

MB-V Series
ACE CENTER

MB-46VA / MB-46VB

MB-56VA / MB-56VB

MB-66VA / MB-66VB

Vertical Machining Centers



MB-V Series

ACE CENTER

Vertical Machining Centers

MB-46VA/MB-46VB MB-56VA/MB-56VB MB-66VA/MB-66VB



ACE CENTER

Accuracy / Speed / Power
Communication
Ecology

Productivity—Machining Quality—Operational Ease Vertical machining centers that satisfies all of the above

Reliable intelligent technology starts with the MB-V series

The global standard for vertical machining centers. MB-V series machines give outstanding machining performance with high-accuracy, high-speed, and powerful cutting in manufacturing settings worldwide. At the same time, they provide a working space that is good for both people and the environment, including good workability, low energy use, and a clean environment. Try pleasant manufacturing with the MB-V series for yourself.

Thermo-Friendly Concept used

Machining dimensional change over time: **8 μm** MB-46/56V
/Per 8°C room temp change. Actual data with TAS-C.

Machining dimensional change over time: **10 μm** MB-66V
/Per 8°C room temp change. Actual data with TAS-C.



ACE CENTER MB-46VA/B



ACE CENTER MB-56VA/B



ACE CENTER MB-66VA/B

Photographs used in this brochure may show optional equipment.

Parts machined with higher quality

Positioning accuracy

MB-46VA with AbsoScale; actual data (measurement method based on ISO 230-2)

The exactness of bi-directional positioning

- X-axis (travel 560 mm) **1.7 μm**
- Y-axis (travel 460 mm) **2.4 μm**
- Z-axis (travel 460 mm) **2.2 μm**

Bi-directional repeatability

- X-axis (travel 560 mm) **1.0 μm**
- Y-axis (travel 460 mm) **1.3 μm**
- Z-axis (travel 460 mm) **1.0 μm**

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.

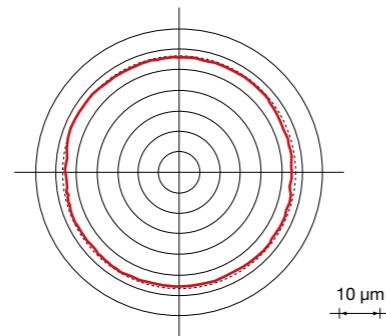
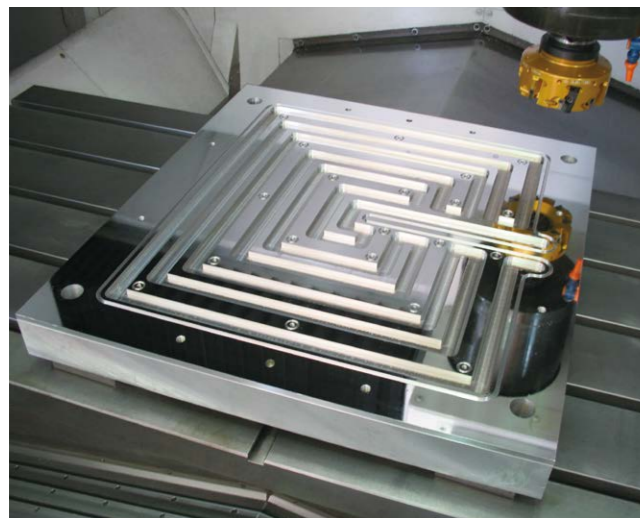
High-accuracy machining

Flatness 3 μm (actual data)

- Machine: MB-66VA
- Machined part: Plate (LCD)
- Material: A5052
- Size: 560 × 600 × 60 mm
- Cycle time: 50 min

Roundness 1.65 μm (actual data)

- Machine: MB-56VA
- Machining dia: ø150 mm
- Material: Al
- Spindle speed: 8,000 min⁻¹
- Feedrate: 2,000 mm/min



Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting conditions, and others.



Thermo-Friendly Concept

The unique approach of "accepting temperature changes."

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.

