High-Speed Horizontal Machining Centers

MB-H series

MB-4000H / MB-5000H
MB-8000H / MB-10000H
High-Speed Horizontal Machining Centers

**MB-H series**

**MB-4000H / MB-5000H / MB-8000H / MB-10000H**

- Intelligent Technology
- Thermo-Friendly Concept
- Collision Assistance System
- Machining Navi

**High accuracy / High productivity**

The best series for all types of machining—from mass produced parts to large, high value-added parts—based on a concept of smooth, stress-free operation.

- High productivity: Reduced non-cutting time
- High accuracy: Outstanding accuracy stability with use of Thermo-Friendly Concept
- Small footprint: Compact
- Expandable: Easy to add more specs
- Easy to operate: User friendly

Photos in this brochure include optional specifications.
Reduced non-cutting time

- **Cycle time comparisons**

  Workpiece: Gear case  
  Material: Die cast aluminum

<table>
<thead>
<tr>
<th>Non-cutting time</th>
<th>30% reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting time</td>
<td>64 sec</td>
</tr>
<tr>
<td>Non-cutting time</td>
<td>116 sec</td>
</tr>
<tr>
<td>2 min 26 sec</td>
<td>1 min 48 sec</td>
</tr>
</tbody>
</table>

- **Machine performance**

<table>
<thead>
<tr>
<th>MB-4000H</th>
<th>MB-5000H</th>
<th>MB-8000H</th>
<th>MB-10000H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid traverse</td>
<td>X-Y-Z: 60 m/min</td>
<td>X-Y-Z: 60 m/min</td>
<td>X-Y-Z: 50 m/min</td>
</tr>
<tr>
<td>Acceleration</td>
<td>Max. 1 G</td>
<td>Max. 0.8 G (Option: 1 G)</td>
<td>Max. 0.8 G (Option: 1 G)</td>
</tr>
<tr>
<td>Tool change</td>
<td>1-T/C-G: 1.0/2.6 sec (tool weight less than 4 kg)</td>
<td>1-T/C-G: 1.3/3.1 sec</td>
<td>1-T/C-G: 1.3/3.1 sec</td>
</tr>
<tr>
<td>Pallet change</td>
<td>7.0 sec</td>
<td>9.0 sec</td>
<td>14.5 sec</td>
</tr>
<tr>
<td>MB-5000H</td>
<td>MB-5000H</td>
<td>MB-10000H</td>
<td>MB-10000H</td>
</tr>
<tr>
<td>Rapid traverse</td>
<td>X-Y-Z: 60 m/min</td>
<td>X-Y-Z: 60 m/min</td>
<td>X-Y-Z: 50 m/min</td>
</tr>
<tr>
<td>Acceleration</td>
<td>Max. 0.8 G (Option: 1 G)</td>
<td>Max. 0.8 G (Option: 1 G)</td>
<td>Max. 0.8 G (Option: 1 G)</td>
</tr>
<tr>
<td>Tool change</td>
<td>T-T/C-C: 1.3/3.1 sec</td>
<td>T-T/C-C: 1.3/3.1 sec</td>
<td>T-T/C-C: 1.3/3.1 sec</td>
</tr>
<tr>
<td>Pallet change</td>
<td>9.0 sec</td>
<td>15.0 sec</td>
<td>15.0 sec</td>
</tr>
</tbody>
</table>

- **Machining Time Shortening Function**

  This shortens Machining time in operations with repeated rapid traverse (G00) and cutting feed (G01) movements, such as for parts with many drilled holes. 
  (The amount by which machining time is shortened will differ depending on machine installation, machined part shape, and part program.)

