

MA-500HII

Horizontal Machining Center



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Master craftsmanship manufacturing for a wide range of applications

From highly precise stable machining of mass-produced parts to extended continuous machining of dies, this machine delivers exceptional results across various machining scenarios.

It is a flagship machine that handles a wide range of machining tasks, from heavy cutting to accurate machining with performance that exceeds expectations.



Ideal performance levels from a variety of spindles for a wide range of applications

- Machining capacity: 901 cm³/min (S45C)

Outstanding dimensional stability with long-run machining of large workpieces

- The Thermo-Friendly Concept, which minimizes dimensional changes caused by ambient temperature fluctuations and machining heat, is applied as standard. Achieves outstanding dimensional stability even during long-run machining.

Productivity improved by shortening non-cutting time

Contribution to the realization of a carbon-free society

- High productivity/high precision and environmental friendliness are achieved at the same time with the Green-Smart Machine and Sludgeless Tank

Flexible production of large-variety workpiece applications

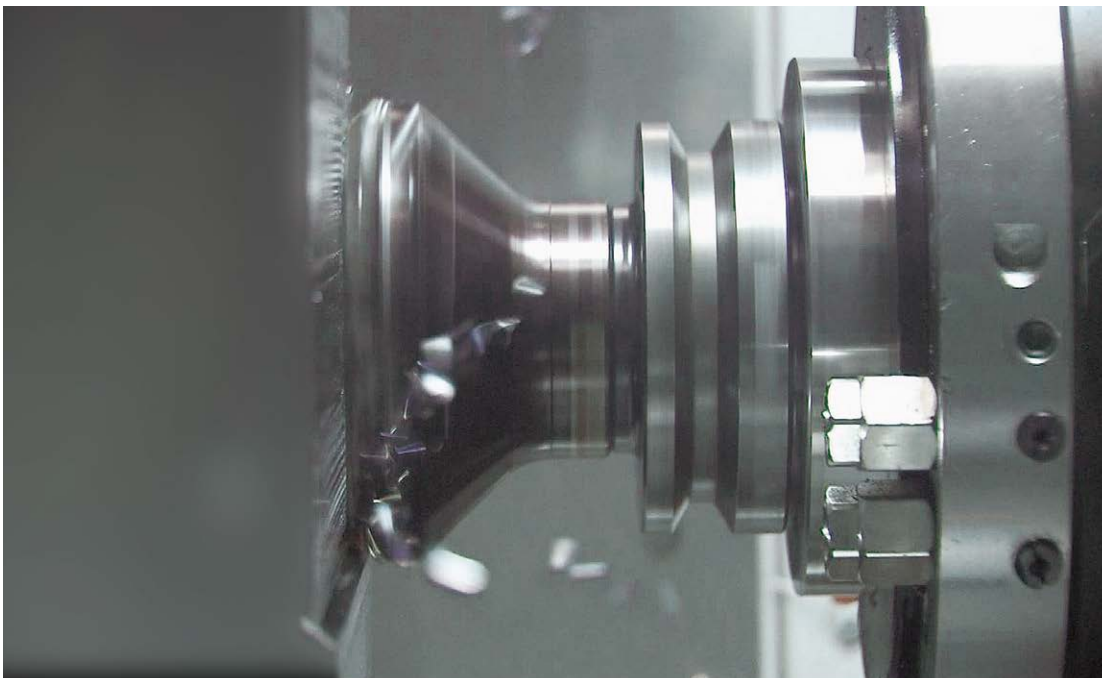
- Respond with a magazine that can store the required number of tools
- Multi-pallet APC and FMS support production plans tailored to the demand for high-mix workpieces

Large-volume chip discharge systems effectively handle automated, long run applications

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

Ideal performance levels from a variety of spindles for a wide range of applications

Highly efficient production with high machining capacity



Machining capacity

Standard spindle No. 50 6,000 min⁻¹

Milling capacity

901 cm³/min
(S45C)

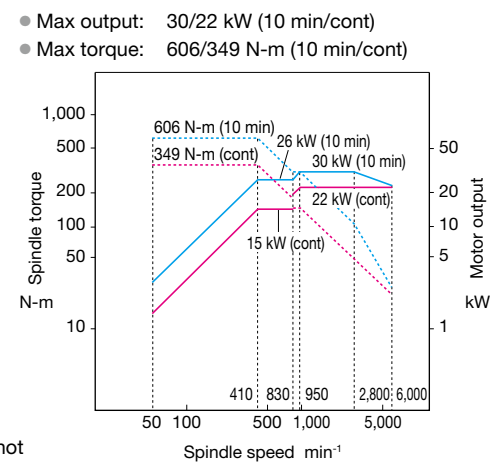
Tool: ø100 mm face mill
10 blades (carbide)
Spindle speed: 955 min⁻¹
Cutting Speed: 300 m/min
Feed rates: 3,220 mm/min
Cut width × depth: 70 mm × 4 mm

End milling capacity

625 cm³/min
(S45C)

Tool: ø50 mm end mill
Porcupine cutter (carbide)
Spindle speed: 1,146 min⁻¹
Cutting Speed: 180 m/min
Feed rates: 500 mm/min
Cut width × depth: 25 mm × 50 mm

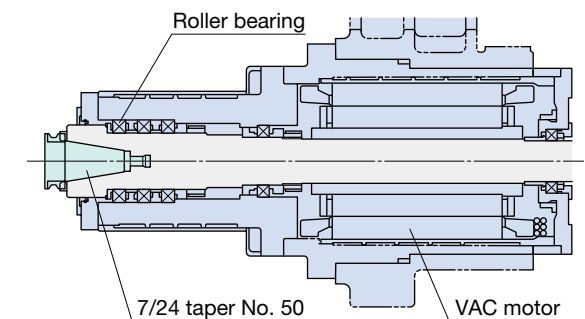
Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting condition, and others.