MB-46/56V Actual data

8 μm

Machining dimensional change over time:
Per 8°C room temp change (TAS-C)

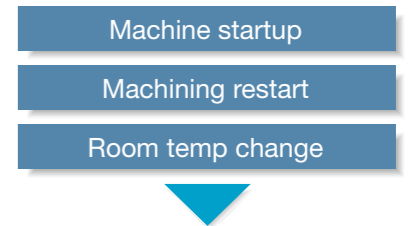
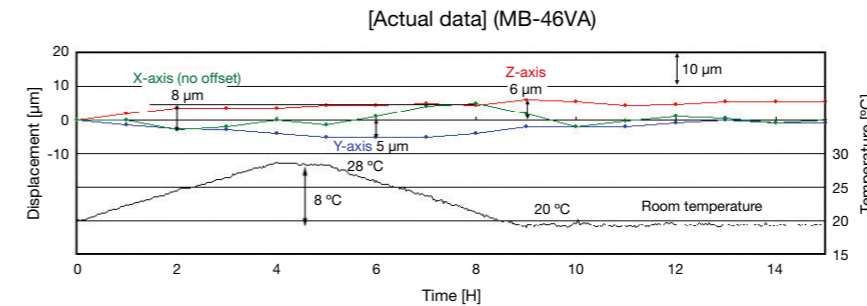
MB-66V Actual data

10 μm

Machining dimensional change over time:
Per 8°C room temp change (TAS-C)

Eliminate waste with the Thermo-Friendly Concept

Okuma's Thermo-Friendly Concept achieves high dimensional stability not only when the room temperature changes, but also at machine startups or when machining is resumed. The warm-up operation time to stabilize thermal deformation is shortened, and the burden of dimensional correction when resuming machining is reduced.



High dimensional stability

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

Providing optimal control of the machine and stable machining accuracies even during ambient temperature changes.

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

Spindle deformation will be accurately controlled even during operations with frequent speed changes.

ECO suite plus

Next-Generation Energy-Saving System

A suite of energy-saving applications for machine tools

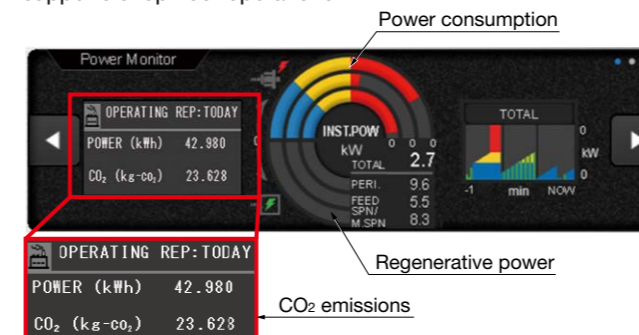
ECO Power Monitor

Evaluating energy savings and analyzing areas of reduced energy

The power consumption and carbon dioxide emissions for the spindle, feed axes, and auxiliary equipment are displayed separately on the OSP operation panel.

With ECO suite plus, you can also analyze detailed carbon dioxide emissions per component on a PC using One-Touch Spreadsheet (option).

A three-phase decarbonization cycle (See, Record, Analyze) supports shop floor operations.



ECO Idling Stop

With accuracy assured, the cooler can be turned off

Auxiliary equipment (large consumers of plant power) can be turned off when not required. For machines equipped with the optional Thermo Active Stabilizer—Spindle (TAS-S), a component of Okuma's "Thermo-Friendly Concept" technology, the machine itself decides the need for cooling and stops the cooler of an idling spindle while maintaining stable accuracy levels. With ECO suite plus, the machine automatically detects the operation status to eliminate the need for operator intervention and button operations, resulting in maximum carbon dioxide emission reductions.

ECO Operation (option)

