

Vertical Machining Center

MB-80V



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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 cm ³ /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 cm ³ /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 cm ³ /min
ø63 face mill 5 blades (carbide)	15,000	2,969	8,523	44	4	1,500



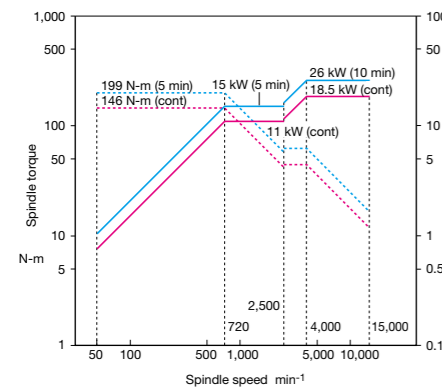
Wide spindle lineup provides the right match for general machinery to die/mold and aluminum parts applications

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

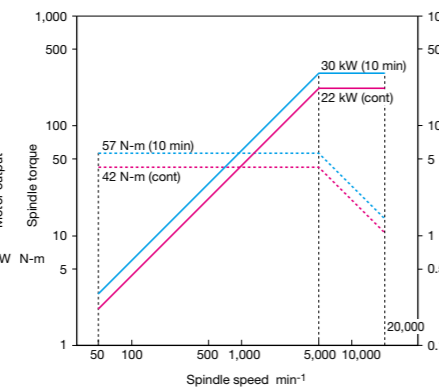
- Spindle speed: 15,000 min⁻¹
- Max output: 26/18.5 kW (10 min/ cont)
- Max torque: 199/146 N-m (5 min/ cont)



High-speed spindle (No. 40)

Mainly for aluminum (Optional)

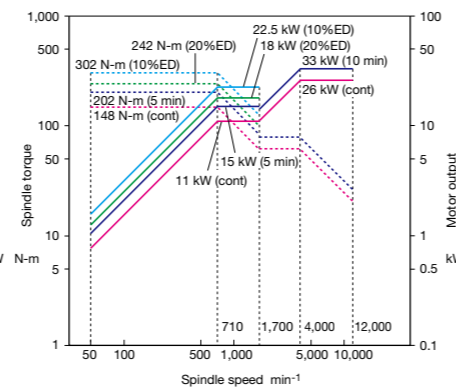
- Spindle speed: 20,000 min⁻¹
- Max output: 30/22 kW (10 min/ cont)
- Max torque: 57/42 N-m (10 min/ cont)



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)



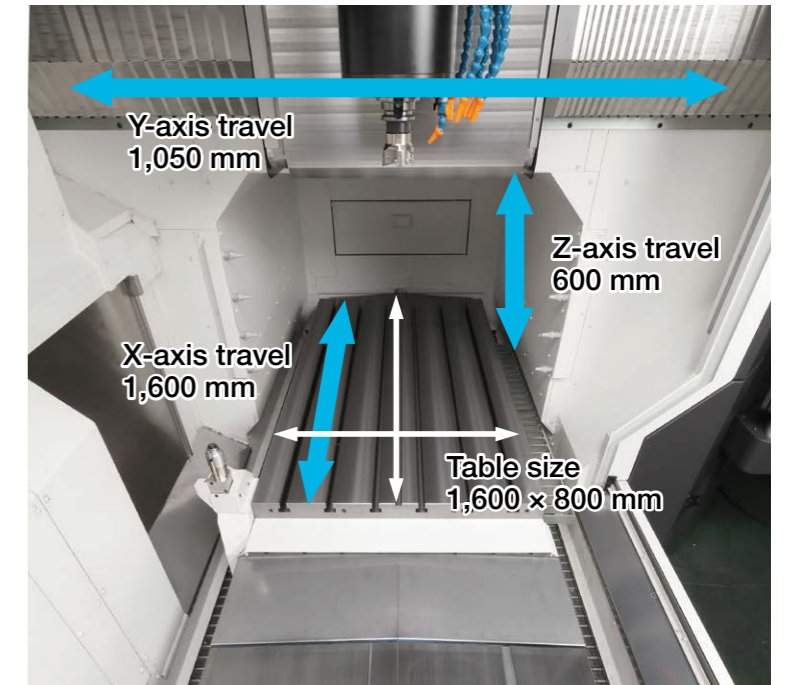
Wide Y-axis travel balanced with excellent workability