Spindle lineup for machining a wide range of materials, from steel to titanium/Inconel

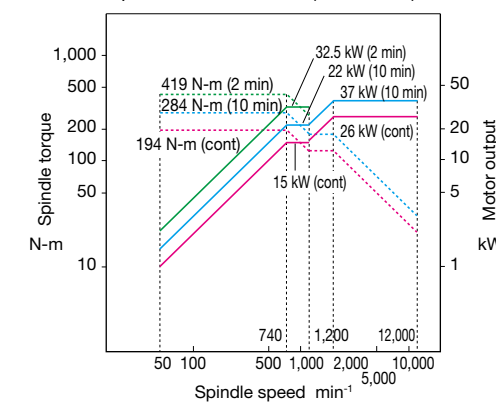


Standard spindle: 6,000 min⁻¹
Front roller bearings also suitable for powerful cutting
Long service life oil-air lubrication for all spindles



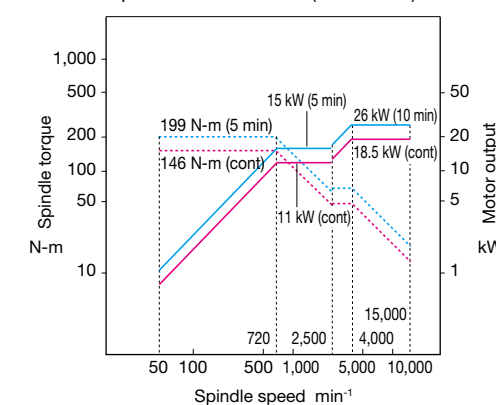
Wide-range spindle No. 50 (option) 419 N-m

- Spindle speed: 12,000 min⁻¹
- Max output: 37/26 kW (10 min/cont)
- Max torque: 419/194 N-m (2 min/cont)



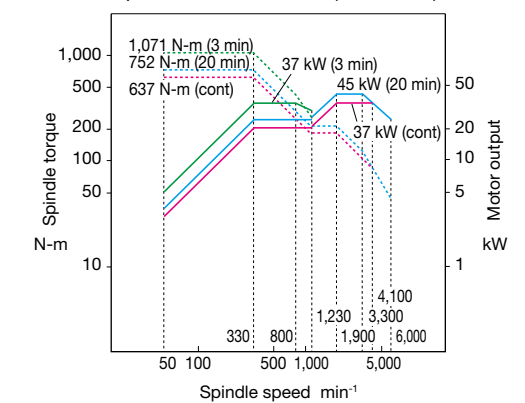
Wide-range spindle No. 40 (option)

- Spindle speed: 15,000 min⁻¹
- Max output: 26/18.5 kW (10 min/cont)
- Max torque: 199/146 N-m (5 min/cont)



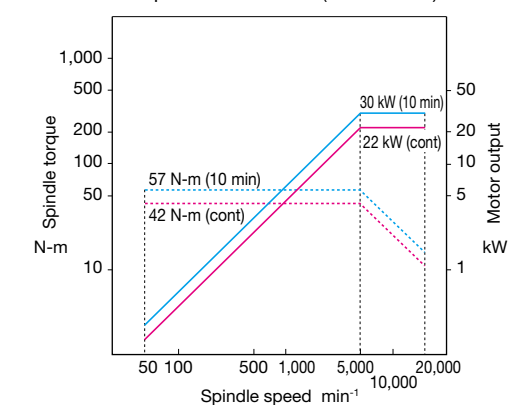
High-torque spindle No. 50 (option) 1,071 N-m (heavy-duty cutting)

- Spindle speed: 6,000 min⁻¹
- Max output: 45/37 kW (20 min/cont)
- Max torque: 1,071/637 N-m (3 min/cont)



High-speed spindle HSK-A63 only (option)

- Spindle speed: 20,000 min⁻¹
- Max output: 30/22 kW (10 min/cont)
- Max torque: 57/42 N-m (10 min/cont)



Outstanding dimensional stability with long-run machining of large workpieces

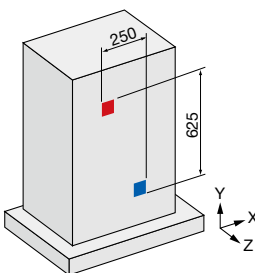
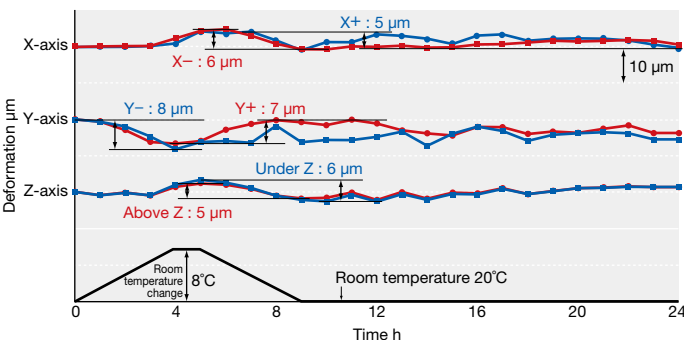


Eliminate waste with the Thermo-Friendly Concept

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.

Thermal deformation over time: 8 μm (room temperature change: 8°C)



Measuring position X: 250 mm, Y: 625 mm
Coolant (with shower washing)

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.

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

Machine is structurally designed to achieve outstanding accuracy

Highly rigid 3-point supported bed

Easy installation thanks to bed that does not twist. Supporting stable, high accuracy over a long period.

Ball-screw bracket

The ball-screw brackets at both ends of the X-Y-Z axes are reinforced and combined for highly accurate drive and positioning.

Ball-screw cooling

Simple ball-screw cooling in the X-Y-Z axes (including motor bracket cooling) is applied as standard. Assuring stable accuracy during high rates of operation.

Indexing table and pallet

Highly accurate indexing table

- Standard: Curvic coupling (1 degree indexing)
- Optional: NC (0.001 degree indexing)

The pallet seating on a tapered cone achieves highly accurate positioning and excellent durability.

The exactness of bi-directional positioning

(AbsoScale actual data*)

- X-axis (travel: 700 mm) **1.7 μm**
- Y-axis (travel: 900 mm) **2.3 μm**
- Z-axis (travel: 780 mm) **1.2 μm**

Bi-directional repeatability

(AbsoScale actual data*)

- X-axis (travel: 700 mm) **1.0 μm**
- Y-axis (travel: 900 mm) **2.3 μm**
- Z-axis (travel: 780 mm) **0.9 μm**

* The “actual data” referred to above represent examples of data obtained by using ISO 230-2 test methods done at Okuma factories, and they are not guaranteed values.

