OKUMA

OPEN POSSIBILITIES

MB-66VA / MB-66VB

Vertical Machining Centers

MB-66VA / MB-66VB

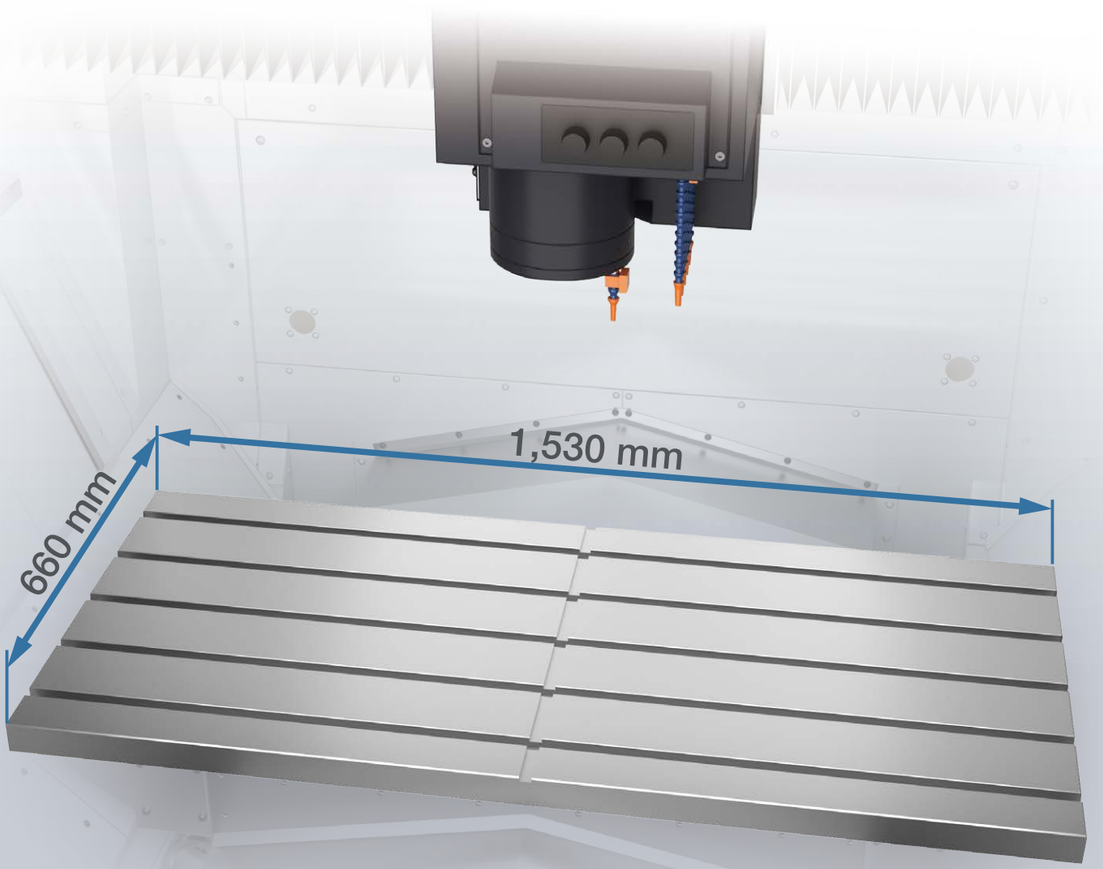
Vertical Machining Centers

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi | SERVONAVI

Productivity—Machining Quality—Operational Ease
Vertical machining centers that satisfies all of the above

Reliable intelligent technology starts with the MB-V series

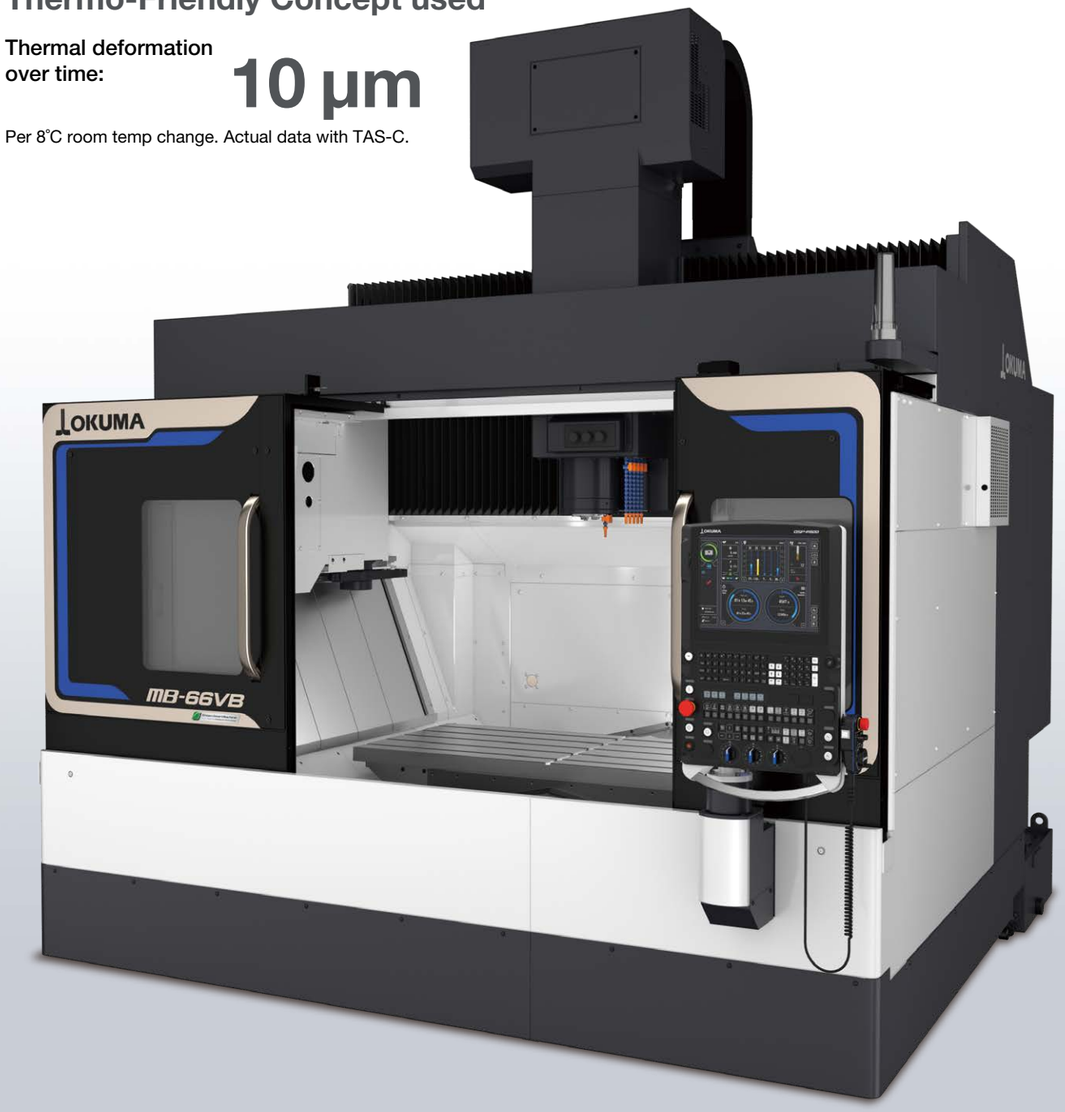
The global standard for vertical machining centers. MB-V series machines provide outstanding machining performance with high-accuracy, high-speed, and powerful cutting in manufacturing settings worldwide. At the same time, they provide a working space that is good for both people and the environment, featuring good workability, low energy use, and a clean environment. Experience pleasant manufacturing with the MB-66V equipped with OSP-P500, a next-generation CNC that makes manufacturing DX a reality.