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



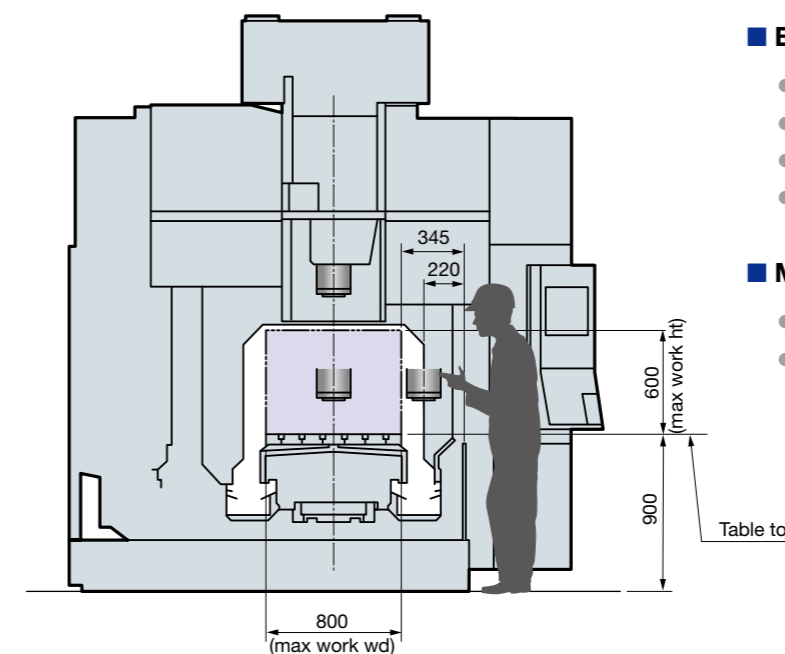
Outstanding table and spindle access provide excellent workability

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



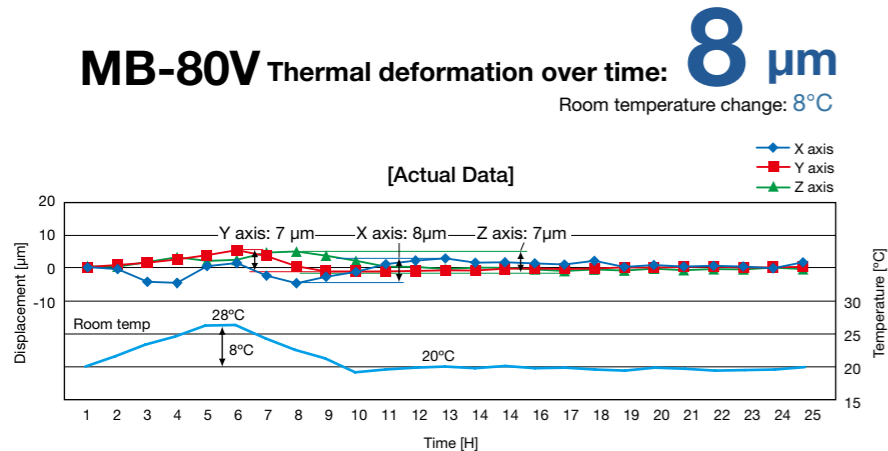
Wide in-machine hinged conveyors surround the table. Large chip volumes discharged smoothly



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

“Working with temperature changes” Thermo-Friendly Concept

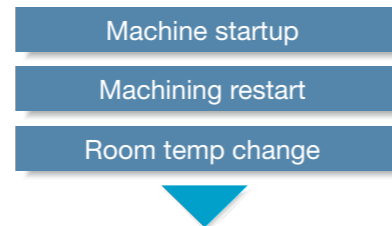
The “Thermo-friendly” concept enables remarkable machining accuracy through original structural design and thermal deformation control technology. It frees you from troublesome dimensional compensation and warm-up. Exhibits excellent dimensional stability even during consecutive operation over long periods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



- **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.