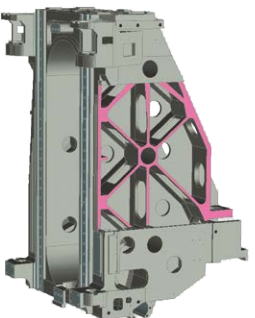
Productivity improved by shortening non-cutting time

High-speed operation and highly rigid structure

Rapid traverse:	60 m/min (X-Y-Z axes)
Rapid acceleration:	0.7 G (maximum)
Tool change:	2.0 sec (T-T)*
	4.9 sec (C-C)*
	4.9 sec (CTCmin)*
Table indexing:	1.9 sec (1 degree indexing 90 degrees)
	2.4 sec (0.001 degree indexing 90 degrees)
Pallet change:	11.4 sec (MAS)
	11.6 sec (ISO)

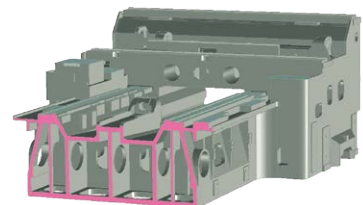
* T-T, C-C: MAS standard measurements (formerly JIS B 6013)
CTCmin: ISO 10791-9 (2001) (JIS B 6336-9) measurements

Highly rigid column strongly withstands bending and torsion



Diagonal rib configuration of column

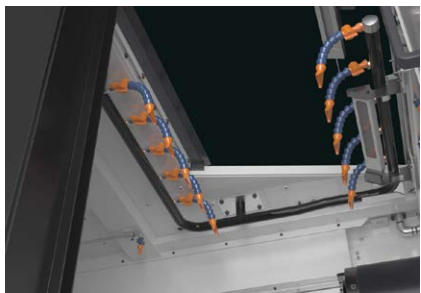
Bed supports fast travel of heavy parts



Ribs placed directly below guideways

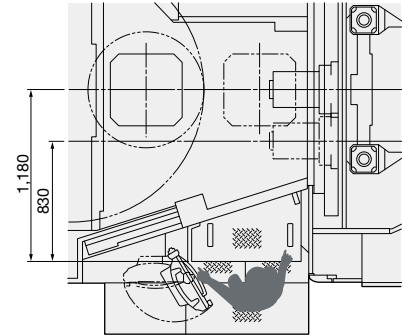
Open-ceiling door

- Easy part load/unload with a crane
- Good lighting and no coolant dripping



Excellent accessibility to spindle and workpiece

- 830 mm from operation panel to spindle at the column traverse. Good access to machine interior with wide, 2-step platform



Left-mounted operation panel Improved visibility with swivel monitor

- XYZ direction of the workpiece and operation screen are the same
- Operator and screen proximity for less fatigue during operation



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.

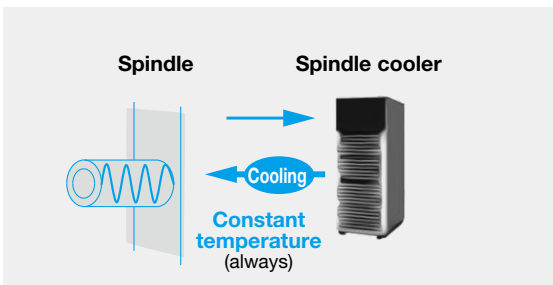
■ Reduction of power used for air conditioning

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



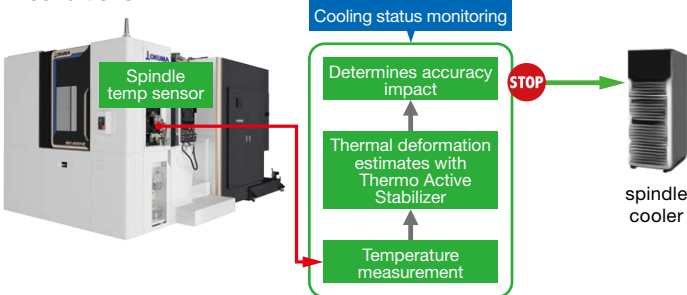
By always setting a constant coolant supply temperature, the cooler power consumption is reduced.

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.

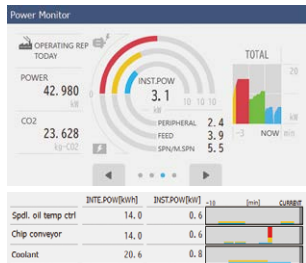


■ ECO Power Monitor

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.



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 (recommended option) efficiently collects sludge and reduces defects caused by coolant containing sludge, such as scratches on machined surfaces and trouble with cutting tools. 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. Coolant supplied with thru-spindle coolant specifications (option) uses a bag filter to collect even finer sludge and improve machined surface quality.

Sludge removal rate **99%**

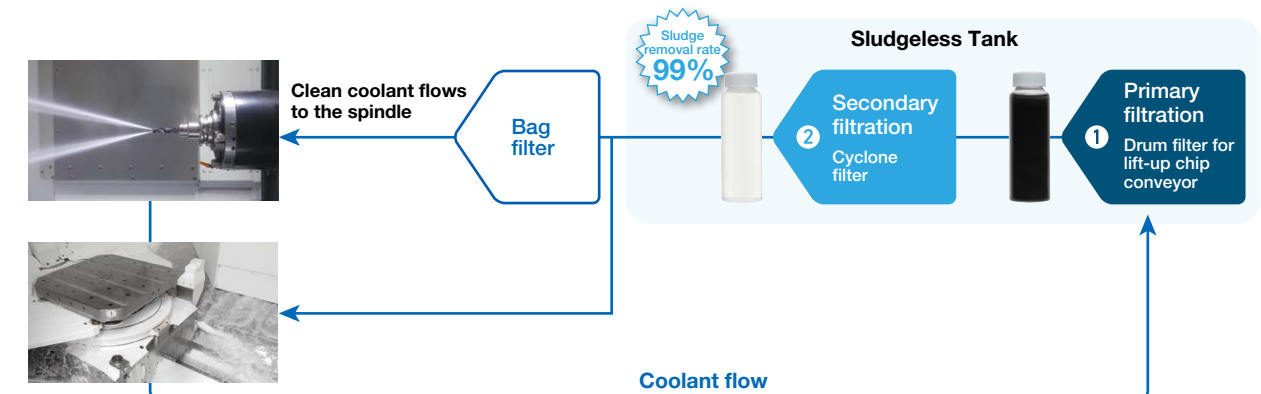
(when the material is casting and aluminum)

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)

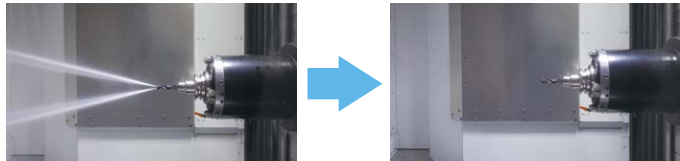
Note: It is necessary to select the hinge + scraper (with drum filter) type chip conveyor if the Sludgeless Tank option is chosen.



