

MA-HII Series
SPACE CENTER

MA-500HII
MA-600HII

Horizontal Machining Centers



MA-HII Series

SPACE CENTER

Horizontal Machining Centers

MA-500HII / MA-600HII



Master craftsmanship manufacturing for a wide range of applications

From highly accurate, steady machining of mass production, to long, continuous, die/mold applications, the MA-HII takes the wide realm of machining to a higher dimension.

From heavy-duty cutting to fine precision work,

Okuma's flagship product offers performance that will exceed your expectations.

— Always making a great product even better —



MA-600HII

Photographs used in this brochure may show 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

901 cm³/min (MA-500HII actual data*¹)

Standard spindle: 6,000 min⁻¹ ø100 face mill Material: S45C

Tool	Spindle speed min ⁻¹	Cutting m/min	Feed rate mm/min	Cut width mm	Cut depth mm	Chips cm ³ /min
ø100 face mill 10 blades (carbide)	955	300	3,220	70	4	901
ø50 porcupine cutter (carbide)	1,146	180	500	25	50	625
ø63 insert drill (carbide)	606	120	121	—	—	—
M42 P4.5 tap	91	12	409.5	—	—	81%*

* Spindle load

802 cm³/min (MA-600HII actual data*¹)

Wide-range spindle: 12,000 min⁻¹ ø100 face mill Material: S45C

Tool	Spindle speed min ⁻¹	Cutting m/min	Feed rate mm/min	Cut width mm	Cut depth mm	Chips cm ³ /min
ø100 face mill 10 blades (carbide)	955	300	2,865	70	4	802
ø50 porcupine cutter (carbide)	1,146	180	400	25	50	500
ø63 insert drill (carbide)	606	120	91	—	—	—
M42 P4.5 tap	91	12	409.5	—	—	—

1,081 cm³/min (MA-600HII actual data*¹)

High-torque spindle: 6,000 min⁻¹ (option) ø200 face mill Material: S45C

Tool	Spindle speed min ⁻¹	Cutting m/min	Feed rate mm/min	Cut width mm	Cut depth mm	Chips cm ³ /min
ø200 face mill 10 blades (cermet)	330	207	1,404	140	5.5	1,081

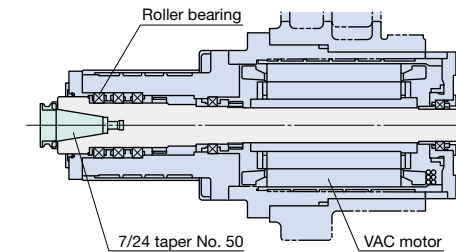
*1. The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting condition, and others.

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



Long service life oil-air lubrication for all spindles

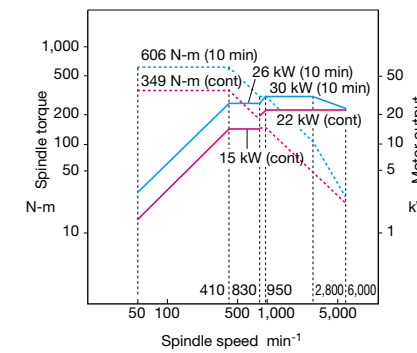
Standard spindle: 6,000 min⁻¹
Front roller bearings also suitable for powerful cutting



Mainly for steel workpieces

Standard spindle No. 50

- Spindle speed: 6,000 min⁻¹
- Max output: 30/22 kW (10 min/cont)
- Max torque: 606/349 N-m (10 min/cont)

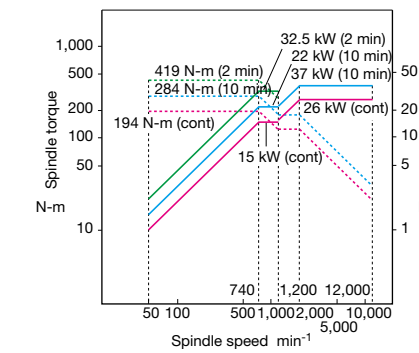


Machines materials from aluminum to steel

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)

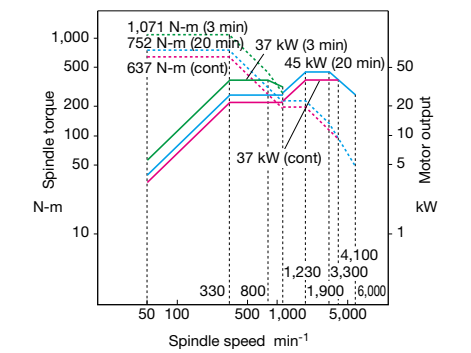


Machines Inconel, titanium and other difficult-to-cut materials

High-torque spindle No. 50 (option)

1,071 N-m (heavy-duty cutting)

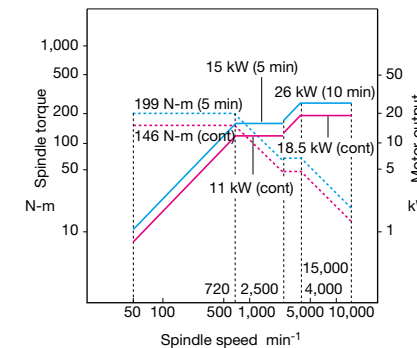
- Spindle speed: 6,000 min⁻¹
- Max output: 45/37 kW (20 min/cont)
- Max torque: 1,071/637 N-m (3 min/cont)



Steel machining

Wide-range spindle No. 40 (option)

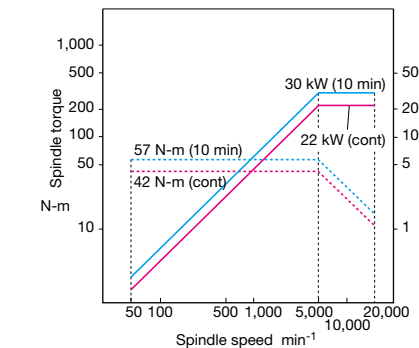
- Spindle speed: 15,000 min⁻¹
- Max output: 26/18.5 kW (10 min/cont)
- Max torque: 199/146 N-m (5 min/cont)



Die/mold and aluminum machining

High-speed spindle HSK-A63 only (option)

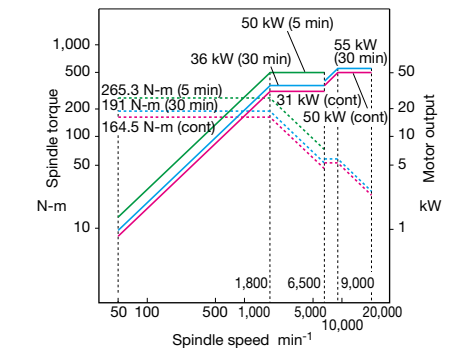
- Spindle speed: 20,000 min⁻¹
- Max output: 30/22 kW (10 min/cont)
- Max torque: 57/42 N-m (10 min/cont)



For a wide range of applications, from aluminum to steel

Wide-range, high-speed spindle HSK-A100 only (option)

- Spindle speed: 20,000 min⁻¹
- Max output: 55/50 kW (30 min/cont)
- Max torque: 265.3/164.5 N-m (5 min/cont)



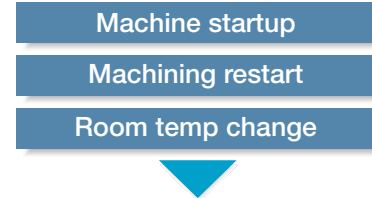
Outstanding dimensional stability with long-run machining of large workpieces



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.