High dimensional stability

AI detects signs of failure AI Machine Diagnosis Function (Optional)

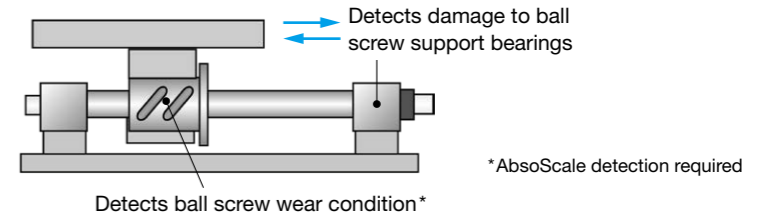
AI Spindle Diagnosis Function

- Detects damage to spindle bearings



AI Feed Axis Diagnosis Function

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



- 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)

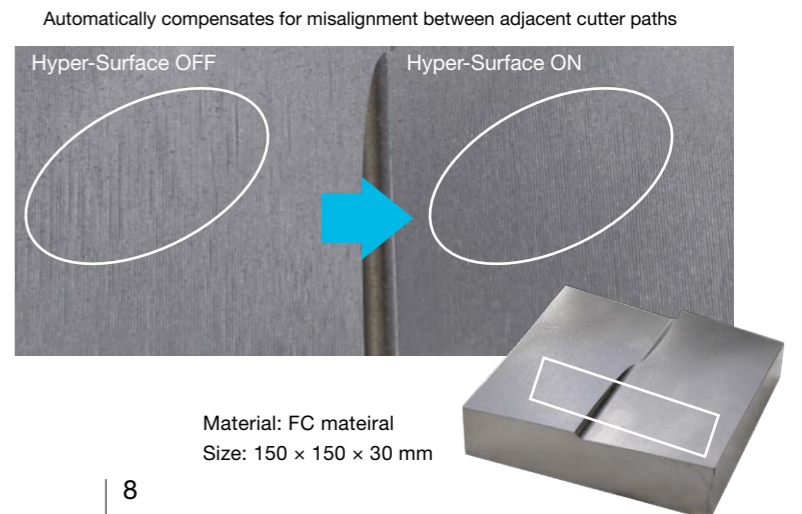
Intermittent/continuous operation of chip conveyor and mist collector during operation

Achieving high die/mold surface quality machining

Hyper-Surface (Optional)

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

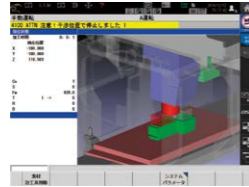
Modifying CAM machining data is not required. Ridgelines and uneven surface edges are reduced, the machined surface quality is improved, and hand-polishing times are eliminated. In addition to the Sculptured-Surface Adaptive Acceleration Control featured in the previous Super-NURBS function, the new 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.



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.



Optimized Servo Control
SERVO NAVI

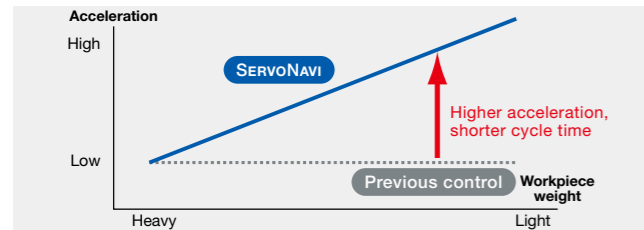
Achieves long term accuracy and surface quality

SERVO NAVI 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.

