

MB-4000H

High-Speed Horizontal Machining Center



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High accuracy, High productivity, Environmentally friendly

All types of machining are supported, from mass production to high value-added processing, based on the concept of smooth, stress-free operation.

Environmentally friendly smart machine that contribute to realizing a carbon-free society

- High productivity Reduced non-cutting time
- High accuracy Outstanding accuracy stability with use of Thermo-Friendly Concept
- Easy to operate User friendly
- Expandable Easy to add more specs
- Environmentally friendly Autonomously achieves stable dimensional accuracies and reduced energy consumption



MB-4000H

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

Higher productivity achieved with higher machining capacity and reduced non-cutting time

High machining capacities achieved with fast, powerful spindles

Machining capacity

638 cm³/min

ø20 roughing end mill Material: S45C
Standard spindle: 15,000 min⁻¹

Tool	Spindle speed min ⁻¹	Cutting m/min	Feed rate mm/min	Cut width mm	Cut depth mm	Chips cm ³ /min
ø80 face mill 8 blades (cermet)	895	225	2,650	56	2.7	400
ø20 roughing end mill 7 flutes (carbide)	4,000	251	5,320	6	20	638
ø35 insert drill (carbide)	880	97	132	-	-	-
Tap M30P3.5	320	30	1,120	-	-	-

Note: The data shown here represent "actual data," which may not be obtained under different specifications, tooling, cutting, and other conditions.

Optimal performance, with spindle tailored to machining task

The types available include: standard spindle for various applications; optimal high-speed spindle for highly efficient aluminum and die/mold machining; — just pick the right spindle for the job.

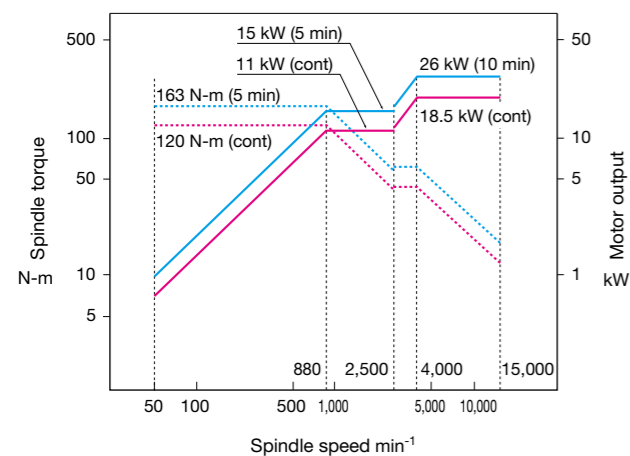
Standard spindle	7/24 taper No. 40, HSK-A63* ● Spindle speed: 15,000 min ⁻¹ ● Output: 26/18.5 kW (10 min/cont) ● Torque: 163/120 N-m (5 min/cont)
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* Option

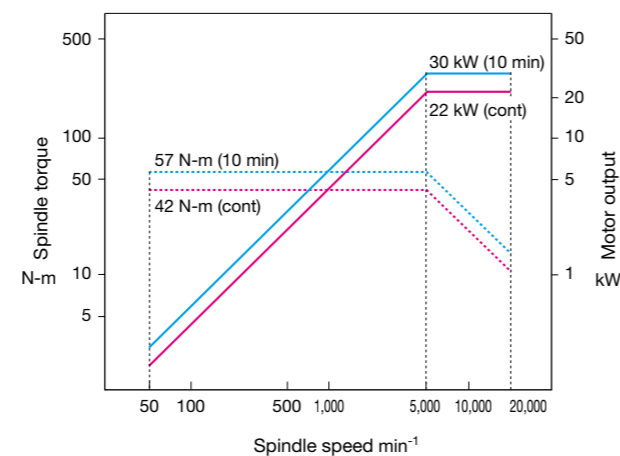
High-speed spindle*	HSK-A63 ● Spindle speed: 20,000 min ⁻¹ ● Output: 30/22 kW (10 min/cont) ● Torque: 57/42 N-m (10 min/cont)
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* Option

Standard specifications 15,000 min⁻¹



High-speed 20,000 min⁻¹



Mechanical structure and construction achieving highly efficient machining

Shorter lead times with reduced non-cutting time

Machine performance

Quicker movements reduce non-cutting time—ideal for high-mix production applications.

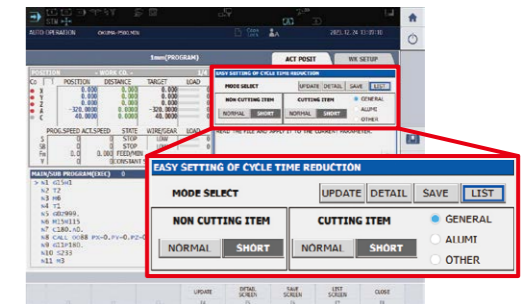
Rapid traverse	X-Y-Z: 60 m/min
Acceleration	Max. 1 G
Tool change	*1 T-T/C-C: 1.0/2.6 sec (tool mass less than 4 kg) 1.3/2.9 sec (tool mass more than 4 kg) *2 CTC min: 2.9 sec
Pallet change	*1 6.9 sec *2 7.0 sec

*1. MAS standard measurements (formerly JIS B 6013)

*2. ISO 10791-9 (2001) (JIS B 6336-9) measurements

Cycle time reduction

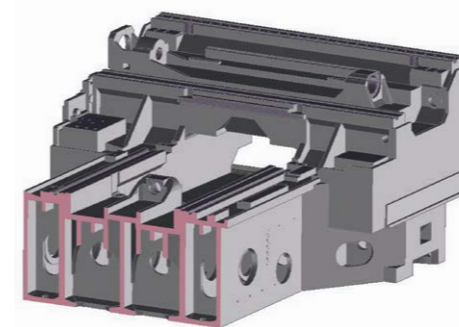
- Operation time reduction
The non-cutting time is shortened by simultaneously performing multiple operations, such as spindle rotation and axis movements, and allowing the rotational axis to take the shortest path.
- Machining time shortening
The cycle time is reduced for parts machining with frequent 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



Machine structure

- Integrated ball-screw bracket
- Y-axis motor base cooling
- Ball-screw cooling (option)
- High accuracy indexing table
- Pallet seating surface uses a taper cone system for high accuracy.
- NC 0.001° indexing