Peripheral equipment runs only when needed

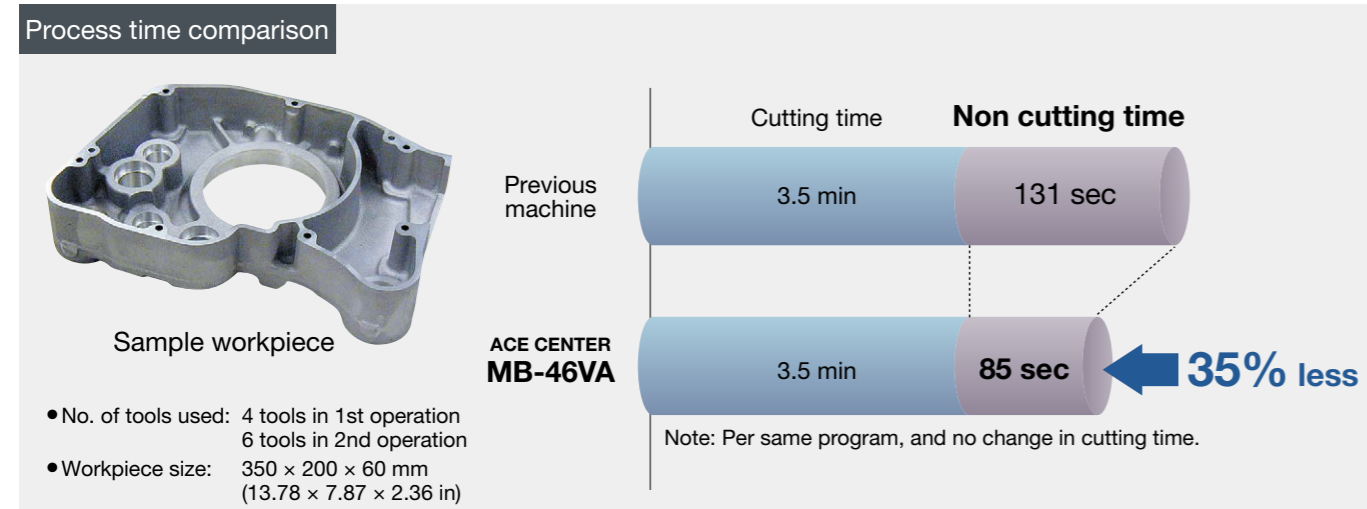
By using only the required peripherals (chip conveyor, mist collector), energy-saving operations that also maintain high productivity are possible. ECO suite plus enables more detailed tuning of "operation patterns" to thoroughly reduce carbon dioxide emission.

High productivity per faster cycle times

35% less non-cutting time (MB-46VA: Compared to previous Okuma machine)

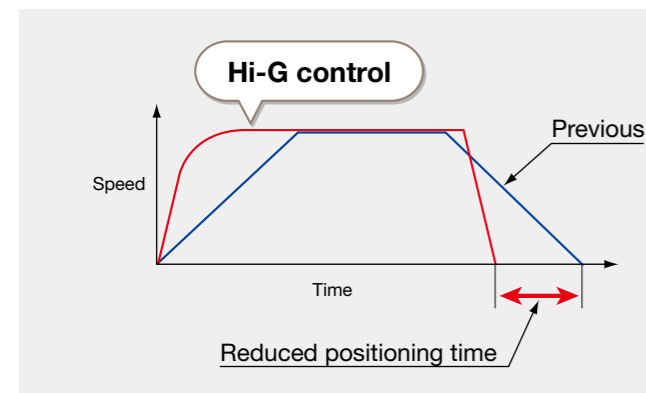
■ Acceleration	Max 0.7 G	■ ATC time ^{*1}
■ Rapid traverse	40 m/min (1,575 ipm) (X-Y)	T-T ^{*2} : 1.5 sec (MB-46/56/66VA)
■ Spindle accel/decel	1.2 sec (0↔8,000 min ⁻¹)	CTC min ^{*3} : 3.6 sec (MB-46VA)
		: 3.8 sec (MB-56VA)
		: 4.2 sec (MB-66VA)

*1. For No. 40 spindles
 *2. MAS standard measurements (formerly JIS B 6013)
 *3. ISO 10791-9 (2001) (JIS B 6336-9) measurements



Hi-G Control

During positioning, this function controls the acceleration/deceleration speed according to the speed-torque characteristics of the BL motor, resulting in high-speed and highly stable positioning. The Hi-G control function reduces positioning time and greatly reduces non-cutting time.