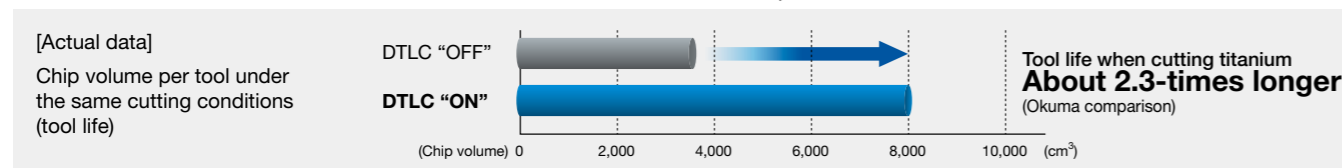


Dynamic Tool Load Control (Optional)

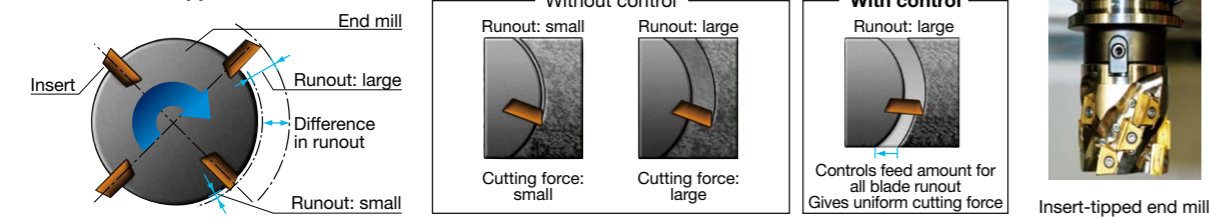
Prevents chipping, extends tool life

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.



Runout of insert-tipped end mill

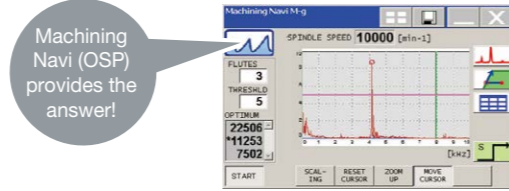


Note: The above are actual examples. Your results may vary due to differences in specifications, tooling and cutting conditions.

Cutting condition search for milling
Machining Navi M-i, M-gII+ (Optional)

Searches for the best cutting conditions

- Machining Navi M-i changes automatically to optimum spindle speed
- Machining Navi M-gII+ displays several spindle speed possibilities



Machining Navi (OSP) provides the answer!

SERVO NAVI 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).

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

Contributes to longer machine life
Vibration Auto Adjustment

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

Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.

Machine Specifications

Item	Unit	MB-80V	
		No. 40 spindle	No. 50 spindle
Travels	X axis (table L/R)	1,600 (62.99)	
	Y axis (ram saddle front/back)	1,050 (41.34)	
	Z axis (spindlehead vertical)	600 (23.62)	
	Table top to spindle nose	200 to 800 (7.87 to 31.50)	
Table	Table size	1,600 × 800 (62.99 × 31.50)	
	Floor to table top	900 (35.43)	
	Max load capacity	2,500 (5,500)	
Spindle	Speed	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	ø70 (ø2.76) (12,000 min ⁻¹ spindle is ø90)	ø90 (ø3.54)
Feed Rates	Rapid traverse	X·Y: 42, Z: 32	
	Cutting feed rate	X·Y·Z: 32,000	
Motors	Spindle	26/18.5 (35/25) [33/26 (43/35), 30/22 (40/30)]	33/26 (43/35)
	Feed axes	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	32 [48, 64]	
	Max tool dia (w/adjacent tool)	ø90 (ø3.54)	ø100 (ø3.94)
	Max tool dia (w/o adjacent tool)	ø125 (ø4.92)	ø152 (ø5.98)
	Max tool length	400 (15.75)	
	Max tool mass	8 (17.6)	12 [15] (26.4 [33])
	Max tool moment	7.8 (5.7)	15.3 [19.1] (11.2 [14.0])
Machine Size	Tool selection	Memory random	
	Height	3,320 (130.71)	
	Floor space	4,500 × 2,970 (177.17 × 116.93)	
	Mass	16,750 (36,850)	17,000 (37,400)

[]: Optional

Standard Specifications

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	3-lamp status indicator	Type C (LED signal tower)
Air cleaner (filter)	Regulator included	Work lamp	Red (alarm), yellow (end), green (running)
Spindle oil-air lubricator		LED lamps (installed on right and left sides)	
Auto lube system (ALS)	Ball screw, guideway, magazine	Full enclosure shielding	With ceiling
ATC magazine	32 tools	Tapered bore cleaning bar	
ATC magazine shutter		Hand tools	
Tool unclamp package		Tool box	
Coolant system	Tank 700 L (Effective 460 L) Pump motor 3.3/3.8 kW (50/60 Hz)	Numerical controller	OSP-P300MA
Coolant nozzles	Adjustable type: 6 tools	Color LCD operation panel	
In-machine chip discharge	Hinge-type chip conveyor	Pulse handle	
Chip pan	64 L		
ATC air blower (blast)			

Note: Fire prevention measures are necessary, as oil-based coolants may cause fire. Never operate machine unattended.