High dimensional stability

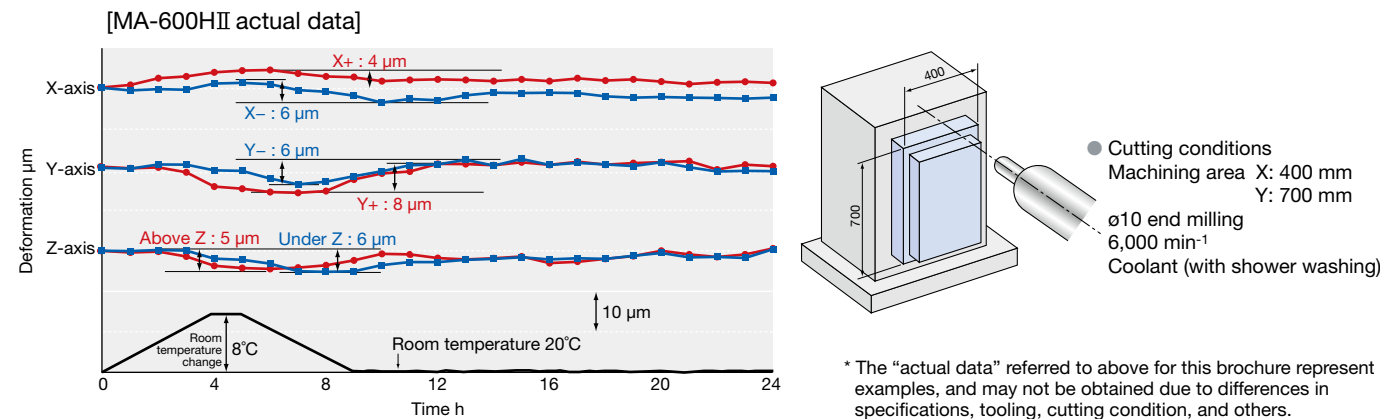
Evolved TAS-C environmental thermal deformation control: Stable dimensional accuracy in large machining area

A function for controlling deformation caused by table or workpiece thermal expansion during room temperature or coolant temperature changes has been

added to TAS-C environmental thermal deformation control, enabling stable dimensional accuracy to be obtained in a large machining area.

The benefits: better dimensional accuracy from large workpieces requiring long cycle times, and reduced dimensional variation from repetitive workpiece mount positioning.

Dimensional changes of less than 8 μm over time in a wide machining range (actual data with room temperature change of 8°C [TAS-C applicable])



Positioning accuracy

The exactness of bi-directional positioning (MA-600HII AbsoScale actual data*)

- X-axis (travel: 1,000 mm) **2.3 μm**
- Y-axis (travel: 900 mm) **2.8 μm**
- Z-axis (travel: 1,000 mm) **2.9 μm**

Bi-directional repeatability (MA-600HII AbsoScale actual data*)

- X-axis (travel: 1,000 mm) **2.3 μm**
- Y-axis (travel: 900 mm) **2.6 μm**
- Z-axis (travel: 1,000 mm) **2.2 μm**

* Note: 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.



A suite of energy saving applications for machine tools

ECO Idling Stop Accuracy ensured, cooler off

This is the intelligent energy-saving application used by Okuma's Thermo-Friendly Concept. When not machining, power consumption can be significantly reduced by frequently stopping unnecessary peripheral equipment.

Moreover, in machines equipped with the optional Thermo Active Stabilizer—Spindle (TAS-S), spindle cooler idling is automatically turned ON/OFF while maintaining stable accuracies.

ECO Power Monitor On-the-spot check of energy savings

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 (option) Intermittent/continuous operation of chip conveyor, or mist collector during machining

ECO Hydraulics (option) Energy-saving hydraulic unit using servo control technology



Achieves long term accuracy and surface quality

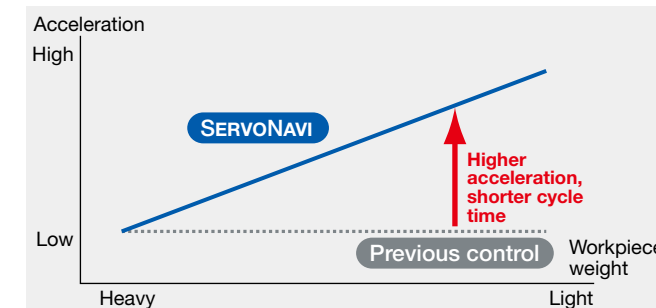
SERVO NAVI AI (Automatic Identification)

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.



Rotary Axis Inertia Auto Setting Maintains high accuracy and stable movements

Depending on the workpiece or fixtures, inertia will vary, and with each variation the rotary axis positioning error in some cases became much larger.

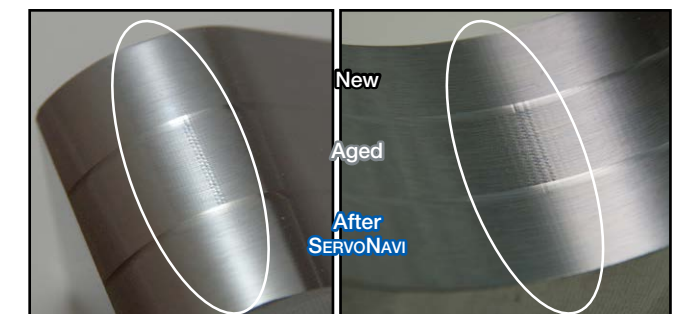
Rotary Axis Inertia Auto Setting is able to estimate inertia from workpiece/fixture acceleration and deceleration, and automatically set the optimum the rotary axis servo parameters to maintain highly accurate and stable machine movements.

SERVO NAVI 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).

SERVO NAVI'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.

Machine structure for high speed feed and high accuracy

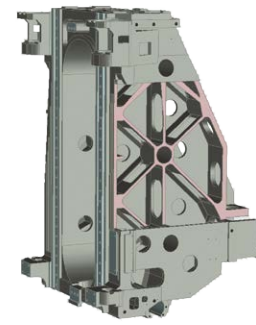
High speed operation

Rapid traverse:	60 m/min (X-Y-Z axes)
Rapid acceleration:	0.7 G (maximum)
Tool change:	2.0 sec (T-T)
	4.4 sec (C-C)
Table indexing:	2.0 sec (MA-600HII 1 degree indexing 90 degrees)
	2.5 sec (MA-600HII 0.001 degree indexing 90 degrees)
Pallet change:	12 sec (MA-600HII)

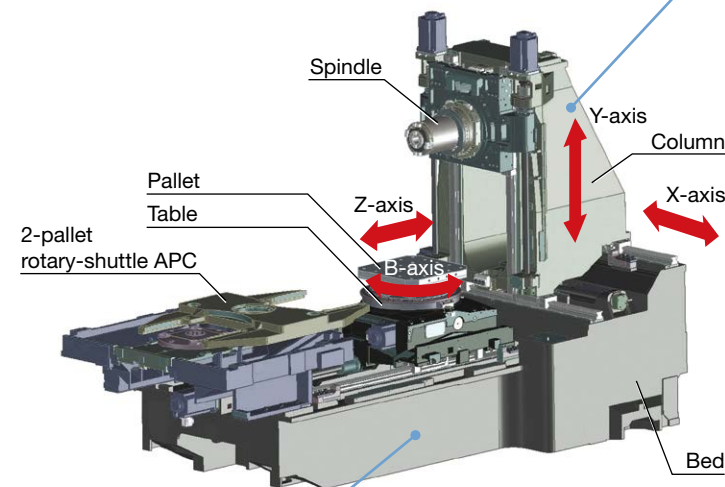
Machine structure

- **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**
X-Y-Z axis ball screw cooling and Y-axis motor bracket cooling are 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.
- **Environmental measures**
Roller guides with retainers for each axis. Lubricating oil pump with optimal control reduces lube oil consumption.

