OKUMA

OPEN POSSIBILITIES

Vertical Machining Center

# MB-80V

Vertical Machining Center

# MB-80V

Intelligent Technology

Thermo-Friendly Concept

Collision Avoidance System

Machining Navi

SERVONAVI

## Achieving good workability and excellent maintainability
## Big productivity boost with medium/large applications from high-precision parts to resin molds

## — A highly accurate and large VMC —


Photos used in this brochure include optional equipment.

# MB-80V Large Vertical Machining Center
## [For Highly Accurate Applications]

**Excellent productivity, high machining quality, ease of use**
**Achieving maximum reliability and floor space productivity with medium/large parts**
**From a continually evolving MB-V Series**

### Short cycle times with high cutting capacity

From roughing to high-quality finishing, highly efficient and large capacity machining can be completed on one machine.

Production lead times can be reduced with an ideal selection of spindles.

| | Wide-range spindle | High-speed spindle | Power spindle |
|---|---|---|---|
| Spindle taper | No. 40 | No. 40 | No. 50 |
| Spindle speed | 15,000 $min^{-1}$ | 20,000 $min^{-1}$ | 12,000 $min^{-1}$ |
| Output | 26 kW | 30 kW | 33 kW |
| Torque | 199 N-m | 57 N-m | 302 N-m |

### Achieving highly accurate machining of medium and large-sized components

With a wide table and work envelope ideal for cutting large dies, molds and semiconductor manufacturing equipment.

Space-saving design provides best-in-class footprint productivity. [Floor space to work envelope]

| | |
|---|---|
| Table size | 1,600 × 800 mm |
| X-axis travel | 1,600 mm |
| Y-axis travel | 1,050 mm |
| Z-axis travel | 600 mm |
| Required floor space | 4,500 × 2,990 mm |
| Footprint productivity | 0.13 |

### Operator-friendly ease of use

Easy access to the spindle and table, and wide door opening makes it easy to set up large components. Handling a variety of hydraulic and pneumatic fixtures is also easy, and APC workflow reduction etc. allow for a more agile expansion of automation systems.

### Outstanding chip discharge features reduce downtime for maintenance

The shielding, coolant, and chip conveyor are optimally designed for excellent chip discharge. The capacity to handle large amounts of aluminum chips also improves the machine operation rate and greatly reduces operator clean-up work.

### Superb machining accuracy and predictive maintenance assure reliable long-term operation

Okuma's Thermo-Friendly Concept (accepting temperature changes) achieves outstanding dimensional accuracy stability over long runs, by minimizing dimensional variations due to fluctuating room temperatures and heat generated during cutting.

By predicting spindle and feed axis abnormalities with AI machine diagnostics, planned maintenance activities enhance the overall operation.

# Highly efficient machining of die/mold and semiconductor manufacturing equipment parts

## Cutting capacities 669 cm³/min / 704 cm³/min

- **12,000 min$^{-1}$ (No. 50) high power spindle** (material: S45C) (Optional)

| Tool | Spindle min$^{-1}$ | Cutting m/min | Feed rate mm/min | Width mm | Depth mm | Chips cm³/min |
|---|---|---|---|---|---|---|
| ø100 face mill 5 blades (carbide) | 955 | 300 | 1,910 | 70 | 5 | 669 |
| ø20 roughing end mill, 7 flutes (carbide) | 4,000 | 251 | 9,520 | 20 | 3.7 | 704 |

- **15,000 min$^{-1}$ (No. 40) wide-range spindle** (material: S45C)

| Tool | Spindle min$^{-1}$ | Cutting m/min | Feed rate mm/min | Width mm | Depth mm | Chips cm³/min |
|---|---|---|---|---|---|---|
| ø100 face mill 5 blades (carbide) | 955 | 300 | 1,429 | 70 | 4 | 400 |
| ø50 insert drill | 606 | 95 | 90.9 | – | – | – |
| Tap M30P3.5 | 240 | 23 | 840 | – | – | 84% (Spindle load) |

- **15,000 min$^{-1}$ (No. 40) wide-range spindle** (material: A5052)

| Tool | Spindle min$^{-1}$ | Cutting m/min | Feed rate mm/min | Width mm | Depth mm | Chips cm³/min |
|---|---|---|---|---|---|---|
| ø63 face mill 5 blades (carbide) | 15,000 | 2,969 | 8,523 | 44 | 4 | 1,500 |

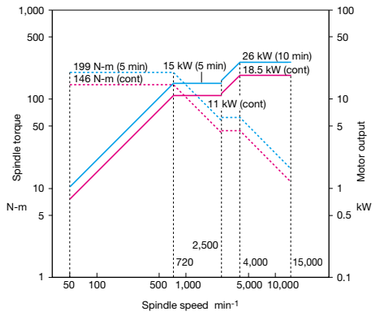
## Wide spindle lineup provides the right match for general machinery to die/mold and aluminum parts applications

In addition to a highly versatile 12,000 min$^{-1}$ standard spindle, a 20,000 min$^{-1}$ high-speed spindle, and a 302 N-m No. 50 power spindle with roller bearings (Optional) are available.

