OKUMA

OPEN POSSIBILITIES

VTM-1200YB
VTM-2000YB

5-Axis Vertical Multitasking Machines

VTM-1200YB
VTM-2000YB

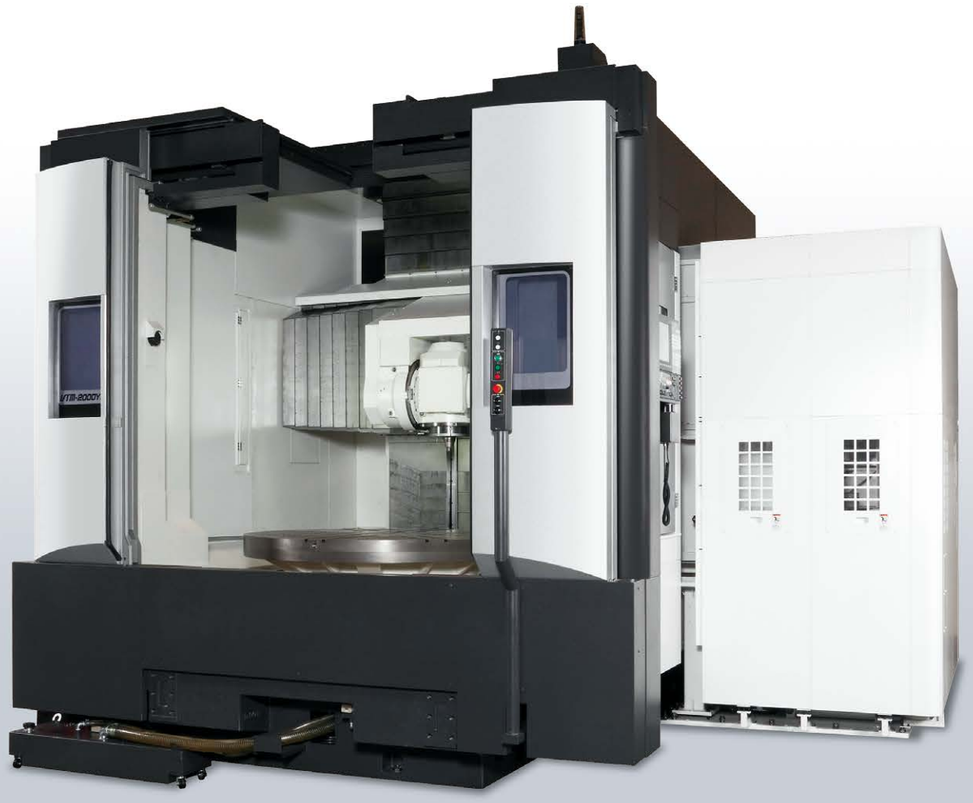
5-Axis Vertical Multitasking Machines

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

Pioneering Process-Integrated Machining — A Breakthrough in High-Accuracy 5-Axis Machining of Large Components

From turning to angled surface machining, our VTMs handle vertical, horizontal, and angular applications efficiently in one operation.
Packed with the cutting-edge technology, these turn/mills support aerospace, energy, and other industries to produce large, complex components.

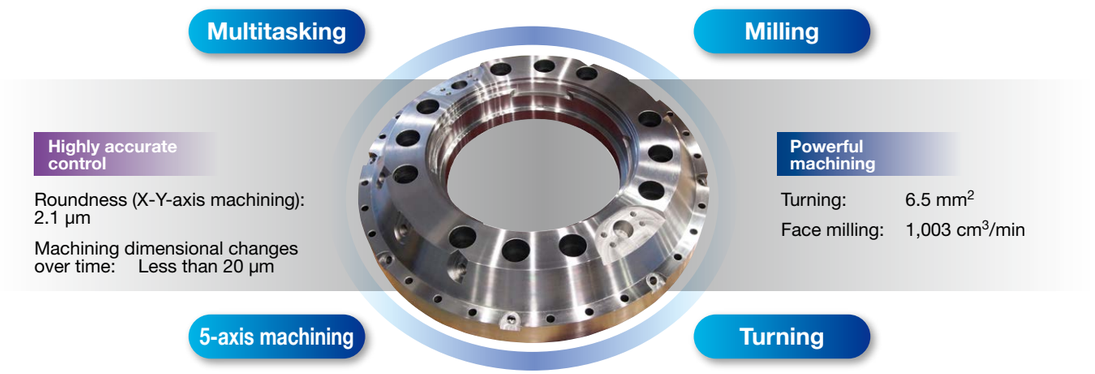
VTM-1200YB



VTM-2000YB

Photographs used in this brochure may include optional equipment.