Machining Time Shortening Function

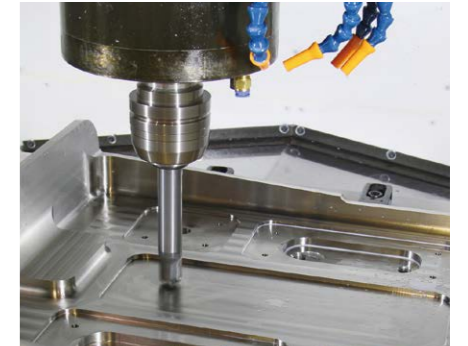
This shortens machining time in operations with repeated rapid traverse (G00) and cutting feed (G01) movements, such as for parts with many drilled holes.

Note: The amount by which machining time is reduced will differ depending on machine setup, machined part shape, and part program.

30% faster cutting time (Compared to previous Okuma machine)

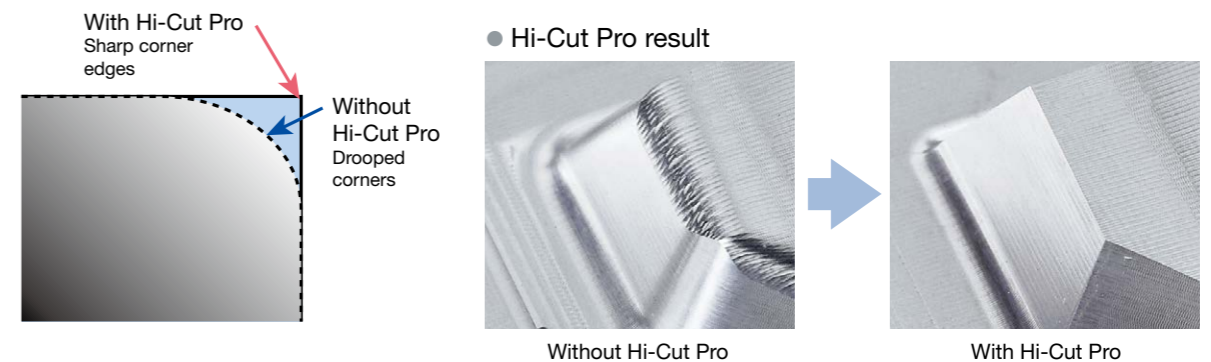
High-speed spindle

● MB-VA (No. 40)	8,000 min ⁻¹ (standard)
	15,000 / 20,000 / 25,000 / 35,000* min ⁻¹ (option)
	* Not available for MB-66VA
● MB-VB (No. 50)	6,000 min ⁻¹ (standard)
	12,000 min ⁻¹ (option)
■ Cutting feed rate	32 m/min (1,260 ipm)



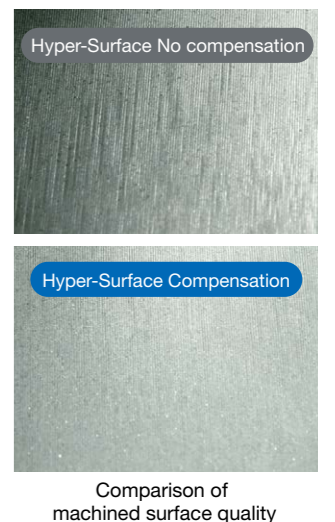
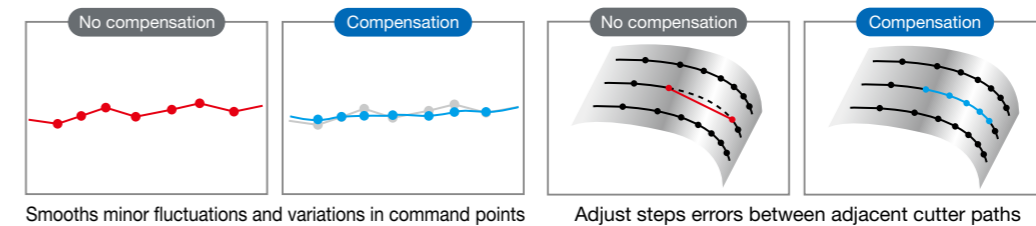
Hi-Cut Pro

This controls the feedrate to provide machining suitable for corner shapes and circular shapes of machining parts, with the aim of ensuring high-accuracy machining and reducing cycle time.