### ■ Wide-range spindle (No. 40)

Highly efficient general machine part applications

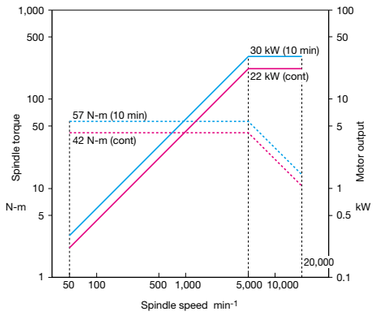
- Spindle speed: 15,000 min$^{-1}$
- Max output: 26/18.5 kW (10 min/ cont)
- Max torque: 199/146 N-m (5 min/ cont)




### ■ High-speed spindle (No. 40)

Mainly for aluminum (Optional)

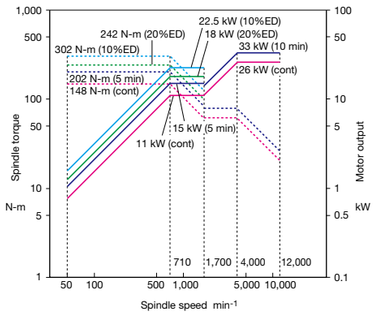
- Spindle speed: 20,000 min$^{-1}$
- Max output: 30/22 kW (10 min/ cont)
- Max torque: 57/42 N-m (10 min/ cont)




### ■ Power spindle (No. 40/50, roller bearings)

Roughing and finish of dies & molds (Optional)

- Spindle speed: 12,000 min$^{-1}$
- Max output: 33/26 kW (10 min/ cont)
- Max torque: 302/148 N-m (10% ED/cont)





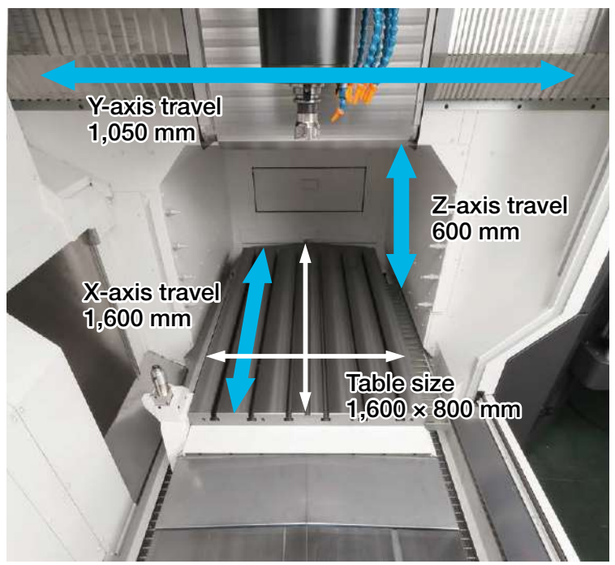

# Wide Y-axis travel balanced with excellent workability

## Ideal work envelope for medium and large-size parts machining

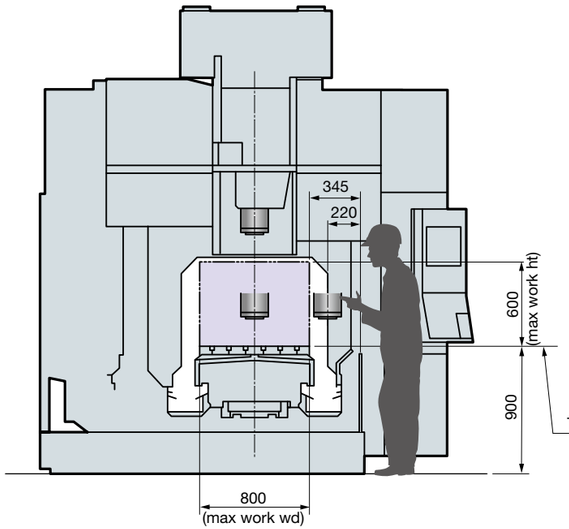
### Y-axis travel: 1,050 mm

**■ For medium and large parts, and large plastic mold manufacturing, with 800 mm table, and 1,050 mm Y-axis travel Best-in-class floor space productivity**

- X-axis travel: 1,600 mm
- Y-axis travel: 1,050 mm
- Table size: 1,600 × 800 mm




## Outstanding table and spindle access provide excellent workability




### ■ Easy access to table and spindle

- Access to spindle: 220 mm
- Access to table: 345 mm
- Table height: 900 mm
- Front door opening: 1,620 mm

