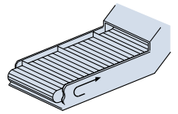
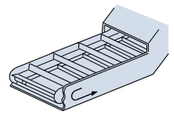
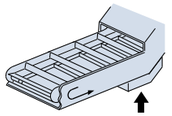
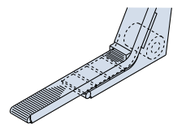
Auto pallet changer	Shuttle-type 2-pallet APC with setup station
High power spindle	VTM-1200YB Loading mass: 5,000 kg (with chuck) Spindle speed: 400 min^{-1}
ø2,000 boring mill jaw table	VTM-2000YB Spindle speed: 200 min^{-1} Boring mill jaws
NC B-axis control	
Wide Y-axis travel specs	VTM-1200YB Y-axis travel: 1,240 mm (–620 to +620)
High column specs	VTM-1200YB Z-axis travel: 1,530 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
In-machine chip discharge	Coil conveyor
Chip bucket	
Front door auto open-close	Required
Oil skimmer	
Coolant gun	
Coolant level detection	Lower limit detection
Air gun	
Turret air blower (blast)	
Mist collector	
In-process work gauging	Radio
Touch Setter A	
AbsoScale	OSP
Scale feedback	FANUC
Highly accurate C-axis control	Standard for VTM-2000YB
Automatic power shutoff	
Circuit breaker	
Hour meters	
Electric buzzer	

60-tool magazine

Chip conveyor

Various chip conveyors

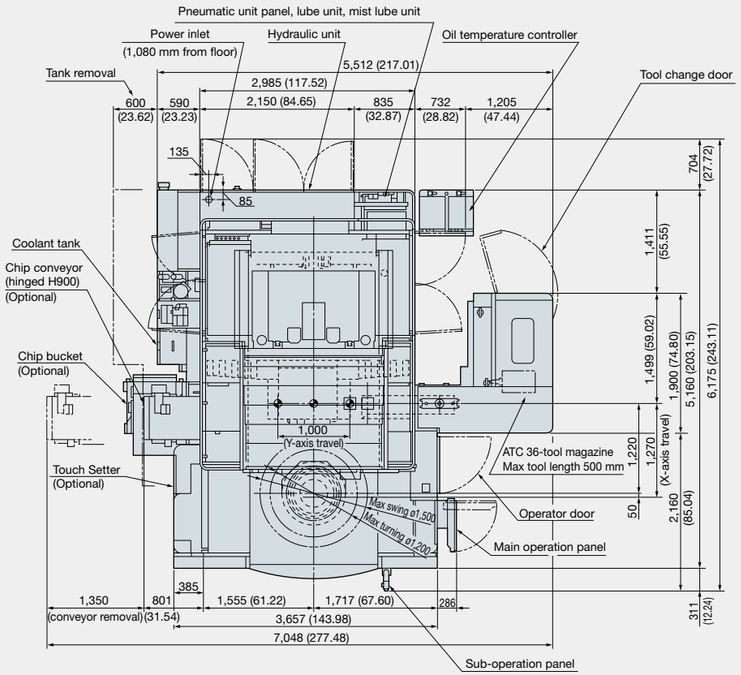
Chip conveyor types and applications

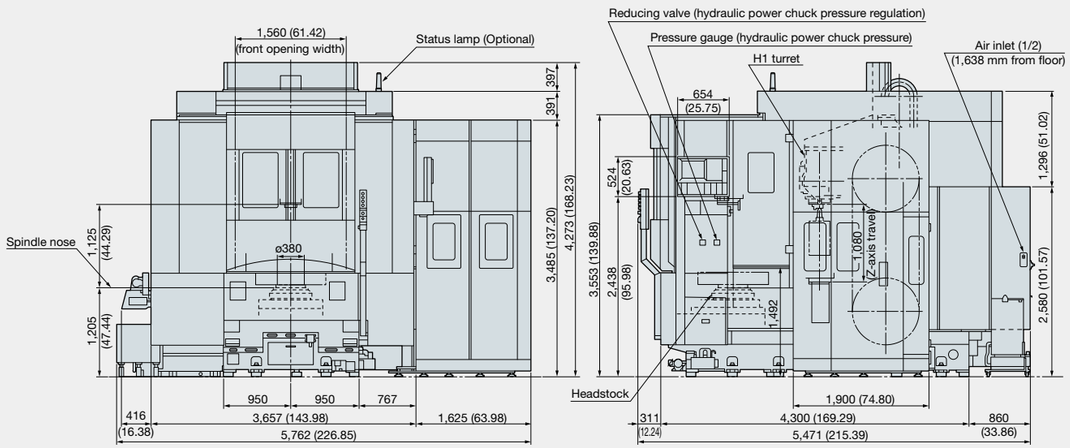
Type	Hinge	Scraper	Magnetic scraper	Hinge + scraper (drum filter)
Application	● For steel	● For cast iron	● For cast iron	● For steel, cast iron nonferrous metal
Features	● General use	● Magnet scraper for sludge processing ● Easy for maintenance ● Blade scraper	● Suitable with sludge ● Not suitable 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

