

OPEN POSSIBILITIES







ΜΑ-500ΗΙ/ΜΑ-600ΗΙ

MA-600HI

SPACE CENTER











High productivity in a broad range of "Monozukuri"* fields

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 -



| 2

* Monozukuri (manufacturing)— the art of "making things" better than ever.

Photos in this brochure include optional specifications.

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	Feedrate 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	Feedrate 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)

Super-heavy spindle: 6,000 min⁻¹ (Optional) ø200 face mill Material: S45C

Fool	Spindle speed min ⁻¹	Cutting m/min	Feedrate mm/min	Cut width mm	Cut depth mm	Chips cm ³ /min
200 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, and other conditions.

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



10

kW

kW

Long service life oil-air lubrication (all spindles)

Mainly for steel workpieces

Machines materials from aluminum to steel

Standard spindle No. 50

• Spindle speed: 6,000 min-1 Max torque: 606/349 N-m (10 min/cont)

Max output: VAC 30/22 kW (10 min/cont)



Steel machining

Wide-range spindle No. 40 (Optional)

Spindle speed: 15,000 min⁻¹ Max output: VAC 26/18.5 kW (10 min/cont) Max torque: 199/146 N-m (5 min/cont) 1,000 500 15 kW (5 min) 26 kW (10 n 199 N-m (5 min) 200 100



N-m 10

Wide-range spindle No. 50 (Optional) 419 N-m (1.7 times more than previous model)

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



Die/mold and aluminum machining



Standard spindle: 6,000 min⁻¹

Front roller bearings also suitable for powerful cutting



Machines Inconel, titanium and other difficult-to-cut materials Super-heavy spindle No. 50 (Optional)





Outstanding dimensional stability with long-run machining of large workpieces



Manageable Deformation—Accurately Controlled Thermo-Friendly Concept

Dimensional changes of less than $8\,\mu m$ over time in a wide

machining range (actual data with room temperature change of 8°C [TAS-C applicable])

Elimination of waste with use of Thermo-Friendly Concept

In addition to maintaining high dimensional accuracy when room temperature changes, Okuma's Thermo-Friendly Concept provides high dimensional accuracy during machine startup and machining restart.

To stabilize thermal deformation, warming-up time is shortened and the burden of dimensional correction during machining restart is reduced.



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: <u>better dimensional accuracy</u> from large workpieces requiring long cycle times, and <u>reduced dimensional variation</u> from repetitive workpiece mount positioning.

When starting the machine

When restarting machining

During room temperature changes

High dimensional stability



Positioning accuracy, based on ISO 230-2 machine tool test conditions



* 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.

Machine tool idling stop ECO Idling Stop

Only the necessary units run

Accuracy ensured, cooler off ECO Idling Stop

Intelligent energy-saving function with the Thermo-Friendly Concept.

The machine itself determines whether or not cooling is needed and cooler idling is stopped with no loss to accuracy. (Standard application on machines with Thermo-Active Stabilizer—Spindle)

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

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

- ECO suite provides a suite of energy-saving functions that can be used on machines
- "ECO Idling Stop" for operation of necessary units only
- "ECO Power Monitor" for visual graphics of power
- Intermittent/continuous operation of chip conveyor and mist collector during operation—"ECO Operation" (Optional)
- Energy-saving hydraulic unit using servo control technology— "ECO Hydraulics" (Optional)



Optimized Servo Control SERVONAVI

Achieves long term accuracy and surface quality

SERVONAVI AI (Automatic Identification)

Cycle time shortened with faster acceleration Work Weight Auto Setting

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





ECO suite benefits

Electricity consumption during non-machining time greatly reduced with "ECO Idling Stop," which shuts down each piece of auxiliary equipment not in use.



SERVONAVI SF (Surface Fine-tuning)

Maintains machining accuracy and surface quality Reversal Spike Auto Adjustment

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.