Bed supports rapid travel of large masses



Ribs placed directly under guideways

Highly rigid column strongly withstands bending and torsion



Diagonal rib configuration of columns

High accuracy and high quality machining with Intelligent Technology

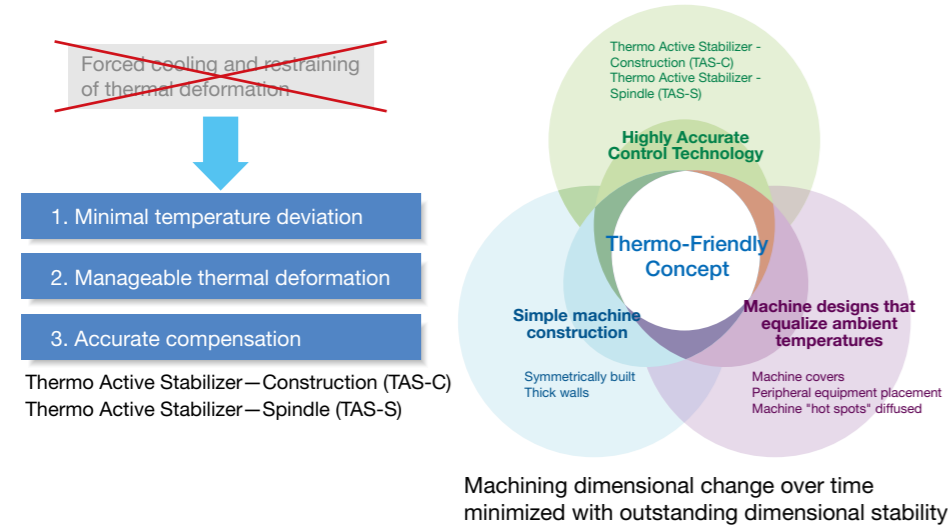
Thermo-Friendly Concept Manageable Deformation—Accurately controlled

High accuracy is enabled in normal factory environments. The unique approach of “accepting temperature changes.”

The machining accuracy of the workpiece changes significantly due to temperature change in the machine's periphery, heat generated from the machine itself, and heat generated from machining.

This unique Thermo-Friendly Concept accommodates such temperature changes, achieving stable accuracy together with reduced carbon dioxide emissions. There is no requirement for excessive ambient temperature control or special machine cooling systems to maintain processing accuracy.

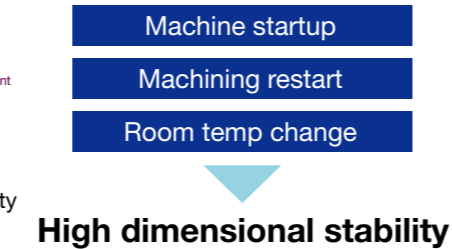
Thermo-friendly structure gives outstanding thermal stability



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.



TAS-C (Thermo Active Stabilizer—Construction)

TAS-C estimates and accurately controls the volumetric thermal deformation of the machine's construction due to ambient temperature changes; based on data from properly placed sensors, feed axis positions, and actual machine thermal deformation characteristics.

TAS-S (Thermo Active Stabilizer—Spindle)

The TAS-S spindle thermal deformation control takes into account various conditional changes such as the spindle's temperature data, modification of the spindle rotation and speed, as well as spindle stoppage. The spindle's thermal deformation will be accurately controlled, even when the rotating speed changes frequently.

SERVONAVI Optimized Servo Control

Achieves long term accuracy and surface quality

SERVONAVI AP (Automatic Parameter setting)

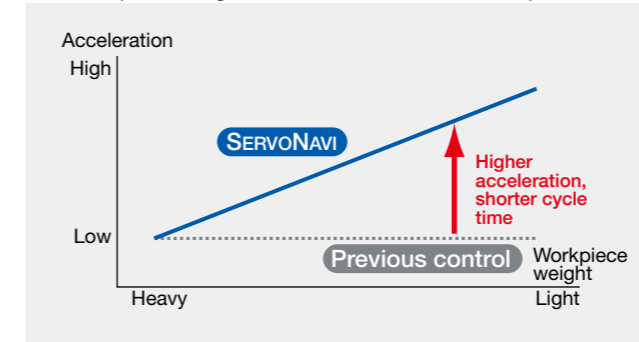
Work Weight Auto Setting

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 linear axis servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.

The workpiece weight and acceleration relationship



Rotary Axis Inertia Auto Setting

Maintains high accuracy and stable movements

Depending on the workpiece and its jig, the inertial mass may vary, and with each variation the positional error of the table rotation axis may increase.

Rotary Axis Inertia Auto Setting is able to estimate inertia from workpiece/fixture acceleration and deceleration, and automatically set the optimum the rotary axis servo parameters to maintain highly accurate and stable machine movements.

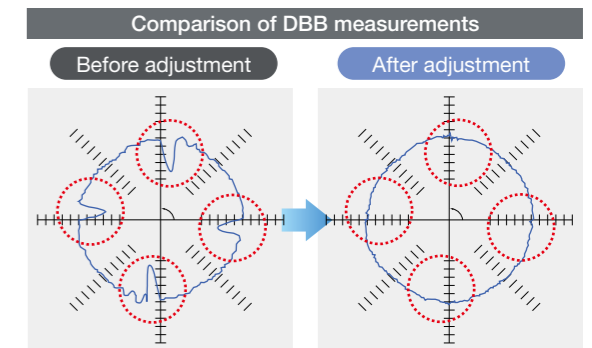
SERVONAVI SF (Surface Fine-tuning)

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).

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

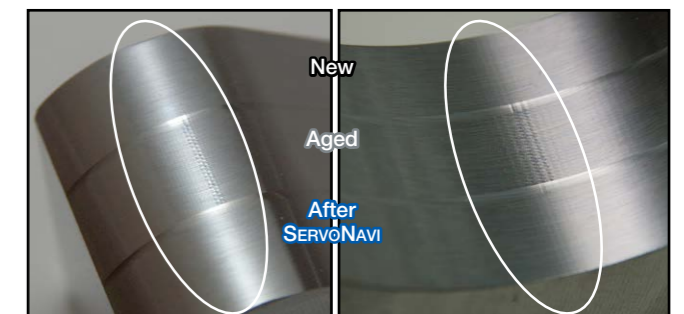


Vibration Auto Adjustment

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.