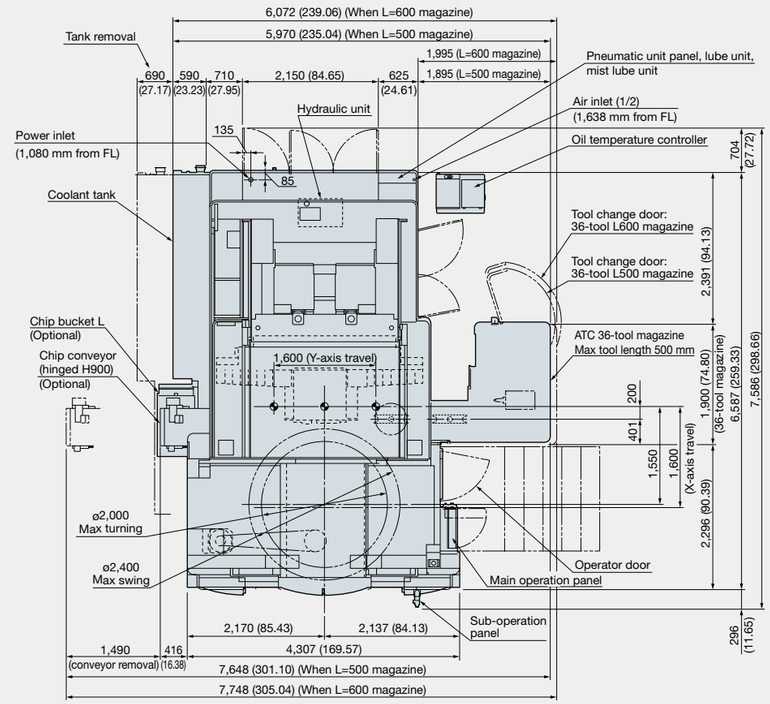
Unit: mm (in)

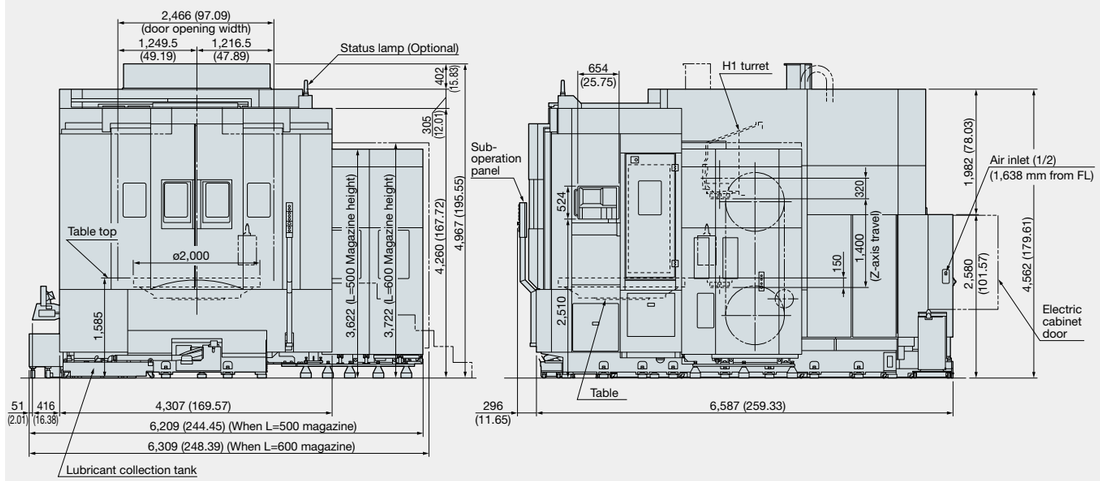




VTM-2000YB
Dimensional Drawing / Installation Drawing

Unit: mm (in)