### ■ Max workpiece

- Size: 1,600 × 800 × 600 mm (L × W × H)
- Load mass: 2,500 kg

# Delivering longer unattended operations

## Large amounts of aluminum chips also cleanly removed

- **Wide in-machine chip conveyor**
- **Crossrail shower system** (Optional)
- **In-machine vertical covers prevent chip accumulation**

Wide in-machine hinged conveyors surround the table.
Large chip volumes discharged smoothly

Crossrail shower system (Optional) removes chips from the workpiece and table

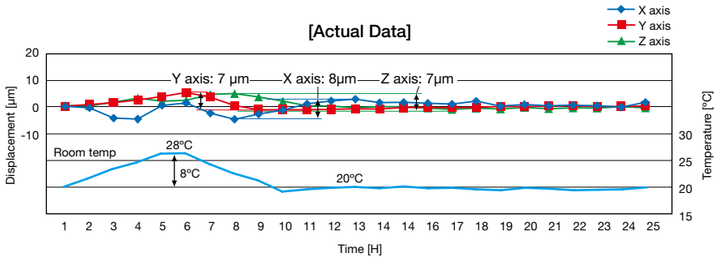
“Working with temperature changes”

## Thermo-Friendly Concept

The “Thermo-friendly” concept enables remarkable machining accuracy through original structural design and thermal deformation control technology. If frees you from troublesome dimensional compensation and warm-up. Exhibits excellent dimensional stability even during consecutive operation over long periods and environmental temperature change in the plant.

**MB-80V Thermal deformation over time: 8 µm**

Room temperature change: 8°C




- **TAS-C**: Thermo Active Stabilizer-Construction (Optional)
  “Proactively” keeps the machine [construction] in optimum, stable condition during shop environment temperature change–resulting in superb (stable) machining accuracies.
- **TAS-S**: Thermo Active Stabilizer-Spindle (Optional)
  Spindle deformation will be accurately controlled even during operations with frequent speed changes.

### 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.

Machine startup
Machining restart
Room temp change

**High dimensional stability**

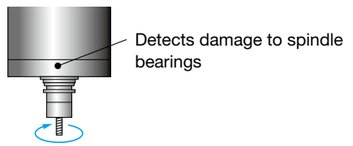


AI detects signs of failure

## AI Machine Diagnosis Function (Optional)

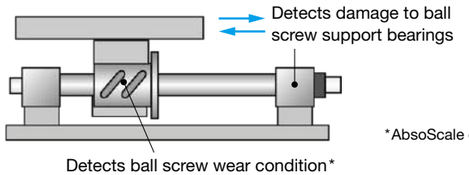
### AI Spindle Diagnosis Function

- **Detects damage to spindle bearings**




### AI Feed Axis Diagnosis Function

- **Detects damage to ball screw support bearings, and ball screw wear***




*AbsoScale detection required

- AI (artificial intelligence) analyzes the diagnostics data detected from the spindle and feed axis “diagnosis operations,” and performs machine condition monitoring.
- Since a “learned AI diagnostic model” can be installed in the OSP-P300A, networking with Okuma’s Connect Plan enables a diagnosis of the “standalone machine,” as well as a method to provide automatic updates of the model data.
- The Maintenance Monitor provides diagnosis notifications (default setting is once a month).

  Note: Periodic diagnosis is recommended.

Next-Generation Energy-Saving System

## ECO suite

A suite of energy saving applications for machine tools

### ECO Idling Stop Accuracy ensured, cooler off

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. Electricity consumption during non-machining time greatly reduced with “ECO Idling Stop”, which shuts down each piece of auxiliary equipment not in use.
(Standard application on machines with Thermo-Active Stabilizer—Spindle)

### 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. The energy-saving benefits from auxiliary equipment stopped with ECO Idling Stop can be confirmed on the spot.

### ECO Operation (Optional)

**Intermittent/continuous operation of chip conveyor and mist collector during operation**

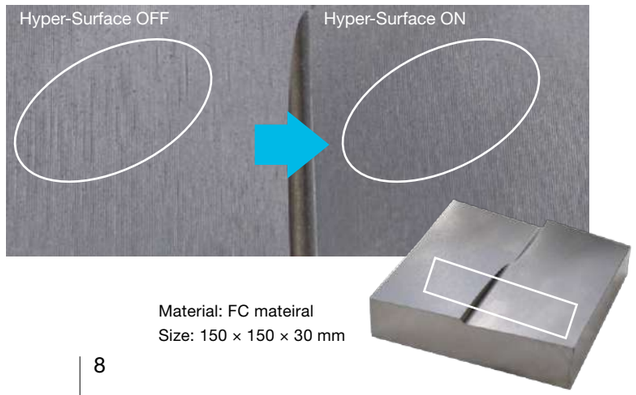
Achieving high die/mold surface quality machining

## Hyper-Surface (Optional)

### Auto machining data compensation, easy and improved die/mold surface quality

Modifying CAM machining data is not required. Ridgelines and uneven surface edges are reduced, the machined surface quality is improved, and hand-polishing times are eliminated. In addition to the Sculptured-Surface Adaptive Acceleration Control featured in the previous Super-NURBS function, the new Hyper-Surface — while maintaining the required shape accuracy — automatically compensates for those edges and adjacent cutter path positioning errors caused by remnants of “disturbances” found in the CAM machining data.