Thermo-Friendly Concept used

Thermal deformation over time: **10 µm**

Per 8℃ room temp change. Actual data with TAS-C.



Photographs and images used in this brochure may include optional equipment.

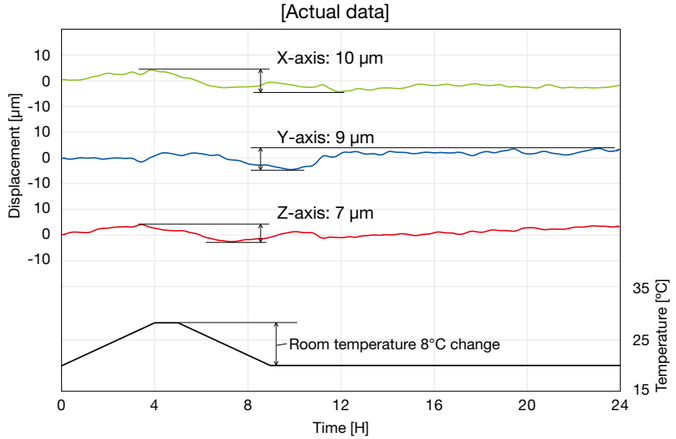
Secured accuracy enables to reduce workload in controlling dimensions and realize stable machining over long hours

Thermo-Friendly Concept

The unique approach of “accepting temperature changes.”

The “Thermo-friendly” concept enables remarkable machining accuracy through original structural design and thermal deformation control technology. It frees you from troublesome dimensional compensation and warm-up. Exhibits excellent dimensional stability even during consecutive operation over long periods and environmental temperature change in the plant.

Thermal deformation over time **10 µm** /Per 8˚C room temp change (TAS-C)



Eliminate waste with the Thermo-Friendly Concept

Okuma’s Thermo-Friendly Concept achieves high dimensional stability not only when the room temperature changes, but also at machine startups or when machining is resumed.
The warm-up operation time to stabilize thermal deformation is shortened, and the burden of dimensional correction when resuming machining is reduced.

Machine startup
Machining restart
Room temp change

High dimensional stability

Note: The data mentioned in this brochure are “actual data” and do not represent guaranteed accuracies.

TAS-C: Thermo Active Stabilizer – Construction

Providing optimal control of the machine and stable machining accuracies even during ambient temperature changes.

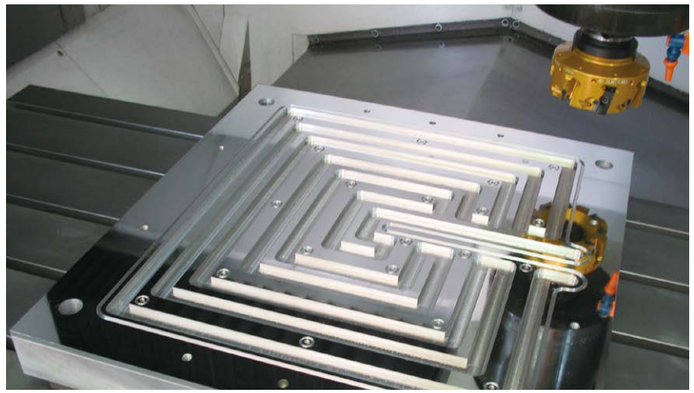
TAS-S: Thermo Active Stabilizer – Spindle

Spindle deformation will be accurately controlled even during operations with frequent speed changes.

High-accuracy machining

Flatness 3 µm (actual data)

- Machine: MB-66VA
- Machined part: Plate (LCD)
- Material: A5052
- Size: 560 × 600 × 60 mm
- Cycle time: 50 min



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

Smooth and simple machine operation to reduce operator burden

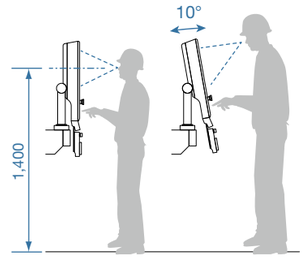
Pleasant work environment

Ease of use with consideration of harmony between humans and machines

1 OSP-P500 operation panel with good operability and visibility

The panel is a swivel type that can be adjusted both horizontally and vertically.

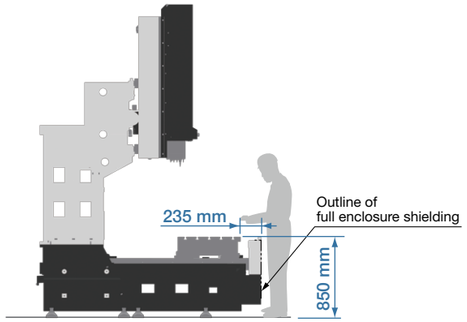
The panel can be swiveled according to the work position to ensure good operability.



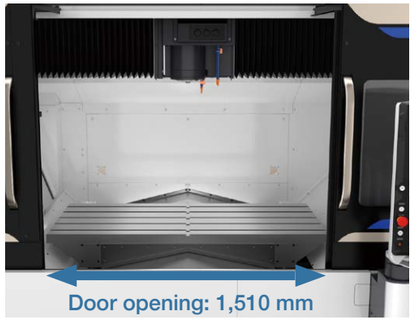
The angle can be adjusted to suit the body height of the operator.

2 Easy workpiece and setup changes

Easy operation with the table positioned at an appropriate height and good accessibility to the machine.



The wide opening enables stress-free work.



3 Short workflow

Tools in the magazine can be attached/detached on the front side of the machine.

4 Tools can be attached/detached in the work chamber

A button is mounted on the spindlehead for easy tool attachment and detachment.

5 Maintenance items are concentrated at the rear of the machine

Arranged to ensure that oil supply and inspections can be performed at the rear of the machine.

Increase in productivity by shortening machining time with highly efficient machining

Cutting capacities: 504 cm³/min / 672 cm³/min
(face milling) (end milling)

Powerful cutting examples (actual data)

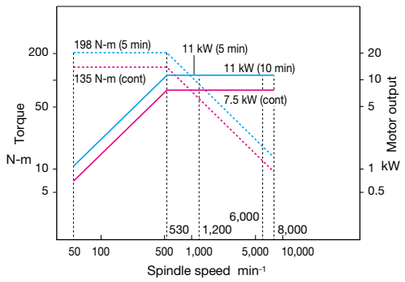
Various items, from steel to castings, aluminum materials, and difficult-to-cut materials, can be handled with a variety of spindles.