From powerful multitasking to high-accuracy 5-axis machining in a single machine



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)

5-axis machining: NC B-axis control (option)

Highly accurate bevel gear tooth face machining

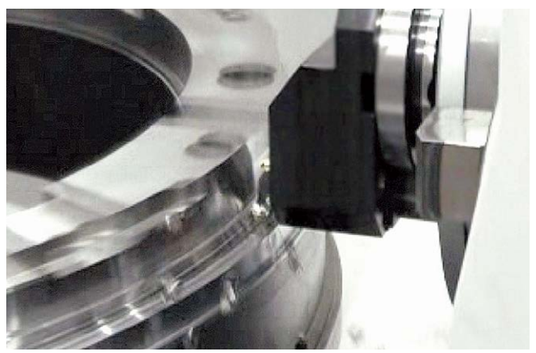
Process-intensive machining of large spiral bevel gears

Process integration of three types of machining operations—including those previously requiring expensive dedicated machines—into a single multitasking machine. Not only are equipment costs and installation space greatly reduced; lead times are also a significantly shortened. High-accuracy machining is achieved with 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)**

- Machining example
  VTM-1200YB (VTM-2000YB not applicable)
  Specs: NC B-axis control, high-accuracy C-axis, Super-NURBS (high speed contouring function)
  Machining operations: One-direction C-axis machining, swarf machining

High machining capacity for difficult-to-cut material applications



Turning

<Actual data>
Cutting area **6.5 mm²** (S45C)

VTM-1200YB (OSP)

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 (OSP)

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

<Actual data>
Cutting volume **1,003 cm³/min** (S45C)

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

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

Face milling
Chip volume: 1,003 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
Chip volume: 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
Chip volume: 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)

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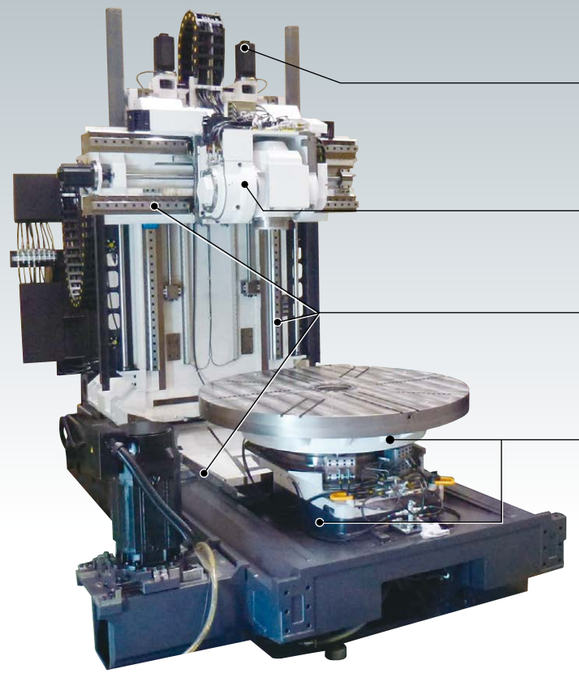
Highly rigid and reliable structure for high-accuracy machining



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-axis roller linear guides used

Stable cutting even with heavy or unbalanced workpieces
Headstock
- Powerful disc brake
- High-accuracy C-axis control*
  Indexing accuracy ±10.8 sec
  (VTM-1200YB, VTM-2000YB)
- C-axis speed hybrid control

Best cooling system
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 /5,000 kg (option)
  * Chuck included

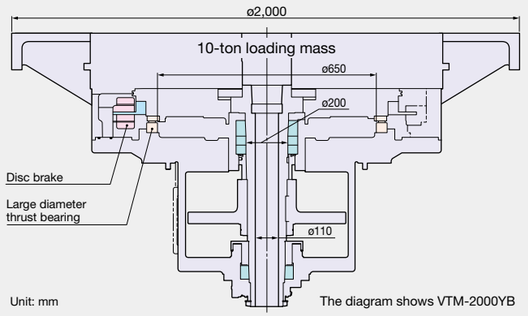
  VTM-2000YB*
  ø1,400 table: 7,600 kg
  ø2,000 table: 6,650 kg (option)
  * Table not included

Powerful C-axis clamp for full-capacity milling

A powerful disc brake near the spindle achieves stable milling

VTM-1200YB
- Clamp torque: 7,000 N-m

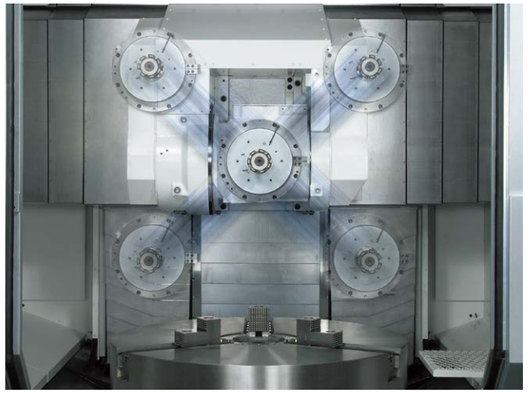
VTM-2000YB
- Clamp torque: 13,000 N-m



Unit: mm

The diagram shows VTM-2000YB

High speed operation



Faster axis feeds: 32 m/min (X-, Y-, Z-axis)

Tool change time reduction (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-, Z-axis

- 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

Coil conveyor (option)

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

Ceiling and front door

- Full separation between machine exterior and the cutting workspace allows the machine to use high-pressure coolant safely.
- It also opens directly above the spindle for easy part load/unload access by crane.

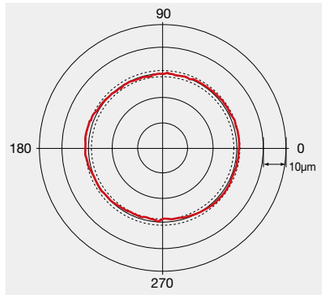
Hydraulic power chuck (VTM-1200YB, option)

In-machine grate steps

Outstanding dimensional stability ensures high-accuracy 5-axis machining and long-term continuous operation.