Automatically compensates for misalignment between adjacent cutter paths



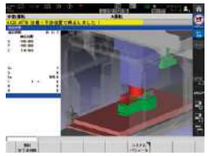

Material: FC mateiral
Size: 150 × 150 × 30 mm

Collision prevention

## Collision Avoidance System (Optional)

### ■ 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.



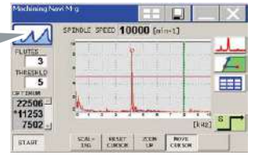
Cutting condition search for milling

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

### ■ 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

Machining Navi (OSP) provides the answer!



Optimized Servo Control

## SERVONAVI

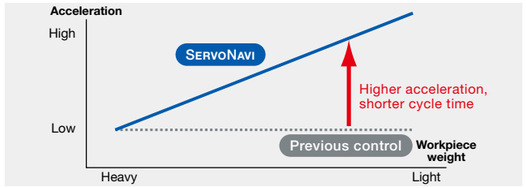
Achieves long term accuracy and surface quality

### 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.




### 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.

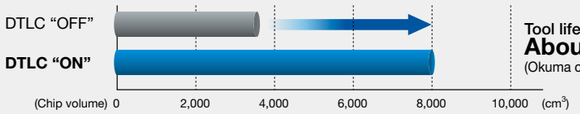
## Dynamic Tool Load Control (Optional)

Prevents chipping, extends tool life

When machining of difficult-to-cut material, chipping from blade runout often occurs with insert-tipped end mills. To stabilize such machining, solid end mills with high tool costs have generally been used.

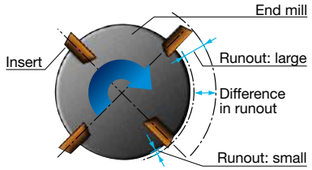
Dynamic Tool Load Control gives uniform cutting force with advanced synchronization of spindle phase and feed rate to control end mill chipping. This improves tool life and stabilizes machining. Switching from expensive solid tools also leads to reduced tool costs.

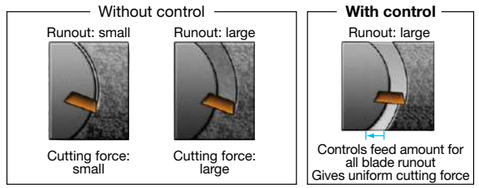
[Actual data]
Chip volume per tool under the same cutting conditions (tool life)




**Tool life when cutting titanium**
**About 2.3-times longer**
(Okuma comparison)

**Runout of insert-tipped end mill**




Insert-tipped end mill

Note: The above are actual examples. Your results may vary due to differences in specifications, tooling and cutting conditions.



## ■ Machine Specifications

| | Item | | MB-80V | |
|---|---|---|---|---|
| | | | No. 40 spindle | No. 50 spindle |
| Travels | X axis (table L/R) | mm (in) | 1,600 (62.99) | |
| | Y axis (ram saddle front/back) | mm (in) | 1,050 (41.34) | |
| | Z axis (spindlehead vertical) | mm (in) | 600 (23.62) | |
| | Table top to spindle nose | mm (in) | 200 to 800 (7.87 to 31.50) | |
| Table | Table size | mm (in) | 1,600 × 800 (62.99 × 31.50) | |
| | Floor to table top | mm (in) | 900 (35.43) | |
| | Max load capacity | kg (lb) | 2,500 (5,500) | |
| Spindle | Speed | $min^{-1}$ | 15,000 [12,000, 20,000] | 12,000 |
| | Speed ranges | | Infinitely variable | |
| | Tapered bore | | 7/24 taper No. 40 [HSK-A63] | 7/24 taper No. 50 |
| | Bearing dia | mm (in) | ø70 (ø2.76) (12,000 $min^{-1}$ spindle is ø90) | ø90 (ø3.54) |
| Feed Rates | Rapid traverse | m/min | X·Y: 42, Z: 32 | |
| | Cutting feed rate | mm/min | X·Y·Z: 32,000 | |
| Motors | Spindle | kW (hp) | 26/18.5 (35/25) [33/26 (43/35) , 30/22 (40/30)] | 33/26 (43/35) |
| | Feed axes | kW (hp) | X5.2 (7), Y·Z: 3.5 (4.7) | |
| Auto Tool Changer | Tool shank | | MAS403 BT40 [HSK-A63] | MAS403 BT50 |
| | Pull stud | | MAS 2 | |
| | Magazine capacity | tool | 32 [48, 64] | |
| | Max tool dia (w/adjacent tool) | mm (in) | ø90 (ø3.54) | ø100 (ø3.94) |
| | Max tool dia (w/o adjacent tool) | mm (in) | ø125 (ø4.92) | ø152 (ø5.98) |
| | Max tool length | mm (in) | 400 (15.75) | |
| | Max tool mass | kg (lb) | 8 (17.6) | 12 [15] (26.4 [33]) |
| | Max tool moment | N-m (ft-lbt) | 7.8 (5.7) | 15.3 [19.1] (11.2 [14.0]) |
| | Tool selection | | Memory random | |
| Machine Size | Height | mm (in) | 3,320 (130.71) | |
| | Floor space | mm (in) | 4,500 × 2,970 (177.17 × 116.93) | |
| | Mass | kg (lb) | 16,750 (36,850) | 17,000 (37,400) |