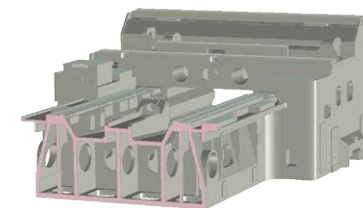
Highly rigid column strongly withstands bending and torsion



Diagonal rib configuration of column



Bed supports fast travel of heavy parts



Ribs placed directly below guideways

Easy to operate . . . the key to improving productivity

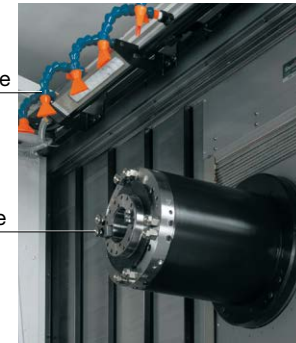
Less burden on the operator, much shorter job preparation times

Large capacity coolant tank gives peace of mind even when operating continuously for a long time

- Tank capacity: 1,070 L (effective: 520 L)
- Pump motor output: 390 W
- Discharge: 42 L/min (water soluble)
- Coolant nozzles (standard): 8, with check valves
- Shower coolant system (option): 10 nozzles

Shower washing nozzle (option)

Coolant nozzle



Open-ceiling door

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

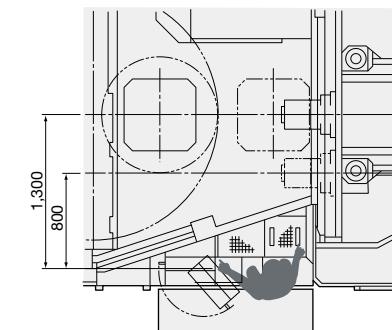


Left-mounted operation panel Improved visibility with swivel monitor

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

Excellent accessibility to spindle and workpiece

- 800 mm from operation panel to spindle at the column traverse



(Drawing is for MA-600HII)

Good access to machine interior with wide, 2-step platform



Required tool storage for productive, high-mix workpiece applications

Respond flexibly with magazine matched to needed tool storage capacity

Auto tool changer

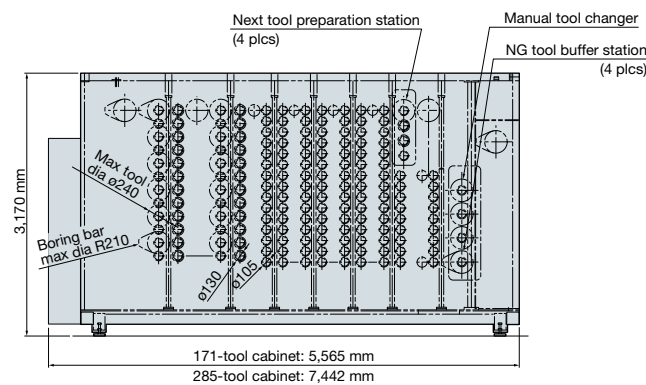
Flexible, high-volume tool storage systems available for adding more types of workpieces. Matrix magazines store larger numbers in compact, quick tool-change arrangements.

ATC type	Magazine type	ATC tool		Maximum length, mass, moment
		Max diameter		
		w/adjacent	w/o adjacent *1	
40 tools (standard), 60 tools	Chain magazine	ø140 mm	ø240 mm	Max length 450 [600 *2] mm Max mass 25 kg Mass moment 36.75 N-m
81 tools, 111 tools, 141 tools, 171 tools	Matrix magazine (171-tool cabinet)	ø105 mm (standard)	ø240 mm (large size)	
195 tools, 225 tools, 255 tools, 285 tools	Matrix magazine (285-tool cabinet)	ø130 mm (mid-size)		
320 tools, 400 tools	Multiple magazine	ø135 mm	ø240 mm	

*1. With MA-600HII 20,000 min⁻¹, the maximum tool diameter is limited depending on the spindle speed used.
*2. Only MA-600HII supported with option

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	
	Total 171 tools	Standard tools only: up to ø105 123 tools Mid-size tool: tool up to ø130 48 tools (Large tool: ø130 to ø240*1 12 tools)	Total 285 tools	Standard tools only: up to ø105 213 tools Mid-size tool: tool up to ø130 72 tools (Large tool: ø130 to ø240*1 18 tools)

*1. With MA-600HII 20,000 min⁻¹, the maximum tool diameter is limited depending on the spindle speed used.

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

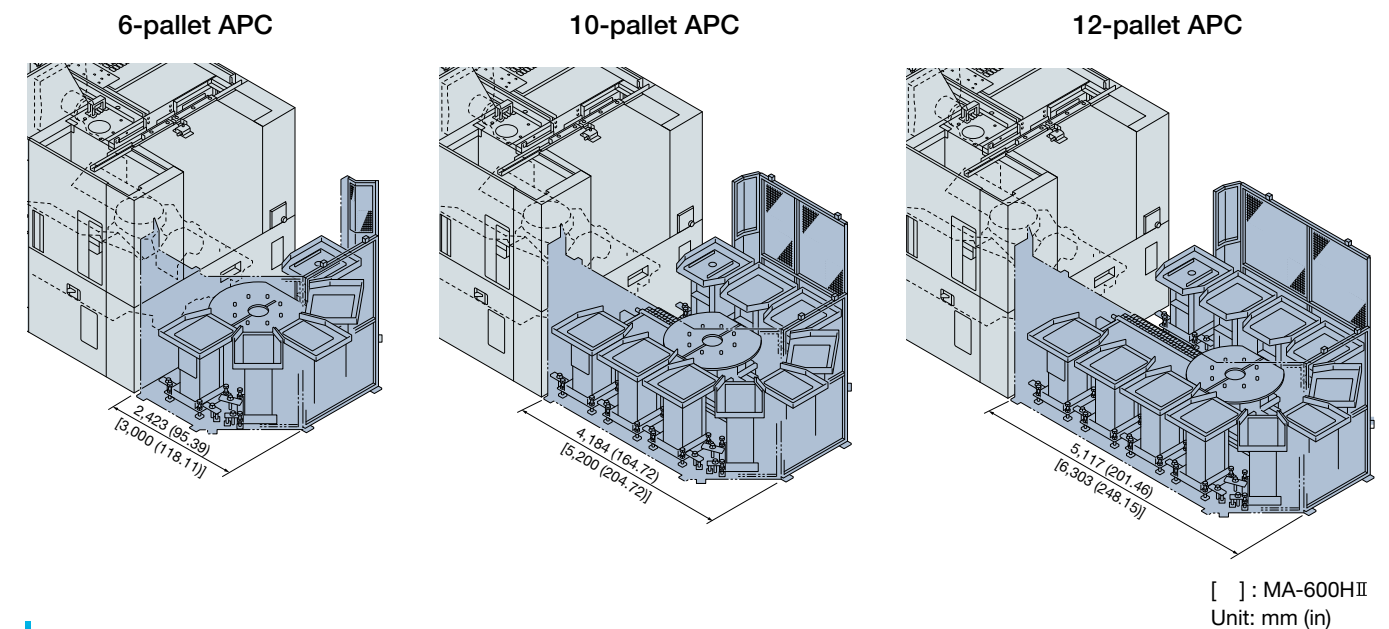
Flexible production of large-variety workpiece applications