Circular cutting (X-Y-axis machining)

Roundness: 2.1 µm (VTM-1200YB 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

Option: NC B-axis (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.

Thermo-Friendly Concept

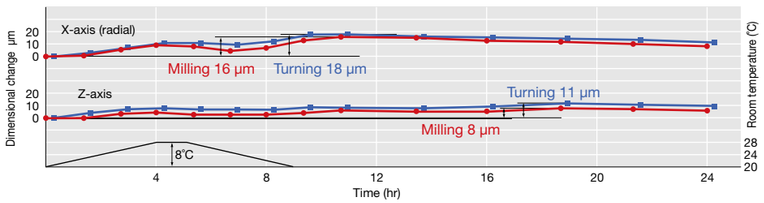
Manageable Deformation—Accurately Controlled

The Thermo-Friendly Concept is an Okuma Intelligent Technology intended to achieve amazing machining accuracy with unique structural design and thermal deformation control technology. It eliminates the need for cumbersome dimensional compensation and warm-up and demonstrates outstanding dimensional stability, even when operation continues over many hours or when the room temperature changes.

Machining dimensional change over time

Less than 20 µm

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



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 to 120 min^{-1}) :	15 min
Milling (1,200 min^{-1}) :	40 min
Turning (finishing) (130 to 200 min^{-1}) :	15 min
Stationary :	10 min

5-Axis Auto Tuning System (option)

Gauging and compensatiom of geometric error

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])	7,600 [6,650] (16,720 [14,630])*1
Travels	X-axis	mm (in)	1,270 (50)	1,600 (62.99)
	Y-axis	mm	1,000 (-500 to +500) [1,240 (-620 to +620)]	1,600 (-800 to +800)
		in	39.37 (-19.69 to +19.69) [48.82 (-24.41 to +24.41)]	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 (2 range motor coil switching)	
	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)	ø200 (7.87)
	Through-hole diameter	mm (in)	ø160 (6.30)	ø110 (4.33)
Milling Tool Spindle	Turret type		H1, ATC	
	Number of tools mounted in turret		1 (L/M)	
	Tool dimension/diameter	mm (in)	□25 (1 × 1), □32 (1-1/4 × 1-1/4)/ø40 (1-1/2 × 1-1/2), ø50 (2 × 2)	
	Max 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)	
Auto tool changer (ATC)	Tool shank/pull stud		MAS BT50 [CAPTO C8, HSK-A100]/MAS2 [–]	
	Max tools (magazine capacity)	tool	36 [60, 120*2]	36 [60, 120]
	Max tool diameter	mm (in)	w/o adjacent tool: ø290 (11.42) [ø250 (9.84)*3], with adjacent tool: ø170 (6.69)	
	Max tool length (from gauge line)	mm (in)	500 [600] (19.69 [23.62])*4	500 [600] (19.69 [23.62])
	Max tool mass	kg (lb)	30 [40] (66 [88])*4	30 [40] (66 [88])
Feed Axes	Rapid traverse	m/min (ipm)	X/Y/Z: 32 (1,260)	
		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 (7.0), 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	Height	mm (in)	4,273 (168.23) [4,990 (196.46)]	4,967 (195.55)
	Required floor space (L × W)	mm (in)	5,512 × 5,471 (217.01 × 215.39)	5,970 × 6,883 (235.04 × 270.98)
	Mass	kg (lb)	28,000 (61,600) [29,500 (64,900)]*5	43,000 (94,600)*5
Controller			OSP-P300SA, FANUC 31i-B	

*1 The maximum spindle load is 10,000 kg (including the table). The ø1,400 table mass 2,400 kg (including clamping jaws), and the ø2,000 table mass 3,350 kg (including clamping jaws).
*2. 120-tool magazine (matrix), max tool: 600 mm × 40 kg
*3. 120-tool magazine
*4. Max tool: 600 mm × 40 kg; machine with high column
*5. Machine only (w/o ATC magazine mass)

[ ] : Option

Standard Specifications

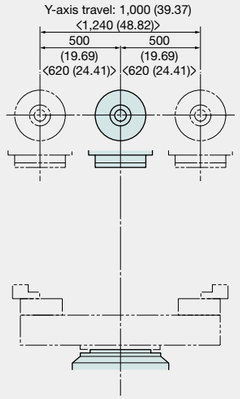
Turning spindle	VTM-1200YB	Automatic tool changer	36-tool magazine, fixed address type
	ø380 flat	Tool shank	MAS BT50 BIG-PLUS®
	500 min^{-1} 30/22 kW (30 min/cont)	In-machine work lamp	
	VTM-2000YB	Highly accurate C-axis	Optional for VTM-1200YB
	Table for ø1,400 boring mill jaw (4T)	CNC	OSP-P300SA/FANUC 31i-B
	300 min^{-1} 30/22 kW (30 min/cont)	Full-enclosure shielding	
Spindle cooler	Oil temperature controller	Door interlock	
Turret	H1, ATC L/M 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		

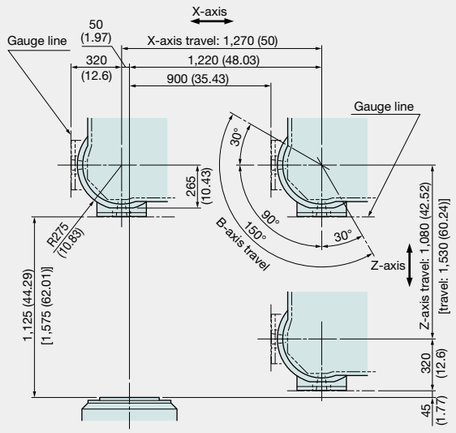
* The pull stud type is for Thru-Spindle Coolant (Okuma only).