## ■ Standard Specifications

[ ]: Optional

| | | | |
|---|---|---|---|
| No. 40 Spindle speed 15,000 $min^{-1}$ | 26/18.5 kW [10 min/cont] *1 | Chip air blower (blast) | Nozzles |
| Rapid traverse | X·Y: 42 m/min, Z: 32 m/min | Spindle air blower (blast) | |
| Spindle/spindlehead cooler | Oil temperature controller | Foundation washers (with jack bolts) | 14 pcs |
| Ball screw cooling | X·Y·Z axis | | |
| Air cleaner (filter) | Regulator included | 3-lamp status indicator | Type C (LED signal tower) Red (alarm), yellow (end), green (running) |
| Spindle oil-air lubricator | | | |
| Auto lube system (ALS) | Ball screw, guideway, magazine | | |
| ATC magazine | 32 tools | Work lamp | LED lamps (installed on right and left sides) |
| ATC magazine shutter | | | |
| Tool unclamp package | | Full enclosure shielding | With ceiling |
| Coolant system | Tank 700 L (Effective 460 L) Pump motor 3.3/3.8 kW (50/60 Hz) | Tapered bore cleaning bar | |
| | | Hand tools | |
| Coolant nozzles | Adjustable type: 6 tools | Tool box | |
| In-machine chip discharge | Hinge-type chip conveyor | Numerical controller | OSP-P300MA |
| Chip pan | 64 L | Color LCD operation panel | |
| ATC air blower (blast) | | Pulse handle | |

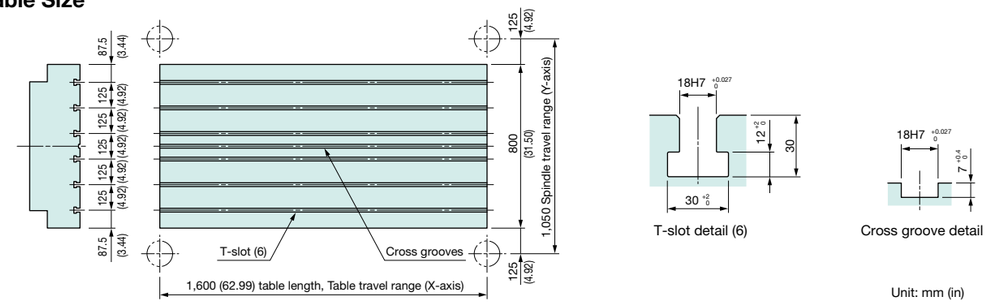
Note: Fire prevention measures are necessary, as oil-based coolants may cause fire. Never operate machine unattended.
*1: For spindle tapered bore, 7/24 taper No. 40 (BT40, BIG-PLUS®, CAT40, DIN40) or HSK-A63 are available.