Suction of excess coolant in spindle (option)

Shorter tool change times are possible when using thru-spindle coolant

In-spindle coolant suction eliminates the need for an air blow to remove residual coolant, shortening tool change time. It also prevents the generation of mist due to air blowing, helping maintain a clean working environment. Additionally, the frequency of required cleaning is reduced, easing the workload on the operator.



Tool storage capacity tailored for efficient high-mix production of workpieces

Respond with a magazine that can store the required number of tools

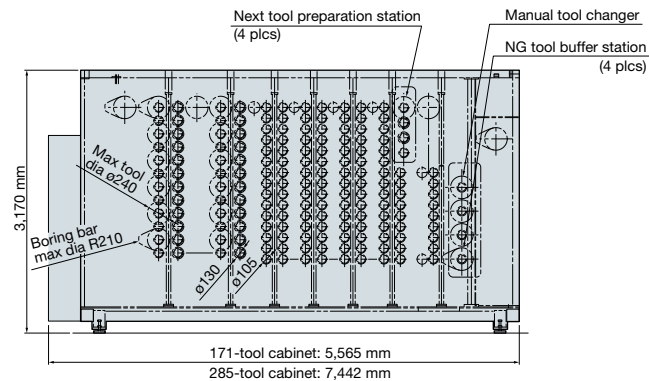
Auto tool changer

This system can flexibly accommodate an increasing number of tools, which becomes larger as more types of workpieces are added. The matrix magazine saves space and shortens tool change time when using multiple tools.

ATC magazine capacity	Magazine type	ATC tool		
		Max diameter		Maximum length, mass, moment
		w/adjacent	w/o adjacent	
40 tools (standard), 60 tools	Chain magazine	ø140 mm	ø240 mm	Max length: 450 mm Max mass: 25 kg Mass moment: 36.75 N-m
81 tools,111 tools,141 tools,171 tools, (171-tool cabinet)	Matrix magazine	ø105 mm (standard)	ø240 mm (large size)	
195 tools, 225 tools, 255 tools, 285 tools, (285-tool cabinet)		ø130 mm (mid-size)		
100 tools, 150 tools, 200 tools, 240 tools, 320 tools, 400 tools	Multiple magazine	ø135 mm	ø240 mm	

Supports ATC matrix magazines with 81 tools or more

- Tool prep time reduced
Minimum: 12 seconds (multiple magazines: 19 seconds)
- Narrower machine width
- Simplified spec change (increase/decrease racks per tool vol.)



Magazine type	171-tool cabinet			285-tool cabinet		
Tool storage capacity	Total 171 tools	Standard tools only: up to ø105 Mid-size tool: tool up to ø130 (Large tool: ø130 to ø240)	123 tools 48 tools 12 tools)	Total 285 tools	Standard tools only: up to ø105 Mid-size tool: tool up to ø130 (Large tool: ø130 to ø240)	213 tools 72 tools 18 tools)

Note: Chain magazine 60 tools; matrix magazine and multiple magazine are optional.

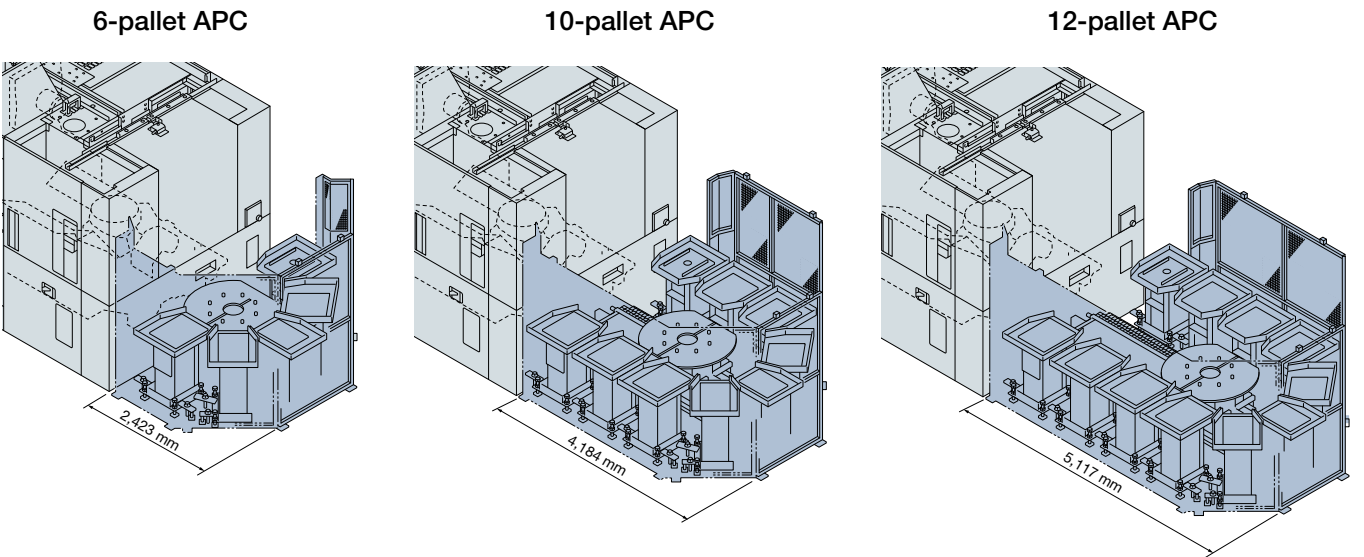
Flexible production of large-variety workpiece applications

Multi-pallet APC and FMS support production plans tailored to the demand for high-mix workpieces

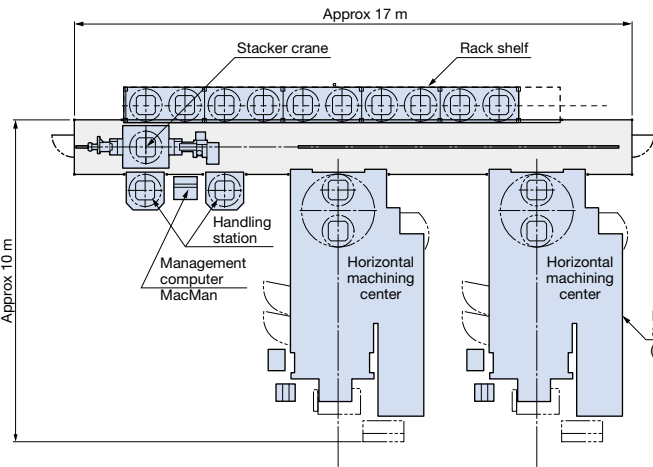
Flexible APC units

The multi-pallet APC allows the operator to set workpieces on the pallet in advance, enabling continuous operation for long hours and eliminating the need of manual loading and unloading of the workpieces, thereby allowing the operator to focus on other tasks. Setups at the end of the day for untended operations are also a benefit.