Excellent operability for improved production efficiency

Easy to operate (making life easier for the operator)

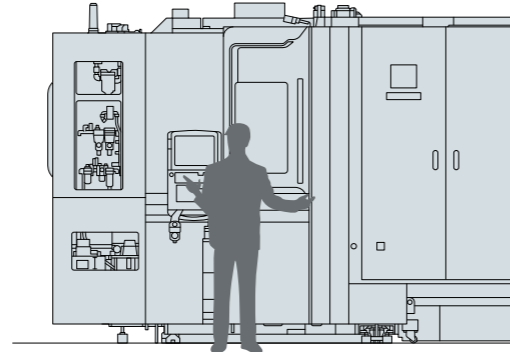
■ Ceiling door

- Good lighting and no coolant dripping
- Easy workpiece mounting/dismounting with a crane



■ Independent left-side operation panel

- Easier to operate the switches and watch machining chamber movements at the same time. (can swivel)



■ Column traverse system

- Outstanding accessibility to pallet (workpiece), spindle

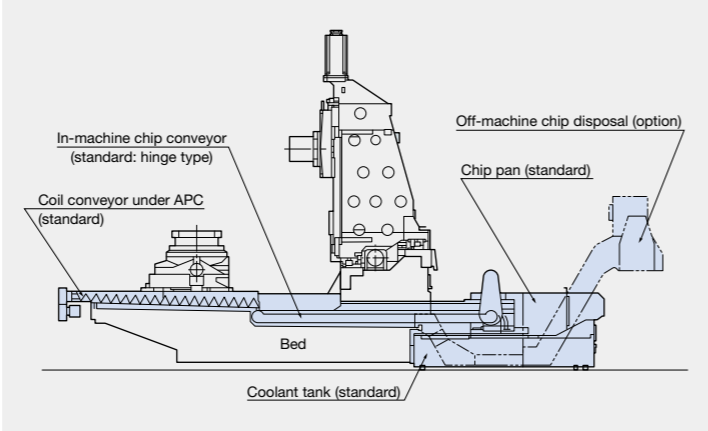
■ Chip discharge

- Chips discharged directly with center trough just under spindle
- No accumulation of chips in the machining chamber, neat and simple covering
- Washing in-machine and under pallet



In-machine chip conveyor

Chips discharged by conveyor



In-machine chip conveyor

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

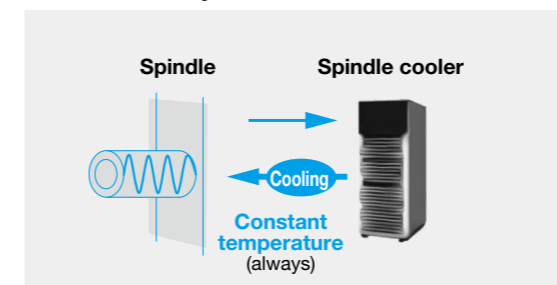
■ Reduction of power used for air conditioning

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



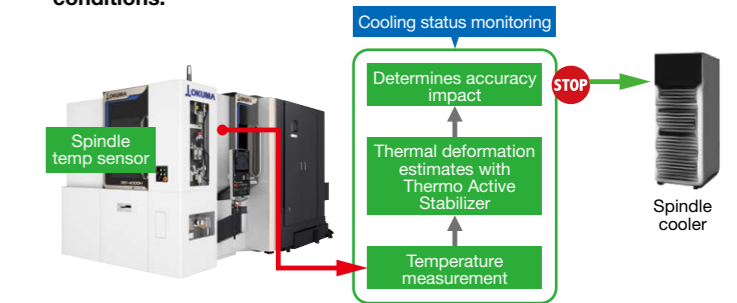
By always setting a constant coolant supply temperature, the cooler power consumption is reduced.

ECO suite plus A system for an energy-saving society

■ ECO Idling Stop

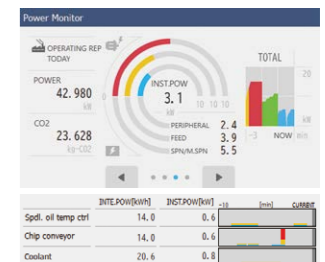
Auxiliary equipment consume a substantial portion of the power used in a factory. This function enables each of them to be turned off when not needed to reduce power consumption. In addition to when automatic operation is suspended, it is now possible to stop idling during manual operation. Power consumption 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.

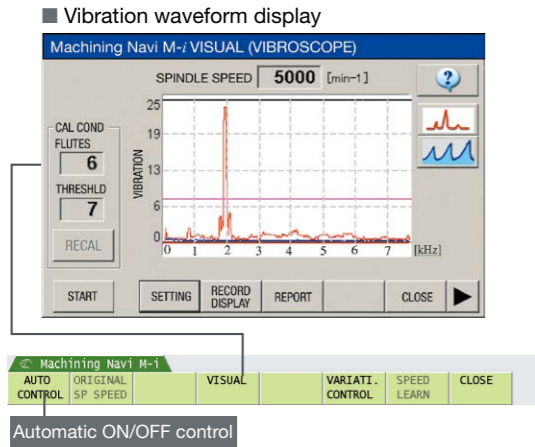
Advanced technology of OSP that is effective at the machining site

Machining Navi M-i, M-gII+ (option)

Cutting condition search for milling

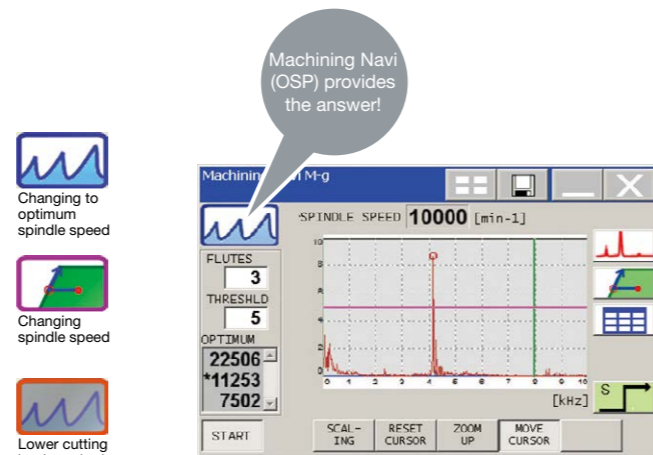
Automatically changes to optimum spindle speed (M-i)

Built-in sensors measure chatter vibration and the machine automatically changes to the best spindle speed.