  Note: 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.
Machining capacity

1,081 cm³/min (MB-8000H actual data)

- 200 face mill, material: S45C
- High power spindle: 6,000 min⁻¹ (VAC 45/37 kW (20 min/cont)) (Optional)

MB-4000H

- Standard spindle: 15,000 min⁻¹
- VAC 26/18.5 kW (10 min/cont)
- Material: S45C

MB-8000H

- Standard spindle: 6,000 min⁻¹
- VAC 30/22 kW (10 min/cont)
- Material: S45C

MB-10000H

- Standard spindle: 6,000 min⁻¹
- VAC 45/37 kW (20 min/cont)
- Material: S45C

MB-5000H

- Standard spindle: 15,000 min⁻¹
- VAC 26/18.5 kW (10 min/cont)
- Material: S45C

Spindle variations, spindle torque, power graph

- Spindle speed: 15,000 min⁻¹ (Std specs)
- Max output: VAC 26/18.5 kW (35/25 hp) (10 min/cont)
- Max torque: 163/120 N·m (120/88 ft·lb) (5 min/cont)

MB-4000H

- Standard spindle
  - Spindle speed: 6,000 min⁻¹
  - Output: VAC 26/18.5 kW (10 min/cont)
  - Torque: 638 N·m (5 min/cont)

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

MB-5000H

- Standard spindle
  - Spindle speed: 15,000 min⁻¹
  - Output: VAC 26/18.5 kW (10 min/cont)
  - Torque: 672 N·m (5 min/cont)

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

MB-8000H/MB-10000H

- Standard spindle
  - Spindle speed: 6,000 min⁻¹
  - Output: VAC 30/22 kW (10 min/cont)
  - Torque: 606/349 N·m (446/257 ft·lb) (10 min/cont)

- Wide-range spindle*
  - Spindle speed: 12,000 min⁻¹
  - Output: VAC 37/26 kW (10 min/cont)
  - Torque: 419/284 N·m (312/212 ft·lb) (2 min/10 min/cont)

- High power spindle* (optional)
  - Spindle speed: 20,000 min⁻¹
  - Output: VAC 45/37 kW (20 min/cont)
  - Torque: 1,071/637 N·m (820/475 ft·lb) (5 min/cont)

Note: 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

Standard spindle which can be used across many applications, high speed and wide-range spindle for high precision machining of aluminum and molds, and high power spindle for difficult-to-machine materials and heavy-duty cutting with high machining allowance.

- High-speed cartridge spindle
- Long-life oil air lubrication
- Thermo Active Stabilizer – Spindle (TAS-S)
- Integral motor/spindle

High productivity

With optional specs

15,000 min⁻¹ VAC 26/18.5 kW (MB-5000H Std spindle)
High-accuracy machining

The MB-10000H has a “box in box” structure (X axis carrier system).

Environmental economic benefits of Okuma’s Thermo-Friendly Concept

In environments with normal temperature changes, machining accuracies equivalent to those in temperature-controlled rooms are achieved. As long as the operator is comfortable, there is no need for air conditioning to ensure accuracy.

- Amount of energy consumed for temperature-controlled room per year: Savings of approximately 135,000 kWh
- Prevents CO2 emissions equivalent to about 7,500 beech trees

* Calculations are examples only, and may differ from actual circumstances. Temperature-controlled room capacity: 10 m × 10 m × H5 m ±2˚C

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

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

This unique thermo-friendly concept, which accommodates such temperature changes, achieves high accuracy in normal factory environments.

Eliminate waste with the 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.

- **TAS-C** (Thermo Active Stabilizer—Construction)
  - 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 shaft.

- **TAS-S** (Thermo Active Stabilizer—Spindle)
  - The TAS-S spindle thermal deformation control takes into account various conditional changes such as the spindle’s temperature data, modification of the spindle rotation and speed, as well as spindle stoppage. The spindle’s thermal deformation will be accurately controlled, even when the rotating speed changes frequently.

Machining dimensional change over time less than 10 µm (MB-5000H actual data).