Contributes to longer machine life Vibration Auto Adjustment

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 rigidity

Easy to operate . . . the key to improving productivity

Less burden on the operator, much shorter job preparation times

High speed operation

Rapid traverse:	60 m/min (X-Y-Z axes)
Rapid acceleration:	0.7G (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)
APC time:	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-Z axis ball screw cooling and Y-axis motor bracket cooling are standard. Assuring stable accuracy during high rates of operation.

Indexing table, pallet

Indexing table uses curvic coupling for high-accuracy indexing.

- · Std: 1 degree
- · Opt: NC 0.001°

Pallet seating surface uses a taper cone system for high accuracy positioning and high durability.

Environmental measures

Roller guides with retainers for each axis. Lubricating oil pump with optimal control for 40% reduction in lubricating oil.

Highly rigid column strongly withstands bending and torsion



Diagonal rib configuration of columns



Bed supports fast travel of heavy parts



Ribs placed directly below guideways

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

Tank capacity 20% larger than previous model

washing nozzle (Optional)

Tank capacity: Tank 1,070 L (effective: 520 L) Pump motor capacity: 390 W Discharge: 42 L/min (water soluble) Coolant nozzles (Standard): 8, with check valves

Shower coolant system (Optional): 10 nozzles

Shower

Coolant nozzle



Left-mounted operation panel Improved visibility with rotating movable monitor

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

Excellent spindle and workpiece accessibility

• 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 tool				
ATC type	Magazine type	Max di	Maximum I	ength, mass,		
		w/adjacent	w/o adjacent *1	mo	ment	
40 tools (standard), 60 tools	Chain magazine	ø140 mm	ø240 mm			
81 tools, 111 tools,	Matrix magazine			Manu lan ath	450 [000 *2]	
141 tools, 171 tools	(171 tool cabinet)	ø105 mm (standard)	2040 mm (lanna aire)	Max length	450 [600 ⁻] mm	
195 tools, 225 tools,	Matrix magazine	ø130 mm (mid-size)	Ø240 mm (large size)	Max mass	25 Kg	
255 tools, 285 tools	(285 tool cabinet)			iviass moment	30.73 IN-M	
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-600HI 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		
Tool storage capacity	Total 171 tools	Standard tools only: up to ø105 Mid-size tool: tool up to ø130 (Large tool: ø130 to ø240*1	123 tools 48 tools 12 tools)	Total 285 tools	$\begin{array}{c} \mbox{Standard tools only:} & \mbox{up to \emptyset105} & 213 \mbox{ tools} \\ \mbox{Mid-size tool:} & \mbox{tool up to \emptyset130} & 72 \mbox{ tools} \\ \mbox{(Large tool:} & \mbox{\emptyset$130 to \emptyset240^{*1}} & 18 \mbox{ tools} \end{array}$)

(4 plcs)

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

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





12-pallet APC



[]: MA-600HI Unit: mm (in.)

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 exam	ple]
	● MA-600HII:	2
71 tool nagazine	 Pallets: 	30
	 Rack levels: 	3 (system height approximately 6 m)
	 Handling stations: 	2

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

High accuracy machining with advanced technology

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



 \bigcirc : Recommended \triangle : Available

Recommended chip conveyors

Material		Steel	FC	AL/Nonferrous metal	Mixed (general use)
Chip shape					
In-machine chip discharge	Hinge (Standard)*1, *2	0	0	0	0
Off-machine chip discharge (Optional)	Hinge type	0	_	—	△ (*4)
	Scraper type	_	(dry)	_	_
	Scraper (with drum filter)	_	O (wet) with magnet	△ (*3)	_
(-,-,-,)	Hinge + Scraper (with drum filter)*3	△ (*1)	△ (wet) (*2)	0	0

*1. Scraper type (Optional) 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 (Optional faster transport + 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

Туре	Hinge	Scraper	Scraper (with drum filter)	Hinge + Scraper (with drum filter)
Shape	C.			



