MA-8000H
SPACE CENTER
Horizontal Machining Center

MA-8000H
SPACE CENTER
Horizontal Machining Center

Intelligent Technology

Thermo-Friendly Concept

Collision Avoidance System

Machining Navi

SERVONAVI

For greater productivity of large parts with outstanding machining capacity and incredible reliability

Increased machining capacity with a powerful 10,000 min^{-1} spindle (option)

- 10,000 min^{-1} No. 50 spindle machining capacity: 1,157 cm^3/min (S45C)
  1,389 cm^3/min (FCD450)

Higher floor space productivity with larger work envelope

- X-axis travel: 1,400 mm (longer than previous machine)
- Y-axis travel: 1,200 mm (longer than previous machine)
- Z-axis travel: 1,350 mm (longer than previous machine)

Outstanding dimensional stability even for long-run machining of large workpieces

- The Thermo-Friendly Concept minimizes dimensional changes due to ambient temperature changes and machining heat.
  Achieves outstanding dimensional stability even during long-run machining.

An operator-friendly machine design

- Daily inspection equipment is placed behind the machine for shortest front accessibility and operator workflow to improved operator efficiency.

Chip discharge that maximizes uptime

- Effective workspace area washing suppresses chip accumulation and reduces frequent chip cleaning inside the machine.

"Sludgeless Tank" enhances stable operations (recommended option)

- The Sludgeless Tank removes coolant impurities (sludge) that affect machining effectiveness—drastically reducing troublesome tank cleaning.

Automation support to further improve productivity

- Flexible support for automation; multi-pallet APC systems
 effective hydraulic/pneumatic fixture port arrangements
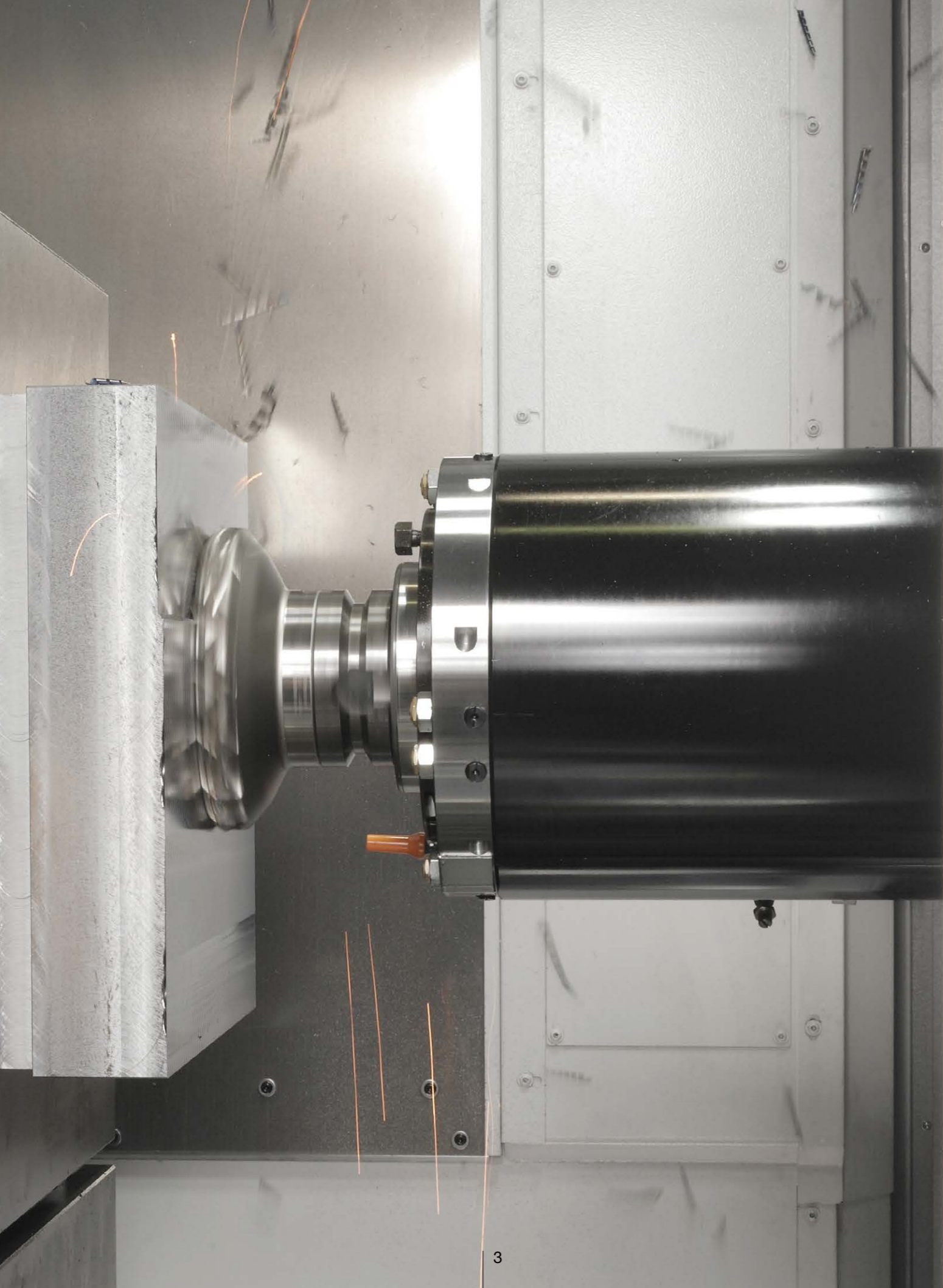
Increased machining capacity with a powerful 10,000 min⁻¹ spindle (option)

> ## Lineup with powerful spindle: 10,000 min⁻¹ (option)

Delivering high machining capacity across a wide range of low to high speeds. Effectively handles a wide range of workpieces from heavy-duty cutting of steel to aluminum machining.

■ Powerful spindle 10,000 min⁻¹ No. 50 (option)

- Spindle speed: **10,000 min⁻¹**
- Max output: **45/30 kW** (20 min, 60% ED/cont)
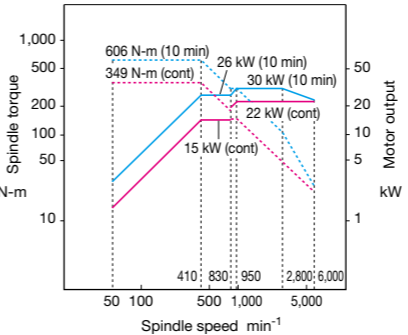- Max torque: **652/349 N-m** (15% ED/cont)
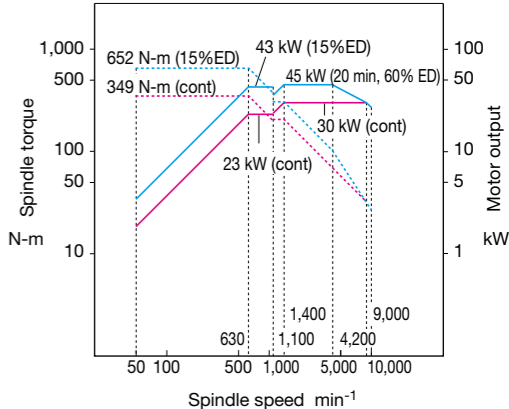
■ Spindle variations