● 8,000 min^{-1} (No. 40) / 6,000 min^{-1} (No. 50) high power spindle (standard)

Tool	Spindle min^{-1}	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm³/min
ø80 face mill 8 blades (cermet)	895	225	2,600	56	2.5	364
ø20 roughing end mill, 7 flutes (carbide)	3,660	230	4,300	4	20	344
ø50 insert drill	1,000	157	150	–	–	–
Tap M30 P3.5	318	30	1,113	–	–	60% (Spindle load)

(Workpiece material: S45C)

Output 11/7.5 kW (10 min/cont)
Torque 198/135 N-m (5 min/cont)

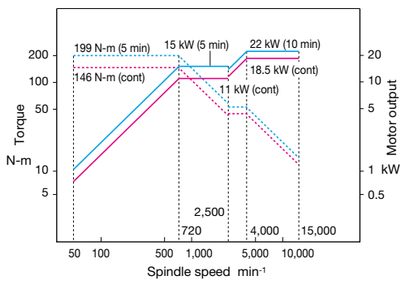


● 15,000 min^{-1} (No. 40) wide-range spindle (option)

Tool	Spindle min^{-1}	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm³/min
ø80 face mill 8 blades (cermet)	895	225	3,000	56	3	504
ø20 roughing end mill, 7 flutes (carbide)	4,000	251	4,800	7	20	672
ø63 insert drill	720	142	108	–	–	–
Tap M30 P3.5	318	30	1,113	–	–	66% (Spindle load)

(Workpiece material: S45C)

Output 22/18.5 kW (10 min/cont)
Torque 199/146 N-m (5 min/cont)

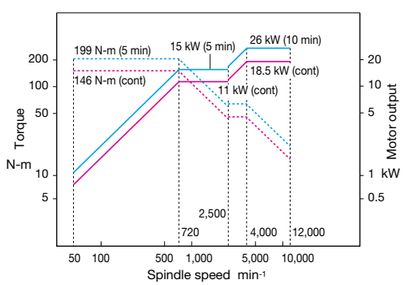


● 12,000 min^{-1} (No. 50) wide-range spindle (option)

Tool	Spindle min^{-1}	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm³/min
ø80 face mill 8 blades (cermet)	895	225	3,000	56	3	504
ø20 roughing end mill, 7 flutes (carbide)	4,000	251	2,800	12	20	672
ø63 insert drill	909	180	137	–	–	–
Tap M36 P4	106	12	424	–	–	–

(Workpiece material: S45C)

Output 26/18.5 kW (10 min/cont)
Torque 199/146 N-m (5 min/cont)



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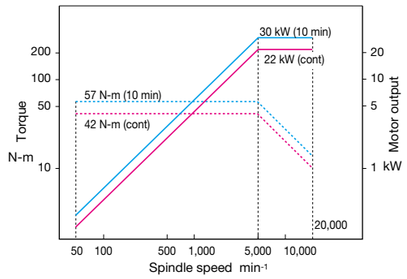
High-speed spindle (option)

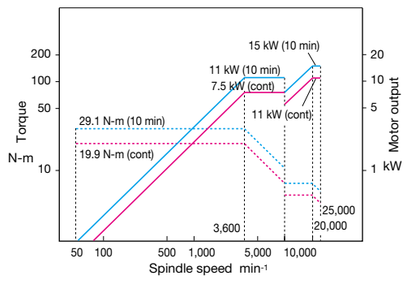
● Die/mold, Al applications

Spindle	50 to 20,000 min^{-1}
Output	30/22 kW (10 min/cont)
Torque	57/42 N-m (10 min/cont)



● High-speed/-quality die/mold applications

Spindle	50 to 25,000 min^{-1}
Output	15/11 kW (10 min/cont)
Torque	29.1/19.9 N-m (10 min/cont)



Shorter non-cutting time

■ Rapid traverse	40 m/min (1,575 ipm) (X-Y)
■ Spindle accel/decel	1.2 sec (0↔8,000 min^{-1}) (MB-66VA)
■ ATC time*1	
T-T *2 : 1.5 sec (MB-66VA)	
CTC min*3 : 4.2 sec (MB-66VA)	

*1. For No. 40 spindles
*2. MAS standard measurements (formerly JIS B 6013)
*3. ISO 10791-9 (2001) (JIS B 6336-9) measurements

Cycle time reduction

- Operation time reduction
  The non-cutting time is shortened by simultaneously performing multiple operations, such as spindle rotation and axis feed, and allowing the rotary axis to take the shortest path.
- Machining time shortening
  The cycle time is reduced for parts machining with frequent switches between cutting feed and rapid traverse by using feeder-mode high-speed switching and optimal acceleration/deceleration.
- Easy parameter setting
  Collects parameters related to cycle time reduction in a single screen for enabling changes and reuse in a single operation.

Suction of excess coolant in spindle (option)

Residual coolant suction time 0.6 sec

- Shorter tool change times are possible when using thru-spindle coolant
  Residual coolant in tools and spindles is removed instantly in 0.6 seconds (actual value for drill tools). The suction of coolant in spindles eliminates the need for air blowing to remove residual coolant from tools and spindles (at least 15 seconds), and so shortens tool change time.

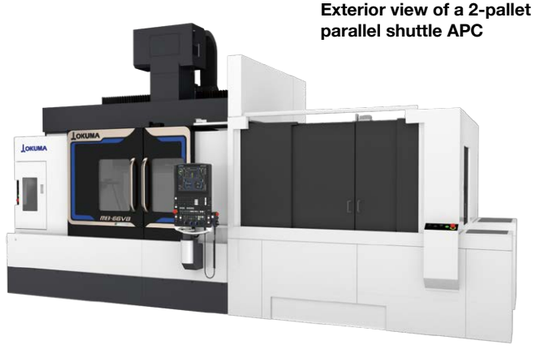
Even higher productivity with a wide range of options for automation and manpower saving

Flexible automation options

■ Auto pallet changer (APC)

- Preparation of workpieces externally improves machine utilization.
- The APC is positioned on the right side of the machine to ensure smooth machine operation. From workpiece load and unload to tool changes, operations are completed at the front of the machine to further improve work efficiency with a simple workflow.

Exterior view of a 2-pallet parallel shuttle APC



■ Multiple tool ATC magazine

- Diverse lineup of chain magazines and matrix magazines.
- Continuous operation over long periods of time and improved productivity are enabled by securing the required number of tools.

32, 48 tools: chain magazine
Over 64 tools: matrix magazine
64, 98, 132, 166, 200, 234, 268 tools

Exterior view of a matrix magazine

■ Automated system with stand-alone articulated robots

- Highly versatile to be compatible with a variety of workpieces.
- Automation of high-mix, low-volume production and system upkeep, such as measurement and cleaning, including peripheral equipment is also freely configurable.
- Automation with a high degree of freedom can be achieved according to production demands, such as process transfer between multiple machines and combination with an NC lathe.

Example of a stand-alone articulated robot

The images and diagrams in the catalog are for illustrative purposes.
Specifications and designs may differ from the actual products.

High-precision, high-grade die/mold machining

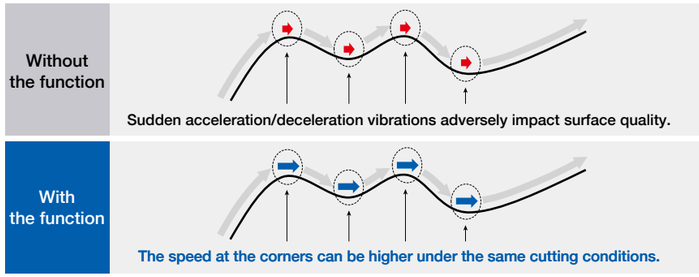
Hyper-Surface Ⅱ (option)

Improves the machined surface quality of dies and free-form surfaces.

When dies and free-form surfaces are machined, streaks and edge irregularities caused by CAM machining data, irregular widths of tool marks in shuttle machining, etc., are suppressed with optimal axis control based on sophisticated digital technology to finish machining with high speed and high quality.

● **Finishing of die machining** [Axis control optimal for the machining shape]

- Controlling vibration without slowing down for corners
- Shortening machining time while also improving surface quality



Comparison of machined surface quality

Recommended die/mold specs (option)

■ 0.1 µm control

The control unit is set to 0.1 µm to improve accuracy and machined surface quality.
Note: ×500 (1 pulse 50 µm) is added to the pulse handles.