Cutting condition search for milling **Machining Navi M-***i*, **M-***g*II+ (Optional)

Automatically changes to optimum spindle speed (M-i)

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



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.



Hi-Cut Pro

Faster! ... using max cutting feedrates By accelerating and decelerating cutting feedrates per upper limits, cycle times are reduced.

More accurate! ... using machine tolerances The OSP automatically controls speeds and acceleration per shape commands (corner angle, arc). Without Hi-Cut Pro With Hi-Cut Pro



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.



Turning cut (Optional)

Turning 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
- Machining of various diameters with a single tool
- Machining of ID/OD greater than largest tool diameter



Machine Specifications

			MA-	500HI	MA-6	500HI
	Item	Unit	No. 50	No. 40*1	No. 50	No.40*1
Travels	X-axis travel (column left/right)	mm (in.)	700 (2	27.56)	1,000	(39.37)
	Y-axis travel (spindle up/down)	mm (in.)		900 (3	35.43)	
	Z-axis travel (table front/back)	mm (in.)	780 (3	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	2.76 to 42.13)
Pallet	Work area	mm (in.)	500 × 500 (1	9.69 × 19.69)	630 × 630 (2-	4.80 × 24.80)
	Max load capacity	kg	800 [1	1,000]	1,200	[1,400]
	Indexing angle	deg		1 [0.	001]	
	Max workpiece dimensions	mm (in.)	ø800 × 1,000 (ø	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	
			[50 to 6,000	50 to 15 000	[50 to 6,000,	50 to 15 000
			(Super-heavy	50 to 15,000,	(Super-heavy	50 to 15,000,
			spindle), 50 to	50 10 20,000	spindle), 50 to	50 10 20,000
			12,000]		12,000, 20,000]	
	Tapered bore		7/24 taper No. 50	7/24 taper No. 40,	7/24 taper No. 50	7/24 taper No. 40,
			[HSK-A100]	HSK-A63*2	[HSK-A100]*3	HSK-A63*2
	Bearing dia	mm (in.)	ø100 (ø3.94)	ø70 (ø2.76)	ø100 (ø3.94)	ø70 (ø2.76)
Feedrate	Rapid traverse	m/min (ipm)		X-Y-Z: 6	0 (2,362)	
	Cutting feed	mm/min (ipm)		X-Y-Z: 1 to 60,00	00 (0.04 to 2,362)	
Motors	Spindle (10 min/cont) *4	kW (hp)	30/22		30/22 [45/37*4,	
			[45/37*4, 37/26]	26/18.5, 30/22	37/26, 55/50*5]	26/18.5, 30/22
			(40/30	(35/25, 40/30)	(40/30 [60/50,	(35/25, 40/30)
			[60/50, 50/35])		50/35, 75/66])	
	Feed axis motors	kW (hp)	X: 4.6 (6.13), Y	: 4.6 (6.13) × 2,	X: 4.6 (6.13), Y	: 4.6 (6.13) × 2,
			Z: 4.6	(6.13)	Z: 5.2	(6.93)
	Table indexing	kW (hp)		3.5 (4.67)	
ATC	Tool shank		MAS403 BT50	MAS 403 BT40,	MAS403 BT50	MAS 403 BT40,
			[HSK-A100]	HSK-A63*2	[HSK-A100]*3	HSK-A63*2
	Pull stud			MAS	-2 [-]	
	Magazine capacity	tools	40 [60, 8	31, 111, 141, 171, 1	95, 225, 255, 285, 3	20, 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	450	450 [600]	450
			(17.72)	(17.72)	(17.72 [23.62])	(17.72)
	Max tool weight	kg (lb)	25 (55)	10 (22)	25 (55)	10 (22)
	Tool selection		Me	mory random (Fixed	with 81 or more to	ols)
Machine	Height	mm (in.)		3,174 (124.96)	
size	Floor space; width x depth	mm (in.)	3,110 × 5,971 (1	22.44 × 235.08)	3,410 × 6,495 (1	34.25 × 255.71)
	Weight	kg (lb)	21,500	(47,300)	24,500	(53,900)
Controller			OSP-P300MA			