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High dimensional stability

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High-accuracy machining

Positioning accuracy
- MB-5000H: AbsoScale actual data (Based on ISO 230-2 machine tool test conditions)
  - The exactness of bi-directional positioning: 1.9 µm (X-axis), 2.7 µm (Y-axis), 1.8 µm (Z-axis)
  - Bi-directional repeatability: 1.2 µm (X-axis), 1.9 µm (Y-axis), 1.2 µm (Z-axis)
  - 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 structure
- Integrated ball screw bracket (except on MB-10000H)
- Y axis motor base cooling
- Ball screw cooling: MB-4000H, 5000H (Optional)
- High accuracy double ball screw employed in all axes. (MB-10000H)
- Bed supports rapid travel of large masses
- Highly rigid column strongly withstands bending and torsion

High accuracy indexing table
- Pallet seating surface uses a taper cone system for high accuracy.
  - NC 0.001 degree: MB-4000H (Standard), MB-5000H, 8000H, 10000H (Optional)
- Achieves highly stable accuracy by employing a highly rigid 3-point support bed. (MB-5000H)

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 is the same regardless of weight, such as workpieces and fixtures loaded on the table.
  - Work Weight Auto Setting estimates the weight of the table and automatically adjusts servo parameters, including acceleration, to the optimum values. Cycle times are shortened without changes to machining accuracy.

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.

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)

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.
- Reduction in power consumption (example)
  - Operating time 88 h, Non-operating time 72 h
  - Total 160 h (8 × 20 days)
  - Monthly electricity consumption before and after adjustment
  - Comparison of DBB measurements
  - Before adjustment: MB-5000H, 423 kWh
  - After adjustment: MB-5000H, 230 kWh
  - ECO Idling Stop benefit: 171 kWh (74%) reduction!
  - ECO Hydraulics benefit: 36 kWh (9%) reduction!
  - *ECO Hydraulics benefit: Optional

* Calculated from actual electricity consumption data. Electricity consumption will differ depending on machine specifications and usage status.
Comfortable operation

Easy to operate

- **Independent left-side operation panel** (except on MB-10000H)
  - Easier to operate the switches and watch machining chamber movements at the same time. (Can swivel)

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

- **Front-facing ATC magazine** (MB-4000H and MB-5000H only)
  - Easy tool exchange: 48-tool, 64-tool tool magazines
  - Magazine door opens to the floor

- **Column traverse system** (MB-10000H uses a traverse carrier system)
  - Outstanding accessibility to pallet (workpiece), spindle

- **Ceiling door**
  - Good lighting and no coolant dripping

Off machine chip disposal (Optional)

Chip pan (Standard)

Coolant tank (Standard)

Bed

Coil conveyor under APC (Standard)

In-machine chip conveyor

(MB-10000H will eject to the front of the machine)

In-machine chip conveyor

Chip pan (Standard)

Off machine chip disposal (Optional)
Expandable

- Space-saving with large tool capacity

<table>
<thead>
<tr>
<th>MB-4000H/MB-5000H</th>
<th>MB-6000H</th>
<th>MB-10000H</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong> 48 tools</td>
<td><strong>Standard</strong> 60 tools</td>
<td><strong>Standard</strong> 40 tools</td>
</tr>
<tr>
<td><strong>Optional</strong> 110 tools, 146 tools, 182 tools, 218 tools, 326 tools</td>
<td><strong>Optional</strong> 81 tools, 111 tools, 141 tools, 171 tools, 195 tools, 225 tools, 255 tools, 285 tools</td>
<td><strong>Optional</strong> 100 tools, 150 tools, 200 tools, 240 tools, 320 tools, 400 tools</td>
</tr>
<tr>
<td><strong>Matrix system</strong></td>
<td><strong>Matrix system</strong></td>
<td><strong>Multiple magazine system</strong></td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td><strong>Specifications</strong></td>
<td><strong>Specifications</strong></td>
</tr>
</tbody>
</table>

Flexible APC units

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

Ready for FMS applications

- A compact FMS designed to simplify the task of setting up 24-hour operations

An FMS with a smart, expandable stacker crane system

<table>
<thead>
<tr>
<th>Handling station 1</th>
<th>Handling station 2</th>
<th>Handling station 3</th>
<th>Handling station 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB-8000H 4</td>
<td>MB-8000H 4</td>
<td>MB-8000H 4</td>
<td>MB-8000H 4</td>
</tr>
<tr>
<td>pallets 32</td>
<td>pallets 32</td>
<td>pallets 32</td>
<td>pallets 32</td>
</tr>
<tr>
<td>rack levels 2</td>
<td>rack levels 2</td>
<td>rack levels 2</td>
<td>rack levels 2</td>
</tr>
<tr>
<td>system height approximately 5.5 m</td>
<td>system height approximately 5.5 m</td>
<td>system height approximately 5.5 m</td>
<td>system height approximately 5.5 m</td>
</tr>
<tr>
<td>handling station 1</td>
<td>handling station 1</td>
<td>handling station 1</td>
<td>handling station 1</td>
</tr>
</tbody>
</table>