■ Die/mold & fine-feed specs

Small-lead ball-screws are used in the axes to improve response during the travel and enable highly accurate shape machining.
Note: X-Y-Z axis feed rate is changed. Rapid: 20 m/min, cutting feed rate: 20,000 mm/min

■ AbsoScale detection

The optical scale manufactured by Okuma directly detects the positions of the X-Y-Z axes. Errors due to ball-screw extension/contraction, torsion, and wear are avoided to achieve highly accurate positioning and movement.

Reducing the environmental impact and burden on operators

Sludgeless Tank (option)

Reducing waste liquid by suppressing coolant deterioration.

The number of troublesome coolant tank cleaning operations is significantly reduced, improving productivity. Furthermore, environmental impact due to coolant disposal is also reduced.

It is important to remove impurities (sludge) contained in the coolant for the stable operation of the machine, and coolant tank cleaning is indispensable. The Sludgeless Tank (option) circulates coolant at a constant speed in the tank to effectively collect sludge even during non-machining while reducing defects caused by the sludge contained in the coolant, such as scratches on machined surfaces and troubles of cutters, as well. Sludge accumulation in the tank is suppressed, which also drastically reduces the frequency of troublesome tank cleaning and enables stable operation over long hours. In addition, the frequency of coolant replacement can be greatly reduced, which also reduces the environmental impact of coolant disposal. Thru-spindle coolant specification (option) collects even finer sludge with a bag filter to improve the quality of machined surfaces.

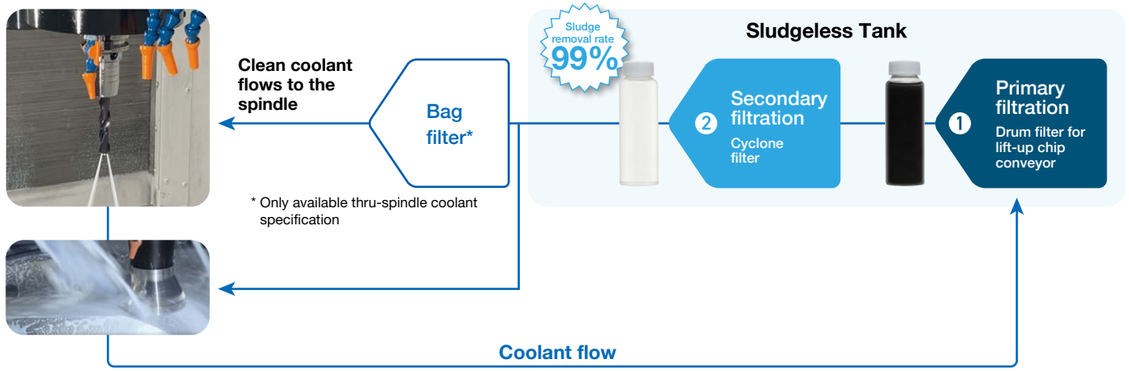
Sludge removal rate **99%** (when the material is casting and aluminum)

Notes: · After secondary filtration (cyclone filter) permeation
· Okuma evaluated removal rate

No tank cleaning for 3 years (okuma equipment actual data)

No coolant replacement for 3 years (okuma equipment actual data)

Note: It is necessary to select the hinge + scraper (with drum filter) type chip conveyor if the Sludgeless Tank is chosen.



Suction of excess coolant in spindle (option)

Preventing deterioration of the working environment.

In-spindle coolant suction removes residual coolant dripping from through-spindle coolant tools. This eliminates the need for air blowing to remove residual coolant and avoids the generation of mist, preventing deterioration of the working environment. The frequency of required cleaning can also be reduced, to ease the workload on the operator.

Contribution to the realization of a carbon-free society

Highly productive, accurate and eco-friendly

Green-Smart Machine

Okuma has worked to reduce energy consumption in order to achieve carbon neutrality at the three factories in Japan which are our main production bases.

We have realized high productivity through automation and process-intensive machining, in addition to high-accuracy machining, and we then introduced the use of green energy to transform the three domestic factories into carbon-neutral factories.
“Green-Smart Machines” is our definition of Okuma’s intelligent machine tools, which autonomously achieve stable dimensional accuracy and reduced energy consumption, to support environmentally friendly production. Our policy is to deploy “Green-Smart Machines” fully, to help achieve a carbon-free society.

Starting with products manufactured at those carbon-neutral factories and supplying them all over the world, we will work together with our customers to help solve the social issues faced by the manufacturing industry.

Green-Smart Machines are **environmentally friendly**
products that autonomously achieve stable dimensional accuracies and reduced energy consumption.

Green-Smart Machine Technology that achieves Green-Smart Machine

Thermo-Friendly Concept

The Okuma Intelligent Technology that enables machines to autonomously maintain high accuracy stability.

The unique concept of accepting temperature changes achieves consistent high accuracy without special coolers or excessive air conditioning.

Reduction of warm-ups and dimensional compensation

Reduce the time needed for daily warm-ups and dimensional compensation to adjust to ambient temperature changes.

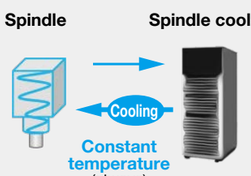
Reduction of power used for air conditioning

Maintain high stability of dimensional accuracy even if the air conditioning temperature range is expanded.

Reduction of machine body coolers

Achieve outstanding dimensional accuracy without any special machine body cooling being required to maintain accuracy.

The Okuma way to cool



By always setting a constant coolant supply temperature, the cooler power consumption is reduced.

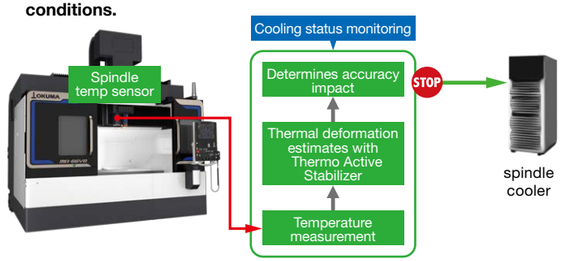
ECO suite plus

A system for an energy-saving society

ECO Idling Stop

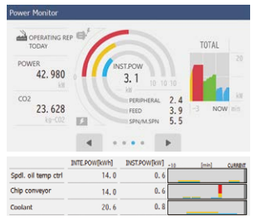
Auxiliary equipment consume a substantial portion of the power used in a factory. This function enables each of them to be turned off when not needed to reduce power consumption. In addition to when automatic operation is suspended, it is now possible to stop idling during manual operation. Power consumption and carbon dioxide emissions are reduced without conscious effort by the operator.

The machine monitors the cooling level when not machining, and proactively turns off the cooler while maintaining high accuracy conditions.



ECO Power Monitor

Power is shown individually for spindle, feed axes, and auxiliaries on the OSP operation screen. In addition to regenerative power, the energy-saving benefits from auxiliary equipment stopped with ECO Idling Stop can be confirmed on the spot.



ECO Operation

By using only the required peripherals (chip conveyor, mist collector), energy-saving operations are possible.