Adjust cutting conditions while monitoring the data (M-gII+)

Navigates effective measures by detecting and analyzing machining chatter with a microphone attached to the machine.

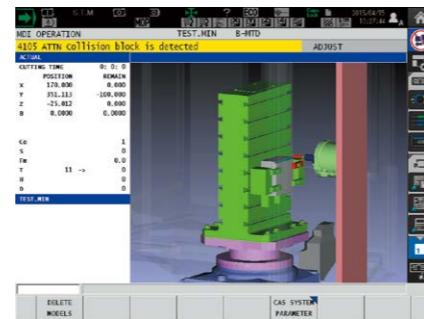


Collision Avoidance System (option)

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)

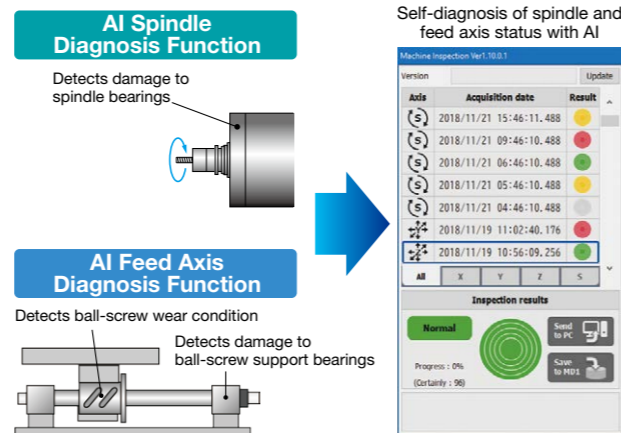
Machine tool diagnostics technology with artificial intelligence (AI)

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.

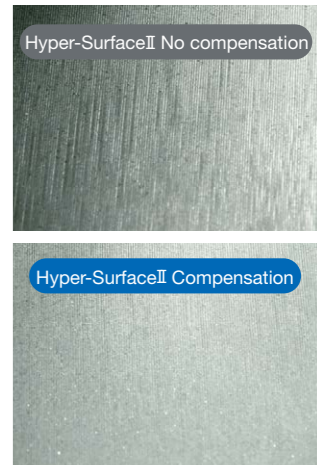
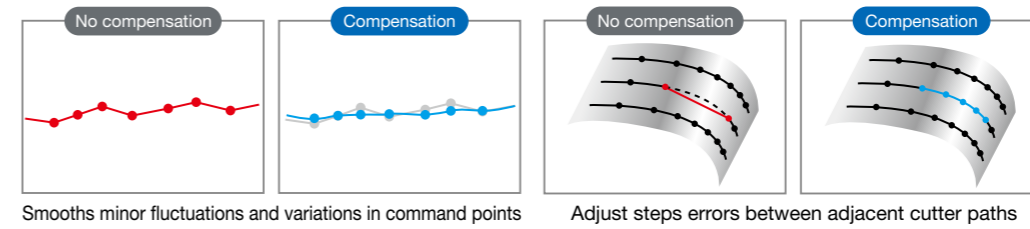
Notes:
AI diagnostic models are already installed, and diagnoses can be performed by the machine itself. AI diagnostic models can be updated through Okuma's Connect Plan. With AbsoScale detection specs, ball-screw wear detection is possible.



Hyper-SurfaceII (option)

Easy and improved die/mold surface quality

By suppressing streaks and edge irregularities caused by CAM machining data, hand finish polishing time can also be reduced. In addition to the Sculptured-Surface Adaptive Acceleration Control with the previous Super-NURBS, the new Hyper-Surface function automatically compensates for edge positioning errors of the machining data output from CAM or the adjacent cutting path while maintaining shape accuracy.



Comparison of machined surface quality

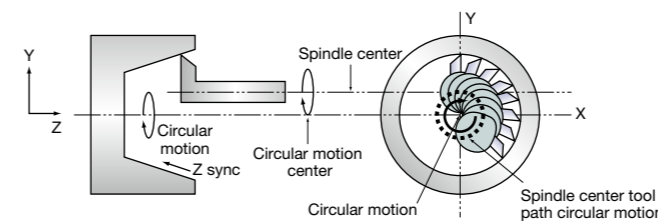
Turn-Cut (option)

Turning operations on machining centers

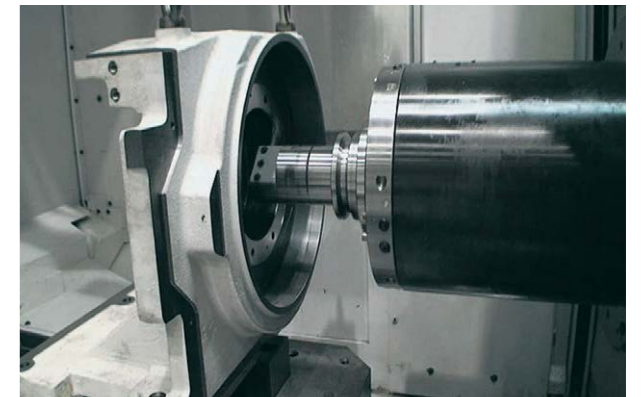
Shorter lead times with process-intensive machining

Simultaneously controlling X-Y circular motion with the tool edge position rotated by the spindle tool enables lathe-like turning.

- Tapers also possible
- Hole making with different diameters — with one tool
- IDs and ODs can be machined when they exceed the maximum tool diameter that ATC can handle



Note: AbsoScale detection and ball-screw cooling required.



Flat-Tool Grooving (option)

Airtight seal grooving

Grooving with high sealability

The spindle phase is precisely synchronized with cutting edge motion, to perform highly accurate grooving.

- Getting high sealability without hand finishing.
- Complex seal groove curves also cut with flat tools.



Flexible production for high-mix workpiece applications, with automated machining over long periods

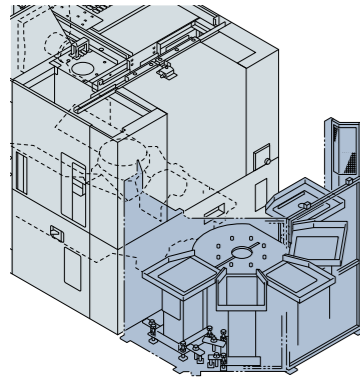
An impressive lineup of automation systems

Compatible with production plans matched to high-mix workpiece demand. The best system for the type of production can be selected.