[]: Optional

*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. Super-heavy 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-Z axes	Full enclosure shielding	Two-pallet pivoted type for APC
Centralized lubrication	Oil level alarm and pressure alarm	Operation panel	
Coolant supply system	Tank 1,070 L (Effective: 520 L),	ATC operation panel	For manual operation
	pump 390 W (50H z), 620 W (60 Hz)	NC (OSP) control cabinet	Heavy current systems
In-machine chip discharge	Hinge	ventilation fan	
Chip pan for above		Status indicator	3 phase C type
ATC air blower (blast)		Foundation washers, jack bolts	
Chip air blower (blast)	Nozzle type	Slip stoppers and chemical	
Coil conveyor under APC		anchors	
In-machine chip washer		Tool release lever	
APC fork washer		Tapered bore cleaning bar	
Air filter and oiler		Hand tools	
Telescopic cover		Tool box	

Optional Specifications

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

Major options

Auto tool length compensation/breakage detection



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



Measurement time

Non-measurement time

For heavy-duty cutting 2. Okuma pull studs required

Auto zero offset / Auto gauging



Optical signal messaging type touch probe Detection increment: 1 µm

The Next-Generation Intelligent CNC OSP suite osp-p300MA

Meet Okuma's control package of "visual and digital" shop floor production instructions, setup data, cutting and utilization status, machine maintenance information, and more. The control interface itself adds a new dimension to ease of use-the more intelligent and faster way to manufacture high-quality components.



"suite apps"

In addition to Okuma's Intelligent Technology, a rich array of applications is available for advanced visual control and digitization of information needed on shop floors to support high-level "Monozukuri"/manufacturing.



"suite operation"

Use of a multi-touch panel achieves intuitive graphical operation. Finger moving, enlarging, reducing, and rotating 3D models, as well as scrolling list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smart phone.



Note: 15-in. operation panel screen shots.

Collision Avoidance System (Optional) shown above.

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 inputs	8-digit decimal, ±99999.999 to 0.001 mm (3937.0078 to 0.0001 in.), 0.001°
		Decimals as: 1 µm, 10 µm, 1 mm (0.0001,1 in.) (1°, 0.01°, 0.001°)
	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
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
Programming	Program capacity	Program storage capacity: 4 GB; operation backup capacity: 2 MB
	Program operations	Program management, editing, multitasking, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements,
		math functions, variables, branch commands, coordinate calculate, area calculate, coordinate convert, programming help
Operations	suite apps	Applications to graphically visualize and digitize information needed on the shop floor
	suite operation	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	"Single-mode operation" 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, alignment compensation
	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
Communications / Networking		USB (2 ports), Ethernet
High speed/accuracy specs		Hi-G Control, Hi-Cut Pro, pitch error compensation, SERVONAVI, Machining Time Shortening Function
Energy-saving	ECO suite	ECO Idling Stop*1, ECO Power Monitor*2
		*1. Chindle cooler Idling Stop is used on TAC C machines

*1. Spindle cooler Idling Stop is used on TAS-S machines.
 *2. The power display shows estimated values. When precise electrical values are needed, select the on-machine wattmeter option.