■ Mainly for steel workpieces

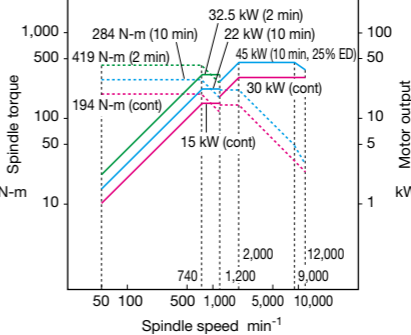**Standard spindle No. 50**

- 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
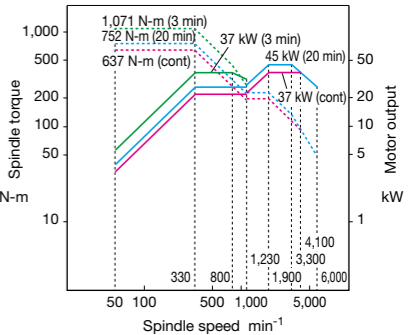
Wide-range spindle No. 50 (option)
Max output: 45 kW
(1.2 times more than previous model)

- Spindle speed: 12,000 min⁻¹
- Max output: 45/30 kW (10 min, 25% ED/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)

■ Handling a wide range of applications from heavy-duty to high-feed machining

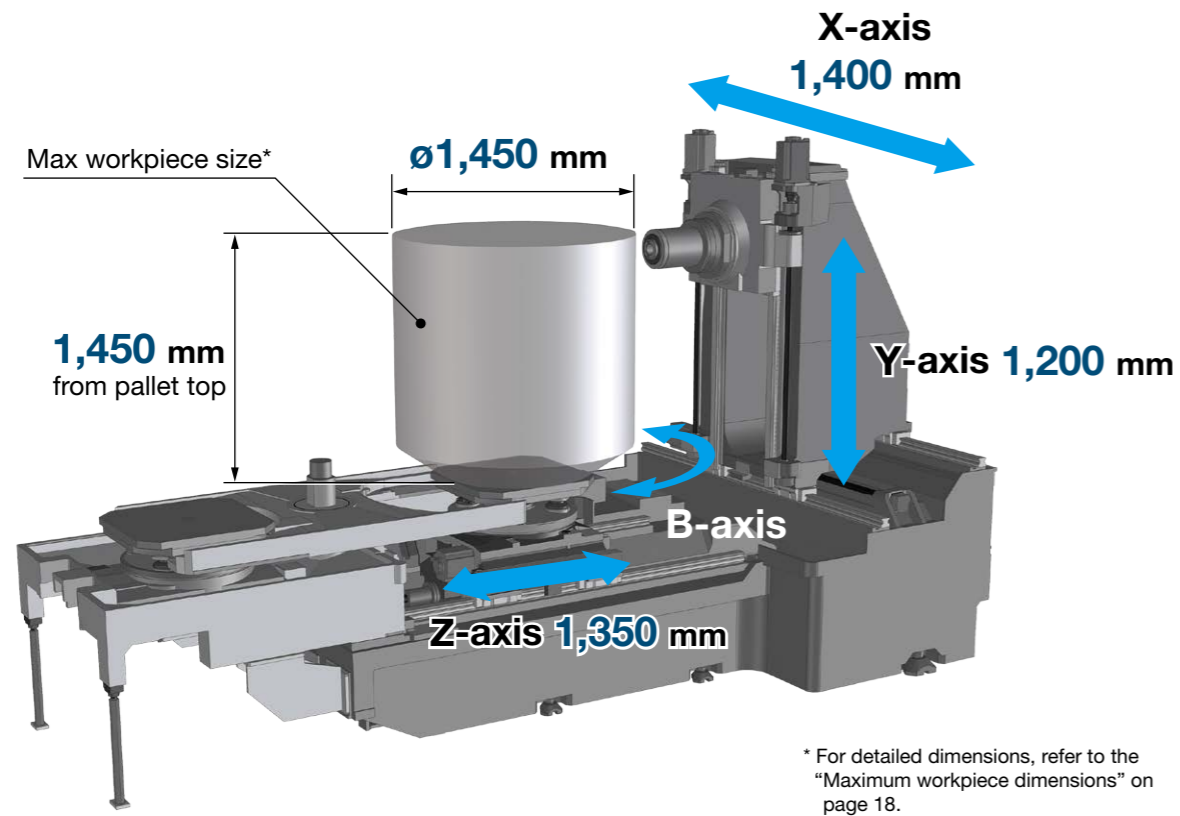### 10,000 min⁻¹ No. 50 (option) Spindle machining capacity

- Milling capacity

1,157 cm³/min (S45C)

Tool:	ø160 mm face mill 16 blades (carbide)
Spindle speed:	597 min⁻¹
Cutting Speed:	300 m/min
Feed rates:	3,826 mm/min
Cut width × depth:	112 mm × 2.7 mm
(Cut position: 741 mm from pallet top)	

- End milling capacity

632 cm³/min (S45C)

Tool:	ø50 mm end mill 4 blades (carbide)
Spindle speed:	1,318 min⁻¹
Cutting Speed:	207 m/min
Feed rates:	1,581 mm/min
Cut width × depth:	10 mm × 40 mm
(Cut position: 776 mm from pallet top)	

- Milling capacity

1,389 cm³/min (FCD450)

Tool:	ø160 mm face mill 16 blades (carbide)
Spindle speed:	497 min⁻¹
Cutting Speed:	250 m/min
Feed rates:	3,180 mm/min
Cut width × depth:	112 mm × 3.9 mm
(Cut position: 742 mm from pallet top)	

- End milling capacity

1,000 cm³/min (FCD450)

Tool:	ø80 mm end mill 4 blades (carbide)
Spindle speed:	980 min⁻¹
Cutting Speed:	246 m/min
Feed rates:	980 mm/min
Cut width × depth:	17 mm × 60 mm
(Cut position: 794 mm from pallet top)	

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.

Higher floor space productivity with larger work envelope

Optimal travels for the large parts applications

With longer X-, Y-, and Z-axis travels, a wider range of applications can be handled.

X-axis **1,400** mm

ø**1,450** mm

Max workpiece size*

1,450 mm from pallet top

Y-axis **1,200** mm

B-axis

Z-axis **1,350** mm

* For detailed dimensions, refer to the "Maximum workpiece dimensions" on page 18.

■ Larger work envelope

- X-axis travel: **1,400** mm (longer than previous machine)
- Y-axis travel: **1,200** mm (longer than previous machine)
- Z-axis travel: **1,350** mm (longer than previous machine)

■ Load capacity

3,000 kg (option) (more than previous machine)

■ Max workpiece size

ø**1,450** × **1,450** mm

■ Max tool length

800 mm (option)

■ High speed operations

- Rapid traverse: 50 m/min (X-, Y-, Z-axis)
- Tool change: 2.0 sec (T-T)[*1]
  4.3 sec (CTC min)[*2]
- Pallet change time: 17.5 sec[*1]
  18.3 sec[*2]
- Table indexing time: 1.9 sec[*3]/90°   1 degree indexing

[*1]. MAS standard measurements (formerly JIS B 6013)
[*2]. ISO 10791-9 (2001) (JIS B 6336-9) measurements
[*3]. At low inertia

Outstanding dimensional stability even for long-run machining of large workpieces

Thermo-Friendly Concept
The unique approach of "accepting temperature changes."

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

> Machine startup
>
> Machining restart
>
> Room temp change

▼
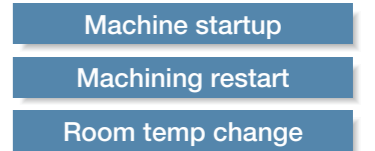
High dimensional stability

■ TAS-C (Thermo Active Stabilizer—Construction) (option)

The TAS-C environmental thermal deformation control accurately controls the machine's structural thermal deformation; by taking into consideration the machine's thermal deformation characteristics, temperature data from properly placed sensors, and the location information of the feed axis.

■ TAS-S (Thermo Active Stabilizer—Spindle) (option)

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

Machine is structurally designed to achieve outstanding accuracy

● Highly rigid 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 axes ball screw cooling and 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.