Various advanced technologies to achieve higher productivity

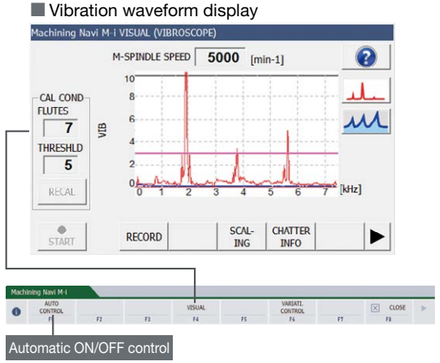
Machining Navi M-*i*, M-*g*Ⅱ+ (option)

Cutting condition search for milling

■ Automatically changes to optimum spindle speed (M-*i*)

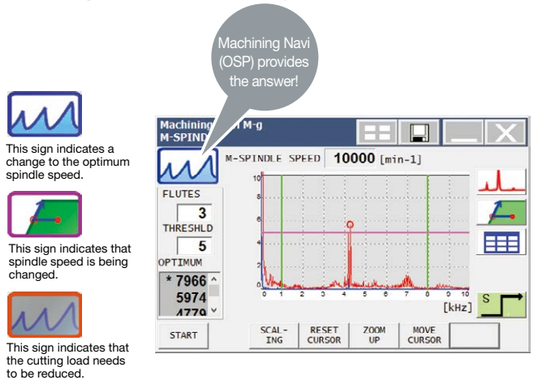
Sensors built in to the machine detect and analyze machining chatter. Machining Navi then navigates to the effective measures in a wide range of spindle speeds, from low to high.

■ Vibration waveform display



■ Adjust cutting conditions while monitoring the data (M-*g*Ⅱ+)

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.



SERVONAVI

Optimized Servo Control

Achieves long term accuracy and surface quality

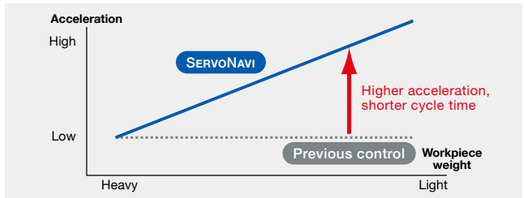
SERVONAVI AP (Automatic Parameter setting)

■ Work Weight Auto Setting

Cycle time shortened with faster acceleration

On table travel type machining centers, the table feed acceleration with the previous system was the same regardless of weight, such as workpieces and fixtures loaded on the table.

Work Weight Auto Setting estimates the weight of the workpiece and fixture on the table and automatically sets the liner axis servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.



SERVONAVI SF (Surface Fine-tuning)

■ Reversal Spike Auto Adjustment

Maintains machining accuracy and surface quality

Slide resistance changes with length of time machine tools are utilized, and discrepancies occur with the servo parameters that were the best when the machine was first installed. This may produce crease marks at motion reversals and affect machining accuracy (part surface quality).

Reversal Spike Auto Adjustment maintains machining accuracy by switching servo parameters to the optimum values matched to changes in slide resistance.

■ Vibration Auto Adjustment

Contributes to longer machine life

When aging changes machine performance, noise, vibration, crease marks, or fish scales may appear.

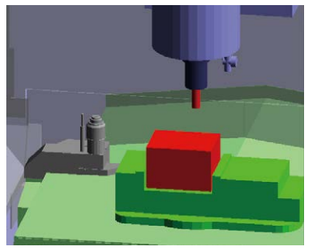
Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.

Collision Avoidance System (option)

Collision prevention

■ 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.



AI Machine Diagnosis Function (option)

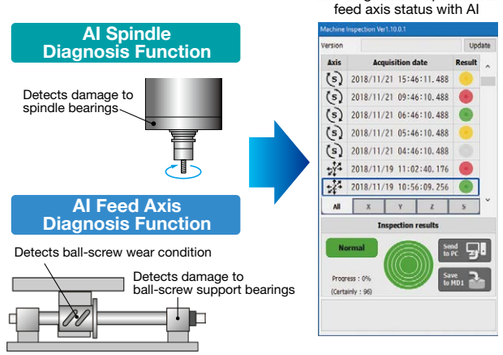
Machine tool diagnostics technology with artificial intelligence (AI)

■ With predictive maintenance, prevent machine stoppages just in time

Okuma's AI-equipped control diagnoses the presence or absence of abnormalities in the machine spindle and feed axes and identifies any irregularities found.

Downtime from machine stoppage is minimized, so the benefits are highly accurate, productive, and stable operations over the long term. The operators themselves can easily diagnose the machine by following simple screen guidelines on the Okuma control.

Notes: AI diagnostic models are already installed, and diagnoses can be performed by the machine itself. AI diagnostic models can be updated through Okuma's Connect Plan.
With AbsoScale detection specs, ball-screw wear detection is possible.



Dynamic Tool Load Control (option)

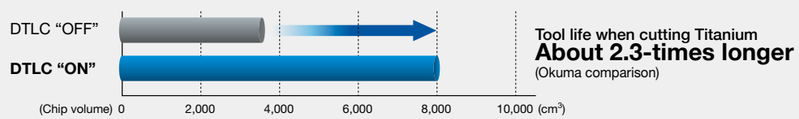
■ Prevents chipping, extends tool life

When machining of difficult-to-cut material, chipping from blade runout often occurs with insert-type end mills. To stabilize such machining, solid end mills with high tool costs have generally been used.

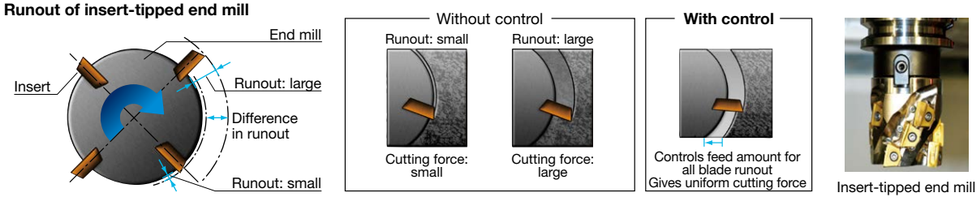
Dynamic Tool Load Control gives uniform cutting force with advanced synchronization of spindle phase and feed rate to control insert-type end mill chipping. This improves tool life and stabilizes machining. Switching from expensive solid tools also leads to reduced tool costs.

[Actual data]

Chip volume per tool under the same cutting conditions (tool life)



Runout of insert-tipped end mill



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Machine Specifications

	item		MB-66VA No. 40	MB-66VB No. 50
Travel	X-axis (ram saddle R/L)	mm (in)	1,500 (59.06)	
	Y-axis (table B/F)	mm (in)	660 (25.98)	
	Z-axis (spindle U/D)	mm (in)	660 (25.98)	
	Table top to spindle nose	mm (in)	150 to 810 (5.91 × 31.89)	
Table	Max work dimension	mm (in)	1,530 × 660 (60.24 × 25.98)	
	Floor to table top	mm (in)	850 (33.46)	
	Max load capacity	kg (lb)	1,500 (3,300)	
Spindle	Spindle speed	min^{-1}	8,000 [15,000, 20,000, 25,000]	6,000 [12,000]
	Speed range		Infinintely variable	
	Tapered bore		7/24 taper No. 40 [HSK-A63]	7/24 taper No. 50
	Bearing dia	mm (in)	ø70 [ø70, ø70, ø60] (ø2.76 [ø2.76, ø2.76, ø2.37])	ø90 [ø90] (ø3.54 [ø3.54])
Feed rate	Rapid traverse	m/min (ipm)	X-Y: 40 (1,575) Z: 32 (1,260)	
	Cutting feed rate	mm/min (ipm)	X-Y-Z: 32,000 (1,260)	
Motor	Spindle	kW (hp)	11/7.5 [22/18.5, 30/22, 15/11] (15/10 [30/25, 40/30, 20/15])	11/7.5 [26/18.5] (15/10 [35/25])
	Feed axes	kW (hp)	X-Y-Z: 4.6 (6.1)	
ATC	Tool shank		MAS BT40 [HSK]	MAS BT50
	Pull stud		MAS2 [–]	MAS2
	Tool capacity	tool	20 [32, 48]	
	Max tool dia (w/adjacent tool)	mm (in)	ø90 (ø3.54)	ø100 (ø3.94)
	Max tool dia (w/o adjacent tool)	mm (in)	ø125 (ø4.92)	ø152 (ø5.98)
	Max tool length	mm (in)	400 (15.75)	
	Max tool mass	kg (lb)	8 (18)	12 [15] (26 [33])
	Max tool moment	N-m (ft-lbf)	7.8 {8 kg × 100 mm} (5.7 {18 lb × 3.94 in})	15.3 [19.1] {12 [15] kg × 130 mm} (11.3 [14.0] {26 [33] lb × 5.12 in})
	Tool selection		Memory random	
Machine size	Height	mm (in)	3,295 (129.72)	
	Floor space	mm (in)	3,045 × 3,404 (119.88 × 134.02)	
	Mass	kg (lb)	11,200 (24,640)	11,800 (25,960)