Optional Specifications

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FREE: 4293301832 BYTE

	Kit Specs*1 NML		٨L	3D		AOT			
Item Kit Specs ·			D	E	D	Е	D		
Interactive functions		-	-		-				
Advanced One-Touch IC									
Interactive MAP (I-MA									
Programming									
Auto scheduled program update									
G/M-code macros	G/M-code macros								
Common variables	1,000 pcs								
(Std: 200 pcs)	(Std: 200 pcs) 2.000 pcs								
Program branch; 2 sets	S								
Program notes (MSG)									
Coordinate system	Coordinate system 100 sets								
selection	200 sets								
(Std: 20 sets)	400 sets								
Helical cutting (within 3									
3D circular interpolatio	n								
Synchronized Tapping	Ш						٠		
Arbitrary angle chamfering									
Cylindrical side facing									
Slope machining									
Tool grooving (flat-tool	free-shaped grooving)								
Turning cut									
Tool max rotational spe	eed setting*1)								
F1-digit feed	4 sets, 8 sets, parameter								
Programmable travel li	mits (G22, G23)								
Skip (G31)									
Axis naming (G14)									
3D tool compensation									
Tool wear compensation							٠		
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						٠		
NC operation monitor	Hour meter, work counter						٠		
Hour meters	Power, spindle, NC, cutting				1				
Operation end buzzer	With M02, M30, and END commands								
Work counter	With M02 and M30 commands								
MOP-TOOL	Adaptive control, overload monitor								
Tool life management	Hour meter, No. of workpieces								
Gauging	• • • • • • • • • • • • • • • • • • •								
Auto gauging	Touch probe (G31)	Incl	uded	in m	nachir	ne sp	becs		
Auto zero offset Includes auto gauging			Included in machine specs						
Iape 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 Tool life management Hour meter, No. of workpieces Gauging Touch probe (G31) Auto gauging Touch probe (G31) Auto zero offset Includes auto gauging Tool breakage (touch sensor) (G31) detection Includes aut tool offset Gauging data printout File output Manual gauging (w/o sensor) Interactive gauging (touch sensor, touch probe required)				• •					
detection Includes auto tool offset			uded	in m	lachi	ne sp	becs		
Gauging data printout File output									
Manual gauging (w/o sensor)							٠		
Interactive gauging (to									

Item Kit Specs*1		NML		3D		AOT	
		Е	D	Е	D	Е	D
External I/O communicati							
RS-232-C interface							
DNC-T3							
DNC-B (232C-Ethernet	transducer used on OSP side)						
DNC-DT							
DNC-/Ethernet							
Additional USB (Additional USB							
Automation / untended or	peration						
Auto power shut-off	M02 and END alarms,						-
	work preps done					•	•
Warm-up (calendar tim	er)						
External program	Button, rotary switch, digital						
selection	switch, BCD (2-digit, 4-digit)						
Cycle time reduction (lo	nores certain commands)					•	•
Pallet pool control (PPC) (Beguired for multi-pallet APC)							-
Robot, loader I/F							
High-speed, high-precisio							
AbsoScale detection	X-, Y-, Z-axis						
Inductosyn detection Additional axes							
Super-NURBS							
0.1 um control (linear a							
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	Inverter					_	
hvdraulic unit	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							
Machining Navi M-i, M-gII+ (cutting condition search)							
One-Touch Spreadshee							
Block skip: 3 sets							
Additional axis							
Fixture offset							
OSP-VPS (Virus Protect							
19-indisplay operation							

*1. NML: Normal, 3D: Real 3D simulation, E: Economy, D: Deluxe,

AOT: Advanced One-Touch IGF-M

*2. **★**Technical consultation needed for specifications

*1) Required with MA-600HII 20,000 min-1

Pallet dimensions

MA-500HI

Unit: mm





MA-600HI

Working range

Center hole detail



Note: the following interference areas A: Spindle head

B: When max workpiece dia is ø800 to ø1,000 mm (ø31.50 to ø39.37 in.) (MA-600H $\rm I\!I$)

Maximum workpiece dimensions

2-pallet rotary-shuttle APC specification



* Workpiece diameter should be within ø800 mm (ø31.49 in.) or interference with X/Y telescopic covers will occur at the negative limit of the Z-axis. Note: Edge locators: optional
[]: T-slot pallets

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



Unit: mm



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> This product is subject to the Japanese government Foreign Exchange and Foreign Trade Control Act with regard to security controlled items; whereby Okuma Corporation should be notified prior to its shipment to another country.