■ The exactness of bi-directional positioning
(MA-8000H AbsoScale actual data)
- X-axis (travel: 1,400 mm) **3.0 μm**
- Y-axis (travel: 1,200 mm) **3.4 μm**
- Z-axis (travel: 1,350 mm) **2.3 μm**

■ Bi-directional repeatability
(MA-8000H AbsoScale actual data)
- X-axis (travel: 1,400 mm) **2.4 μm**
- Y-axis (travel: 1,200 mm) **2.8 μm**
- Z-axis (travel: 1,350 mm) **1.6 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.

An operator-friendly machine design

Good machine access and better work efficiency

■ Improved setup station operator efficiency
■ Wider APC door opening width
● More efficient setups for maximum-size parts

Max workpiece dia
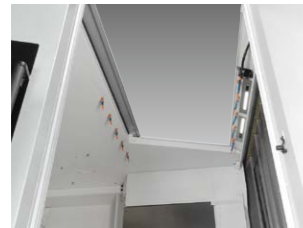ø1,450 mm

Open
1,700 mm

■ Open ceiling for setup station and workspace area
● Easy part load/unload by crane
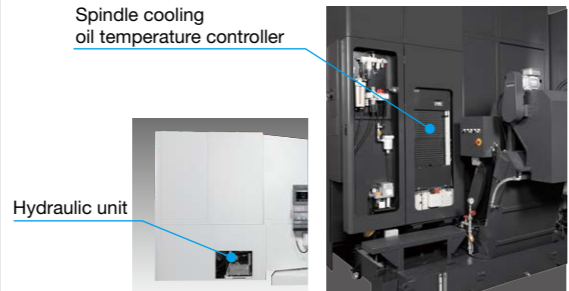● Lighting is good, and coolant doesn't drop in the workspace area

Setup station

Workspace area

■ Operation panel mounted on the left Swivel movement improves visibility and workability
● Workpiece and operation screen XYZ directions are the same
● Operator can be close to the screen, for less fatigue
● Operation panel moves horizontally toward spindle

Swivel

Horizontally

■ Maintenance improved by grouping daily inspection equipment behind the machine
■ Hydraulic unit is located on the operation side and daily check points are located at the rear of machine.
● Operator efficiency also improved with shortest workflow

Spindle cooling
oil temperature controller

Hydraulic unit

■ Space around the machine— operator preference steps available
● Easy to move around the machine, and a wide 700 mm steps (option) is available
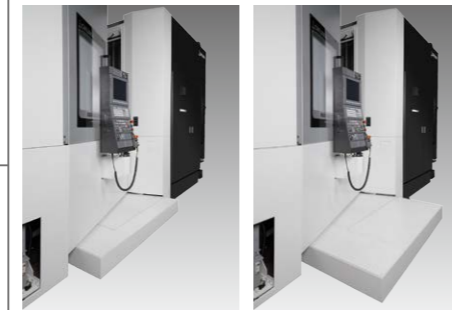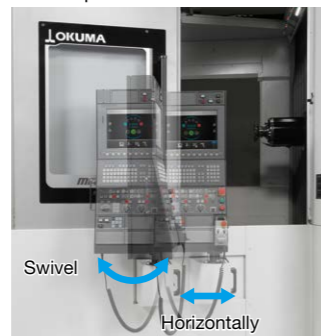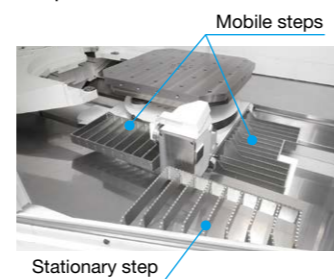
220 mm (standard)　　700 mm (option)

■ Good accessibility to the spindle and workpiece
● 520 mm from tool load/unload button to spindle

Tool L/U btn

■ In-machine steps (standard) improve in-machine operator efficiency
● Steps move with table and stationary step at workspace area entrance

Mobile steps

Stationary step

Chip discharge that maximizes uptime

With simple workspace covering and reinforced coolant applications, efficient chip discharge and long-run machining possible

Just Z-axis travel single cover and a smooth X-, Y-axis telescopic covers suppress chip accumulation.
Moreover, in dry machining without coolant, washing only the lower workspace area with coolant is possible.
In-machine washing prevents likely areas of chip accumulation, by cleaning away chips to maintain long-run production runs.

■ Chip discharge and workspace area designed to prevent chip accumulation

Stronger workspace lower area with large-volume coolant wash and hinge conveyor smoothly removes accumulated chips out of the machine.

From the upper area of the workspace, a shower coolant system (option) and coolant from the X-, Y-axis telescopic covers suppress chip accumulation.
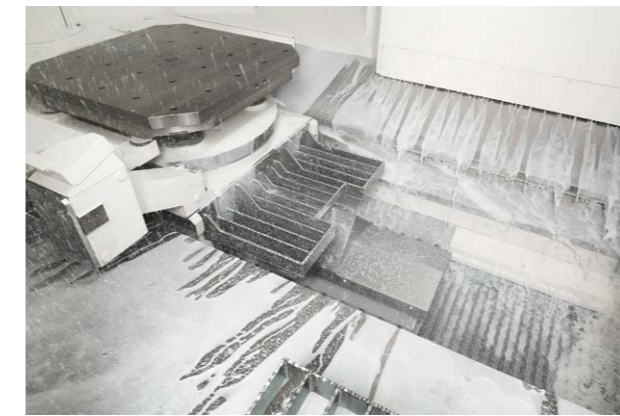
Preventing chip accumulation with smooth X-, Y-axis telescopic covers and Z-axis stainless steel single cover.

Flat covers in the workspace prevent chip accumulation.

Center trough design enhances large amount of chip discharge out of the machine.

Z-axis stainless steel single cover　　X-, Y-axis telescopic covers

■ Out-of-machine chip discharge
Optional a lift-up chip conveyor that discharges chips to the outside of the machine, and a Sludgeless Tank (recommended option) that efficiently removes sludge are available.

Note: The Sludgeless Tank (recommended option) includes:
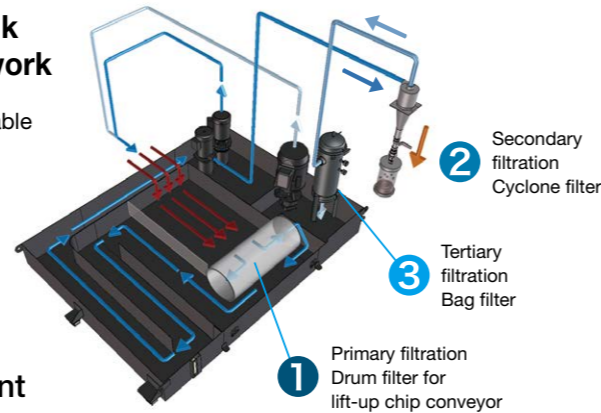　　 a hinge + scraper (with drum filter) lift-up chip conveyor.

Lift-up
chip conveyor

Sludgeless
Tank

"Sludgeless Tank" enhances stable operations
(recommended option)

Suppresses sludge accumulation in the coolant tank
Dramatically reducing troublesome tank cleaning work

It is important to remove impurities (sludge) contained in the coolant for stable operation of the machine, and coolant tank cleaning is indispensable. The Sludgeless Tank (recommended option) effectively removes sludge and reduces coolant contaminants. By suppressing sludge accumulation in the tank, the frequency of troublesome tank cleaning can also be drastically reduced, enabling stable operations over long runs.