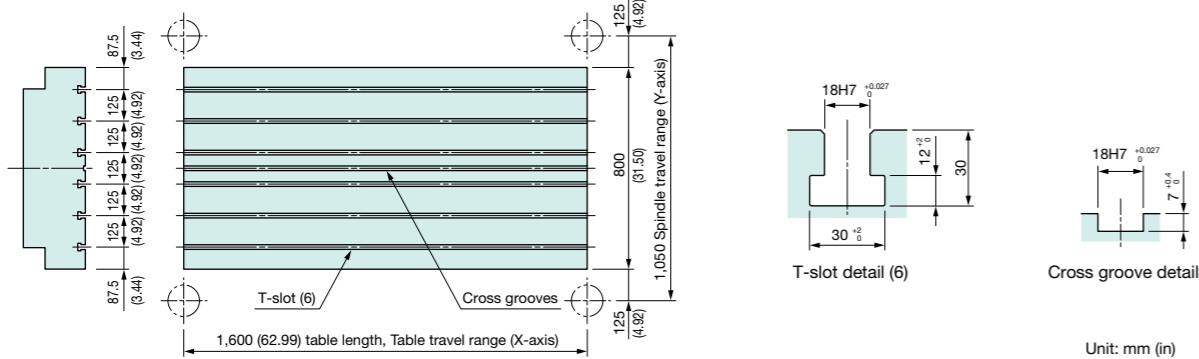
*1: For spindle tapered bore, 7/24 taper No. 40 (BT40, BIG-PLUS®, CAT40, DIN40) or HSK-A63 are available.

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) For 64 or more tools (matrix magazine)	Workpiece wash gun	
Pull stud specs	△ MAS1, CAT, DIN, JIS	Off-machine chip discharge	△ Lift-up chip conveyor: floor or drum filter type
Attachment preps	Accelerator attachment Angle-head attachment Oil-hole supplier	Chip bucket	△
AbsoScale	X-Y-Z axes	Auto tool length compensation · tool breakage detection	With touch sensor
Automatic pallet changer	2-pallet parallel shuttle APC (left side), FMS	Auto zero offset· Auto gauging	With touch probe
NC rotary table	Specify chuck, tailstock requirements, rotary table type	Collision Avoidance System	
Installation specifications for the NC rotary table		Machining Navi M-i, M-g□+	Cutting condition search
High-crossrail specs	+200 mm	TAS-S	Thermo Active Stabilizer—Spindle
Thru-spindle coolant *1	Specify 1.5 MPa or 7.0 MPa	TAS-C	Thermo Active Stabilizer—Construction
Chip air blower (adapter)		Automatic door	
		Chemical anchors	