## Optional Specifications

| | | | |
|---|---|---|---|
| No. 40 High-speed spindle 20,000 min-1 △ | 30/22 kW [10 min/cont]*2 | Oil mist unit | |
| No. 40 Powerful spindle 12,000 min-1 △ | 33/26 kW [10 min/cont]*2 | Mist collector | |
| No. 50 Powerful spindle 12,000 min-1 △ | 33/26 kW [10 min/cont]*3 | Semi-dry machining | |
| Dual contact spindle △ | HSK, BIG-PLUS® | Shower coolant | Mounted to crossrail and/or ceiling |
| ATC magazine △ | 48, 64 (chain type ) | Workpiece wash gun | |
| | For 64 or more tools (matrix magazine) | Off-machine chip discharge △ | Lift-up chip conveyor: floor or drum filter type |
| Pull stud specs △ | MAS1, CAT, DIN, JIS | | |
| Attachment preps | Accelerator attachment<br>Angle-head attachment<br>Oil-hole supplier | Chip bucket △ | |
| | | Auto tool length compensation · tool breakage detection | With touch sensor |
| AbsoScale | X-Y-Z axes | Auto zero offset· Auto gauging | With touch probe |
| Automatic pallet changer | 2-pallet parallel shuttle APC (left side), FMS | Collision Avoidance System | |
| | | Machining Navi M-*i*, M-*g*□+ | Cutting condition search |
| NC rotary table | Specify chuck, tailstock requirements, rotarty table type | TAS-S | Thermo Active Stabilizer—Spindle |
| | | TAS-C | Thermo Active Stabilizer—Construction |
| Installation specifications for the NC rotary table | | Automatic door | |
| | | Chemical anchors | |
| High-crossrail specs | +200 mm | | |
| Thru-spindle coolant *1 | Specify 1.5 MPa or 7.0 MPa | | |
| Chip air blower (adapter) | | | |

△: Corresponding standard specification is deleted
*1. Okuma pull stud required (general commercial products have different end-face grinding, ring, and through hole diameter)
*2. For spindle tapered bore, 7/24 taper No. 40 (BT40, BIG-PLUS®, CAT40, DIN40) or HSK-A63 are available.
*3. For spindle tapered bore, 7/24 taper No. 50 (BT50, BIG-PLUS®, CAT50, DIN50) are available.

## Table Size






T-slot detail (6)



Cross groove detail

Unit: mm (in)

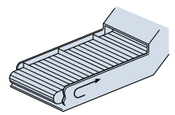
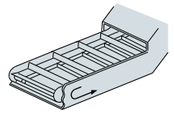
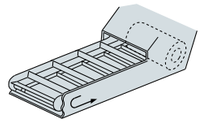
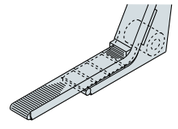
## Recommended Chip Conveyors (Please contact an Okuma sales representative for details.)

○: Recommended
△: Recommended with conditions

| Workpiece material | | Steel | FC | Aluminum / Nonferrous | Mixed (general use) |
|---|---|---|---|---|---|
| Chip shape | |  |  |  |  |
| In-machine | Hinge (Standard) | ○ | ○ | ○ | ○ |
| Off-machine (Optional) | Hinge | ○ | — | — | △ (*4) |
| | Scraper | — | ○ (Dry) | — | — |
| | Scraper (with drum filter) | — | ○ (Wet) with magnet | △ (*3) | — |
| | Hinge + scraper (with drum filter) | △ (*1) | △ (Wet) (*2) | ○ | ○ |

*1. When there are many fine chips *2. When chips are longer than 100 mm *3. When chips are shorter than 100 mm *4. When there are few fine chips

### Off-machine lift-up chip conveyors

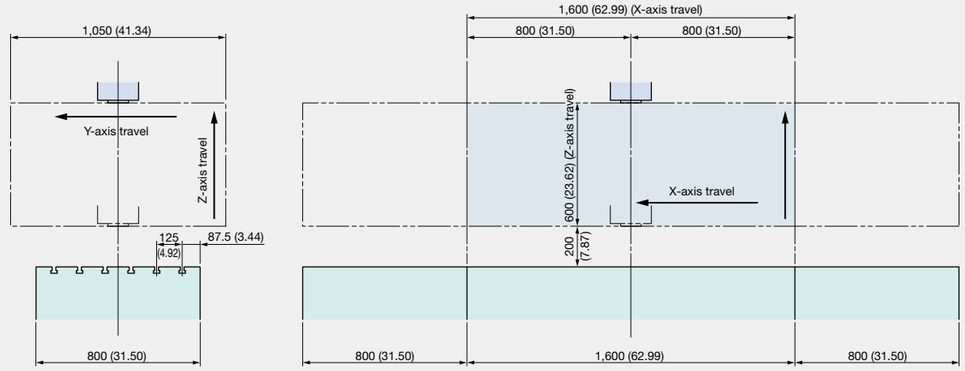
| Type | Hinge | Scraper | Scraper (with drum filter) | Hinge + scraper (with drum filter) |
|---|---|---|---|---|
| Shape |  |  |  |  |

Note: The machine may need to be raised (platform) depending on the type of chip conveyor.