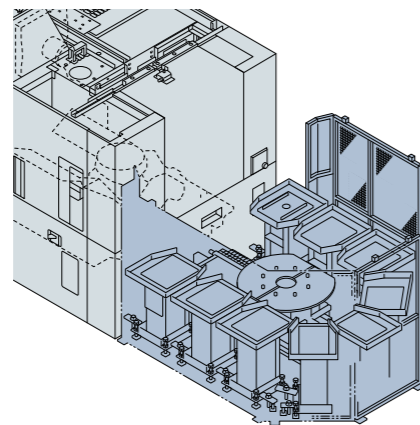
Flexible APC systems

- Multi-pallet APC connects to standard 2-pallet rotary-shuttle APC
- APC change time is the same as in the standard APC
- Can be adapted to match plant layout and type of production

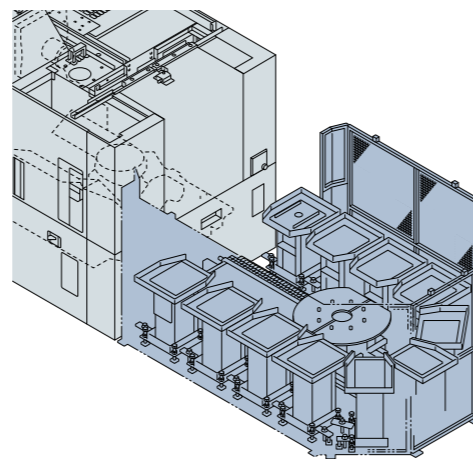
6-pallet APC



10-pallet APC

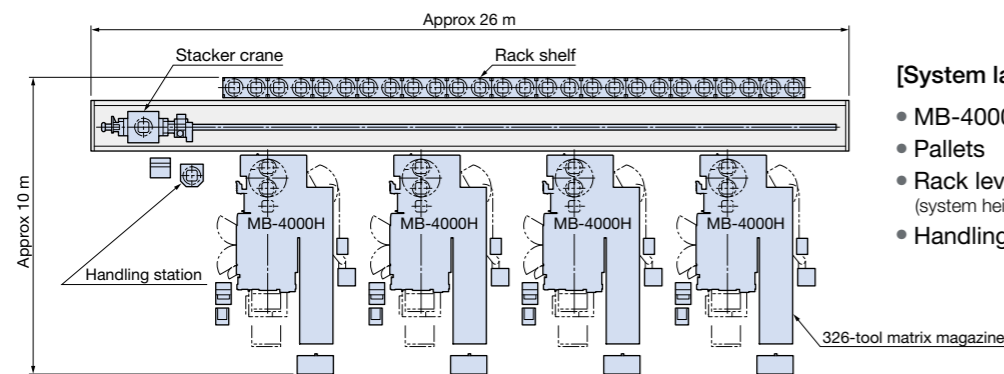


12-pallet APC



Ready for FMS applications

- An FMS with a smart, expandable stacker crane system



[System layout example]

- MB-4000H 4
- Pallets 50
- Rack levels 2 (system height approximately 3.5 m)
- Handling station 1

Efficient high-mix production of diverse parts

Expandability of tool magazine

Respond flexibly with magazine matched to needed tool storage capacity.

Space-saving with large tool capacity



Chain system ATC magazine (64-tool: option)

Chain system ATC magazine (front-facing)



Matrix system ATC magazine (option)

Matrix system ATC magazine

Front-facing chain type ATC magazine

- Easy tool exchange: 48-tool, 64-tool tool magazines
- Magazine door opens to the floor

Standard	Chain system	48 tools
	Chain system	64 tools
Optional Specifications	Matrix system	110 tools, 146 tools, 182 tools, 218 tools, 326 tools

Machine Specifications

	Item	Unit	MB-4000H
Travels	X-axis (column left/right)	mm (in)	560 (22.05)
	Y-axis (spindle up/down)	mm (in)	560 (22.05)
	Z-axis (table front/back)	mm (in)	625 (24.61)
	Spindle center to pallet top	mm (in)	50 to 610 (1.97 to 24.02)
	Spindle nose to pallet center	mm (in)	85 to 710 (3.35 to 27.95)
Pallet	Pallet size	mm (in)	400 × 400 (15.75 × 15.75)
	Max load	kg (lb)	400 (880)
	Indexing angle	deg	0.001
	Max workpiece dimensions	mm (in)	ø600 × 900 (ø23.62 × 35.43)
Spindle	Spindle speed	min ⁻¹ (rpm)	50 to 15,000 [50 to 20,000]
	Tapered bore		7/24 taper No. 40 [HSK-A63]
	Bearing dia	mm (in)	ø70 (ø2.76)
Feed rate	Rapid traverse	m/min (ipm)	X-Y-Z: 60 (2,362)
	Cutting feed rate	mm/min (ipm)	1 to 60,000 (0.04 to 2,362)
Motors	Spindle (10 min/cont)	kW (hp)	26/18.5 (35/25) [30/22 (47/33)]
	Feed axes	kW (hp)	X: 4.6 (6.13), Y-Z: 3.5 (4.67)
	Table indexing	kW (hp)	3.0 (4.0)
Auto tool changer (ATC)	Tool shank		MAS403 BT40 [HSK-A63]
	Pull stud		MAS2 [-]
	Magazine capacity	tools	48 [64, 110 to 326]
	Max tool dia (w/ adjacent)	mm (in)	ø70 (ø2.76)
	Max tool dia (w/o adjacent)	mm (in)	ø150*1 (ø5.91)
	Max tool length	mm (in)	300 (11.81) [400 (15.75)]*2
	Max tool mass	kg (lb)	10 (22)
Machine Size	Tool selection		Memory random*3
	Height	mm (in)	2,650 (104.33)
	Floor space; width × depth	mm (in)	2,420 × 4,700 (95.28 × 185.04)
Controller	Mass	kg (lb)	9,500 (20,900)
			OSP-P500M

*1. Max tool size 2 pots away can not exceed ø110 mm (ø4.33 in)

*2. Shutter open/close times become longer with the optional specification.