△: 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



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

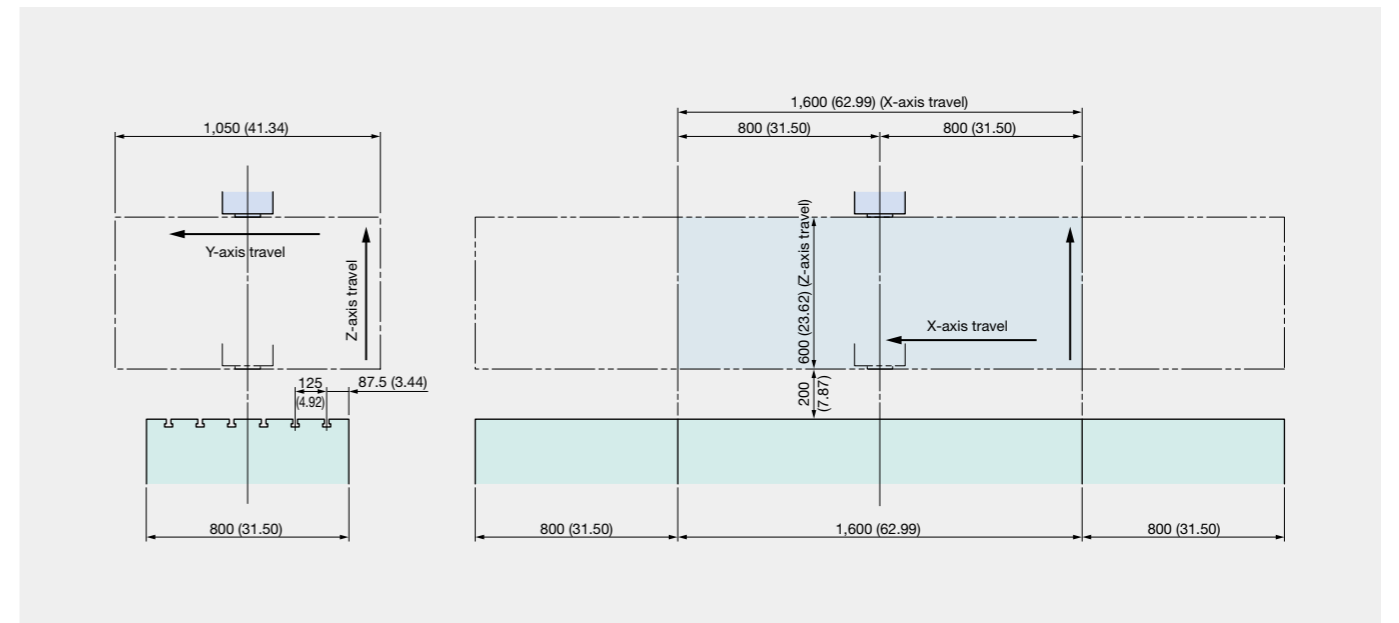
Off-machine lift-up chip conveyors

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.