Hyper-Surface (option)

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



Powerful spindles and highly rigid machine structures provide heavy-duty cutting with ease

Cutting capacities: **504 cm³/min** / **672 cm³/min**
(face milling) (end milling)

Powerful cutting examples

● 8,000 min⁻¹ (No. 40) / 6,000 min⁻¹ (No. 50) high power spindle (standard)

Tool	Spindle min ⁻¹	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm ³ /min
ø80 face mill 8 blades (cermet)	895	225	2,600	56	2.5	364
ø20 roughing end mill, 7 flutes (carbide)	3,660	230	4,300	4	20	344
ø50 insert drill	1,000	157	150	-	-	-
Tap M30P3.5	318	30	1,113	-	-	60% (Spindle load)

(Workpiece material: S45C)

● 15,000 min⁻¹ (No. 40) wide-range spindle (option)

Tool	Spindle min ⁻¹	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm ³ /min
ø80 face mill 8 blades (cermet)	895	225	3,000	56	3	504
ø20 roughing end mill, 7 flutes (carbide)	4,000	251	4,800	7	20	672
ø63 insert drill	720	142	108	-	-	-
Tap M30P3.5	318	30	1,113	-	-	66% (Spindle load)

(Workpiece material: S45C)

● 12,000 min⁻¹ (No. 50) wide-range spindle (option)

Tool	Spindle min ⁻¹	Cutting m/min	Feed rate mm/min	Width mm	Depth mm	Chips cm ³ /min
ø80 face mill 8 blades (cermet)	895	225	3,000	56	3	504
ø20 roughing end mill, 7 flutes (carbide)	4,000	251	2,800	12	20	672
ø63 insert drill	909	180	137	-	-	-
Tap M36P4	106	12	424	-	-	-

(Workpiece material: S45C)

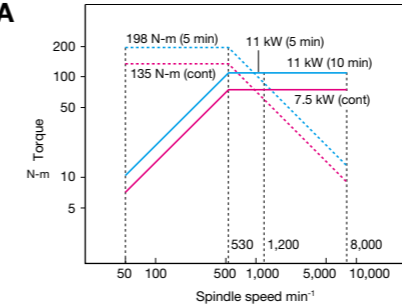


High power spindle

For general machine components

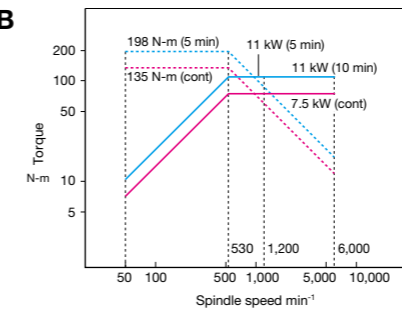
MB-46/56/66VA

- 8,000 min⁻¹
- 11/7.5 kW (15/10 hp) (10 min/cont)
- 198/135 N-m (5 min/cont)
- 7/24 taper No. 40



MB-46/56/66VB

- 6,000 min⁻¹
- 11/7.5 kW (15/10 hp) (10 min/cont)
- 198/135 N-m (5 min/cont)
- 7/24 taper No. 50

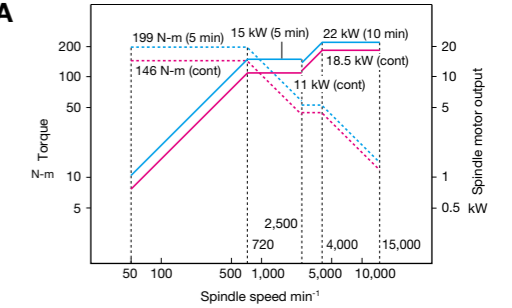


Wide-range spindle (option)

Fast/efficient non-ferrous to structural steel

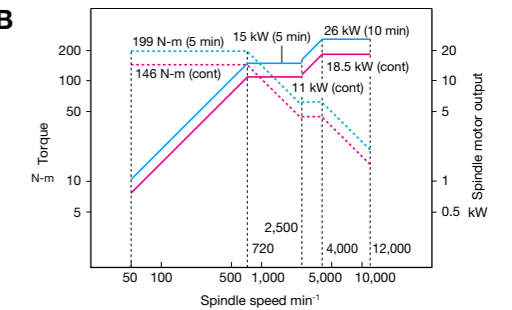
MB-46/56/66VA

- 15,000 min⁻¹
- 22/18.5 kW (30/25 hp) (10 min/cont)
- 199/146 N-m (5 min/cont)
- 7/24 taper No. 40