Working Ranges

Unit: mm (in)

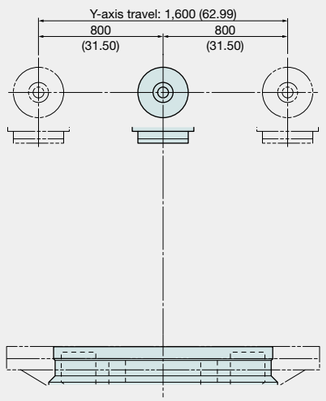
VTM-1200YB BT50 turret





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

VTM-2000YB BT50 turret



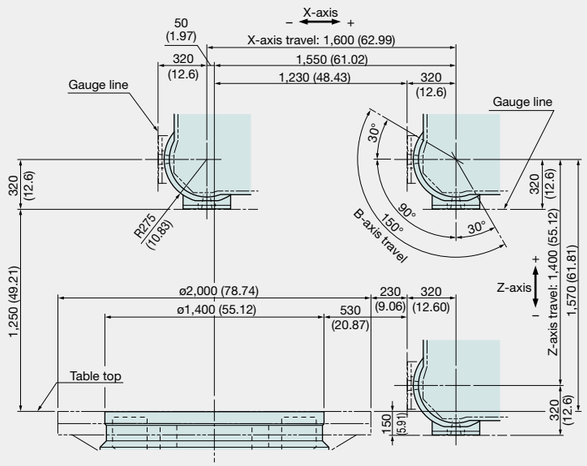
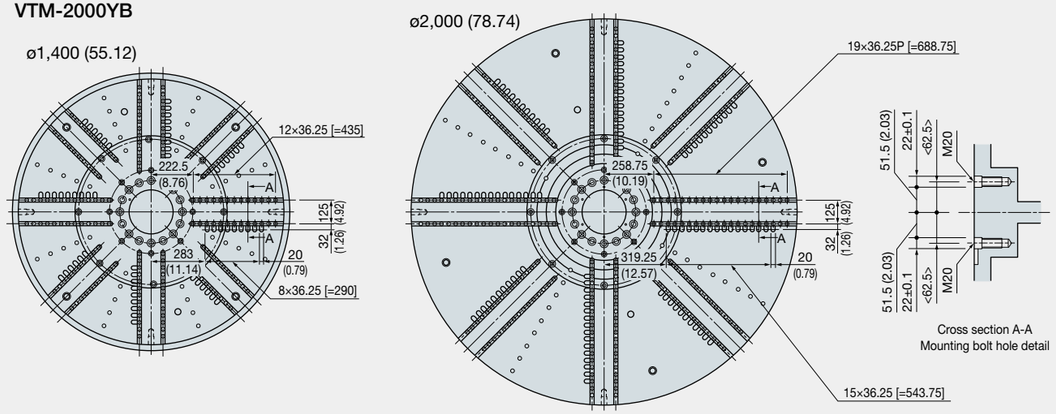


Table Dimensions

Unit: mm (in)

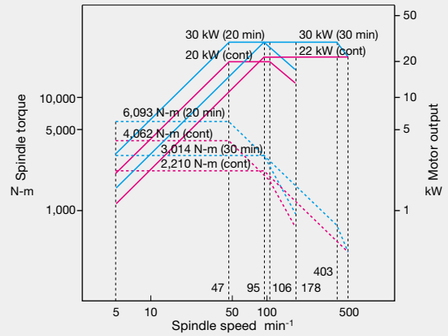
VTM-2000YB



Turning spindle output/torque diagram

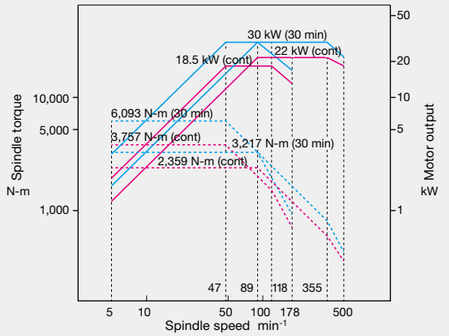
VTM-1200YB (OSP)

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



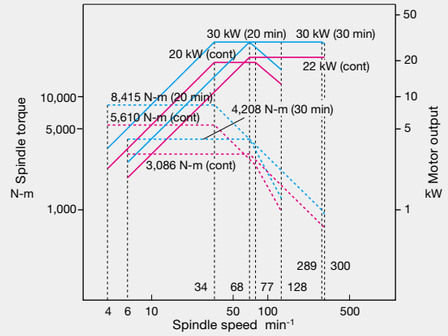
VTM-1200YB (FANUC)

- Turning spindle: 500 min^{-1}
- Max output: 30/22 kW (30 min/cont)
- Max torque: 6,093/3,757 N-m (30 min/cont)