- Multi-pallet APC connects to standard 2-pallet rotary-shuttle APC
- A suitable APC unit can be selected according to the plant layout and production type



Ready for FMS applications



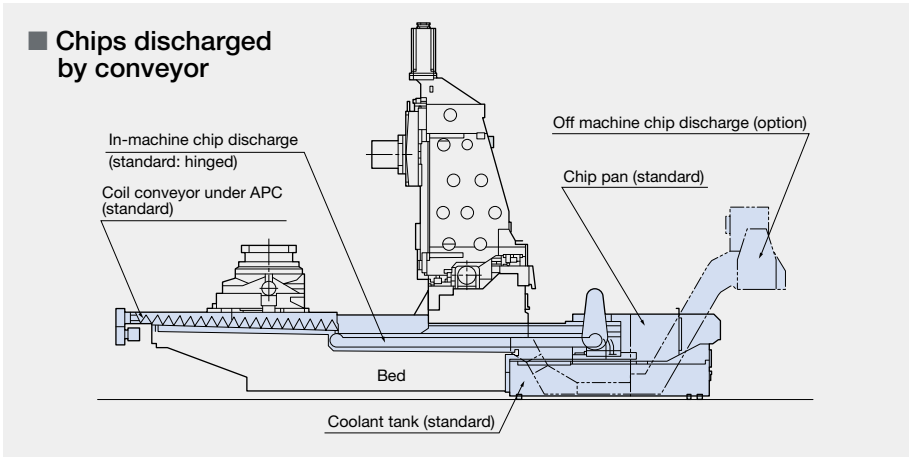
With several machines, stacker/transport system, and a control system, this FMS makes possible flexible production of large-variety, large-volume jobs. With long, untended operations, efficient (waste-less) machine utilization, reduced work-in-progress inventory, and space-saving arrangement raises shop productivity to high levels.

- [System layout example]
- Horizontal machining centers : 2
 - Pallets: 30
 - Rack levels: 3 (system height approximately 6 m)
 - Handling stations: 2

Large-volume chip discharge systems effectively handle automated, long run applications

Chip discharge

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



In-machine chip discharge



Off-machine chip discharge



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

Workpiece material	Steel	Cast iron	Aluminum/non-ferrous metal	Mixed (general use)
Chip shape				
In-machine chip discharge	Hinge (standard)*1			
Off-machine chip discharge (option)*2	Hinge + scraper with drum filter (recommended)			
	Hinge type			
	Scraper type*3			
	Scraper type with drum filter			

*1. Scraper type (option) can be selected *2. With limitations per conveyor discharge direction *3. When chips are not longer than 100 mm

Off-machine lift-up chip conveyors

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

Note: Becomes hinge + scraper with drum filter if Sludgeless Tank (option) is selected.

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.

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.



15-inch operation panel

1 Digital Twin On PC*

Simulate shop machines in the office

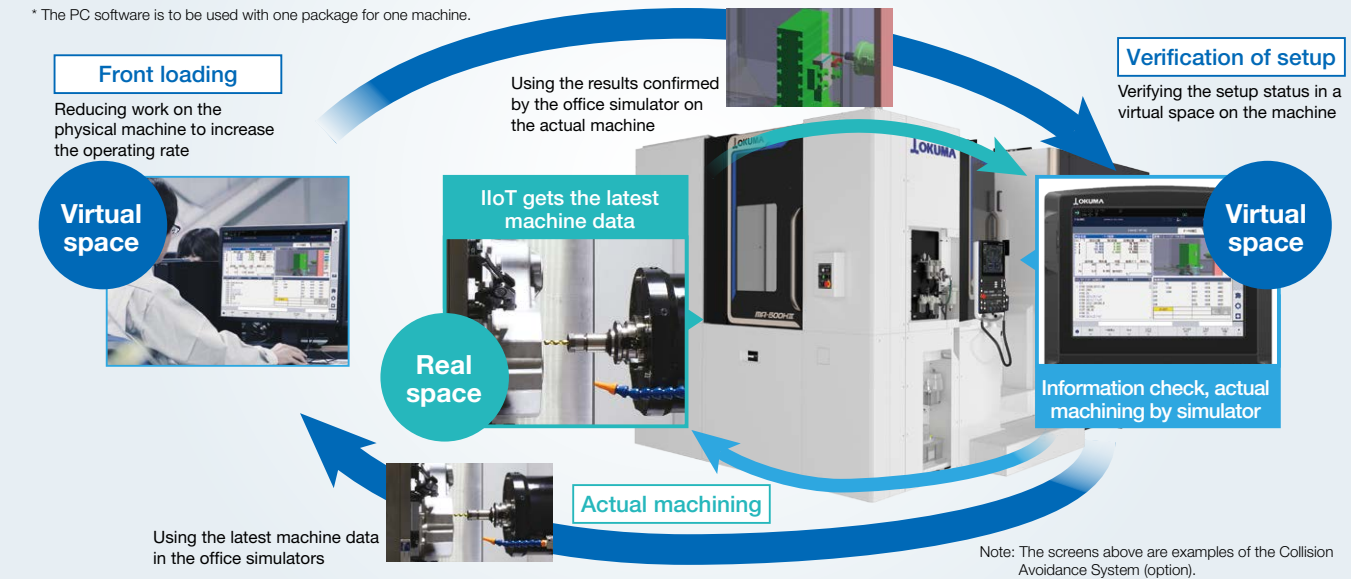
Front loading is performed with the actual status matched with the data on the office PC to further improve productivity. Highly accurate pre-verification minimizes trial and error in first part machining, and reduces machine downtime to the minimum.