② Secondary filtration Cyclone filter

③ Tertiary filtration Bag filter

① Primary filtration Drum filter for lift-up chip conveyor

■ Coolant sludge removal, less environmental impact when disposing coolant

Sludge removal rate 　**99**%* (for castings)
　　　　　　　　　　 97%* (for aluminum)

Note: · After tertiary filtration (bag filter) permeation
　　　 · Okuma evaluated removal rate

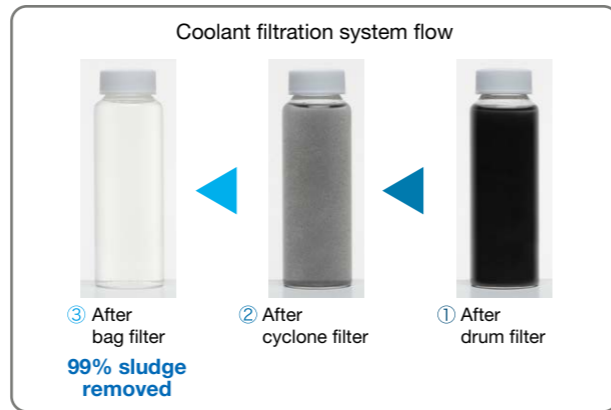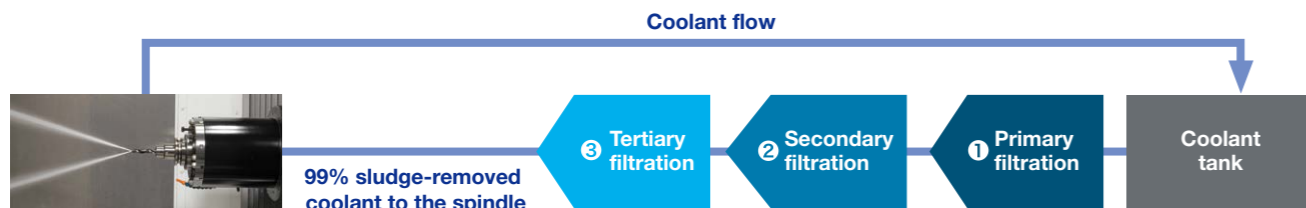**No tank cleaning required for three years**
(Okuma equipment actual data)

Unidirectional coolant flow in the Sludgeless Tank also suppresses coolant deterioration due to stagnation. Coolant replacement frequency is greatly reduced, and the environmental impact is less when coolant disposal amounts are also reduced.

* Water-soluble coolants only.

Coolant filtration system flow

③ After bag filter 　② After cyclone filter 　① After drum filter
99% sludge removed

■ Keeping spindle tapers clean

The three filtration devices in the Sludgeless Tank and coolant suction inside the spindle reduce dirt on the spindle taper and lessen defective machining.
Note: Suction of coolant from the spindle also limits the outflow of coolant to the spindle taper when changing tools.
　　　Air blow (min 15 sec) is also not required to remove residual coolant and achieve shorter tool change times.

Coolant flow

99% sludge-removed coolant to the spindle → ③ Tertiary filtration → ② Secondary filtration → ① Primary filtration → Coolant tank

■ Compact—integrated with the through-spindle coolant tank

The thru-spindle coolant tank is integrated for space-saving installation.

Lift-up chip conveyor (option)

Integrated with through-spindle coolant tank
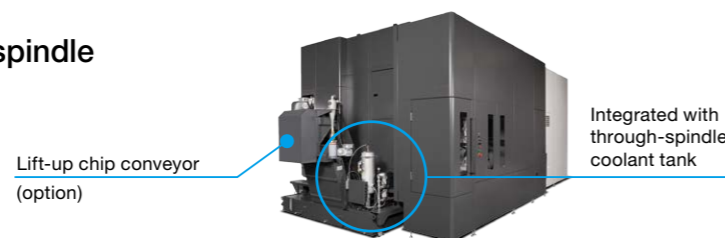
# Automation support to further improve productivity

Flexible automation support

■ Equipped with a large number of thru-pallet fixture ports (option)

The setup station pallet base can be equipped with up to 16 fixture ports for hydraulic and pneumatic pressure, and the workspace area table base can have up to 8 ports for flexible automation applications. Simplifying complex hydraulic circuits is possible, making it easier to design auto-clamp fixtures. Customers benefit from more agile system building to handle diverse automation requirements.

Setup station

Max **16** ports (hyd/pneu)[*1, *2]
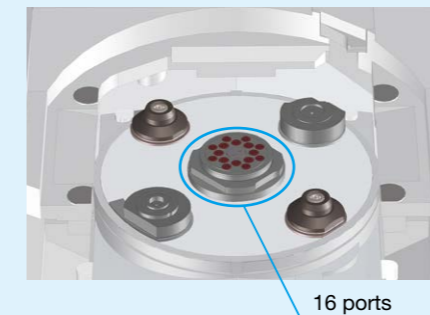
16 ports

For the setup station 16 ports preps

With 16 ports, arrangements for robotic and automation applications will be expanded, and more flexible fixture support will be possible. With 16 ports, a large number of parts can be mounted, and a different workpiece can be clamped on each side of a 4-sided tooling block fixture.

*1. 8 or 16 ports available.
　 (for 16 ports, max 12 hydraulic ports)
*2. Hydraulic pressure: 7 MPa.

Workspace area (in machine)

Part load/unload[*1]: 　Max **7** ports[*3]
Workholding clamps[*2]: Max **8** ports[*3]

7 or 8 ports
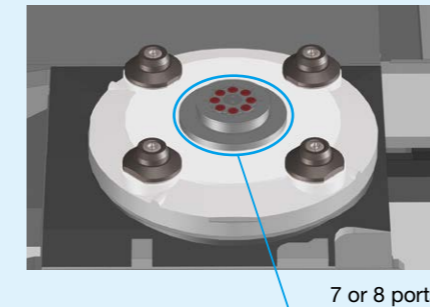
Part load/unload in workspace area (table) also possible

"Part load/unload" fixture ports also allow part load/unload in the workspace area in the machine. Adjustment times for trial cuts can be shortened and fixture readjustments in the workspace improve work efficiency. With more ports, hydraulic applications have increased, eliminating complicated hydraulic circuits arrangements.

*1. For part load/unload in the workspace area,
　 select part load/unload.
*2. If the above is not required,
　 select workholding clamps.
*3. Hydraulic pressure: 7 MPa.
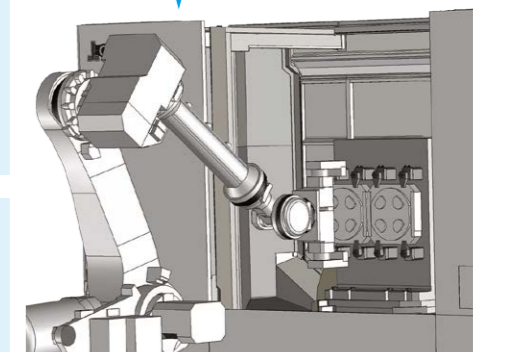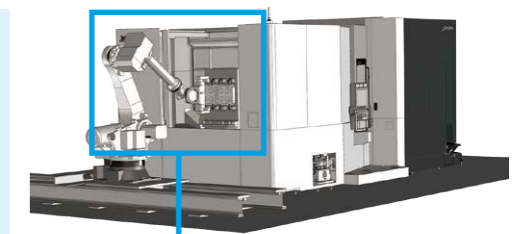
Example of robotic automation

■ Auto Setup Station Pallet Rotate (option)

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.

Flexible production of large-variety workpiece applications

## An impressive lineup of automation systems

■ Flexible APC systems

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
- ● Pallet change time is the same as in the standard APC
- ● Can be adapted to match plant layout and type of production

6-pallet APC

10-pallet APC

4,128 mm

7,228 mm
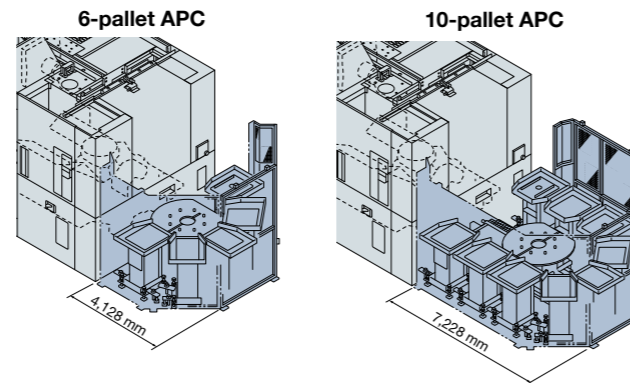
■ Auto tool changer

The standard number of tools that can be stored is 60. Flexible, high-volume tool storage systems available for adding more types of workpieces.
Matrix magazines store larger numbers in compact, quick tool-change arrangements.