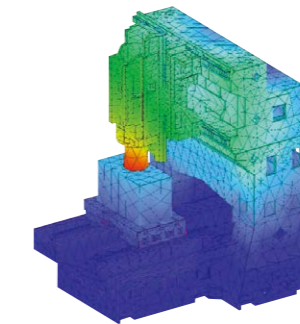
MB-46/56/66VB

- 12,000 min⁻¹
- 26/18.5 kW (35/25 hp) (10 min/cont)
- 199/146 N-m (5 min/cont)
- 7/24 taper No. 50



Rugged machine structure

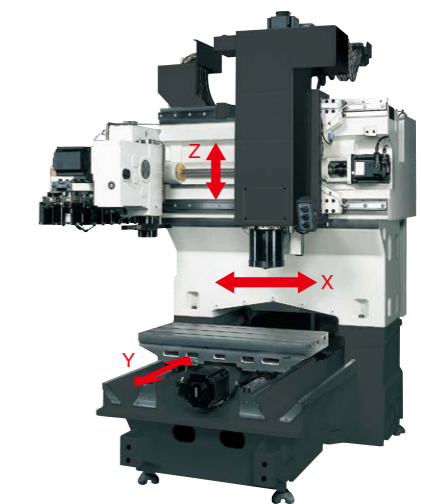
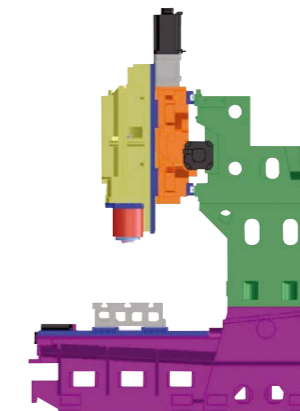
- Rugged machine structure developed using 3D-CAD and FEM analysis
- Same rugged column structure as used in our proven column machining centers
- Bearing bracket of feeding axis integrated into the machine



FEM analysis

Less overhang

- Less overhang from slideway to machining phase means a more stable machine structure



Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, and cutting conditions.

Creating user- and earth-friendly environments

Ergonomic front access and environmentally friendly

Work-intensive space

- Loading/unloading magazine tools can also be performed from the front of the machine



Tools can be loaded/unloaded from spindle side

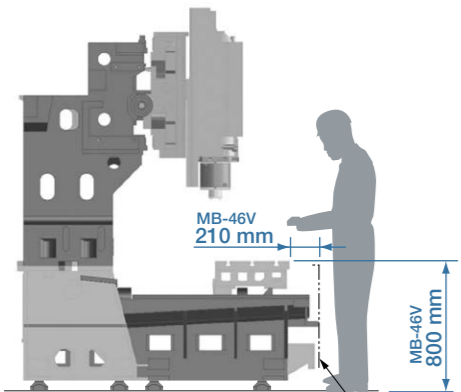
- Tool load/unload button on spindlehead



Tool load/unload button

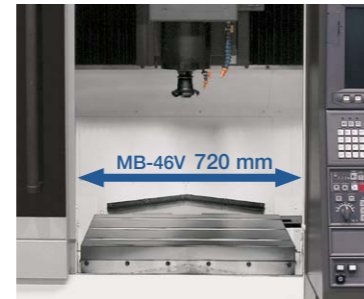
Easy workpiece, setup change

- Ideal table height easy to access and work with



- Table height
 - MB-46V: 800 mm
 - MB-56V: 800 mm
 - MB-66V: 850 mm
- Access to table
 - MB-46V: 210 mm
 - MB-56V: 215 mm
 - MB-66V: 235 mm