* 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.

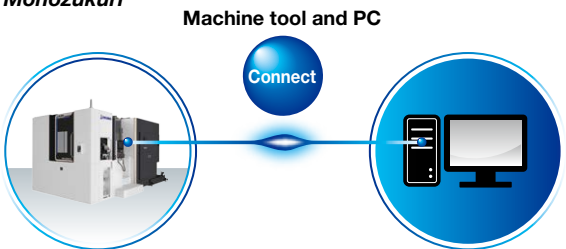


Connect Plan

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.



Advanced technology—effective for machine shops

AI Machine Diagnosis Function (option) Machine tool diagnostics technology with artificial intelligence (AI)

With predictive maintenance, prevent machine stoppages just in time

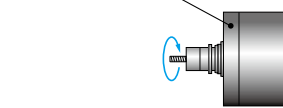
Okuma's AI-equipped control diagnoses the presence or absence of abnormalities in the machine spindle and feed axes and identifies any irregularities found.

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.

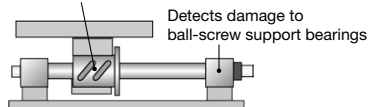
AI Spindle Diagnosis Function

Detects damage to spindle bearings

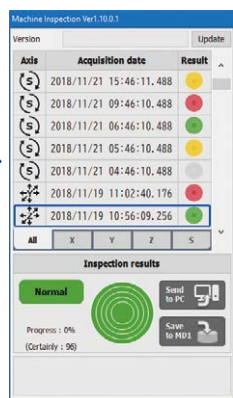


AI Feed Axis Diagnosis Function

Detects ball-screw wear condition



Self-diagnosis of spindle and feed axis status with AI



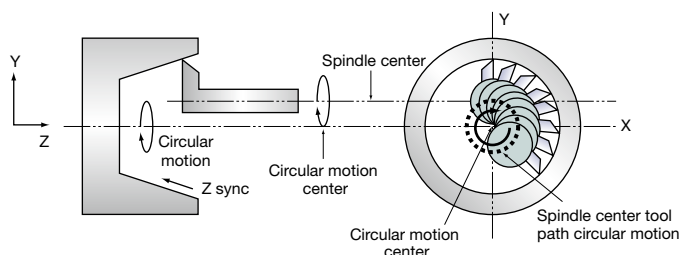
Turn-Cut (option)

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.

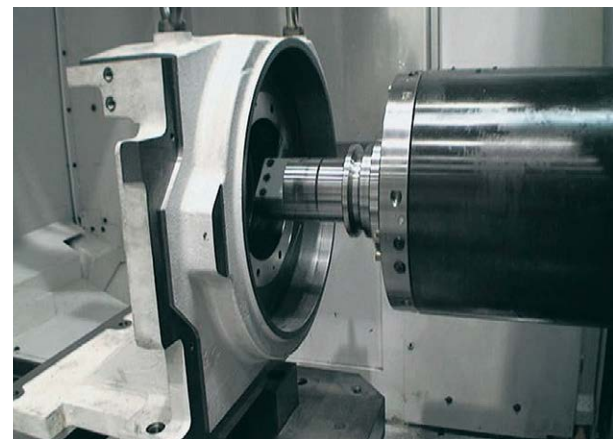
- Tapers also possible
- Hole making with different diameters — with one tool
- IDs and ODs can be machined when they exceed the maximum tool diameter that ATC can handle



Note: AbsoScale detection and ball-screw cooling required

Example of use: Turning valve parts

With Turn-Cut, it's possible to turn the seating surfaces required by gas pipe sealing conditions.



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 grooves with connected curves can also be machined.

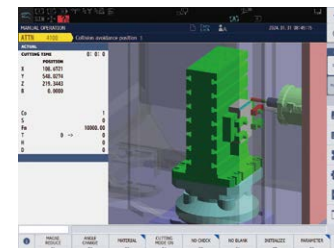


Collision Avoidance System (option) Collision prevention

Allowing operators to focus on making parts

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.



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

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.

Rotary Axis Inertia Auto setting

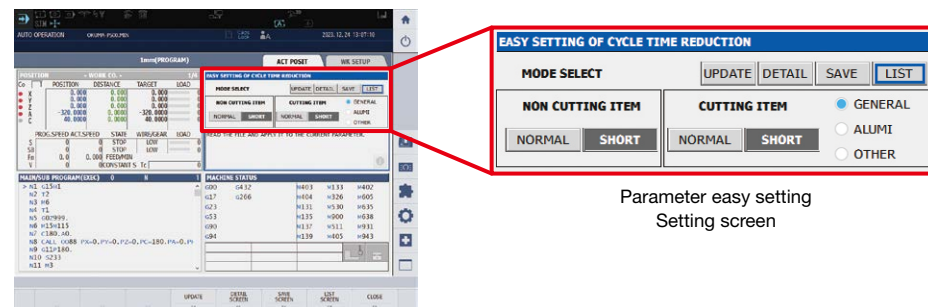
- Maintains high accuracy and stable movements

The "ServoNavi Rotary Axis Inertia Auto Setting" estimates the inertia of the workpiece and jig from the acceleration torque, and automatically sets the optimum servo parameters for the table rotation axis, including acceleration, thereby maintaining the high-precision operation of the table rotary axis. Moreover, the table indexing time for light weight workpieces is reduced.

Cycle time reduction

Significantly shortens cycle times and reduces power consumption

- 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



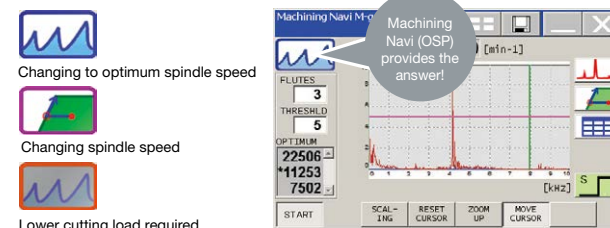
Parameter easy setting
Setting screen

Machining Navi M-i, M-gII+ (option) Cutting condition search for milling

Longer tool life and shorter machining times by optimizing cutting conditions

Searches for the best cutting conditions

- Machining Navi M-i changes automatically to optimum spindle speed
- Machining Navi M-gII+ displays several spindle speed possibilities