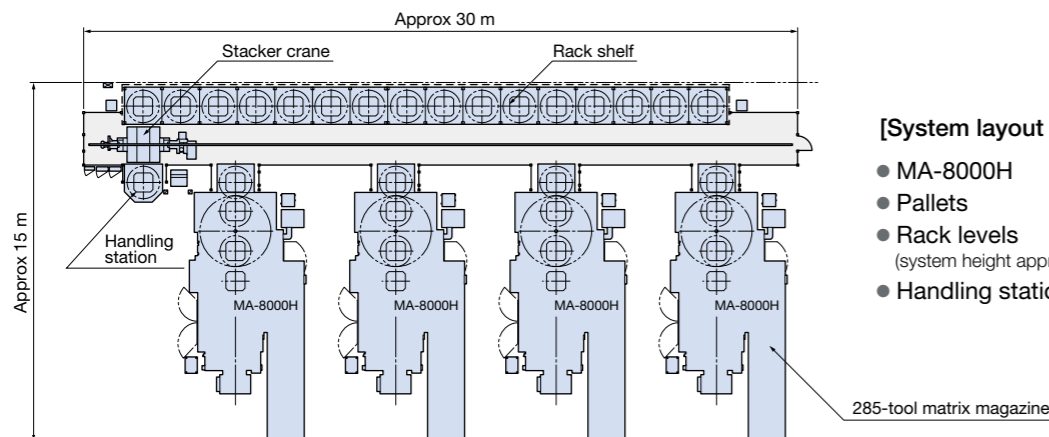| ATC magazine capacity	Magazine type	ATC tool		Maximum length, mass, moment	
		Max diameter			
		w/adjacent	w/o adjacent		
40 tools, 60 tools (standard)	Chain magazine	ø140 mm	ø240 mm	Max length 600 [800] mm	Max mass 25 kg Mass moment 36.75 N-m
81 tools, 111 tools, 141 tools, 171 tools	Matrix magazine (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		

[ ]: Option

Matrix system ATC magazine (option)

■ Ready for FMS applications

- ● An FMS with a smart, expandable stacker crane system

Approx 30 m

Stacker crane

Rack shelf

Approx 15 m

Handling station

MA-8000H MA-8000H MA-8000H MA-8000H

285-tool matrix magazine

[System layout example]
- ● MA-8000H   4
- ● Pallets   32
- ● Rack levels   2
  (system height approximately 5.5 m)
- ● Handling station   1

OSP suite OSP-P300MA
The Next-Generation Intelligent CNC

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.

Smooth operations even with wet or work-gloved hands

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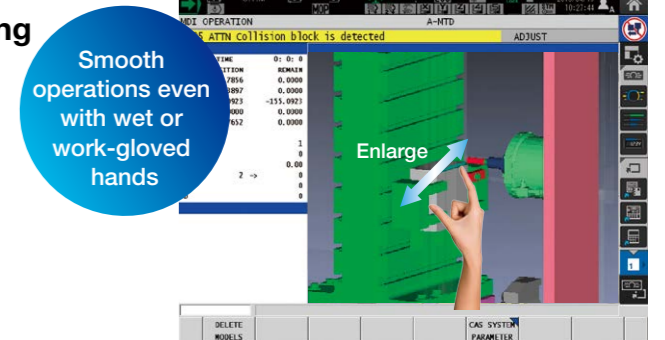
Note: 15 inch operation panel screen shots.
Collision Avoidance System (option) shown above.

"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.

[INFO] button

Spindle Output Monitor
S11
Increased productivity through visualization of motor power reserve

Turn-Cut Guide (option)
S12
Making new machining technology simpler and easier to use

E-mail Notification
S15
Monitoring operating status even when away from the machine

Screen Capture
S16
Automatic saving of recorded alarms

Scheduled Program Editor
S10
Easy programming without keying in code

Connect Plan
Get Connected, **G**et Started, and **G**et 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.

Machine tool and PC

Connect
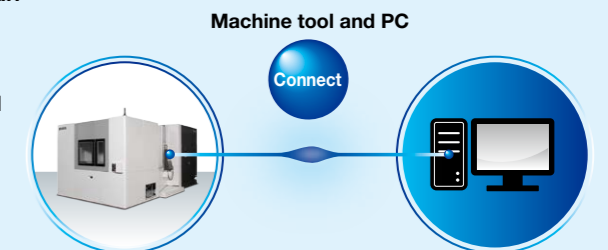
Advanced technology—effective for machine shops
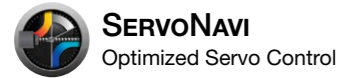
SᴇʀᴠᴏNᴀᴠɪ
Optimized Servo Control

Achieves long term accuracy and surface quality

■ SᴇʀᴠᴏNᴀᴠɪ 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 liner 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

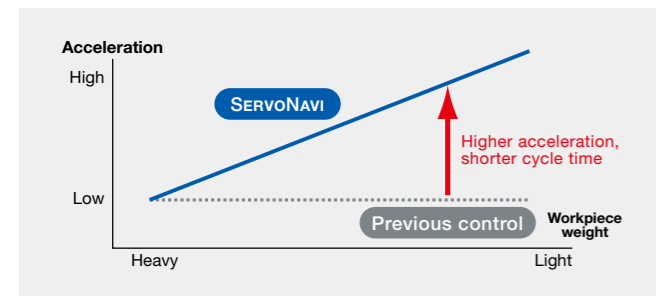Depending on the workpiece or fixtures, inertia will vary, and with each variation the rotary axis positioning error in some cases became much larger.

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.

■ SᴇʀᴠᴏNᴀᴠɪ SF (Surface Fine-tuning)

● Reversal Spike Auto Adjustment
Maintains machining accuracy and surface quality

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

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

● Vibration Auto Adjustment
Contributes to longer machine life

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

Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.
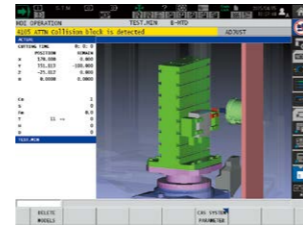
Collision Avoidance System (option)
Collision prevention

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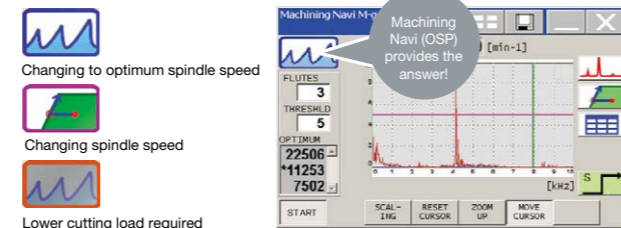
Machining Navi M-*i*, M-*g*Ⅱ+ (option)
Cutting condition search for milling

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-*g*Ⅱ+ displays several spindle speed possibilities

Changing to optimum spindle speed

Changing spindle speed

Lower cutting load required

Machining Navi (OSP) provides the answer!