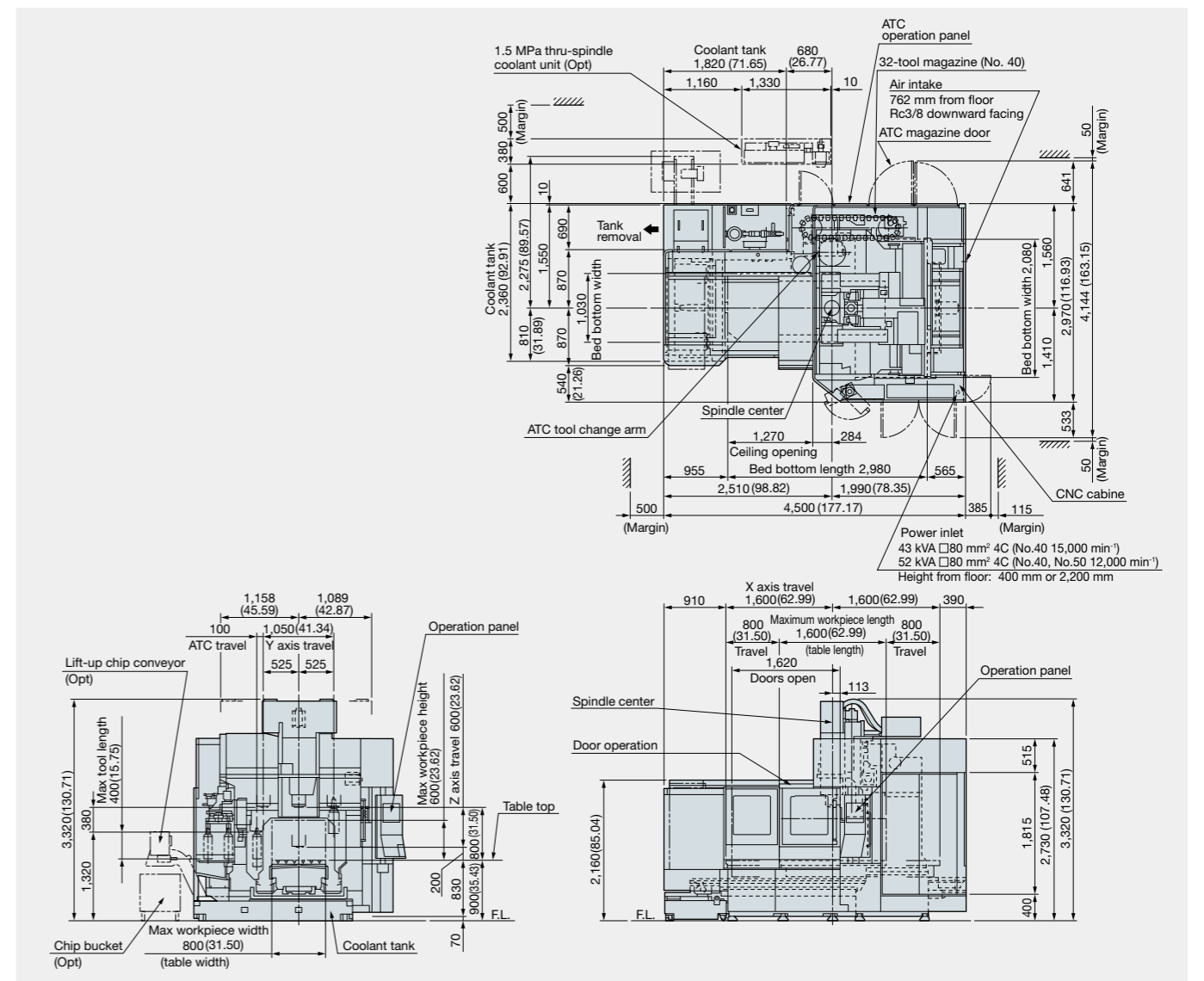
Working Ranges

Unit: mm (in)



Dimensional and Installation Drawings

Unit: mm (in)

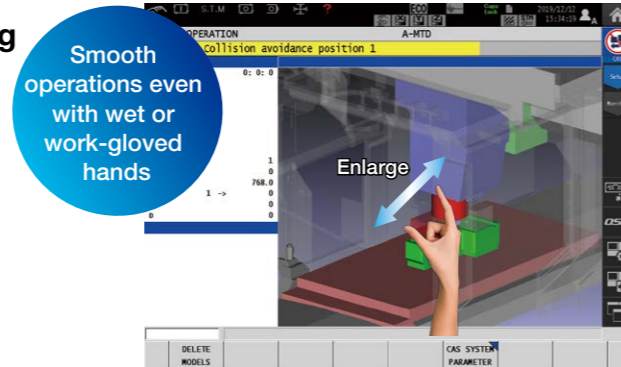


With revamped operation and responsiveness—ease of use for machine shops first!

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.



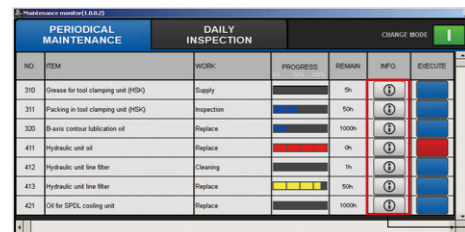
Note: Collision Avoidance System (Optional) shown above.

“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.



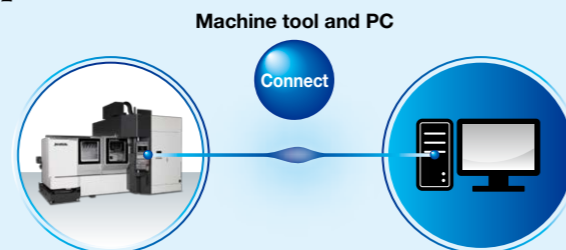
[INFO] button

- 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 programming 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
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 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		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							
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						
Gauging							
Auto gauging	Touch probe (G31)						
Auto zero offset	Includes auto gauging						
Tool breakage detection	Touch sensor (G31)						
	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						
	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-7, M-gII+ (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.

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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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.