Compatible with production plans matched to high-mix workpiece demand

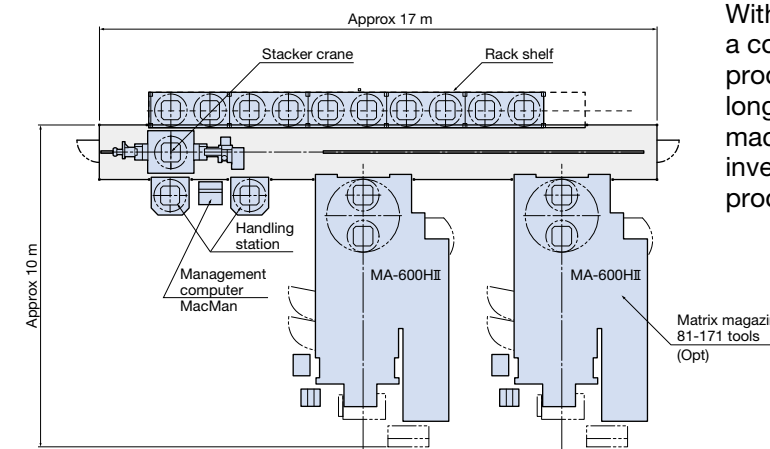
Flexible APC units

Multi-pallet APCs allow the operator to single setup a large number of workpieces, and use the extra time available for other jobs. 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
- APC change time remains same.
- Can be adapted flexibly to match plant layout and type of production



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.

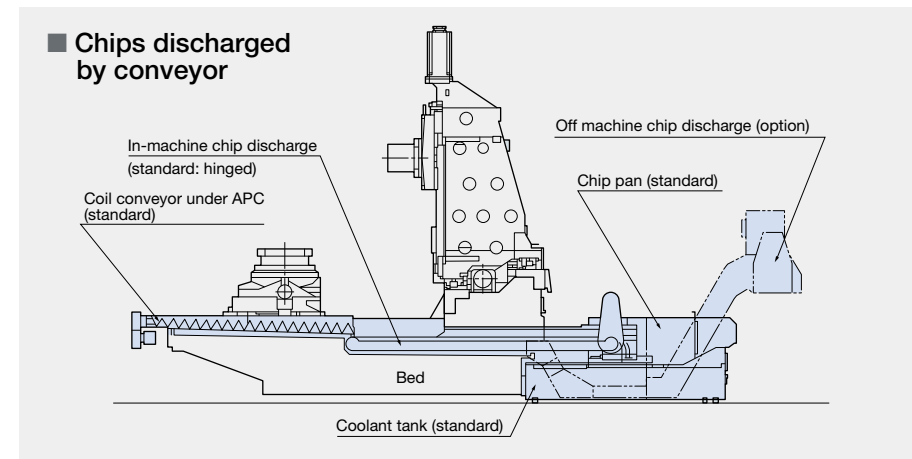
[System layout example]

- MA-600HII: 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

○ : Recommended △ : Conditionally recommended

Material	Steel	Cast iron	Aluminum/ non-ferrous metal	Mixed (general use)
Chip shape				
In-machine chip discharge	Hinge (standard)*1, *2	○	○	○
Off-machine chip discharge (option)	Hinge type	○	—	△ (*4)
	Scraper type	—	○ (dry)	—
	Scraper type with drum filter	—	○ (wet) with magnet	△ (*3)
	Hinge + Scraper with drum filter*3	△ (*1)	△ (wet) (*2)	○

*1. Scraper type (option) can be selected. *2. With MA-600HII at 20,000 min⁻¹, hinged system (optional faster transport) required.
 *3. With MA-600HII at 20,000 min⁻¹, hinged system + scraper and drum filter special faster conveyor and dimensions required.
 (*1). When there are many fine chips (*2). When chips are longer than 100 mm (*3). When chips are not longer than 100 mm (*4). When there are few fine chips
 Note: When chips are dry, clean out chips that have accumulated under the pallet or elsewhere in the machine as needed.

Off-machine lift-up chip conveyors

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

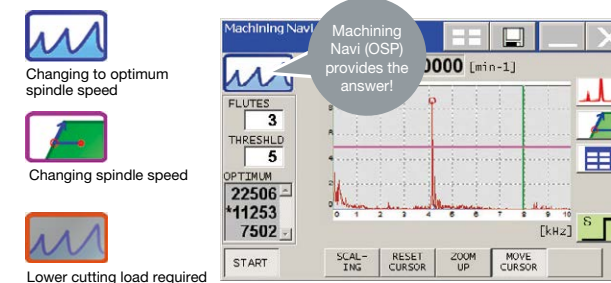
High accuracy machining with advanced technology

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

Cutting condition search for milling

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

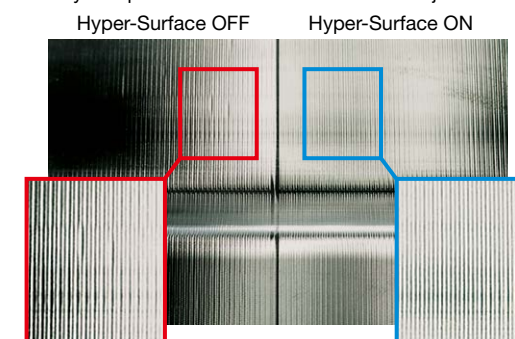


Hyper-Surface (option)

Machining data automatically compensated

In addition to Sculptured-Surface Adaptive Acceleration Control with previous Super-NURBS, this serves to compensate disordered machining data output from CAM on the NC, maintain shape accuracy, and improve surface quality.

Automatically compensates for deviation between adjacent tool paths

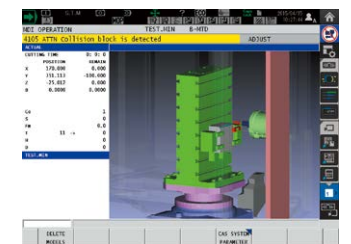


Collision Avoidance System (option)

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.



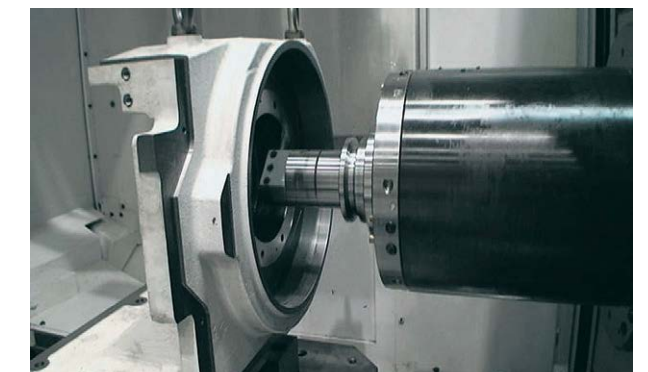
Turn-Cut (option)

Shorter lead times with process-intensive machining

Turning on a machining center

Lead times are reduced with this process-intensive turning application done on a machining center. Turning is done with synchronized control with X-Y coordinate arc and tool edge position of rotating spindle tool.

- Machining of tapered holes
- Hole making with different diameters — with one tool
- Machining of ID/OD greater than largest tool diameter



AI Machine Diagnosis (option)

Machine tool diagnostics technology with artificial intelligence (AI)

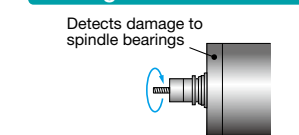
With predictive maintenance, prevent machine stoppages just in time

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

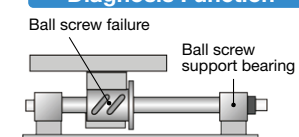
Downtime from machine stoppage is minimized, so the benefits are highly accurate, productive, and stable operations over the long term. The operators themselves can easily diagnose the machine by following simple screen guidelines on the Okuma control.