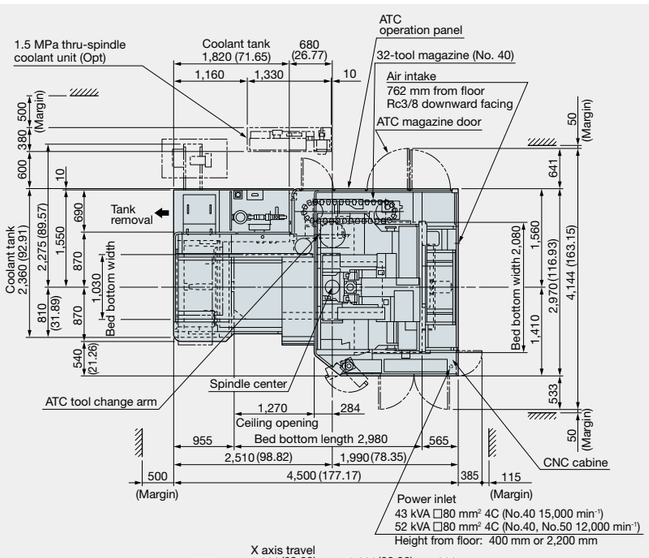
## Working Ranges

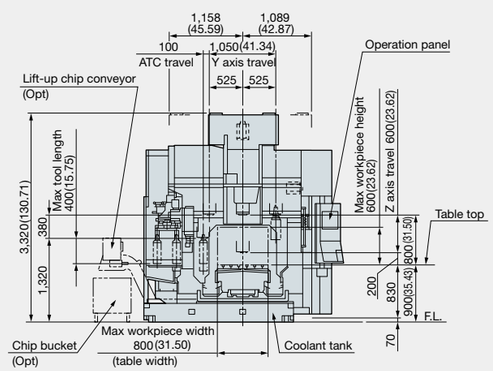
Unit: mm (in)

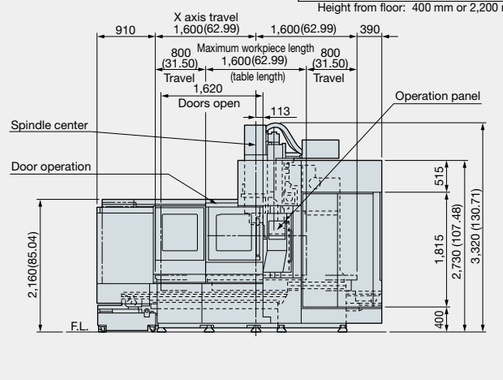



## Dimensional and Installation Drawings

Unit: mm (in)



The Next-Generation Intelligent CNC

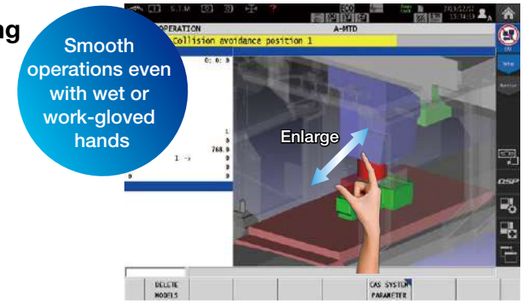
# OSP suite OSP-P300MA

## 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 smart phone

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 smart phone. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.




Note: Collision Avoidance System (Optional) 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.

Routine inspection support
### Maintenance Monitor

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

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

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

Comment display for greater ease of use and faster work
### Common Variable Monitor

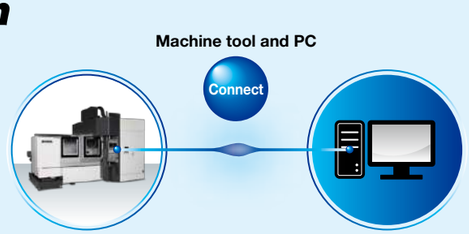
Automatic saving of recorded alarms
### Screen Capture

Easy programing without keying in code
### Scheduled Program Editor

Get Connected, Get Started, and Get Innovative with Okuma "*Monozukuri*"
## Connect Plan

### Connect, Visualize, Improve

Okuma's Connect Plan is a system that provides analytics for improved utilization by connecting machine tools and visual control of factory operation results and machining records. Simply connect the OSP and a PC and install Connect Plan on the PC to see the machine operation status from the shop floor, from an office, from anywhere. The Connect Plan is an ideal solution for customers trying to raise their machine utilization.






## Standard Specifications

| | | |
|---|---|---|
| Basic Specs | Control | X, Y, Z, simultaneous 3 axis, spindle control (1 axis) |
| | Position feedback | OSP full range absolute position feedback (zero point return not required) |
| | Coordinate functions | Machine coordinate system (1 set), work coordinate system (20 sets) |
| | Min / Max command | ±99999.999 mm, ±9999.9999° 8-digit decimal, command unit: 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" for a series of operations for a single screen<br>Easy-to-use operation panel supports complete 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 |
| High speed/accuracy specs | | Hi-G Control, Hi-Cut Pro, pitch error compensation, SERVONAVI, Machining Time Shortening Function |
| Energy-saving function | ECO suite | ECO Idling Stop *1, ECO Power Monitor *2 |

*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 wattmeter option.