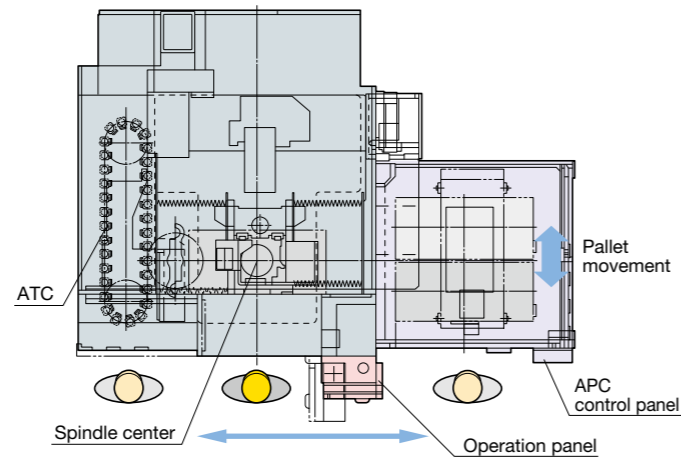
- Wide door opening
 - MB-46V: 720 mm
 - MB-46VE*: 850 mm
 - MB-56V: 1,329 mm
 - MB-66V: 1,510 mm
- * E: Extension type



MB-46V 720 mm

Superior operability even with 2-pallet shuttle APC (option)

- Pallets returned to the interior are automatically moved to front
 - Setup work is concentrated at machine front
- Machine front and APC front correspond
 - Close to operating panel, good workability
 - Regular tasks, including tool access, also done from the front of the machine



Eco-friendly and energy-saving features

Huge reduction in power consumption

- PREX motor used in energy-saving magazine drive system
- No hydraulic unit
 - An energy-saving, compact, and quieter tool unclamp package (electric pump cylinder) is used instead
- Oil controller controlled by power-saving inverter

For safe and clean factories

- Fully enclosed shielding with ceiling



Cover closed



Cover open

Reduced use of lubricating oil

- LUBE LHL System used to considerably reduce consumption and maintenance frequency

Low-noise guideways

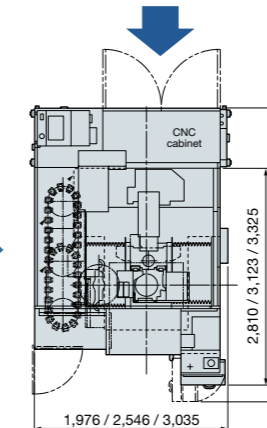
Reduced machine installation space

- No maintenance on left or right



Left side

Maintenance concentrated in rear



Right side

MB-46V images
MB-46V / 56V / 66V
dimensions

Machine specifications

	item		MB-46VA <VAE>	MB-56VA	MB-66VA
			MB-46VB <VBE>	MB-56VB	MB-66VB
Travel	X-axis (ram saddle R/L)	mm (in)	560 <762> (22.05 <30.00>)	1,050 (41.34)	1,500 (59.06)
	Y-axis (table B/F)	mm (in)	460 (18.11)	560 (22.05)	660 (25.98)
	Z-axis (spindle U/D)	mm (in)	460 (18.11)		660 (25.98)
	Table top to spindle nose	mm (in)	150 to 610 (5.91 to 24.02)		150 to 810 (5.91 × 31.89)
Table	Max work dimension	mm (in)	760 × 460 <1,000 × 460> (29.92 × 18.11 <39.37 × 18.11>)	1,300 × 560 (51.18 × 22.05)	1,530 × 660 (60.24 × 25.98)
	Floor to table top	mm (in)	800 (31.50)		850 (33.46)
	Max load capacity	kg (lb)	500 <700> (1,100 <1,540>)	900 (1,980)	1,500 (3,300)
Spindle	Spindle speed	min ⁻¹	8,000 [15,000, 20,000, 25,000, 35,000] (*1)		
			6,000 [12,000]		
	Speed range		Infinitely variable		
	Tapered bore		7/24 taper No. 40 [HSK-A63 / HSK-F63] (*1)		
			7/24 taper No. 50		
Bearing dia	mm (in)		ø70 [ø70, ø70, ø60, ø60] (ø2.76 [ø2.76, ø2.76, ø2.37, ø2.37]) (*1)		
			ø90 [ø90] (ø3.54 [ø3.54])		
Feed rate	Rapid traverse	m/min (ipm)	X-Y: 40 (1,575) Z: 32 (1,260)		
	Cutting feed rate	mm/min (ipm)	X-Y-Z: 32,000 (1,260)		
Motor	Spindle	kW (hp)	11/7.5 [22/18.5, 30/22, 15/11, 15] (15/10 [30/25, 40/30, 20/15, 20]) (*1)		
	Feed axes	kW (hp)	X-Y-Z: 3.5 (4.7)	X-Y-Z: 4.6 (6.1)	
ATC	Tool shank		MAS BT.40 [HSK] MAS BT.50		
	Pull stud		MAS 2 [-] MAS 2		
	Tool capacity	tool	20 [32, 48] 48-tool only for MB-46VAE, MB-56V, MB-66V		
	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)	300 (11.81)	400 (15.75)	
	Max tool mass	kg (lb)	8 (18) 12 (26)	8 (18) 12 [15] (26 [33])	
	Max tool moment	N-m (ft-lbf)	7.8 (5.7) (8 kg × 100 mm (17.6 lb × 3.94 in)) 15.3 (12 kg × 130 mm) (11.3 (26.4 lb × 5.12 in))		15.3 [19.1] (12 [15] kg × 130 mm) (11.3 [14.0]) (26.4 [33] lb × 5.12 in)
	Tool selection		Memory random		
	Machine size	Height	mm (in)	2,746 (108.11)	
Floor space		mm (in)	1,976 (2,026*2) <2,236> × 2,810 (78 (80) <88> × 111)	2,546 × 3,123 (100 × 123)	3,035 × 3,325 (119 × 131)
Mass		kg (lb)	6,800 <7,100> (14,960 <15,620>) 7,000 <7,300> (15,400 <16,060>)	8,300 (18,260) 8,500 (18,700)	11,200 (24,640) 11,800 (25,960)