The Next-Generation Intelligent CNC

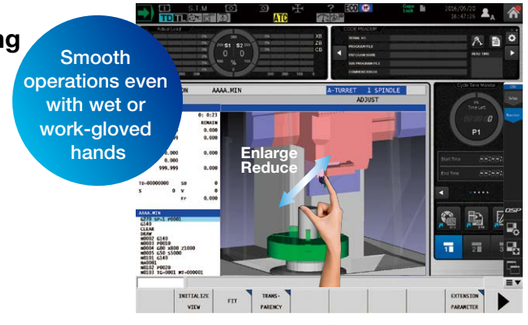
OSP suite OSP-P300SA

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

Smart factories are using advanced digitization and networking (IIoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC 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. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.



Note: 19-in. operation panel (Optional) screen shots.
Collision Avoidance System (Optional) shown above.

"Just what we wanted."— Refreshed OSP suite apps

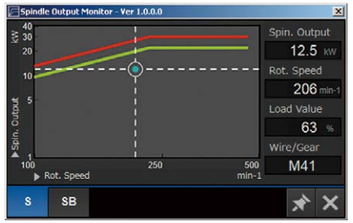
This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brain power packed into the CNC, built by a machine tool manufacturer, will "empower shop floor" management.

S11

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.



S10

Easy programing without keying in code

Scheduled Program Editor

S15

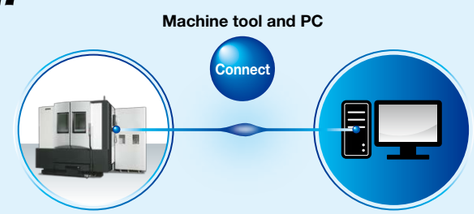
Monitoring utilization status even when away from the machine

E-mail Notification

Get Connected, Get Started, and Get Innovative with Okuma "*Monozukuri*" ***Connect Plan***

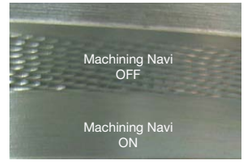
Connect, Visualize, Improve

Okuma's Connect Plan is a system that provides analytics for improved utilization by connecting machine tools and visual control of factory operation results and machining records. Simply connect the OSP and a PC and install Connect Plan on the PC to see the machine operation status from the shop floor, from an office, from anywhere. The Connect Plan is an ideal solution for customers trying to raise their machine utilization.



Maximizing machine tool performance

Machining Navi (Optional) Cutting condition search 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.

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.

High accuracy gear cutting with a multitasking machine

Gear Machining Package (Optional)

Process-intensive machining is achieved, including the gear cutting that used to be done on expensive special-purpose machines. Gear cutting that previously required complex programming can now also 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.

Skiving
(OD/ID splines)

Machining operation select

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.

OSP-P300SA

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 command	±99999.999 mm, ±99999.999° 8-digit decimal, command unit: 0.001 mm, 0.01 mm, 1 mm, 0.001°, 0.01°, 1°
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands override 50~200%　Constant cutting speed, optimum turning speed designate, oriented spindle stop (electric)
	Tool commands	2-digit tool no. + 4-digit tool no. (max tool registration: 1000 sets)
	Tool compensation	Tool offset, 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: 4 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)
	Programing	Program management, edit, 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, pulse handle), load meter, operations help, alarm help, sequence return, manual interrupt & auto return, threading slide hold, data I/O
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
	Com / Net	USB ports, Ethernet
High speed/ accuracy	Thermo Active Stabilizer–Construction	Corrects thermal deformation error generated during shop temperature changes affecting machine construction (TAS-C)
	TAS-S	Milling tool Thermo Active Stabilizer–Spindle. Corrects thermal deformation error during spindle rotation of the milling tool spindle
	High speed/accuracy	Hi-G control, B-axis rotation compensation, X-Y-Z-B-C axis pitch error compensation, 0.1 µm control
Energy-saving	ECO suite	ECO Idling Stop, ECO Power Monitor