- Approx 30 m

([System layout example])
### Machine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>MB-4000H</th>
<th>MB-5000H</th>
<th>MB-8000H</th>
<th>MB-10000H</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spindle</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X axis travel (Left/right column)</td>
<td>560 (22.0)</td>
<td>760 (29.9)</td>
<td>1,300 (51.1)</td>
<td>1,400 (55.1)</td>
</tr>
<tr>
<td>Y axis (spindle up/down)</td>
<td>560 (22.0)</td>
<td>760 (29.9)</td>
<td>1,100 (43.1)</td>
<td>1,250 (49.21)</td>
</tr>
<tr>
<td>Z axis (table front/back)</td>
<td>625 (24.61)</td>
<td>760 (29.9)</td>
<td>1,250 (49.21)</td>
<td>1,250 (49.21)</td>
</tr>
<tr>
<td>Spindle center to palm area</td>
<td>50 to 610 (1.97 to 24.02)</td>
<td>50 to 610 (1.97 to 24.02)</td>
<td>50 to 1,150 (3.97 to 46.28)</td>
<td>50 to 1,150 (3.97 to 46.28)</td>
</tr>
<tr>
<td>Spindle nose to palm area</td>
<td>86 to 710 (3.35 to 27.95)</td>
<td>150 to 895 (5.91 to 35.23)</td>
<td>100 to 1,350 (3.94 to 53.15)</td>
<td>100 to 1,350 (3.94 to 53.15)</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool size</td>
<td>450 x 450 (17.5 x 17.5)</td>
<td>500 x 500 (19.7 x 19.7)</td>
<td>400 x 400 (15.7 x 15.7)</td>
<td>200 x 200 (7.9 x 7.9)</td>
</tr>
<tr>
<td>Max load</td>
<td>400 (880)</td>
<td>510 (1,160)</td>
<td>2,000 (4,400)</td>
<td>2,000 (4,400)</td>
</tr>
<tr>
<td>Indexing angle</td>
<td>deg</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Max workpiece dimensions</td>
<td>mm (in.)</td>
<td>ø800 x 900 (32.32 x 35.43)</td>
<td>ø800 x 1,000 (31.5 x 39.37)</td>
<td>ø1,450 x 1,450 (57.08 x 57.08)</td>
</tr>
<tr>
<td>Spindle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min rpm</td>
<td>150</td>
<td>150</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Max rpm</td>
<td>50</td>
<td>50</td>
<td>1,800</td>
<td>1,800</td>
</tr>
<tr>
<td>Tapered bore</td>
<td>7/24 taper No. 40 [HSK-A63]</td>
<td>7/24 taper No. 50 [HSK-A100]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spindle speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min rpm</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
</tr>
<tr>
<td>Max rpm</td>
<td>10,000 (393.7)</td>
<td>10,000 (393.7)</td>
<td>10,000 (393.7)</td>
<td>10,000 (393.7)</td>
</tr>
<tr>
<td>Cutting feedrate</td>
<td>mm/min (ipm)</td>
<td></td>
<td></td>
<td>1 to 60.000 (0.04 to 2.362)</td>
</tr>
<tr>
<td><strong>Feed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spindle (10 min/cool)</td>
<td>kW (hp)</td>
<td>26/15.5 (35/20.5)</td>
<td>30/22 (40/30)</td>
<td>30/22 (40/30)</td>
</tr>
<tr>
<td>Feed axes</td>
<td>kW (hp)</td>
<td>X: 4.6 (1.83), Y: 3.5 (1.37), Z: 4.6 (1.83)</td>
<td>X: 5.1 (1.88), Y: 3.5 (1.37), Z: 5.1 (1.88)</td>
<td>X: 4.6 (1.83), Y: 3.5 (1.37), Z: 4.6 (1.83)</td>
</tr>
<tr>
<td>Table indexing</td>
<td>mm (in.)</td>
<td>3.6 (0.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool shank</td>
<td>MAS403 BT40 [HSK-A63]</td>
<td>MAS403 BT50 [HSK-A100]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full feed</td>
<td>26/18.5 (35/20.5)</td>
<td>30/22 (40/30)</td>
<td>30/22 (40/30)</td>
<td>30/22 (40/30)</td>
</tr>
<tr>
<td>Magazine capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools</td>
<td>48 [4.11 to 32.6]</td>
<td>48 [60.81 to 285.32, 400.40]</td>
<td>48 [60.81 to 285.32, 400.40]</td>
<td>48 [60.81 to 285.32, 400.40]</td>
</tr>
<tr>
<td>Max tool dia (w/adjacent)</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
<td>ø70 (2.76)</td>
</tr>
<tr>
<td>Max tool dia (w/adjacent)</td>
<td>ø80 (3.15)</td>
<td>ø80 (3.15)</td>
<td>ø80 (3.15)</td>
<td>ø80 (3.15)</td>
</tr>
<tr>
<td>Max tool length</td>
<td>mm (in.)</td>
<td>300 (11.81) [400 (15.75)]</td>
<td>300 (11.81) [400 (15.75)]</td>
<td>300 (11.81) [400 (15.75)]</td>
</tr>
<tr>
<td>Max tool weight</td>
<td>kg (lb)</td>
<td>7 (15.42)</td>
<td>7 (15.42)</td>
<td>7 (15.42)</td>
</tr>
<tr>
<td>Tool selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory random</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Machine size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>mm (in.)</td>
<td>3,049 (119.9)</td>
<td>3,049 (119.9)</td>
<td>3,049 (119.9)</td>
</tr>
<tr>
<td>Floor space width x depth x height</td>
<td>mm (in.)</td>
<td>2,420 x 1,700 x 2,700 (95.28 x 66.93 x 106.3)</td>
<td>2,420 x 1,700 x 2,700 (95.28 x 66.93 x 106.3)</td>
<td>2,420 x 1,700 x 2,700 (95.28 x 66.93 x 106.3)</td>
</tr>
<tr>
<td>Weight</td>
<td>kg (lb)</td>
<td>9,500 (20,900)</td>
<td>11,500 (25,300)</td>
<td>27,000 (59,400)</td>
</tr>
<tr>
<td>Controller</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSP-P300M</td>
<td></td>
<td>OSP-P300M</td>
</tr>
</tbody>
</table>