*3. Fixed address for 110 or more tools

[] : Option

Standard Specifications

Spindle/spindlehead cooling system	Oil temperature controller	Work lamp	LED, 1 location
		Status indicator	3-lamp signal tower
Hydraulic unit		Foundation washers	
Centralized lubrication automatic oil supplier	Tank 6 L, oil level alarm and pressure alarm equipped	Side-slip prevention tool	Chemical anchors included
		Auto tool changer	Tool capacity: 48
Coolant supply system	Tank 750 L (510 L*), pump motor 1,500 W (double use for nozzle and in-machine)	Auto 0.001° indexing table	
		Auto pallet changer (APC)	2-pallet rotary-shuttle*2
Coolant nozzle	Insert nozzle type	In-machine chip discharge*3	Hinge type chip conveyor
Table area wash	In-machine and under-pallet wash	Chip pan for above	
ATC air blower (blast)		In-machine chip discharge (below APC)	Coil type chip conveyor
Chip air blower (blast)	Nozzle type		
Full enclosure shielding		TAS-S	Thermo Active Stabilizer – Spindle
Hand tools, tool box		TAS-C	Thermo Active Stabilizer – Construction
Tool release lever		Door interlock	
Tapered bore cleaning bar			

*1. Effective *2. Pallets with MAS tapped holes *3. Directly below the spindle

Optional Specifications



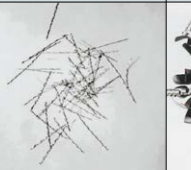
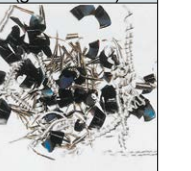
Spindle speeds	50 to 20,000 min ⁻¹ (30/22 kW), HSK-A63	Off-machine chip discharge (lift-up chip conveyor)	Please see the chip conveyors below
Dual contact spindle*1	HSK-A63, BIG-PLUS®	Chip buckets (heights)	L type: 700 mm, H type: 1,000 mm
ATC magazine capacity (tools)	64 (chain) 110, 146, 182, 218, 326 (matrix)	Hydraulic oil cooler	
Max ATC tool length	Max tool length: 400 mm	Coolant heater/cooler	
AbsoScale detection	X-Y-Z axes	Auto tool length compensation	Touch sensor (w/tool breakage detection)
APC pallets	6, 10, 12, FMS	Auto workpiece gauging	Touch probe (w/zero offset)
Pallet surfaces	T-slot	Pull stud shape	MAS1, JIS, CAT, DIN
Spare pallets		Standard T-column fixture	Height: 640 mm, width: 400 mm, T-slot pitch: 80 mm
Edge locator		Standard square-column fixture	Height: 640 mm, width: 270 mm, T-slot pitch: 80 mm
Coolant pump		Angle plate	
Thru-tool coolant	1.5 MPa	Ball-screw cooler	X-Y-Z axes
Thru-spindle coolant*2	MPa: 1.5, 7.0, large flow 1.5, large flow 7.0	Additional work lamp	
Suction of excess coolant in spindle		Machining Navi	M-i, M-gII+
Semi-dry machining	Thru-spindle, nozzle, thru/nozzle switch	Turning cut	AbsoScale detection (X-Y-Z axes and ball-screw cooling are required)
Shower coolant	10 nozzles, 550 W pump	Hydraulic fixture systems	Linked, pallet-thru types
Table area wash discharge		Recommended for die machining	AbsoScale detection (X-Y-Z axes) Hyper-Surface II
Work wash gun	250 W pump		DNC-DT, 0.1 µm control
Oil mist lubricator			
Mist collector			
Chip air blower	Adapter		
In-machine chip discharge	Scraper type chip conveyor		

*1 Be sure to select this specification when BIG-PLUS® holder is used.

*2 Okuma pull studs required.

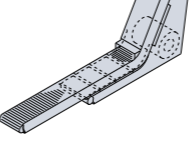
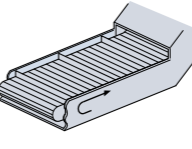
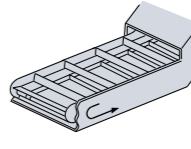
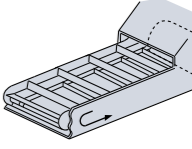
Chip conveyors (Please contact an Okuma sales representative for details.)

○ : Recommended △ : Conditionally recommended

Workpiece material	Steel	Cast iron	Aluminum / Non-ferrous metal	Mixed (general use)
Chip shape				
In-machine	Hinge type (standard) *1	○	○	○
Off-machine (option)	Hinge + scraper (with drum filter)	○	○	○
	Hinge type	○	—	△ *2
	Scraper type	—	○ (Dry)	—
	Scraper type (with drum filter)	—	○ (Wet) with magnet	△ *3

*1. Scraper type (option) can be selected. *2. When there are few fine chips *3. When chips are shorter than 100 mm

Off-machine lift-up chip conveyors

Name	Hinge + scraper (with drum filter)	Hinge	Scraper	Scraper (with drum filter)
Shape				

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 create 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

The same simulation can be run on the CNC of a real machine as well as on an office PC. When a problem occurs on the shop floor, it can be solved quickly on site without going back to the office.

The CNC control, data, and 3D models, the same as those on the real machine, are used to faithfully simulate a virtual machine and improve simulation accuracy.

Pre-verification can be conducted in a short time through super high-speed simulation.

1 Digital Twin On PC^{*1}

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.

*1. 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.

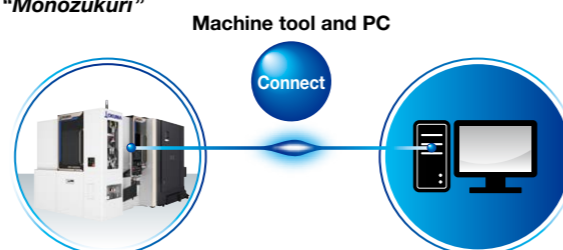


Connect Plan

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
	Programming	Program capacity
Program operations		Scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, Coordinate calculate, area machining, coordinate convert, programming help, user task, 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, SERVO NAVI, Cycle time reduction (operation time reduction, machining time reduction, easy parameter setting)
Energy-saving	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.