ECOsuite
Next-Generation Energy-Saving System

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 and mist collector during operation

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

## Hyper-Surface (option)
Auto machining data compensation

■ Further improvement of machined surface quality with new machining data compensation

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

Hyper-Surface No compensation

Hyper-Surface Compensation

No compensation | Compensation | No compensation | Compensation
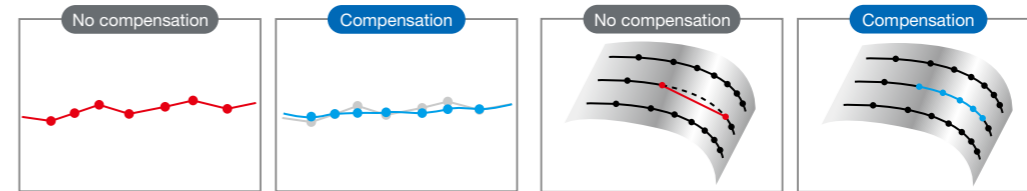
Smooths minor fluctuations and variations in command points

Adjust steps errors between adjacent cutter paths
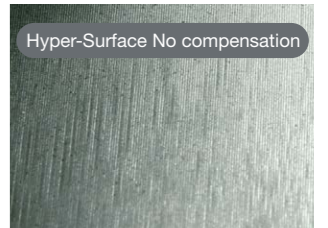
Comparison of machined surface quality

Turn-Cut (option)

■ 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
- ● Machine IDs/ODs with ATC-oversized large tool diameters

Spindle center
Circular motion
Z sync
Circular motion center
Circular motion center
Spindle center tool path circular motion
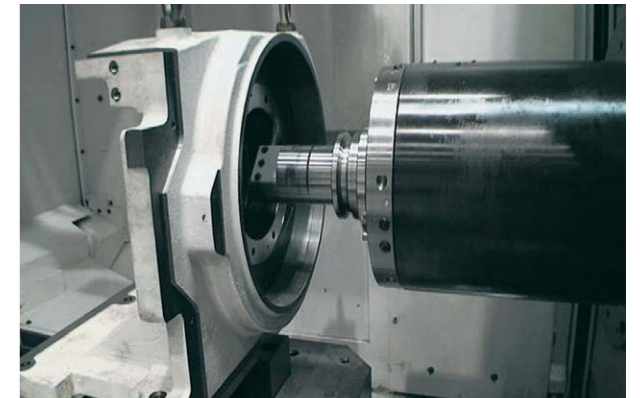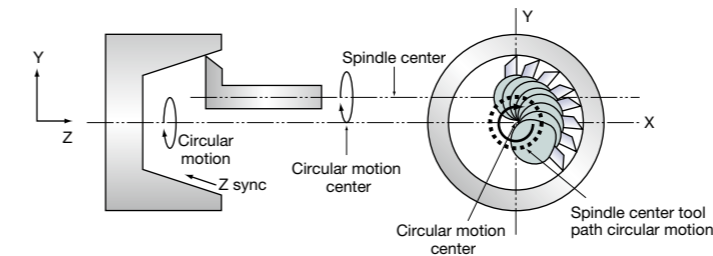
AI Machine Diagnosis Function (option)
Machine tool diagnostics technology with artificial intelligence (AI)

■ 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:
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
Detects damage to spindle bearings
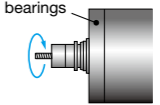
AI Feed Axis Diagnosis Function
Detects ball screw wear condition
Detects damage to ball screw support bearings

Self-diagnosis of feed axis status with AI

■ Machine Specifications

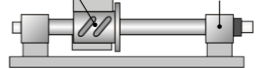|	Item	Unit	MA-8000H
Travels	X-axis (column left/right)	mm (in)	1,400 (55.12)
	Y-axis (spindle up/down)	mm (in)	1,200 (47.24)
	Z-axis (table front/back)	mm (in)	1,350 (53.15)
	Spindle center to pallet top	mm (in)	100 to 1,300 (3.94 to 51.18)
	Spindle nose to pallet center	mm (in)	100 to 1,450 (3.94 to 57.09)
Pallet	Work area	mm (in)	800 × 800 (31.50 × 31.50)
	Max load capacity	kg (lb)	2,000 [3,000]*1 (4,400 [6,600]*1)
	Indexing angle	deg	1 [0.001]
	Max workpiece dimensions	mm (in)	ø1,450 × 1,450 (57.09 × 57.09)
Spindle	Speed	min-1	50 to 6,000 [50 to 6,000 (high-torque spindle), 50 to 10,000, 50 to 12,000]
	Tapered bore		7/24 taper No. 50 [HSK-A100]
	Bearing dia	mm (in)	ø100 (ø3.94)
Feed rate	Rapid traverse	m/min (ipm)	X, Y, Z: 50 (1,969)
	Cutting feed rate	mm/min (ipm)	X, Y, Z: 1 to 50,000 (0.04 to 1,969)
Motors	Spindle (10 min/cont)*2	kW (hp)	30/22 [45/37*2, 45/30*2, 45/30] (40/30 [60/50, 60/40, 60/40])
	Feed axes	kW (hp)	X: 5.1 (6.8), Y: 3.5 (4.67) × 2, Z: 5.1 (6.8)
	Table indexing	kW (hp)	4.6 (6.13)
ATC	Tool shank		MAS403 BT50 [HSK-A100]
	Pull stud		MAS 2 [–]
	Magazine capacity	tools	60 [40, 81, 111, 141, 171, 195, 225, 255, 285, 320, 400]
	Max tool dia (w/ adjacent)*3	mm (in)	ø140 (5.51)
	Max tool dia (w/o adjacent)*3	mm (in)	ø240 [ø315]*4 (9.45 [12.40]*4)
	Max tool length	mm (in)	600 [800]*4 *5 (23.62 [31.50]*4 *5)
	Max tool mass	kg (lb)	25 [30]*4 (55 [66]*4)
	Tool selection		Memory random [Matrix magazines use fixed addresses]
Machine size	Height	mm (in)	3,442 (135.51)
	Floor space; width × depth	mm (in)	3,960 × 8,178 (155.91 × 321.97)*6
	Mass	kg (lb)	33,000 (72,600)*7
Controller			OSP-P300MA

[   ]: Option   *1. Machine component movements become slower with this optional specification.   *2. High-torque spindle (heavy-duty cutting) and 10,000 min-1 spindle rating: 20 min/cont.   *3. Values differ with a matrix magazine. Please inquire.   *4. Shutter open/close times become longer with the optional specification.   *5. Max workpiece diameters may be limited by required tool lengths. *6. Off-machine chip discharge; hinge + scraper with drum filter (Recommended).   *7. Workpieces and tools not included.

■ Standard Specifications

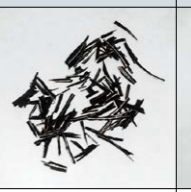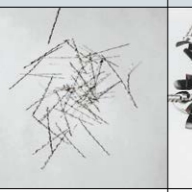|			
Spindle speed	6,000 min-1 (30/22 kW [10 min/cont])	In-machine chip washer	
ATC magazine capacity	60 tools	APC fork washer	
Spindlehead cooling system		Air filter and oiler	
Ball screw cooler	X-Y-Z axes	Telescopic cover	
Centralized lubrication	Tank: 20 L	Hydraulic unit	
	Oil level alarm and pressure alarm	Automatic 1° indexing table	
Coolant supply system	Tank: 1,144 L	2-pallet rotary-shuttle APC	Pallet top surface M16 tap
	(Dirty tank: 1,018 L (effective: 696 L))	Full enclosure shielding	2-pallet pivoted type for APC
	(Clean tank: 126 L)	Operation panel	15 in; movable (swivel, horizontal)
	Pump: 3.0 kW, 1.5 kW,	ATC operation panel	For manual operation
	0.55 kW (50 Hz)/0.75 kW (60 Hz)	NC (OSP) control cabinet ventilation fan	
In-machine chip discharge	Hinge	Work lamp	LED (2 locations)
Chip pan for above		Status indicator	3 phase C type
Coolant nozzle	Universal nozzle type	Foundation washers, jack bolts	
Thru-spindle coolant*	1.5 MPa	Slip stoppers and chemical anchors	
Suction of excess coolant in spindle		Tool release lever	
ATC air blower (blast)		Tapered bore cleaning bar	
Chip air blower (blast)	Nozzle type	Hand tools	
Coil conveyor under APC		Tool box	

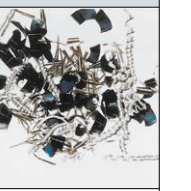* : Okuma pull stud required with thru-spindle coolant.