- Notes:
1. 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.
 2. With AbsoScale detection specs, ball screw wear detection is possible.

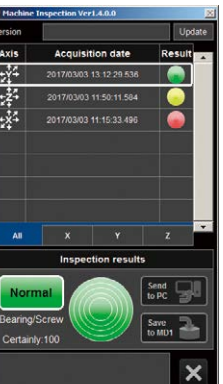
AI Spindle Diagnosis Function



AI Feed Axis Diagnosis Function



Self-diagnosis of feed axis status with AI



Machine Specifications

	Item	Unit	MA-500HII		MA-600HII	
			No. 50	No. 40*1	No. 50	No.40*1
Travels	X-axis (column left/right)	mm (in)	700 (27.56)		1,000 (39.37)	
	Y-axis (spindle up/down)	mm (in)	900 (35.43)			
	Z-axis (table front/back)	mm (in)	780 (30.71)		1,000 (39.37)	
	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)		70 to 1,070 (2.76 to 42.13)	
Pallet	Work area	mm (in)	500 × 500 (19.69 × 19.69)		630 × 630 (24.80 × 24.80)	
	Max load	kg	800 [1,000]		1,200 [1,400]	
	Indexing angle	deg	1 [0.001]			
	Max workpiece dimensions	mm (in)	ø800 × 1,000 (ø31.50 × 39.37)		ø1,000 × 1,000 (ø39.37 × 39.37)	
Spindle	Spindle speed	min ⁻¹	50 to 6,000 [50 to 6,000 (High-torque spindle), 50 to 12,000]	50 to 15,000, 50 to 20,000	50 to 6,000 [50 to 6,000, (High-torque spindle), 50 to 12,000, 20,000]	50 to 15,000, 50 to 20,000
	Tapered bore		7/24 taper No. 50 [HSK-A100]	7/24 taper No. 40, HSK-A63*2	7/24 taper No. 50 [HSK-A100]*3	7/24 taper No. 40, HSK-A63*2
	Bearing dia	mm (in)	ø100 (ø3.94)	ø70 (ø2.76)	ø100 (ø3.94)	ø70 (ø2.76)
Feed rate	Rapid traverse	m/min (ipm)	X, Y, Z: 60 (2,362)			
	Cutting feed rate	mm/min (ipm)	X, Y, Z: 1 to 60,000 (0.04 to 2,362)			
Motors	Spindle (10 min/cont) *4	kW (hp)	30/22 [45/37*4, 37/26] (40/30 [60/50, 50/35])	26/18.5, 30/22 (35/25, 40/30)	30/22 [45/37*4, 37/26, 55/50*5] (40/30 [60/50, 50/35, 75/66])	26/18.5, 30/22 (35/25, 40/30)
	Axis feed	kW (hp)	X: 4.6 (6.13), Y: 4.6 (6.13) × 2, Z: 4.6 (6.13)		X: 4.6 (6.13), Y: 4.6 (6.13) × 2, Z: 5.2 (6.93)	
	Table indexing	kW (hp)	3.5 (4.67)			
ATC	Tool shank		MAS403 BT50 [HSK-A100]	MAS 403 BT40, HSK-A63*2	MAS403 BT50 [HSK-A100]*3	MAS 403 BT40, HSK-A63*2
	Pull stud		MAS-2 [-]			
	Magazine capacity	tools	40 [60, 81, 111, 141, 171, 195, 225, 255, 285, 320, 400]			
	Max tool dia (w/ adjacent) *6	mm (in)	ø140 (5.51)	ø100 (3.94)	ø140 (5.51)	ø100 (3.94)
	Max tool dia (w/o adjacent) *6	mm (in)	ø240 (9.45)	ø150 (5.91)	ø240 (9.45)*7	ø150 (5.91)
	Max tool length	mm (in)	450 (17.72)	450 (17.72)	450 [600] (17.72 [23.62])	450 (17.72)
	Max tool mass	kg (lb)	25 (55)	10 (22)	25 (55)	10 (22)
	Tool selection		Memory random (fixed with 81 or more tools)			
Machine size	Height	mm (in)	3,174 (124.96)			
	Floor space; width x depth	mm (in)	3,110 × 5,971 (122.44 × 235.08)		3,410 × 6,495 (134.25 × 255.71)	
	Mass	kg (lb)	21,500 (47,300)		24,500 (53,900)	
Controller		OSP-P300MA				

[]: option

*1. No. 40 spindle is optional.

*2. 20,000 min⁻¹ with HSK-A63 only

*3. 20,000 min⁻¹ with HSK-A100 only

*4. High-torque spindle motor rating is 20 min/cont (for heavy-duty cutting)

*5. 20,000 min⁻¹ spindle motor rating is 30 min/cont

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

*7. With MA-600HII 20,000 min⁻¹, the maximum tool diameter is limited depending on the spindle speed used.

Standard Specifications

Spindle speed	6,000 min ⁻¹ (30/22 kW [10 min/cont])	Hydraulic unit	
ATC magazine capacity	40 tools	Automatic 1° indexing table	
Spindlehead cooling system		2-pallet rotary-shuttle APC	Pallet top surface M16 tap
Simple ball screw cooler	X-Y-Z axes	Full enclosure shielding	2-pallet rotary-shuttle APC
Centralized lubrication	Oil level alarm and pressure alarm	Operation panel	
Coolant supply system	Tank 1,070 L (Effective: 520 L), pump 390 W (50 Hz), 620 W (60 Hz)	ATC operation panel	For manual operation
		NC (OSP) control cabinet ventilation fan	Heavy current systems
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			
Telescopic cover			

Optional Specifications

Spindle speeds	50 to 12,000 min ⁻¹ , 37/26 kW, No. 50	Off-machine chip discharge (Lift-up chip conveyor types)	Refer to Recommended chip conveyors on page 11.
	50 to 15,000 min ⁻¹ , 26/18.5 kW, No. 40	Chip bucket for above	Height 700 mm (27.56 in), 1,000 mm (39.37 in)
	50 to 20,000 min ⁻¹ , 30/22 kW, HSK-A63 only (MA-600HII) 20,000 min ⁻¹ , 55/50 kW, HSK-A100 only	Hydraulic oil cooler	
High-torque spindle*1	6,000 min ⁻¹ , 45/37 kW, 1,071 N-m, No.50	Coolant heater / cooler	
Dual contact spindle	HSK-A63, HSK-A100, BIG-PLUS®	Auto tool length comp/ Breakage detection	Touch sensor
ATC magazine capacity (tools)	60 tool (chain magazine type)	Auto zero offset/ Auto gauging	Touch probe
	81, 111, 141, 171, 195, 225, 255, 285 tool (matrix magazine type)	Tool life management	By hour meter
320, 400 tool (multiple magazine system)		Turn-Cut	AbsoScale detection (X-Y-Z axes) and ball screw cooling required
AbsoScale detection	X-Y-Z axes, X-Y axes	Pull stud bolt shape	MAS-1, CAT, DIN, JIS
Auto 0.001° indexing table	Built-in NC table	Pull stud bolt	MAS-1, MAS-2, CAT, DIN, JIS
Multi-pallet APC	6, 10, 12	Standard T-column fixture	Height: 850/825 mm, Pitch: 100/125 mm (MA-500HII/MA-600HII)
FMS 2-pallet APC	Wing block type, Under-pallet fork type	Standard square-column fixture	Height: 850/825 mm, Pitch: 100/125mm (MA-500HII/MA-600HII)
Pallet top surface configuration	T-slot	Ball-screw cooler	X-Y-Z axes
Spare pallets		Recommended for die machining	AbsoScale detection (X-Y-Z axes) Hyper-Surface DNC-DT, 0.1 μm control
Edge locator		TAS-S	Thermo Active Stabilizer—Spindle
Oil hole coolant system	1.5 MPa	TAS-C	Thermo Active Stabilizer—Construction
Thru-spindle coolant*2	1.5 MPa, 7.0 MPa, large flow 1.5 MPa, large flow 7.0 MPa		
Shower coolant	10 nozzles		
Work wash gun			
Oil mist lubricator			
Chip air blower (blast)	Adapter type		

*1. For heavy-duty cutting *2. Okuma pull studs required.