[ ]: Option

Standard Specifications

Spindle speed 50 to 8,000 min^{-1}	MB-66VA 7/24 taper No. 40, 11/7.5 kW	Chip pan*2	92 L (effective)
Spindle speed 50 to 6,000 min^{-1}	MB-66VB 7/24 taper No. 50, 11/7.5 kW	ATC air blower (blast)	
Spindle/spindlehead cooler	Oil temperature controller	Chip air blower (blast)	Nozzles
Air cleaner (filter)	Regulator included	Spindle air blower (blast)	
Spindle oil-air lubricator		Foundation washers (with jack bolts)	8 pcs
Slideway lube supplier		3-lamp status indicator	Type C (LED signal tower)
TAS-S	Thermo Active Stabilizer - Spindle	Work lamp*2	LED
TAS-C	Thermo Active Stabilizer - Construction	Full enclosure shielding	With ceiling
ATC	20-tool magazine	Tapered bore cleaning bar	
ATC magazine shutter		Hand tools	
Tool unclamp package		Tool box	
Coolant tank capacity*1	460 L (effective: 270 L)	Numerical controller	OSP-P500M
	pump: 390 W (50 Hz), 620 W (60 Hz)	Color LCD operation panel	15-inch
Coolant nozzles	Flexible, 5	Pulse handle	
Cloolant flusher*1	Table L/R		

*1. Use water-based coolant. For oil-based applications when necessary, larger pumps (and in-machine coil-type chip conveyor) may be required. Oil-based coolants are highly flammable, so fire prevention measures must always be taken when using these coolants. Do not operate unattended.
*2. “Required” optional specs

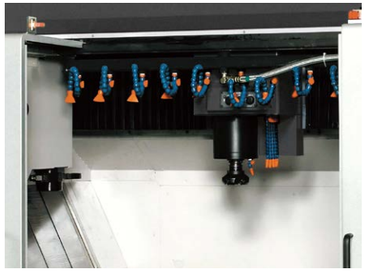
Optional Specifications

Spindles available:		High crossrail (+200 mm) △	Required with APCs
Wide-range: 50 to 15,000 min^{-1} △	22/18.5 kW, No. 40, HSK-A63	Sludgeless Tank	
High-speed: 50 to 20,000 min^{-1} △	30/22 kW, HSK-A63, BIG-PLUS® (No. 40)	Thru-spindle coolant*3	Specify 1.5 or 7.0 MPa 25,000 min^{-1} specs for HSK-A63 only
High-speed: 50 to 25,000 min^{-1} △	15/11 kW, HSK-A63, BIG-PLUS® (No. 40)		
Wide-range: 50 to 12,000 min^{-1} △	26/18.5 kW, No. 50	Suction of excess coolant in spindle	
Dual contact spindle*1 △	HSK, BIG-PLUS®		
Recommended die/mold specs	Die/mold & find-feed specs	Chip air blower (adapter)	Not available with thru-spindle coolant spec
	AbsoScale detection		
	Hyper-SurfaceⅡ: 3 linear axes	Oil mist unit	
	0.1 µm control	Mist collector	
	DNC-DT (recommended)	Semi-dry machining	
Tool unclamp hydraulic unit*2 △	Separately mounted	Shower coolant systems	Ceiling mounted (10 nozzles)
ATC magazine capacity △	32-tool, 48-tool: chain magazine type Over 64-tool: matrix magazine type	Workpiece wash gun	
		In-machine chip conveyor (coil) △	Table L/R
Tool shank	CAT, DIN, HSK		
Pull stud specs △	MAS1, JIS, CAT, DIN	Lift-up chip conveyor △	See “Recommended chip conveyors” on page 15
Attachment preps	Accelerator attachment		
	Angle-head attachment	Chip bucket for above △	
	Oil-hole supplier	Dust collector	
AbsoScale detection	X-Y-Z axes	Tool breakage detection / Auto tool length compensation	Touch sensor*4 (Metrol)
Die/mold & find-feed specs △	X-, Y-, Z-axis rapids: 20 m/min		
NC rotary table	Specify chuck, tailstock requirements, rotarty table type	Auto zero offset / Auto gauging	Touch probe (Renishaw, Marposs)
		NC Gage	Standard/high specs
Index table		Chemical anchors	
2-pallet parallel shuttle APC (right side)	Tapped or T-slot pallets available.	Sub-tables	
		Work lamp	LED, added to left side

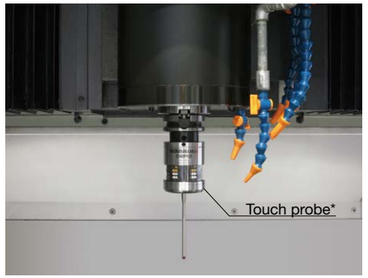
△: Corresponding standard specification is deleted.
*1. Be sure to select this specification when BIG-PLUS® holder is used.
*2. Recommended for short and repetitive ATC operations.
For details, please contact your Okuma sales representative.
*3. Okuma pull studs required. (excluding HSK shanks)
*4. Table mounted, which may limit the available working range and ATC tool dimensions.

Hinge lift-up chip conveyor

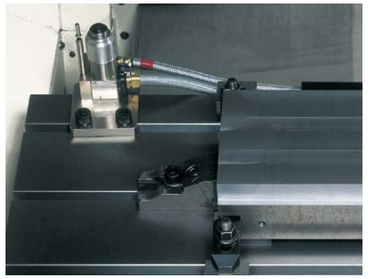
In-machine chip discharge (coil)



Shower coolant (ceiling)



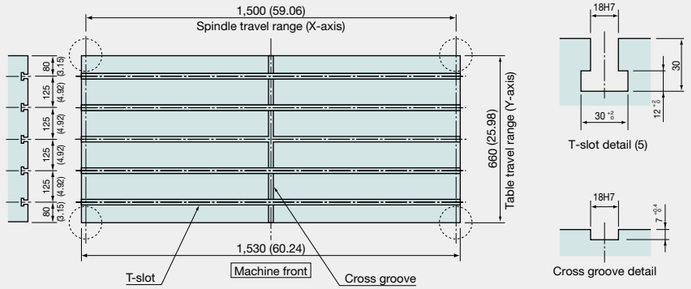
Auto zero offset & auto gauging
(*optical signal)



Auto tool length compensation

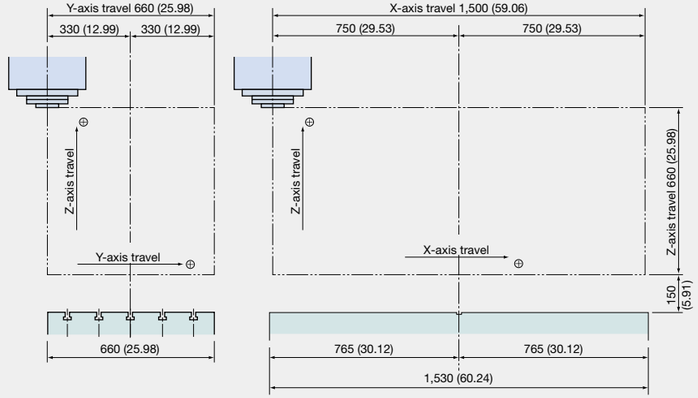
Table size

Unit: mm (in)



Working ranges

Unit: mm (in)



Recommended chip conveyors

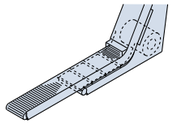
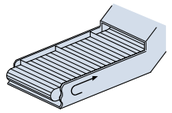
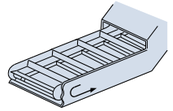
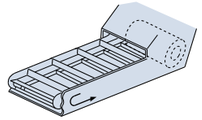
(Please contact an Okuma sales representative for details.)