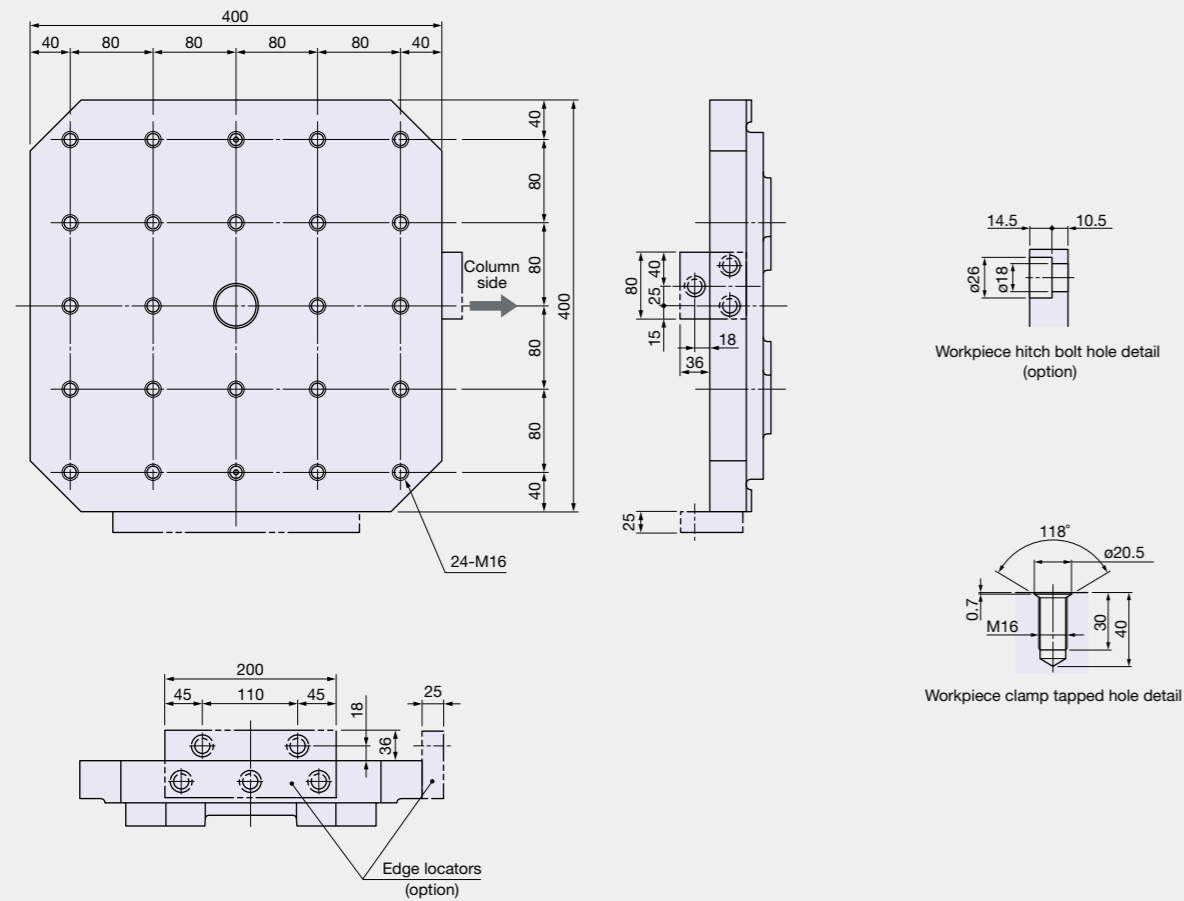
OSP-P500M kit/optional specifications

Item	Kit Specs	NML		AOT		DT		DT AOT	
		E	D	E	D	E	D	E	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 10MB									
Program notes (MSG)									
Auto scheduled program update									
Block skip: 9 sets									
Program branch: 9 sets									
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									
Turn-Cut									
Dynamic Tool Load Control									
3-D tool compensation									
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								
Gauging									
Auto tool length offset/breakage detection									
In-magazine tool breakage detection									
Auto Workpiece Gauging/Auto zero offset									
Manual gauging (w/o sensor)									
Interactive gauging (touch sensor, touch probe required)									
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									
Tool retract cycle									
Automation / unattended operation									
Warm-up (calendar timer)									
External program	Button, rotary switch								
	Digital switch, BCD (2-digit, 4-digit)								
Pallet pool control (PPC) (Required for multi-pallet APC)									
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-Surface II	3 linear axes, 3 linear axes + 2 rotary axes								
ECO suite plus									
ECO Power Monitor	On-machine wattmeter								
Spindle Power Peak Limiter									
Energy-saving hydraulic unit	ECO Hydraulics								
External output interface of consumed electricity									
Other									
Circuit breaker									
OSP-VPSII (Virus Protection System)									
Pulse handles	2 pcs, 3 pcs								
External M codes	[4 sets, 8 sets]								

Note: NML: Normal kit, AOT: Advanced One-Touch IGF-M kit, DT: Digital Twin kit, DT AOT: Digital Twin Advanced One-Touch IGF-M kit, E: Economy, D: Deluxe
VE and VD kits are also equipped with the Digital Twin on PC function, allowing running from a PC.
* With AbsoScale detection specs, ball-screw wear detection is possible.
Specifications, etc. are subject to change without notice.