#### Standard Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Work lamp</th>
<th>Status indicator</th>
<th>LED, 1 location*3</th>
<th>3-lamp signal tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralized lubrication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil automatic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>supplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil supplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>supply system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-4000H</td>
<td>Tank 6 L</td>
<td>Foundation blocks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-5000H</td>
<td>Oil level alarm and pressure alarm equipped</td>
<td>Side-tip prevention tool</td>
<td>Chemical anchors included</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-8000H</td>
<td>Tool changer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-10000H</td>
<td>Oil level alarm and pressure alarm equipped</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-4000H</td>
<td>Tank 640 L (400 L)</td>
<td>Pump motor 390 W*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-5000H</td>
<td>Pump motor 390 W* (for nozzle), 730 W* (for in-machine wash)</td>
<td>1-degree indexing table</td>
<td>MB-4000H indexing: 0.001 degree</td>
<td>MB-4000H only</td>
<td></td>
</tr>
<tr>
<td>MB-8000H</td>
<td>Pump motor 390 W* (for nozzle), 550 W (for in-machine wash)</td>
<td>MB-8000H tool capacity: 48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB-10000H</td>
<td>Pump motor 390 W* (for nozzle), 1,500 W (for in-machine wash)</td>
<td>MB-10000H tool capacity: 48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyeball nozzle type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table area wash</td>
<td>In-machine and under-pallet wash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATC air blower (blast)</td>
<td>Ball screw cooling</td>
<td>Std: MB-4000/8000 (Opt: MB-4000/5000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chip air blower (blow)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full enclosure shielding</td>
<td>Door interlock</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating tools, tool box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool release lever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tapered bore cleaning bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. Machine component movements become slower with this optional specification.
*2. Max tool size 2 pots can not exceed ø10 mm (ø4.33 in.).
*3. Shutter open/close times become longer with the optional specification.
*4. Fixed address for 110 or more tools.
*5. Max workpiece diameters may be limited by required tool lengths.
*6. Fixed address for 81 or more tools.
*7. Fixed address for 100 or more tools.
*8. Optional
Space-saving design improves productivity per square footage