Major options

- Auto tool length compensation / Breakage detection



Measurement time

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



Non-measurement time

- Auto zero offset / Auto gauging



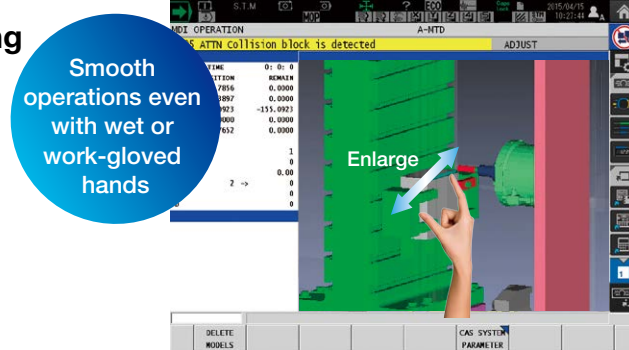
Optical signal type touch
probe
Detection increment: 1 μm

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

Smart factories are using advanced digitization and networking (IIoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed. The OSP suite also features a full range of useful apps that could only come from a machine tool manufacturer, making smart manufacturing a reality.

Smooth, comfortable operation with the feeling of using a smartphone

Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Moving, enlarging, reducing, and rotating 3D models, as well as list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smartphone. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.



Note: 15 inch operation panel screen shots. Collision Avoidance System (option) shown above.

“Just what we wanted.”— Refreshed OSP suite apps

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

Maintenance Monitor

Routine inspection support

The Maintenance Monitor displays items for inspections before starting daily operation and regular inspections and the rough estimate of inspection timing. Touching the [INFO] button displays the PDF instruction manual file of relevant maintenance items.

PERIODICAL MAINTENANCE	DAILY INSPECTION	CHANGE MODE
300	301	302
303	304	305
306	307	308
309	310	311
312	313	314
315	316	317
318	319	320
321	322	323
324	325	326
329	330	331
332	333	334
337	338	339
341	342	343
344	345	346
349	350	351
354	355	356
359	360	361
364	365	366
369	370	371
374	375	376
379	380	381
384	385	386
389	390	391
394	395	396
399	400	401
404	405	406
409	410	411
414	415	416
419	420	421
424	425	426
429	430	431
434	435	436
439	440	441
444	445	446
449	450	451
454	455	456
459	460	461
464	465	466
469	470	471
474	475	476
479	480	481
484	485	486
489	490	491
494	495	496
499	500	501



Spindle Output Monitor

Increased productivity through visualization of motor power reserve

Turn-Cut Guide (option)

Making new machining technology simpler and easier to use

E-mail Notification

Monitoring operating status even when away from the machine

Screen Capture

Automatic saving of recorded alarms

Scheduled Program Editor

Easy programming without keying in code

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.

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%, rapid traverse override 0 to 100%
	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	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
	Program capacity	Program storage capacity: 4 GB; operation buffer: 2 MB
Operations	Program operations	Program management, editing, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area machining, coordinate convert, programming help
	“suite apps”	Applications to graphically visualize and digitize information needed on the shop floor
	“suite operation”	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	“Single-mode operation” to complete a series of operations, advanced operation panel/graphics facilitate smooth machine control
	Machine operations	MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operation help, alarm help, sequence return, manual interrupt/auto return, pulse handle overlap, parameter I/O, PLC monitor, easy setting of cycle time reduction
Communications / Networking	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
		USB (2 ports), Ethernet, DNC-T1
High speed/accuracy specs		Hi-G Control, Hi-Cut Pro, pitch error compensation, ServoNavi, Machining Time Shortening Function
Energy-saving		ECO suite

*1. The power display shows estimated values. When precise electrical values are needed, select the on-machine wattmeter option.