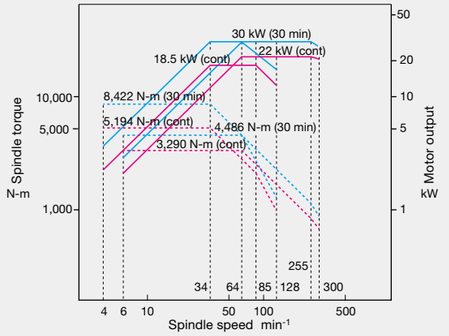
VTM-2000YB (OSP)

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



VTM-2000YB (FANUC)

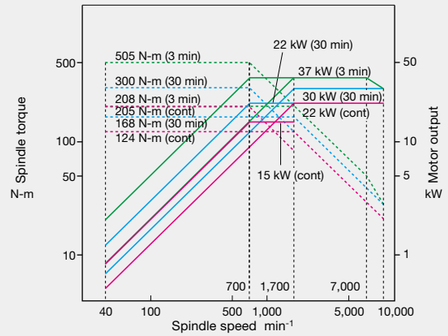
- Turning spindle: 300 min^{-1}
- Max output: 30/22 kW (30 min/cont)
- Max torque: 8,422/5,194 N-m (30 min/cont)



Milling tool spindle output/torque diagram

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

- 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)

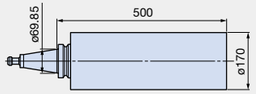


ATC Tool Dimensions

Unit: mm

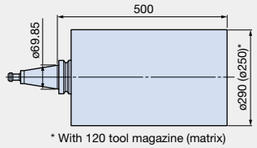
Maximum adjacent tool size

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



Maximum non-adjacent tool size

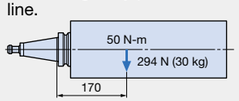
Maximum tool size that can be used when there are no adjacent tools on either side in the ATC magazine



* With 120 tool magazine (matrix)

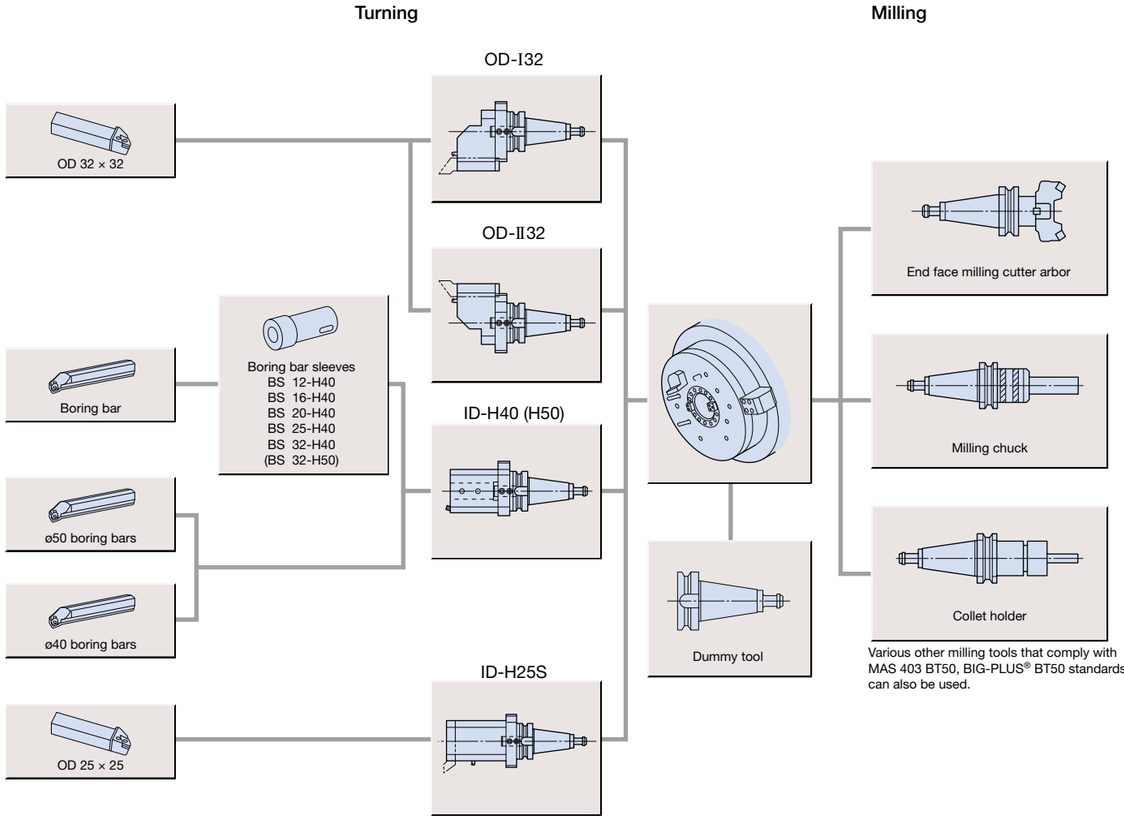
Maximum tool mass moment

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
HSK-A100 and CAPTO C8 are also available