○: Recommended
△: Conditionally recommended

Workpiece material		Steel	Cast iron	Aluminum / Nonferrous	Mixed (general use)
Chip shape					
In-machine	Chip flusher (standard)	—	○ (Wet)	○	—
	Coil (option)	○	○ (Dry-Wet)	—	○
Off-machine (option)	Hinge + scraper with drum filter	○	○	○	○
	Hinge	○	—	—	△*1
	Scraper	—	○ (Dry)	—	—
	Scraper with drum filter	—	○ (Wet) with magnet	△*2	—

*1. When there are few fine chips *2. When chips are shorter than 100 mm
Note: Oil-based coolants are highly flammable, so fire prevention measures must always be taken when using these coolants.

Off-machine lift-up chip conveyors

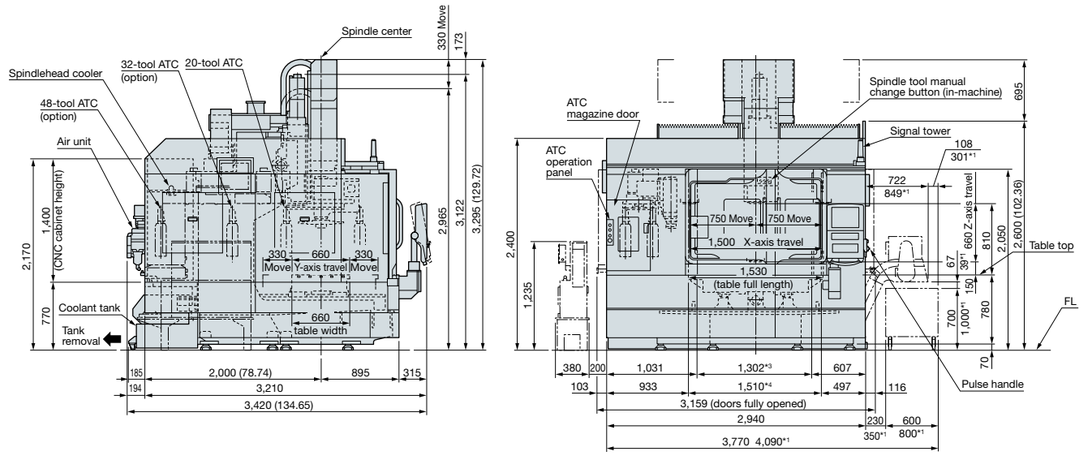
Type	Hinge + scraper with drum filter	Hinge	Scraper	Scraper with drum filter
Shape				

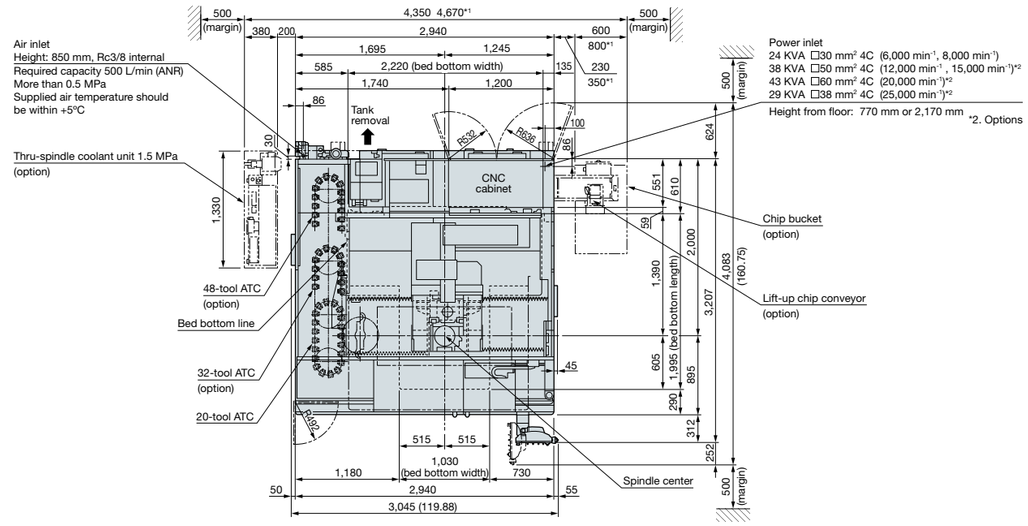
Notes: The machine may need to be raised (platform) depending on the type of chip conveyor.
Becomes hinge + scraper with drum filter type chip conveyor if Sludgeless Tank (option) is selected.

Dimensional and Installation Drawings

Unit: mm (in)

MB-66 VA and MB-66VB have the same installation dimensions.
The drawings show the lift-up chip conveyor H750 mm specification.





*1. Lift-up chip conveyor H1,000 mm spec.
*3. Door opening operation
*4. Maximum door open width

A next-generation CNC that makes manufacturing DX (digital transformation) a reality

OSP-P500

Improved productivity and stable production

As Your Single Source for M-E-I-K (Mechanics - Electronics - IT - Knowledge) merging technology, Okuma offers this CNC to build an advanced “digital twin” that faithfully reproduces machine control and machining operations and creates new value. In addition, Okuma offers productivity improvement and stable production with ease of use that allows customers to use their machining know-how, an energy-saving solutions that achieve both high accuracy/productivity and eco-friendly products, with robust security protection against increasing threats of cyber attacks.

15-inch operation panel

Faithful reproduction of machines and processing — Digital support for shop floor work

Digital Twin (option)

“Okuma’s two digital twins” made possible by an office PC and a next-generation CNC reduce machine downtime and improve machine utilization

Simulation using the latest machine information can be achieved with an office PC and OSP-P500 installed on the physical machine. This enables preparation for machining in advance in the office environment (front loading). Preparing machining for the next part while continuing machining can reduce the preparation time for the physical machine. When a problem occurs on the shop floor, it can be solved quickly on site without going back to the office.

1 Digital Twin On PC*

Simulate shop machines in the office

Front loading is performed with the actual status matched with the data on the office PC to further improve productivity.
Highly accurate pre-verification minimizes trial and error in first part machining, and reduces machine downtime to the minimum.

* The PC software is to be used with one package for one machine.

2 Digital Twin On Machine

Simulating the CNC of a real machine

Super-fast and super-accurate machining simulations are performed with the CNC of a real machine on-site to minimize machining preparation work.
Actual machining can be started immediately, greatly improving the operating rate of the machine.

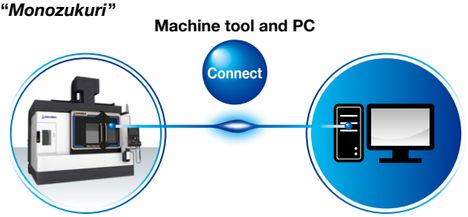
Note: The screens above are examples of the Collision Avoidance System (option).