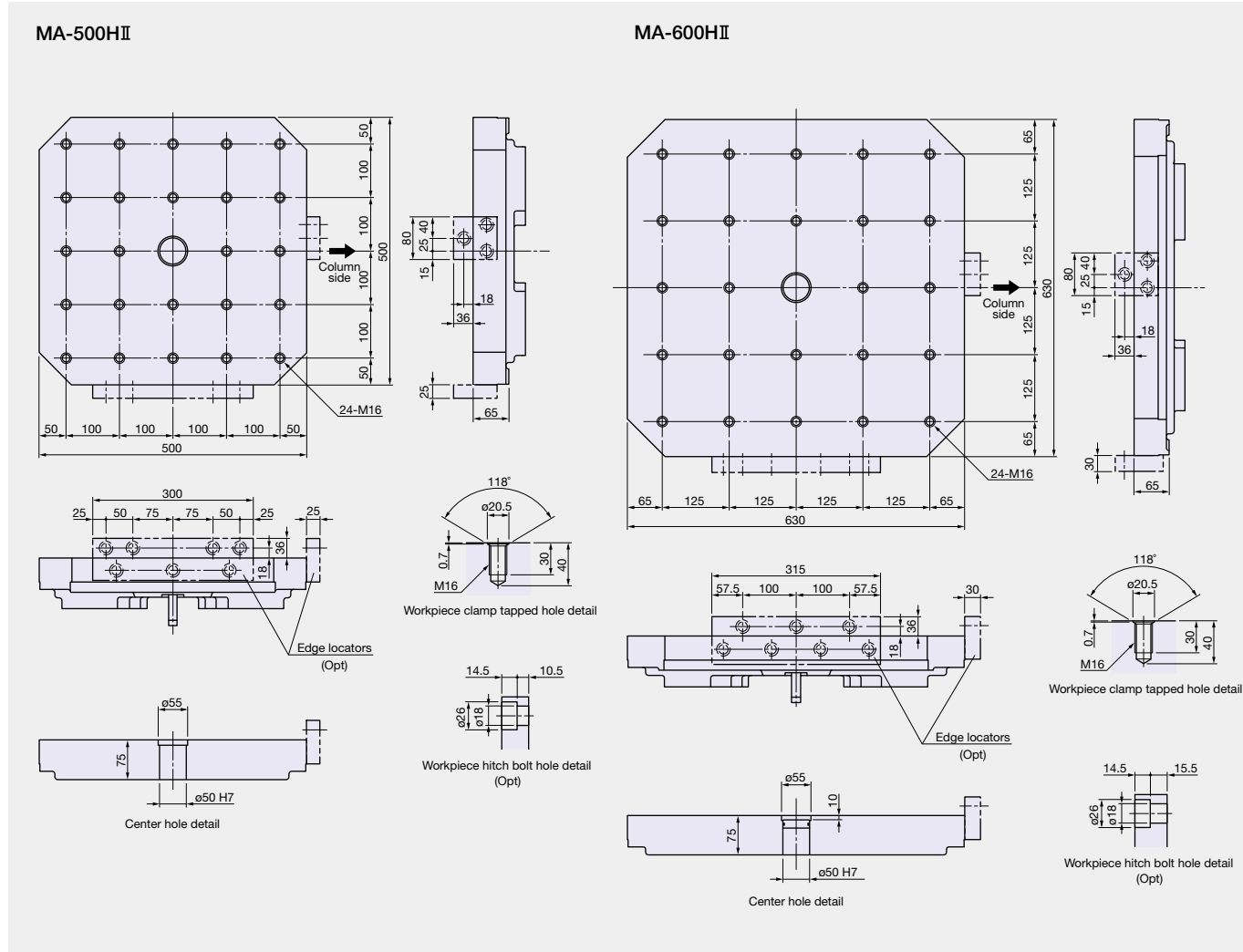
Optional Specifications

Item	Kit Specs*1	NML		3D		AOT	
		E	D	E	D	E	D
Interactive functions							
Advanced One-Touch IGF-M (Real 3D simulation included)							
Interactive MAP (I-MAP)							
Programming							
Operation buffer 10MB							
Auto scheduled program update							
G/M-code macros							
Common variables (Std: 200 pcs)	1,000 pcs						
	2,000 pcs						
Program branch; 2 sets							
Program notes (MSG)							
Coordinate system selection (Std: 20 sets)	100 sets						
	200 sets						
	400 sets						
Helical cutting (within 360°)							
3D circular interpolation							
Synchronized Tapping II							
Arbitrary angle chamfering							
Cylindrical side facing							
Slope machining							
Tool grooving (flat-tool free-shaped grooving)							
Turn-Cut							
Tool max rotational speed setting*1							
F1-digit feed	4 sets, 8 sets, parameter						
Programmable travel limits (G22, G23)							
Skip (G31)							
Axis naming (G14)							
3D tool compensation							
Tool wear compensation							
Drawing conversion	Programmable mirror image (G62)						
	Enlarge/reduce (G50, G51)						
User task 2	I/O variables (16 each)						
Tape conversion*							
Monitoring							
Real 3D Simulation							
Simple load monitor	Spindle overload monitor						
NC operation monitor	Hour meter, work counter						
Hour meters	Power, spindle, NC, cutting						
Operation end buzzer	With M02, M30, and END commands						
Work counter	With M02 and M30 commands						
MOP-TOOL	Adaptive control, overload monitor						
AI Machine Diagnosis Function	Feed axes, spindle						
Machine Status Logger							
Cutting Status Monitor							
Tool life management	Hour meter, No. of workpieces						
Gauging							
Auto gauging	Touch probe (G31)						
Auto zero offset	Includes auto gauging						
Tool breakage detection	(touch sensor) (G31) Includes auto tool offset						
Manual gauging (w/o sensor)							
Interactive gauging (touch sensor, touch probe required)							
External I/O communication							
RS-232C connector							
DNC-T3							
DNC-B (RS-232C-Ethernet transducer used on OSP side)							
DNC-DT							
DNC-C/Ethernet							
Additional USB (Additional 2 ports, Std: 2 ports)							
Automation / untended operation							
Auto power shut-off	M02 and END alarms, work preps done						
Warm-up (calendar timer)							
External program selection	Button, rotary switch, digital switch, BCD (2-digit, 4-digit)						
Cycle time reduction (Ignores certain commands)							
Pallet pool control (PPC) (Required for multi-pallet APC)							
Robot, loader I/F							
High-speed, high-precision							
AbsoScale detection	X-Y-Z axes						
Inductosyn detection	Additional axes						
Hyper-Surface*2	Linear axes						
Super-NURBS*2	Linear and rotary axes						
0.1 μm control (linear axis commands)							
TAS-S (Thermo Active Stabilizer—Spindle)							
TAS-C (Thermo Active Stabilizer—Construction)							
ECO suite (energy saving functions)							
ECO Operation							
ECO Power Monitor	Wattmeter						
Energy-saving hydraulic unit	Inverter ECO Hydraulics						
Other							
CNC cabinet lamp							
Circuit breaker							
Sequence operation	Sequence stop						
Upgraded sequence restart	Mid-block return						
Pulse handles	2 pcs, 3 pcs (Std: 1 pc)						
External M signals	4, 8 signals						
Collision Avoidance System*2							
Machining Navi M-i, M-gII+ (cutting condition search)							
One-Touch Spreadsheet							
Block skip; 3 sets							
Additional axes	A, B, C axes [preps, specs]						
Fixture offset							
OSP-VPS (Virus Protection System)							
19 inch display operation panel w/ adjustable-tilt key board							

Note 1. NML: Normal, 3D: Real 3D Simulation, E: Economy, D: Deluxe, AOT: Advanced One-Touch IGF-M
 Note 2. *1. Required with MA-600HII 20,000 min⁻¹
 *2. There are limitations when Hyper-Surface and Collision Avoidance System are used simultaneously.
 There are limitations when Super-NURBS and Collision Avoidance System are used simultaneously.
 Select Super-NURBS for simultaneous linear and rotational axis machining.