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

Optional Specifications & Accessories

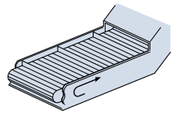
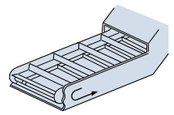
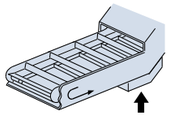
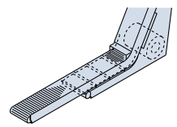
Auto pallet changer (APC)	Shuttle-type 2-pallet APC with setup station
High power spindle	VTM-1200YB Loading mass: 5,000 kg (included chuck) Spindle speed: 400 min^{-1}
ø2,000 boring mill jaw table	VTM-2000YB Spindle speed: 200 min^{-1} Boring mill jaws
B-axis indexing	NC B-axis
Wide Y-axis travel specs	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 Chuck auto open/close Chuck operating buttons
Tooling types	See separate tooling system diagram
Chip discharge (required)	Hinged conveyor Scraper-type conveyor With drum filter 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 workpiece 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

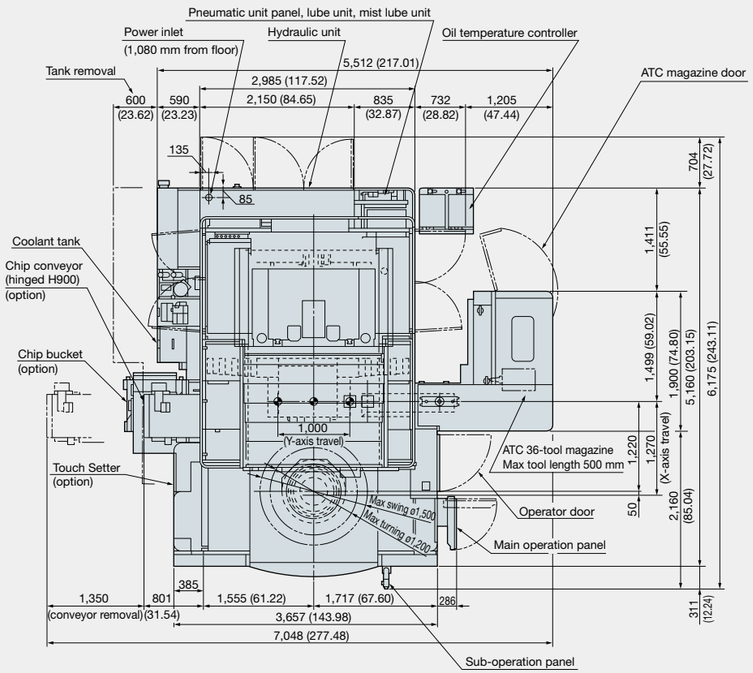
Chip conveyor types and applications

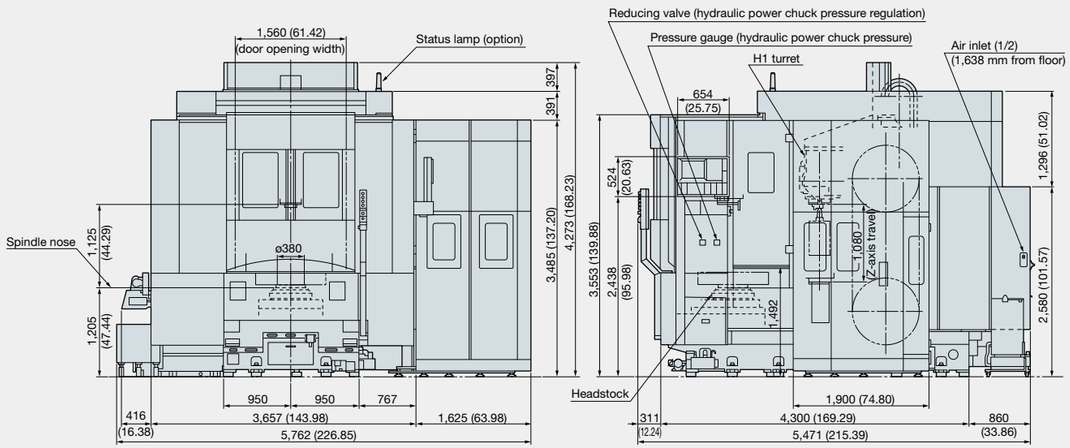
Type	Hinge	Scraper	Magnetic scraper	Hinge + scraper (with drum filter)
Application	● For steel	● For cast iron	● For cast iron	● For steel, cast iron nonferrous metal
Features	● General use	● Magnet scraper for sludge processing ● Easy for maintenance ● Blade scraper	● Suitable with sludge ● Not suitable for nonferrous metals	● Filtration of long and short chips and coolant
Shape			 Magnet	