Optional Specifications

Item		Kit specs*1	NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
New operation functions								
Advanced L One-Touch IGF (Multitasking)							●	●
Programming								
Coordinate system selection	10 sets		●	●	●	●	●	●
	50 sets							
	100 sets							
Operation buffer (10 MB)								
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								
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			●	●	●	●	●	●
3-dimensional coordinate conversion								
Monitoring								
One-Touch Spreadsheet								
Real 3D 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			●	●	●	●	●	●
Measuring								
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								

Item		Kit specs*1	NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
External I/O, communication functions								
RS-232C connector								
Additional USB	2 additional ports possible							
DNC link	DNC–T3							
	DNC–C / Ethernet*2							
	DNC–DT							
Automation / untended operation								
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*2 (ignores certain commands)			●	●	●	●	●	●
High-speed / high-accuracy functions								
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							
	3D coordinate change							
AbsoScale (X-Y-Z axes)								
5-Axis Auto Tuning System	Standard, high spec							
Hi-Cut Pro			●	●	●	●	●	●
ECO suite (energy saving functions)								
ECO Operation								
Spindle power peak cutting function								
Other functions								
Machining Navi L-*g*, M-*g*Ⅱ+, M-*i*, T-*g* (threading)								
Machine Data Logger								
Feed shaft retract								
Turning spindle speed setting								
Profile helical cutting								
Hobbing								
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								

*1. NML: Normal, 3D: Real 3D simulation, AOT-M: Advanced L One-Touch IGF (Multitasking), E: Economy, D: Deluxe
*2. Technical consultations required.

FANUC 31i-B

Controller Specifications

Item	Specifications	Item	Specifications
Controlled axes	5: X, Y, Z, B, C, (4 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
Display	Operating panel 10.4 in color TFT
	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)
	Oriented spindle stop (1 point)
Zero return	Manual and auto zero return
	Auto second zero return (ATC)
Tool functions	Tool selection A code (fixed address)
	Tool offset 6 digits, T code, 999 pairs
	Tool geometry/wear compensation
	Incremental offset
Feed functions	Threading range, lead command, 0.001 to 500.0 mm/rev
	Feedrate override 0 to 200% (10% each)
	Rapid traverse override: 0, 10, 25, 50, 100%
Automatic operations	Single block
	Feed hold
	Dry run
	Machine lock
	Optional stop
Manual operations	Jog feed
	Spindle: CW, CCW, inching, stop
	Coolant: On, Off, Auto

Item	Specifications
Programming	Tool nose radius compensation
	Fixed drilling cycle
	Part program storage length 64 KB (160 m)
	No. of registerable programs: 63
	Manual guide i
	Work coordinate system (G54 to G59)
	Flat surface selection
	Extension program editing
	3-dimensional coordinate conversion
	Programmable data input
	Cs contouring control
	Simultaneous control axis expansion
	Polar coordinate interpolation
	Cylindrical interpolation
	Pitch error compensation for VTM-YB
	Tool management for multitasking machine
Other functions	Background editing
	Y-axis offset
	Run hour and parts count display
	Rigid tapping (M spindle)
	Continuous threading
	AI contour control I
	Custom macro B
	Thermo growth compensation
	Idling stop

Optional Specifications

Item	Specifications		Item	Specifications
Programming	Combination fixed cycle		Other functions	Mobile pulse handle (0.001, 0.01, 0.1 mm)
	Chamfering/corner R			External program number selection
	Helical interpolation			High speed skip function, Multi-step skip
	Part program storage length	128 KB (320 m)		Abnormal load detection (spindle + feed axes)
		256 KB (640 m)		Addition of custom macro common variables Total 600
		512 KB (1,280 m)		Program restart
		1 MB (2,560 m)		RS-232C connector 1ch, 2ch
		2 MB (5,120 m)		Spare M codes (4, 8)
		4 MB (10,240 m)		Status lamp
		8 MB (20,480 m)		Electric buzzer
	No. of registerable programs	125		Circuit breaker
		250		Auto power shutoff
		500		3D tool compensation
		1,000		Oriented spindle stop (4 points)
		2,000		Inverse time feed
		4,000		USB memory input/output
				Operation history large capacity specs
				Chuck status confirmation release

VTM-1200YB
VTM-2000YB

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.
Pub No. VTM-1200YB/2000YB-E-(4a)-300 (Feb 2020)

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