■ Optional Specifications

Spindle speeds	50 to 10,000 min-1, 45/30 kW, No. 50	In-machine chip discharge	Scraper type chip conveyor
	50 to 12,000 min-1, 45/30 kW, No. 50	Off-machine chip discharge (lift-up chip conveyor types)	Refer to Recommended chip conveyors.
High-torque spindle	6,000 min-1, 45/37 kW, 1,071 N-m, No. 50		
Dual contact spindle	HSK, BIG-PLUS®	Chip bucket for above	Height 700 mm, 1,000 mm
ATC magazine capacity (tools)	40 tools (chain magazine type)	Hydraulic oil cooler	
	81, 111, 141, 171, 195, 225, 255, 285 tools (matrix magazine type)	Coolant heater / cooler	
		Auto tool length comp / breakage detection	Touch sensor
	320, 400 tools (multiple magazine system)		
AbsoScale detection	X-Y-Z axes	Auto zero offset/auto gauging	Touch probe
Auto 0.001° indexing table	Built-in NC table	Tool life management	By hour meter
APC Auto pallet changer	Parallel shuttle: 6P, 10P	Turn-Cut	AbsoScale detection required
FMS 2-pallet APC	Wing block type, Under-pallet fork type	Pull stud bolt shape	MAS-1, CAT, DIN, JIS
Pallet top surface configuration	T-slot	Pull stud bolt	MAS-1, MAS-2, CAT, DIN, JIS
Spare pallets		2-sided tooling block	
Edge locator		4-sided tooling block	
Oil-hole coolant system	1.5 MPa	Angle plate	
Thru-spindle coolant*1	7.0 MPa, large flow 1.5 MPa, large flow 7.0 MPa	Additional work lamp	
Semi-dry machining	Thru-spindle type, nozzle type, thru-spindle/nozzle switch type	Machining Navi	M-i, M-gII+
		Hydraulic fixture systems	Linked, pallet-thru types
Shower coolant	10 nozzles	Recommended for die machining	AbsoScale detection (X-Y-Z axes)
Work wash gun			Hyper-Surface
Oil mist lubricator			DNC-DT, 0.1 µm control
Mist collector		TAS-S*2 *3	Thermo Active Stabilizer—Spindle
Chip air blower (blast)	Adapter	TAS-C*3	Thermo Active Stabilizer—Construction
Coolant system	Sludgeless Tank (recommended option)		

*1. Okuma pull stud required with thru-spindle coolant.
*2. Required for 10,000 min-1 or higher spindle speed applications.
*3. Standard in certain markets.
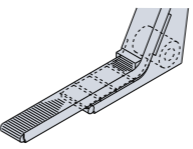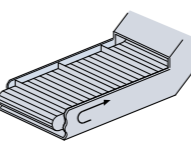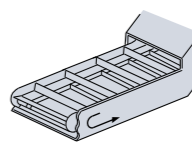
■ Chip conveyors   (Please contact an Okuma sales representative for details.)

○: Recommended
△: Conditionally recommended

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

*1. Scraper type (option) also available.   *2. Included when Sludgeless Tank is selected.   *3. When chips are shorter than 100 mm
*4. With limitations per conveyor discharge direction.

■ Off-machine lift-up chip conveyors

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

OSP suite OSP-P300MA The Next-Generation Intelligent CNC

■ 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
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
Programming	Program capacity	Program storage capacity: 4 GB; operation buffer: 2 MB
	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
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, easy setting of cycle time reduction
	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
Communications / Networking		USB (2 ports), Ethernet, DNC-T1
High speed/accuracy specs		Hi-G Control, Hi-Cut Pro, pitch error compensation, SᴇʀᴠᴏNᴀᴠɪ, Machining Time Shortening Function
Energy-saving	ECO suite	ECO Idling Stop, ECO Power Monitor*1

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

■ Optional Specifications

Item	Kit Specs	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 10 MB							
Auto scheduled program update		●	●	●	●	●	●
Additional G/M-code macros							
Common variables	1,000 pcs						
(Std: 200 pcs)	2,000 pcs						
Program branch; 2 sets							
Program notes (MSG)			●		●		●
Coordinate system	100 sets		●		●		●
selection	200 sets		●		●		●
(Std: 20 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							
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*1	Spindle, feed axes / Spindle						
Machine Status Logger							
Cutting Status Monitor							
Tool life management	Hour meter, No. of workpieces	●	●	●	●	●	●
Gauging							
Auto gauging	Touch probe (G31)	Included in machine specs					
Auto zero offset	Includes auto gauging	Included in machine specs					
Tool breakage detection	Touch sensor (G31)	Included in machine specs					
	Includes auto tool offset						
Manual gauging (w/o sensor)		●	●	●	●	●	●
Interactive gauging (touch sensor, touch probe required)							

Item	Kit Specs	NML		3D		AOT	
		E	D	E	D	E	D
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 → OFF	●	●	●	●	●	●
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	X-Y-Z axes only						
Super-NURBS*3 *4	X-Y-Z, rotational axis (up to 2)						
0.1 μm control (linear axis commands)							
TAS-S (Thermo Active Stabilizer—Spindle)*5 *6							
TAS-C (Thermo Active Stabilizer—Construction)*6							
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 codes	4 sets, 8 sets						
Collision Avoidance System*2 *3							
Machining Navi M-i, M-gII+ (cutting condition search)							
One-Touch Spreadsheet							
Block skip; 3 sets							
Additional axes	A-, B-, C-axis [preps, specs]						
Fixture offset							
OSP-VPS (Virus Protection System)							
19 inch display operation panel w/ adjustable-tilt key board							

*1. With AbsoScale detection specs, ball screw wear detection is possible.
*2. There are limitations when Hyper-Surface and Collision Avoidance System are used simultaneously.
*3. There are limitations when Super-NURBS and Collision Avoidance System are used simultaneously.
*4. Select Super-NURBS for simultaneous linear and rotational axis machining.
*5. Required for 10,000 min-1 or higher spindle speed applications.
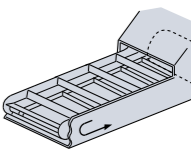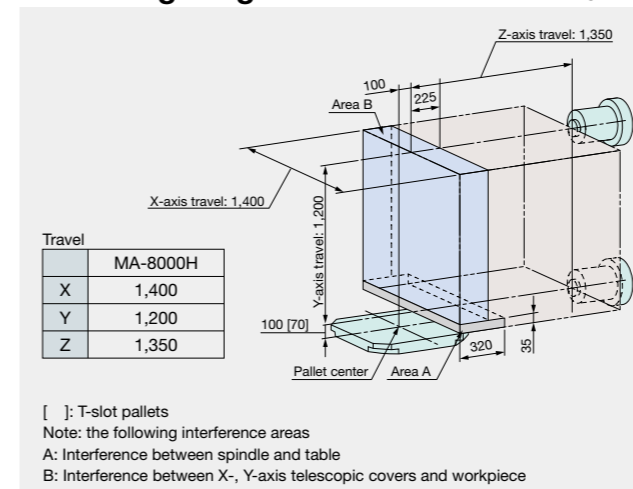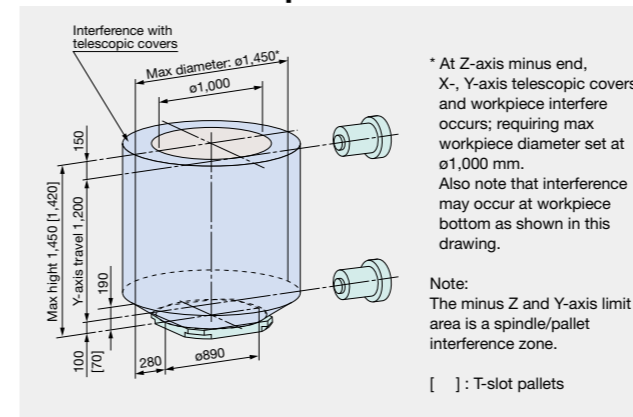*6. Standard in certain markets.