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

VTM-1200YB
Dimensional Drawing / Installation Drawing

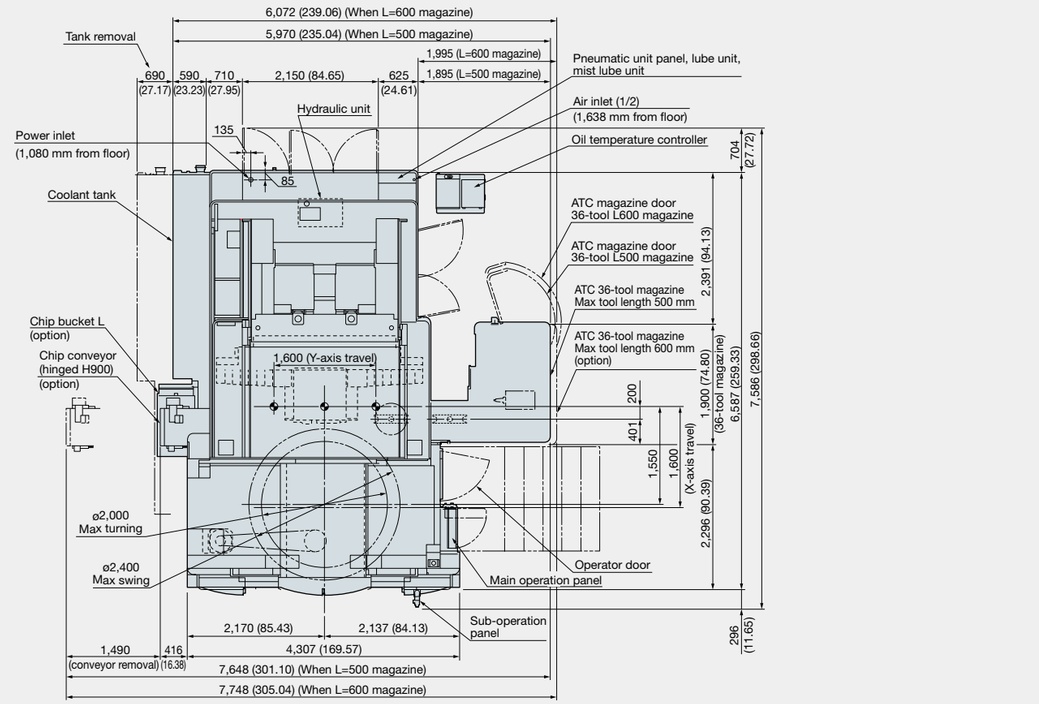
Unit: mm (in)

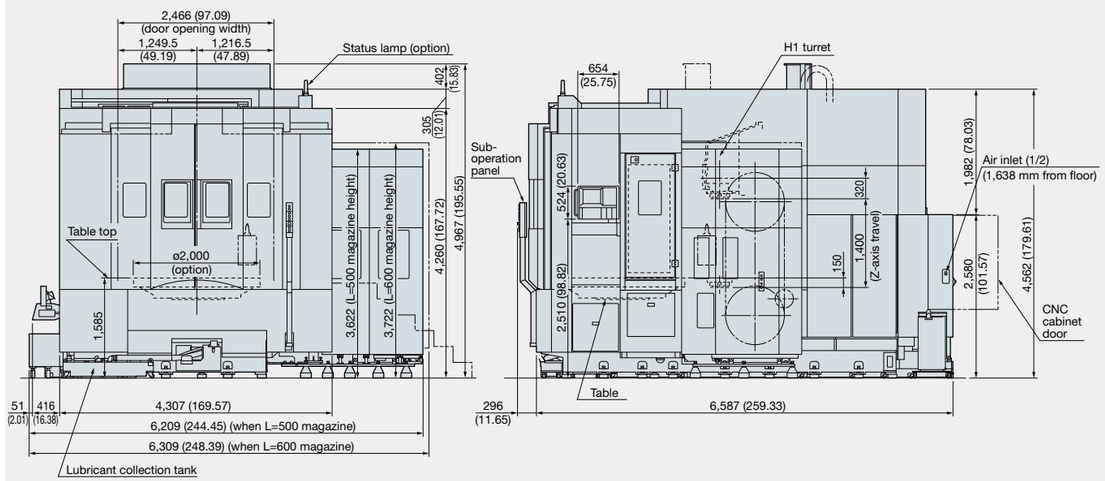




VTM-2000YB
Dimensional Drawing / Installation Drawing

Unit: mm (in)





OSP suite OSP-P300SA

Intelligent CNC

With excellent 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.
Okuma's excellent control uses high-end CPUs for a significant 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 smartphone

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 smartphone. 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 (option) screen shots.
Collision Avoidance System (option) 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.

Spindle Output Monitor
Increased productivity through visualization of motor power reserve

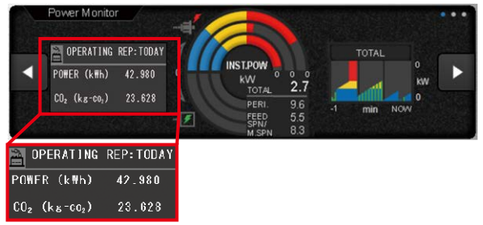
Scheduled Program Editor
Easy programming without keying in code

E-mail Notification
Monitoring utilization status evenwhen away from the machine

ECO suite plus

A system for an energy-saving society

- **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** (option)
- Example of a Power Monitor check

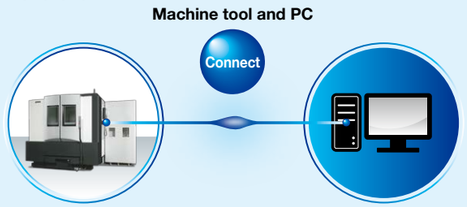


Connect Plan

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

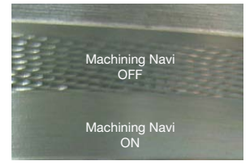
Connect, Visualize, Improve

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 (option) 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

Machining Navi L-*g*Ⅱ(guidance)
Chatter-free applications for lathes

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

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

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

For milling

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

Based on the chatter noise captured by the microphone, Machining Navi displays a number of optimal spindle speed possibilities on the screen. The operator can change to the indicated spindle speed with a single touch and immediately confirm the result.