Machine Specifications

			MA-500HII	
	Item	Unit	No. 50	[No. 40]* ¹
Travels	X-axis (column left/right)	mm (in)	700 (27.56)	
	Y-axis (spindle up/down)	mm (in)	900 (35.43)	
	Z-axis (table front/back)	mm (in)	780 (30.71)	
	Spindle center to pallet top	mm (in)	50 to 950 (1.97 to 37.40)	
	Spindle nose to pallet center	mm (in)	70 to 850 (2.76 to 33.46)	
Pallet	Work area	mm (in)	500 × 500 (19.69 × 19.69)	
	Max load	kg (lb)	800 (1,760) [1,000 (2,200)]	
	Indexing angle	deg	1 [0.001]	
	Max workpiece dimensions	mm (in)	ø800 × 1,000 (ø31.50 × 39.37)	
Spindle	Spindle speed	min ⁻¹	50 to 6,000 [50 to 12,000, 50 to 6,000 (High-torque spindle)]	50 to 15,000 [50 to 20,000]
	Tapered bore		7/24 taper No. 50 [HSK-A100]	HSK-A63 [7/24 taper No. 40]* ²
	Bearing dia	mm (in)	ø100 (ø3.94)	ø70 (ø2.76)
Feed rate	Rapid traverse	m/min (fpm)	X, Y, Z: 60 (197)	
	Cutting feed rate	mm/min (ipm)	X, Y, Z: 1 to 60,000 (0.04 to 2,362)	
Motors	Spindle	kW (hp)	30/22 (40/30) (10 min/cont) [12,000 min ⁻¹ : 37/26 (50/35) (10 min/cont), High-torque spindle: 45/37 (60/50) (20 min/cont)]	26/18.5 (35/25) (10 min/cont) [20,000 min ⁻¹ : 30/22 (40/30) (10 min/cont)]
	Axis feed	kW (hp)	X: 4.6 (6.13), Y: 4.6 (6.13) × 2, Z: 4.6 (6.13)	
	Table indexing	kW (hp)	3.5 (4.67)	
ATC	Tool shank		MAS403 BT50 [CAT50, DIN50, HSK-A100]	HSK-A63 [MAS403 BT40, CAT40, DIN40]* ²
	Pull stud		MAS2 [MAS1, CAT, DIN, JIS]	— [MAS2, MAS1, CAT, DIN, JIS]* ²
	Magazine capacity	tools	40 [60 (chain magazine type)] [81, 111, 141, 171, 195, 225, 255, 285 (matrix magazine type)] [100, 150, 200, 240, 320, 400 (multiple magazine system)]	
	Max tool dia (w/ adjacent)* ³	mm (in)	ø140 (5.51)	ø100 (3.94)
	Max tool dia (w/o adjacent)* ³	mm (in)	ø240 (9.45)	ø150 (5.91)
	Max tool length	mm (in)	450 (17.72)	
	Max tool mass	kg (lb)	25 (55)	10 (22)
	Tool selection		Memory random (fixed with 81 or more tools)	
Machine size	Height	mm (in)	3,173 (124.92)	
	Floor space; width x depth	mm (in)	3,110 × 5,998 (122.44 × 236.14)	
	Mass	kg (lb)	21,500 (47,300)	
Controller			OSP-P500M	

[]: option *1. No. 40 spindle is optional. *2. Selectable for 15,000 min⁻¹ spindle. (20,000 min⁻¹ is HSK only.)

*3. Values differ with a matrix magazine. Please inquire.

MA-500HII Standard Specifications

Spindle speed	6,000 min ⁻¹ (30/22 kW [10 min/cont])	2-pallet rotary-shuttle APC	Pallet top surface M16 tap
ATC magazine capacity	40 tools	Full enclosure shielding	2-pallet rotary-shuttle APC
Spindlehead cooling system		Operation panel	
Simple ball screw cooler	X-Y-Z axes	ATC operation panel	For manual operation
Centralized lubrication	Oil level alarm and pressure alarm	NC (OSP) control cabinet ventilation fan	Heavy current systems
Coolant supply system	Tank 1,070 L (Effective: 520 L), pump 390 W	Work lamp	LED
In-machine chip discharge	Hinge type chip conveyor	Status indicator	3 phase C type
Chip pan for above		Foundation washers, jack bolts	
ATC air blower (blast)		Slip stoppers and chemical anchors	
Chip air blower (blast)	Nozzle type	Tool release lever	
Coil conveyor under APC		Tapered bore cleaning bar	
In-machine chip washer		Hand tools	
APC fork washer		Tool box	
Air filter and oiler		TAS-S	Thermo Active Stabilizer – Spindle
Telescopic cover		TAS-C	Thermo Active Stabilizer – Construction
Hydraulic unit			
Automatic 1° indexing table			

MA-500HII Optional Specifications

Spindle speeds	No. 50	50 to 12,000 min ⁻¹ , 37/26 kW	Shower coolant	10 nozzles
*See p4 for details.	No. 40	50 to 15,000 min ⁻¹ , 26/18.5 kW	Work wash gun	
	HSK-A63	50 to 20,000 min ⁻¹ , 30/22 kW	Oil mist lubricator	
High-torque spindle* ¹	No. 50	6,000 min ⁻¹ , 45/37 kW, 1,071 N-m	Chip air blower (blast)	Adapter type
Dual contact spindle* ²		HSK, BIG-PLUS®	Off-machine chip discharge (Lift-up chip conveyor types)	Refer to Recommended chip conveyors on page 11.
ATC magazine capacity (tools)	60 tools (chain magazine type)		Chip bucket for above	Height 700 mm, 1,000 mm
	81, 111, 141, 171, 195, 225, 255, 285 tools (matrix magazine type)		Hydraulic oil cooler	
	100, 150, 200, 240, 320, 400 tools (multiple magazine system)		Coolant heater / cooler	
			Auto tool length comp/ Breakage detection	Touch sensor
AbsoScale detection	X-Y-Z axes, X-Y axes		Auto zero offset/	Touch probe
Auto 0.001° indexing table	Built-in NC table		Auto gauging	
Auto pallet changer (APC)	Parallel shuttle: 6P, 10P, 12P		Tool life management	By hour meter
FMS 2-pallet APC	Wing block type, under-pallet fork type		Turn-Cut	AbsoScale detection (X-Y-Z axes) and ball-screw cooling required
Pallet top surface configuration	T-slot, inch specifications		Pull stud bolt shape	MAS1, CAT, DIN, JIS
Auto Setup Station Pallet Rotate			Pull stud bolt	MAS1, MAS2, CAT, DIN, JIS
Spare pallets			Standard T-column fixture	Height: 850 mm, Pitch: 100 mm
Edge locator			Standard square-column fixture	Height: 850 mm, Pitch: 100 mm
Oil hole coolant system	1.5 MPa		Ball-screw cooler	X-Y-Z axes
Thru-spindle coolant* ³	1.5 MPa, 7.0 MPa, large flow 1.5 MPa, large flow 7.0 MPa		Recommended for die machining	AbsoScale detection (X-Y-Z axes) Hyper-SurfaceII DNC-DT, 0.1 μm control
Suction of excess coolant in spindle				
Sludgeless Tank				

*1. For heavy-duty cutting
*2. Be sure to select this specification when BIG-PLUS® holder is used.
*3. Okuma pull studs required.