## Optional Specifications

| Item | Kit Specs*1 | NML E | NML D | 3D E | 3D D | AOT E | AOT 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 | | ● | ● | ● | ● | ● | ● |
| G-/M-code macros | | | | | | | |
| Common variables (Std: 200 pcs) | 1,000 pcs | | | | | | |
| | 2,000 pcs | | | | | | |
| Program branch; 2 sets | | | | | | | |
| Program notes (MSG) | | | ● | | ● | | ● |
| Coordinate system selection (Std: 20 sets) | 100 sets | ● | | ● | | ● | |
| | 200 sets | | ● | | ● | | ● |
| | 400 sets | | | | | | |
| Helical cutting (within 360°) | | ● | ● | ● | ● | ● | ● |
| 3D circular interpolation | | | | | | | |
| Synchronized Tapping II | | ● | ● | ● | ● | ● | ● |
| Arbitrary angle chamfering | | ● | ● | ● | ● | ● | ● |
| Cylindrical side facing | | | | | | | |
| Slope machining | | | | | | | |
| Tool grooving (flat-tool free-shaped grooving) | | | | | | | |
| 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*2 | | | | | | | |
| **Monitoring** | | | | | | | |
| Real 3D simulation | | | | ● | ● | ● | ● |
| Simple load monitor | Spindle overload monitor | ● | ● | ● | ● | ● | ● |
| NC operation monitor | Hour meter, work counter | ● | ● | ● | ● | ● | ● |
| Hour meters | Power, spindle, NC, cutting | | | | | | |
| Operation end buzzer | With M02, M30, and END commands | | | | | | |
| Work counter | With M02 and M30 commands | | | | | | |
| MOP-TOOL | Adaptive control, overload monitor | | | | | | |
| AI Machine Diagnosis Function | Feed axes / Spindle | | | | | | |
| Machining Status Logger | | | | | | | |
| Cutting Status Monitor | | | | | | | |
| Tool life management | Hour meter, No. of workpieces | ● | ● | ● | ● | ● | ● |

| Item | Kit Specs*1 | NML E | NML D | 3D E | 3D D | AOT E | AOT D |
|---|---|---|---|---|---|---|---|
| **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 | | | | | | |
| Gauging data printout | File output | | | | | | |
| Manual gauging (w/o sensor) | | ● | ● | ● | ● | ● | ● |
| Interactive gauging (Touch-sensor, touch-probe required) | | | | | | | |
| **External I/O communication** | | | | | | | |
| RS-232C connector | | | | | | | |
| DNC-T3 | | | | | | | |
| DNC-B (RS-232C-Ethernet transducer used on OSP side) | | | | | | | |
| DNC-DT | | | | | | | |
| DNC-C/Ethernet | | | | | | | |
| Additional USB (Additional 2 ports, Std: 2 ports) | | | | | | | |
| **Automation / untended operation** | | | | | | | |
| Auto power shut-off | M02 and END alarms<br>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) | | ● | ● | ● | ● | ● | ● |
| Robot, loader I/F | | | | | | | |
| **High-speed, high-accuracy** | | | | | | | |
| AbsoScale detection X-Y-Z-axis | | | | | | | |
| Hyper-Surface*3 | | | | | | | |
| TAS-S (Thermo Active Stabilizer—Spindle) | | | | | | | |
| TAS-C (Thermo Active Stabilizer—Construction) | | | | | | | |
| **ECO suite (energy saving functions)** | | | | | | | |
| ECO Operation | | | | | | | |
| ECO Power Monitor | On-machine wattmeter | | | | | | |
| **Other** | | | | | | | |
| Control cabinet lamp (inside) | | | | | | | |
| Circuit breaker | | ● | ● | ● | ● | ● | ● |
| Sequence operation | Sequence stop | | ● | | ● | | ● |
| Upgraded sequence restart | Mid-block return | | | | | | |
| Pulse handle | 2 pts, 3 pts (standard 1 pt) | | | | | | |
| External M code | 4-point, 8-point | | | | | | |
| Collision Avoidance System*3 | | | | | | | |
| Machining Navi M-*i*, M-*g*II+ (cutting condition search) | | | | | | | |
| One-Touch Spreadsheet | | | | | | | |
| Block skip; 3 sets | | | | | | | |
| OSP-VPS (Virus Protection System) | | | | | | | |

*1. NML: Normal, 3D: Real 3D simulation, AOT: Advanced One-Touch IGF-M
E: Economy, D: Deluxe
*2. Technical consultation needed for specifications
*3. There are limitations when Hyper-Surface and Collision Advance System are used simultaneously.

MB-80V

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

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