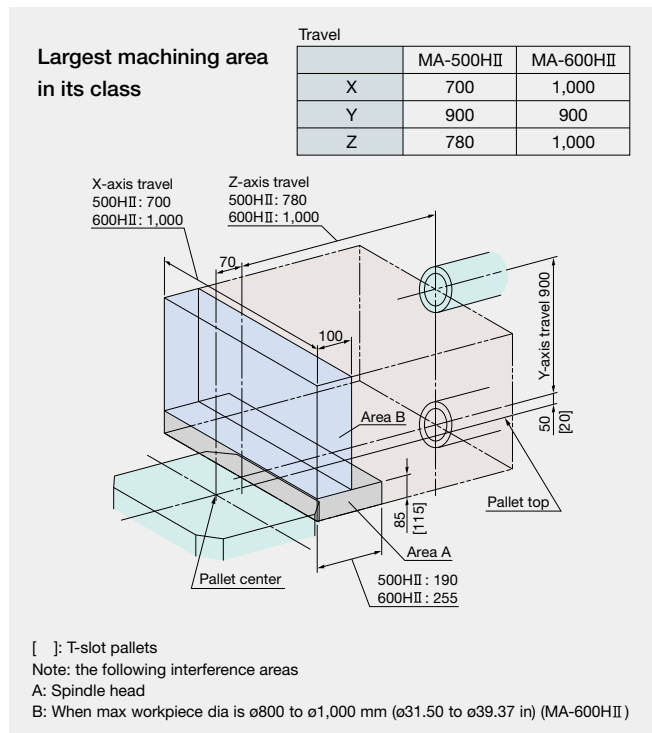
Pallet dimensions

Unit: mm



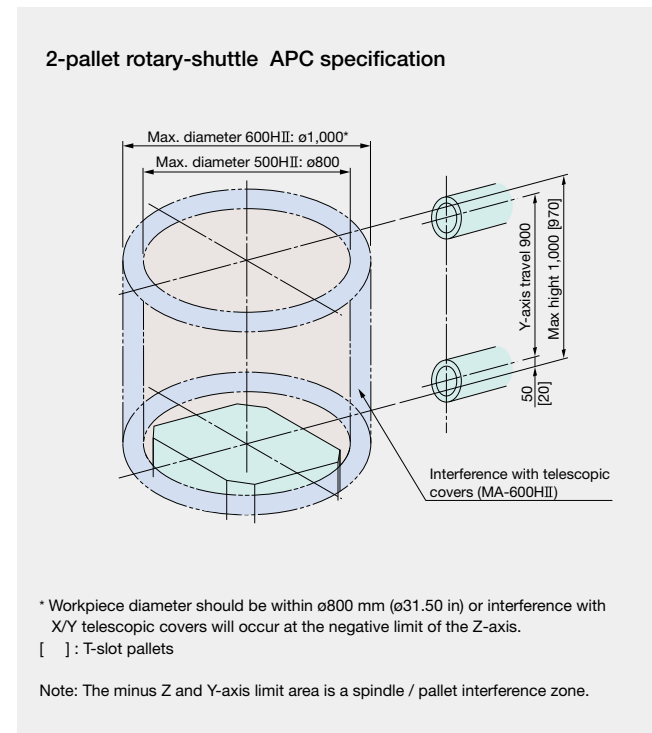
Working range

Unit: mm

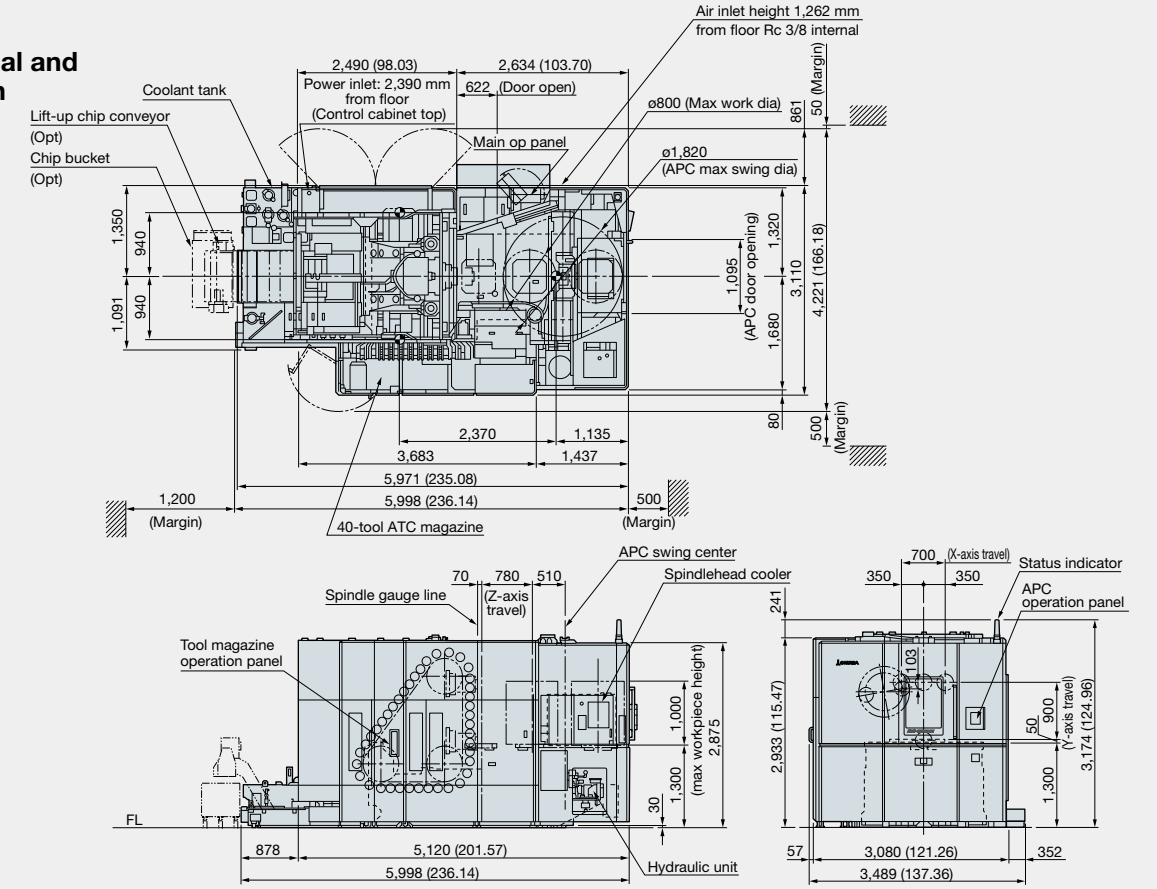


Maximum workpiece dimensions

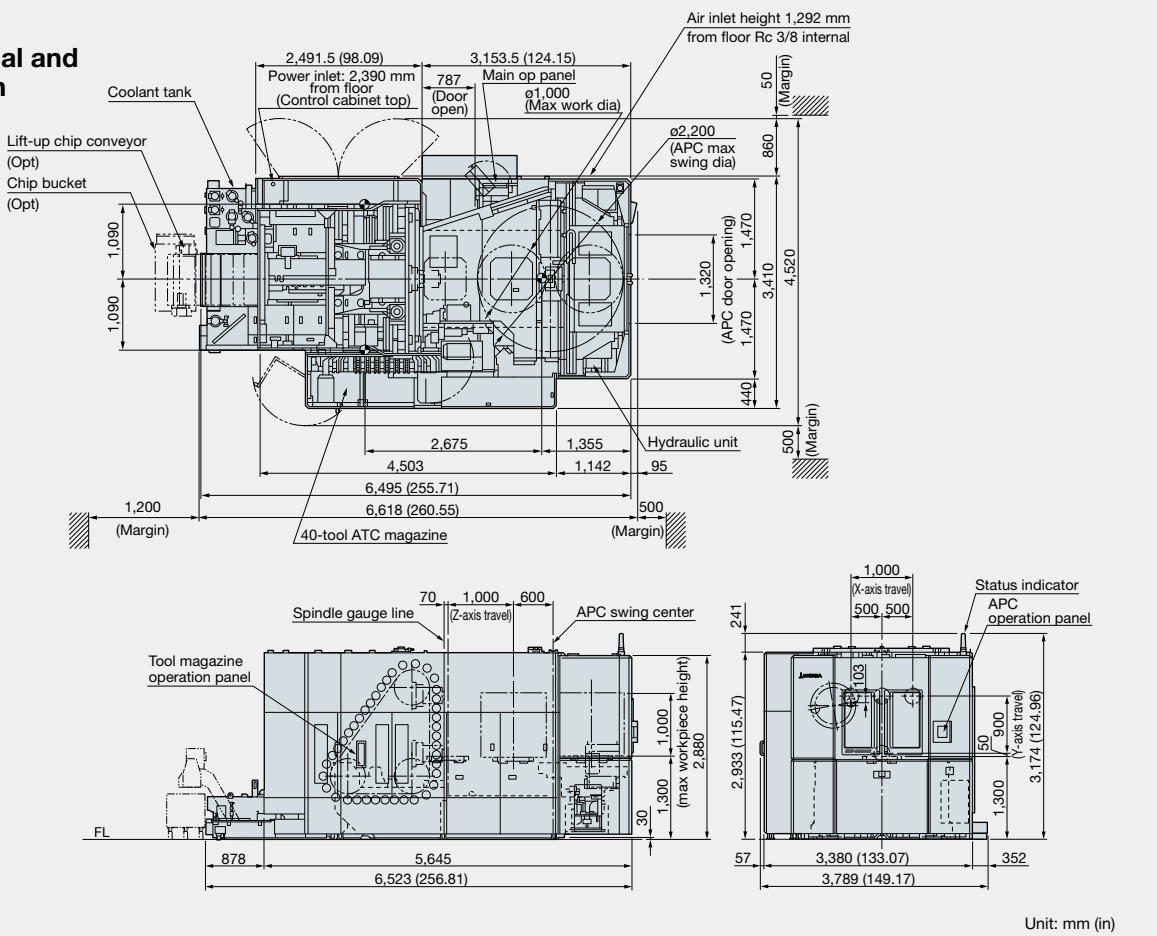
Unit: mm



MA-500HII Dimensional and Installation Drawings



MA-600HII Dimensional and Installation Drawings



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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