Major options

- Auto tool length compensation / Breakage detection



Measurement time



Non-measurement time

Probe type sensor
Detection increment: 1 μm
Auto-measure aligning air blower equipped

- Auto zero offset / Auto gauging



Optical signal type touch probe
Detection increment: 1 μm

- Auto Setup Station Pallet Rotate

This feature automatically rotates the setup station pallet in 90° increments by stepping on the foot switch. Operator efficiency has been improved, and robotic part load/unload can be done from multiple fixtures.

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
Programming	Security	Operator authentication, Lock screen, OSP-VPSII-STD
	Program capacity	Program storage capacity: 4 GB; operation buffer: 2 MB
	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, SERVONavi, Cycle time reduction (operation time reduction, machining time shortening, easy parameter setting)
Energy-saving functions	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.

Item	Kit Specs	NML		AOT		DT		DT AOT	
		E	D	E	D	E	D	E	D
Digital Twin									
Virtual Machining						● (V/E)	● (V/D)	● (V/E)	● (V/D)
Quick Modeling						● (V/E)	● (V/D)	● (V/E)	● (V/D)
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									
Axis name designation									
Fixture offset II									
Dynamic fixture offset									
Tool grooving									
Turn-Cut									
Dynamic Tool Load Control									
3-D tool compensation									
Coordinate change and drawing conversion	Programmable mirror image (G62)	●		●		●		●	
	Enlarge/reduce (G50, G51)	●		●		●		●	
	Common variables 1,000, 2,000 pcs								
	G code macros: 80 sets added								
User task	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								

[illegible]

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

Largest machining area in its class

The diagram shows a 3D perspective of a T-slot pallet. The main body is a rectangular block with a T-slot on top. The T-slot has a width of 190 and a height of 85. The main body has a width of 70 and a height of 900. The T-slot is positioned 50 from the right edge. The pallet is mounted on a base. The travel ranges are indicated by arrows: X-axis travel 700, Y-axis travel 900, and Z-axis travel 780. The pallet is labeled 'Pallet top' and 'Pallet center'. The area of the T-slot is labeled 'Area A'.

Travel	
X	700
Y	900
Z	780

Dimensions and labels in the diagram:

- X-axis travel 700
- Z-axis travel 780
- 70
- 900 Y-axis travel 900
- 50 [20]
- Pallet top
- 85 [115]
- 190
- Area A
- Pallet center

[]: T-slot pallets
A: Spindle head

2-pallet rotary-shuttle APC specification

Max diameter ø800

Y-axis travel 9'00

Max height 11'000 [9'70]

50 [20]

[] : T-slot pallets

Note:
The minus Z and Y-axis limit area is a spindle / pallet interference zone.

[illegible]

Technical drawings of the HPM 1000 machine, showing front, side, and top views with dimensions in mm and inches.

Front View Dimensions:

- Overall width: 5,998 (236.14)
- Overall height: 4,221 (166.18)
- Spindle gauge line: 70 (Z-axis travel)
- APC swing center: 780 (Z-axis travel)
- Spindlehead cooler: 510
- Tool magazine operation panel: 878
- Hydraulic unit: 352
- APC operation panel: 3,173 (124.92)
- Status indicator: 50
- APC door opening: 1,320
- APC max swing dia: $\phi 1,820$
- Max work dia: $\phi 800$
- Air inlet height: 1,262 mm from floor Rc 3/8 internal
- Main op panel: 622 (Door open)
- Power inlet: 2,390 mm from floor (Control cabinet top)
- Coolant tank: 2,489 (97.99)
- Lift-up chip conveyor (option): 1,350
- Chip bucket (option): 940
- 40-tool ATC magazine: 5,998 (236.14)
- Margin: 500

Side View Dimensions:

- Overall width: 3,080 (121.26)
- Overall height: 2,933 (115.47)
- Spindle gauge line: 70 (Z-axis travel)
- APC swing center: 780 (Z-axis travel)
- Spindlehead cooler: 510
- Tool magazine operation panel: 878
- Hydraulic unit: 352
- APC operation panel: 3,173 (124.92)
- Status indicator: 50
- APC door opening: 1,320
- APC max swing dia: $\phi 1,820$
- Max work dia: $\phi 800$
- Air inlet height: 1,262 mm from floor Rc 3/8 internal
- Main op panel: 622 (Door open)
- Power inlet: 2,390 mm from floor (Control cabinet top)
- Coolant tank: 2,489 (97.99)
- Lift-up chip conveyor (option): 1,350
- Chip bucket (option): 940
- 40-tool ATC magazine: 5,998 (236.14)
- Margin: 500

Top View Dimensions:

- Overall width: 5,998 (236.14)
- Overall height: 4,221 (166.18)
- Spindle gauge line: 70 (Z-axis travel)
- APC swing center: 780 (Z-axis travel)
- Spindlehead cooler: 510
- Tool magazine operation panel: 878
- Hydraulic unit: 352
- APC operation panel: 3,173 (124.92)
- Status indicator: 50
- APC door opening: 1,320
- APC max swing dia: $\phi 1,820$
- Max work dia: $\phi 800$
- Air inlet height: 1,262 mm from floor Rc 3/8 internal
- Main op panel: 622 (Door open)
- Power inlet: 2,390 mm from floor (Control cabinet top)
- Coolant tank: 2,489 (97.99)
- Lift-up chip conveyor (option): 1,350
- Chip bucket (option): 940
- 40-tool ATC magazine: 5,998 (236.14)
- Margin: 500

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

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

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