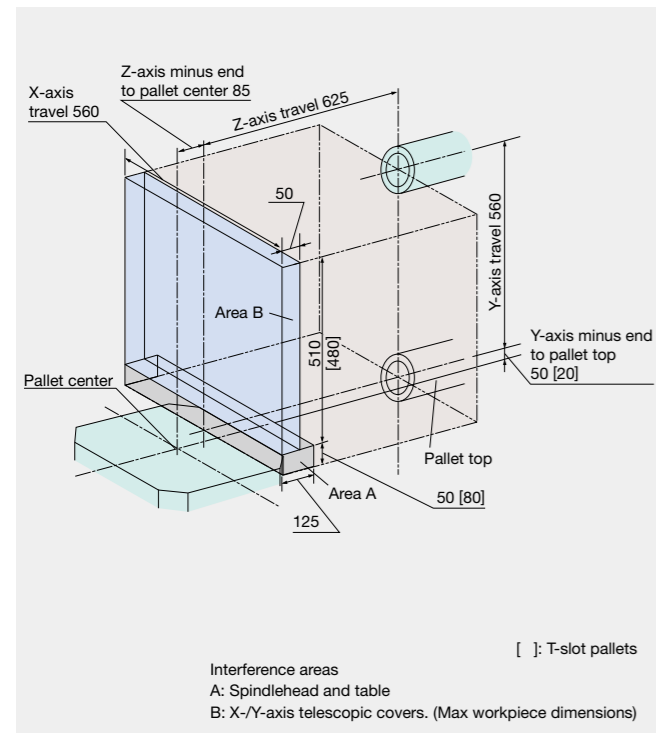
■ Pallet dimensions

Unit: mm



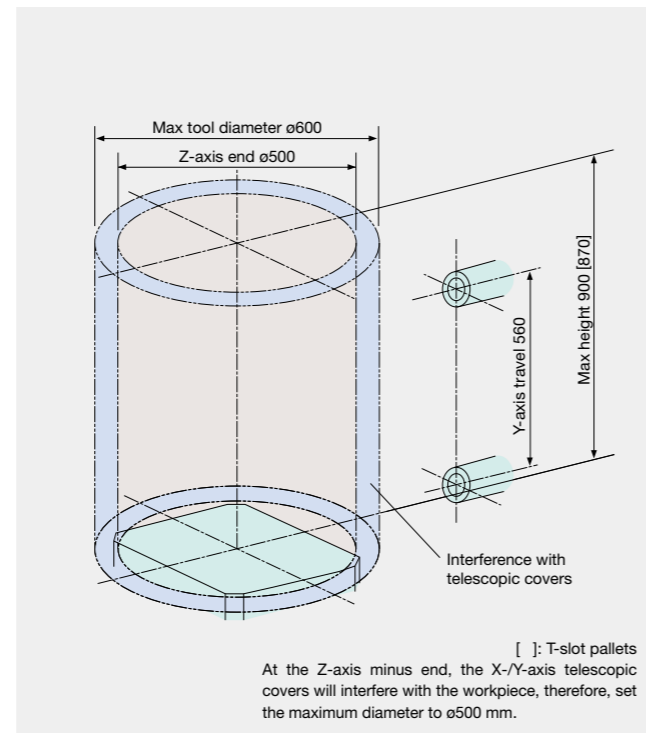
■ Working range

Unit: mm



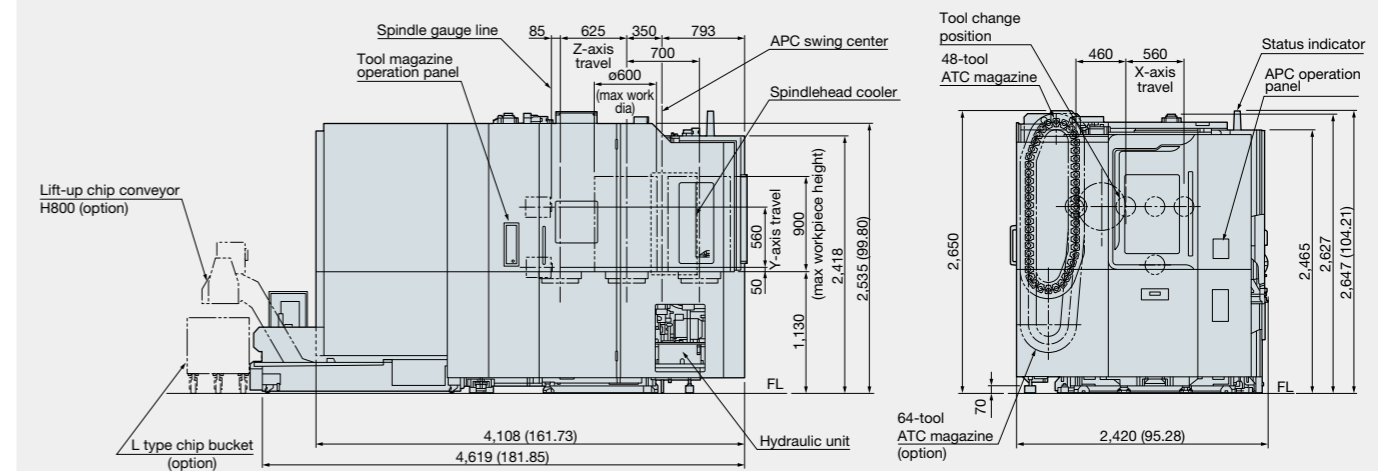
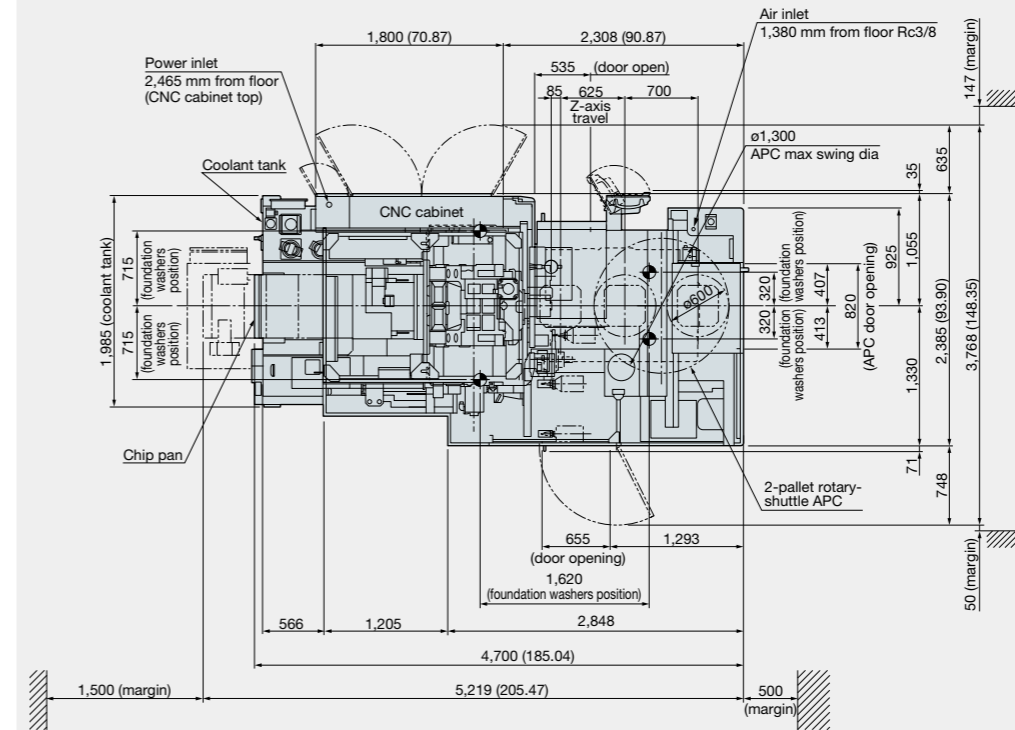
■ Maximum workpiece dimensions

Unit: mm



MB-4000H Dimensional and Installation Drawings

Unit: mm (in)



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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