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.



OSP-P500M standard specifications

Basic specs	Control	X, Y, Z, simultaneous 3 axis, spindle control (1 axis)
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Coordinate functions	Machine coordinate system (1 set), work coordinate system (20 sets)
	Min/max command	±99999.999 mm, ±9999.9999° 8-digit decimal, command units: 0.001 mm, 0.01 mm, 1 mm, 0.0001°, 0.001°, 1°
	Feed	Cutting feed override: 0 to 200%
	Spindle control	Direct spindle speed commands, override 30 to 300%, multi-point indexing
	Tool compensation	No. of registered tools: Max 999 sets, tool length/radius compensation: 3 sets per tool
	Display	15-inch color LCD + multi-touch panel operations
	Security	Operator authentication, Lock screen, OSP-VPSⅡ-STD (Virus Protection System)
Programming	Program capacity	Program storage capacity: 4 GB; operation buffer: 2 MB
	Program operations	Scheduled program, fixed cycle, user task (G-/M-code macros, arithmetic, logic statements, functional operations, variables, branch commands), coordinate calculate, area machining, coordinate convert, programming help, keyway cycle
Operations	OSP suite	“suite apps” to graphically visualize and digitize information needed on the shop floor, “suite operation” enable one-touch access to “suite apps”.
	Easy Operation	“Single-mode operation” to complete a series of operations. Advanced operation panel/graphics facilitate smooth machine control
	MacMan plus	Machining management: aggregation and display of machining records, operating records and problem information, Visualization of power consumption, file output
	Machine operations	Operation help, load meter, alarm help, sequence return, manual interrupt/auto return, pulse handle overlap, parameter I/O, PLC monitor, auto power shut-off
Communications / Networking		USB (2 ports), Ethernet, DNC-T1, Smart I/F
High speed/accuracy specs		Thermo Active Stabilizer – Spindle (TAS-S), Thermo Active Stabilizer – Construction (TAS-C), Hi-Cut Pro, Pitch error compensation, Hi-G control, SERVONAVI, cycle time reduction (operation time reduction, machining time reduction, easy parameter setting)
Energy-saving function	ECO suite plus	ECO Idling Stop, ECO Operation, oil temperature controller auto control, ECO Power Monitor
	Power Regeneration System	Regenerative power is used when the spindle and feed axes decelerate to reduce energy waste.

OSP-P500M kit/optional specifications

Item	Kit specs	NML E	NML D	AOT E	AOT D	DT E	DT D	DT AOT E	DT AOT D
Digital Twin									
Virtual Machining						● (VE)	● (VD)	● (VE)	● (VD)
Quick Modeling						● (VE)	● (VD)	● (VE)	● (VD)
OPC UA for Machine Tools						●	●	●	●
OSP API KIT						●	●	●	●
Interactive functions									
Advanced One-Touch IGF-M (w/ Real 3-D simulation)				●	●			●	●
Interactive MAP (I-MAP)						●	●		
Smart OSP Operation				●	●	●	●	●	●
Programming									
Operation buffer 10 MB		●	●	●	●	●	●	●	●
Program notes (MSG)		●	●	●	●	●	●	●	●
Auto scheduled program update		●	●	●	●	●	●	●	●
Block skip; 9 sets									
Program branch; 9 sets									
Sub-program large capacity operation									
Coordinate system select (Std: 20 sets)	100 sets	●		●		●		●	
	200 sets		●		●		●		●
	400 sets								
Helical cutting		●	●	●	●	●	●	●	●
3-D circular interpolation									
Skip									
Synchronized Tapping Ⅱ		●	●	●	●	●	●	●	●
Arbitrary angle chamfering		●	●	●	●	●	●	●	●
Cylindrical side facing									
Tool max rotational speed setting									
F1-digit feed	External switch type, parameter type								
Programmable travel limits (G22, G23)		●	●	●	●	●	●	●	●
Slope machining	Type Ⅰ, Type Ⅱ								
Axis name designation									
Fixture offset Ⅱ									
Dynamic fixture offset									
Tool grooving									
Dynamic Tool Load Control									
3-D tool compensation									
Coordinate change and drawing conversion	Programmable mirror image (G62)		●		●		●		●
	Enlarge/reduce (G50, G51)		●		●		●		●
User task	Common variables 1,000, 2,000 pcs								
	G-code macros: 80 sets added								
	I/O variables (16 each)								
Sequence stop		●	●	●	●	●	●	●	●
Sequence return	Mid-block sequence return		●		●		●		●
Tool wear compensation	Includes input restriction	●	●	●	●	●	●	●	●
Tool life management	Includes warning	●	●	●	●	●	●	●	●
External I/O communication									
RS-232C connector									
DNC connection	DNC-T3, DNC-B, DNC-DT DNC-C/Ethernet								

Item	Kit specs	NML E	NML D	AOT E	AOT D	DT E	DT D	DT AOT E	DT AOT D
Gauging									
Auto tool length offset/breakage detection									
Auto Workpiece Gauging/Auto zero offset									
Manual gauging (w/o sensor)		●	●	●	●	●	●	●	●
Interactive gauging (touch sensor, touch probe required)									
NC Gage									
Monitoring									
21.5-inch color LCD operation panel tilt adjustment									
One-Touch Spreadsheet									
Collision Avoidance System									
Real 3-D Simulation				●	●	●	●	●	●
Simple load monitor	Spindle overload monitor	●	●	●	●	●	●	●	●
NC operation monitor	Hour meter, workpiece counter	●	●	●	●	●	●	●	●
Status indicator									
Operation end buzzer									
Workpiece counters on machine									
Tool breakage no-load detection			●		●		●		●
MOP-TOOL	Adaptive control, overload monitor								
AI machine diagnostics*	Spindle + feed axes, or feed axes only								
Machine Status Logger									
Cutting Status Monitor									
Machining Navi M-*i*, M-*g*Ⅱ+(cutting condition search)									
Feed axis retraction									
Tapping retraction									
Tool retract cycle									
Automation / unattended operation									
Warm-up (calendar timer)									
External program	Button, rotary switch								
	Digital switch, BCD (2-digit, 4-digit)								
Connection with automated devices	Robot, loader I/F								
	Stacker crane I/F								
	FMS link I/F								
High-speed, high-precision									
AbsoScale detection	X-Y-Z axes								
Dynamic displacement compensation		●	●	●	●	●	●	●	●
0.1 µm control (linear axis commands)									
Hyper-SurfaceⅡ	3 linear axes, 3 linear axes + 2 rotary axes								
Straightness compensation									
ECO suite plus									
ECO Power Monitor	On-machine wattmeter								
Spindle Power Peak Limiter									
Energy-saving hydraulic unit	ECO Hydraulics (APC specs)								
External output interface of consumed electricity									
Other									
Circuit breaker									
OSP-VPSⅡ-EX (Virus Protection System)									
Pulse handles	2 pcs, 3 pcs								
External M codes [4 sets, 8 sets]									

* With AbsoScale detection specs, ball-screw wear detection is possible.

Notes: NML: Normal kit, AOT: Advanced One-Touch IGF-M kit, DT: Digital Twin kit,
DT AOT: Digital Twin Advanced One-Touch IGF-M, E: Economy, D: Deluxe
VE and VD kits are also equipped with the Digital Twin on PC function, allowing running from a PC.
Specifications, etc. are subject to change without notice.

MB-66VA
MB-66VB

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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