MB-5000H
32% smaller footprint
(Compared to previous machine)

MB-4000H
10% smaller footprint
(Compared to MA-400HA)

MB-8000H
3,960 × 7,505
(155 × 295)

MB-10000H
4,545 × 6,465
(178 × 255)

[Referencing coolant tank end]

MB-5000H
3,960 × 7,505
(155 × 295)

MB-8000H
3,960 × 7,505
(155 × 295)

MB-10000H
4,545 × 6,465
(178 × 255)

[With optional lift-up center coil conveyor tank]

■ Recommended chip conveyors
(Please contact an Okuma sales representative for MB-10000H recommendations.)

<table>
<thead>
<tr>
<th>Workpiece material</th>
<th>Steel</th>
<th>FC</th>
<th>Aluminum / Nonferrousmetal</th>
<th>Mixed (General use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip shape</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-machine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hinge type (Standard) *</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Scraper type</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Scraper type (with drum filter)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>In-machine</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Hinge + scraper (with drum filter)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

■ Off-machine lift-up chip conveyors

<table>
<thead>
<tr>
<th>Name</th>
<th>Hinge</th>
<th>Scraper</th>
<th>Scraper (with drum filter)</th>
<th>Hinge + scraper (with drum filter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

■ Recommended chip conveyors
(Please contact an Okuma sales representative for MB-10000H recommendations.)

- □: Recommended specification
- △: Optional specification

■ suite apps
In addition to Okuma’s Intelligent Technology, a rich array of applications is available for visualization and digitization of information needed on shop floors to support high-level “monozukuri.”

■ suite operation
A highly reliable touch panel suited to shop floors is used. Suite apps can be started by touching a function key icon on the right side of the screen. They are then displayed in a pop-up window. The icon layout is customizable. Suite apps can be accessed with one touch according to the desired phase of operation.
OSP advanced technology

- Automatically changes to optimum spindle speed (M-)
  - Built-in sensors measure chatter vibration and the machine automatically changes to the best spindle speed.

- Adjust cutting conditions while monitoring the data (M-2+)
  - Navigates automatic features by detecting and analyzing machining chatter with a microscope attached to the machine.

- 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.

Collision prevention
Collision Avoidance System (Optional)

OSP full range absolute position feedback (zero point return not required)

***OSP-VPS (Virus Protection System)***

Collision Avoidance System (CAS) prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.

![OSP-VPS Diagram](image)

- Automatic ON/OFF control
- Vibration waveform display
- Tapping vibration measurement

![OSP-VPS Diagram](image)

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

![OSP-VPS Diagram](image)

- 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.

**Cutting condition search for milling**

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

- Automatically changes to optimum spindle speed (M-)
- Built-in sensors measure chatter vibration and the machine automatically changes to the best spindle speed.

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**Collision prevention**
Collision Avoidance System (Optional)

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![OSP-VPS Diagram](image)

- Automatic ON/OFF control
- Vibration waveform display
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![OSP-VPS Diagram](image)

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**Collision prevention**
Collision Avoidance System (Optional)

- CAS prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.
MB-6000H
Dimensional and Installation Drawings

Unit: mm (in.)

MB-10000H
Dimensional and Installation Drawings

Unit: mm (in.)
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.

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