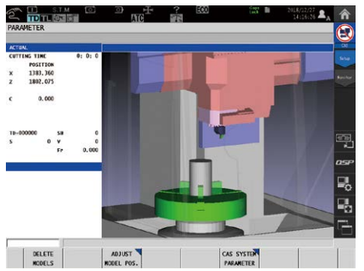
Machining Navi M-*i*
(intelligently optimized spindle speed control)
Simple, auto-mode—leave it to the machine
Finding optimum cutting conditions quickly

Chatter vibration is measured by built-in sensors, and Machining Navi automatically changes spindle speed 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.

Collision Avoidance System (option)
Collision prevention

Allowing operators to focus on making parts

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

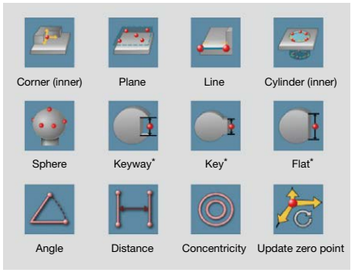


Virtual machine (collision check)

NC Gage (option)

Effortlessly and easily achieves high-precision quality control and reduces lead times

Dimensions such as hole position and flatness, as well as geometric accuracy, can be measured directly on the machine. This eliminates the need for workpiece transport, loading/unloading, and setup changeovers for each measurement point—significantly reducing lead time.
Over 20 types of geometric tolerance and positional dimension measurements are supported, with intuitive teaching enabling automatic generation of measurement programs.
Measurement results can be utilized for quality control, and reports can be saved.



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: 1,000 sets)
	Tool compensation	Tool offset, nose R comp, tool shape / wear compensation: 20 sets per tool
	Display	15-inch color display operational panel, multi touch panel operations
	Security	Operator authentication, OSP-VPSⅡ-STD (Virus Protection System)
	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)
	Programming	Program management, edit, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, 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, Data I/O, easy setting of cycle time reduction
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Communication / Networking		USB ports, Ethernet, DNC-T1
High speed/ accuracy	Thermo Active Stabilizer–Construction	Corrects thermal deformation error generated during shop temperature changes affecting machine construction (TAS-C)
	TAS-S	Thermo Active Stabilizer–Milling tool 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 function	ECO suite plus	ECO Idling Stop, ECO Power Monitor
	Power Regeneration System	Regenerative power is used when the spindle and feed axes decelerate to reduce energy waste.

Kit and 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: 1,000 (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							
Feed axes retract							
Spindle speed setting							
Profile helical cutting							
Hobbing							
Monitoring							
One-Touch Spreadsheet							
Real 3D simulation*3				●	●	●	●
Cycle time over check		●	●	●	●	●	●
Load monitor (spindle, feed axis)				●	●	●	●
Load monitor no-load detection (load monitor ordered)							
Machine Data Logger							
AI Machine Diagnosis (feed axes / M-spindle)*2							
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		●	●	●	●	●	●

Item \ Kit specs*1		NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
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							
External I/O, communication functions							
RS-232C interface							
Additional USB	2 additional ports possible						
DNC link	DNC–T3						
	DNC–C / Ethernet*3						
	DNC–DT						
Automation/Unattended operation							
Harmonic spindle speed control (HSSC)		●	●	●	●	●	●
Power shutoff, M02, Alarm							
Warm-up function (by calendar timer)							
Tool retract cycle							
External program selection	Button, rotary switch, digital switch, BCD (2-digit, 4-digit)						
Cycle time reduction*3 (ignores certain commands)		●	●	●	●	●	●
High-speed/High-accuracy functions							
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 plus (energy-saving functions)							
ECO Operation							
Spindle power peak cutting function							
Other functions							
Machining Navi L-*g*Ⅱ, M-*g*Ⅱ+, M-*i*, T-*g* (threading)							
Circuit breaker							
External M codes [2, 4, 8, 16 sets]							
Edit interlock							
Multi-insert tool function							
OSP-VPSⅡ-EX (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. With AbsoScale detection specs, ball-screw wear detection is possible.
*3. 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 (tool change position)
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
	Feed rate 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 64 KB
	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
	Thermo Growth Compensation
	Idling stop

Optional Specifications

Item	Specifications	
Programming	Combination fixed cycle	
	Chamfering/corner R	
	Helical interpolation	
	Part program storage	128 KB
		256 KB
		512 KB
		1 MB
		2 MB
		4 MB
		8 MB
	No. of registerable programs	125
		250
		500
		1,000
		2,000
		4,000

Item	Specifications
Other functions	Mobile pulse handle (0.001, 0.01, 0.1 mm)
	External program number selection
	High speed skip function, Multi-step skip
	Abnormal load detection (spindle + feed axes)
	Addition of custom macro common variables Total 600
	Program restart
	RS-232C interface 1ch, 2ch
	Spare M codes (4, 8)
	Status lamp
	Electric buzzer
	Circuit breaker
	Auto power shutoff
	3D tool compensation
	Oriented spindle stop (4 points)
	Inverse time feed*
	USB memory input/output
	Operation history large capacity specs

* It can be selected NC B-axis control specification.

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.
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OKUMA

OKUMA Corporation

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