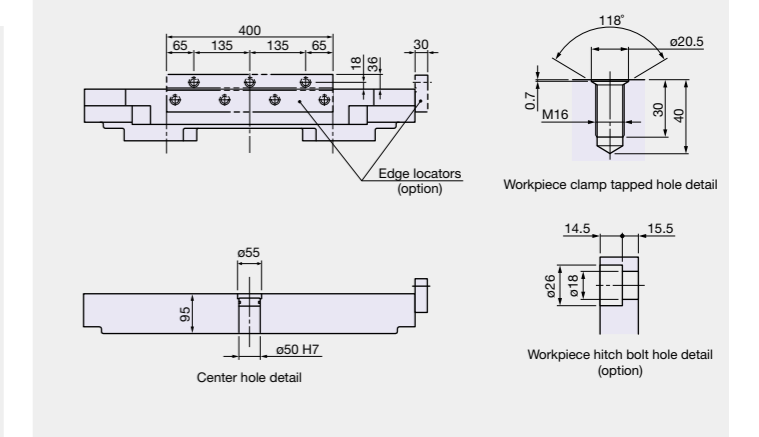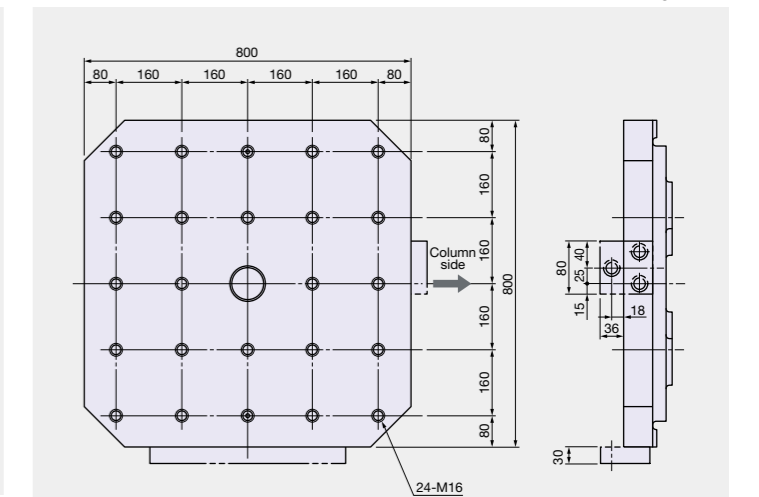Note 1. NML: Normal, 3D: Real 3D Simulation, AOT: Advanced One-Touch IGF-M,
E: Economy, D: Deluxe
Note 2. ★Technical consultation needed for specifications

■ Working range
Unit: mm

Travel		
		MA-8000H
X		1,400
Y		1,200
Z		1,350

[   ]: T-slot pallets
Note: the following interference areas
A: Interference between spindle and table
B: Interference between X-, Y-axis telescopic covers and workpiece

■ Maximum workpiece dimensions
Unit: mm

* At Z-axis minus end, X-, Y-axis telescopic covers and workpiece interfere occurs; requiring max workpiece diameter set at ø1,000 mm. Also note that interference may occur at workpiece bottom as shown in this drawing.

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

[   ] : T-slot pallets

■ Pallet dimensions
Unit: mm

MA-8000H Dimensional/Installation Drawings
Unit: mm
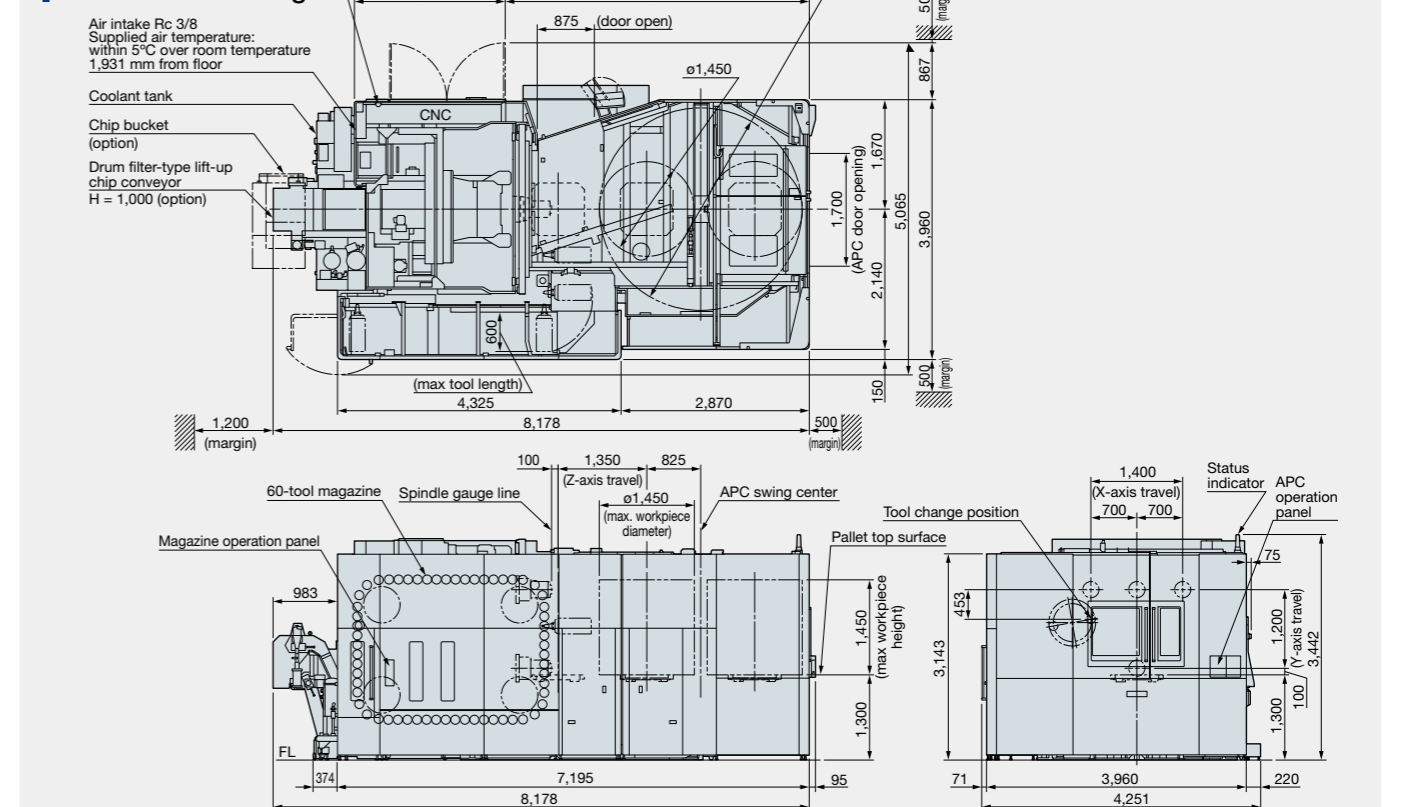
This product is subject to the Japanese government Foreign Exchange and Foreign Trade Control Act with regard to security controlled items; whereby Okuma Corporation should be notified prior to its shipment to another country.

OKUMA

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