*1. 35,000 min⁻¹ spindle (15 kW, HSK-F63) not available with MB-66VA
*2. MB-46VB

[] : Option
< > : E (extension type)

Standard specifications

Spindle speed	50 to 8,000 min ⁻¹	7/24 taper No. 40, 11/7.5 kW (46/56/66VA)
Spindle speed	50 to 6,000 min ⁻¹	7/24 taper No. 50, 11/7.5 kW (46/56/66VB)
Rapid traverse; X-Y; Z:	40; 32 m/min	
Spindle/spindlehead cooler		Oil temperature controller
Air cleaner (filter)		Regulator included
Spindle oil-air lubricator		
Slideway lube supplier		
ATC		20-tool magazine
ATC magazine shutter		
Tool unclamp package		
Coolant tank capacity *1	MB-46V	190 L (effective: 100 L), pump: 250 W (50 Hz/60 Hz)
	MB-56V	230 L (effective: 120 L), pump: 250 W (50 Hz/60 Hz)
	MB-66V	460 L (effective: 270 L), pump: 390 W (50 Hz) 620 W (60 Hz)
Coolant nozzles		Flexible, 5
Coolant flusher *1		Table L/R
Chip pan *2	MB-46V	60 L (effective)
	MB-56V	69 L (effective)
	MB-66V	92 L (effective)
ATC air blower (blast)		
Chip air blower (blast)		Nozzles
Spindle air blower (blast)		
Foundation washers (with jack bolts)		8 pcs
3-lamp status indicator		Type C (LED signal tower)
Work lamp *2		LED
Full enclosure shielding		With ceiling
Tapered bore cleaning bar		
Hand tools		
Tool box		
Numerical controller		OSP-P300MA
Color LCD operation panel		
Pulse handle		

*1. Use water-based coolant. For oil-based applications when necessary, larger pumps (and in-machine coil-type chip conveyor) may be required.
Highly flammable oil-based coolant require strict fire prevention measures; machine operation should be closely monitored and attended by qualified machinist or operator.

*2. "Required" optional specs



Air blower (blast) nozzle

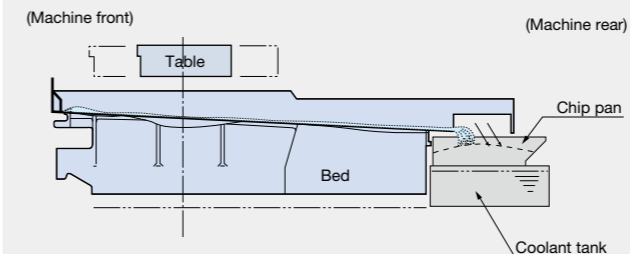


Signal tower

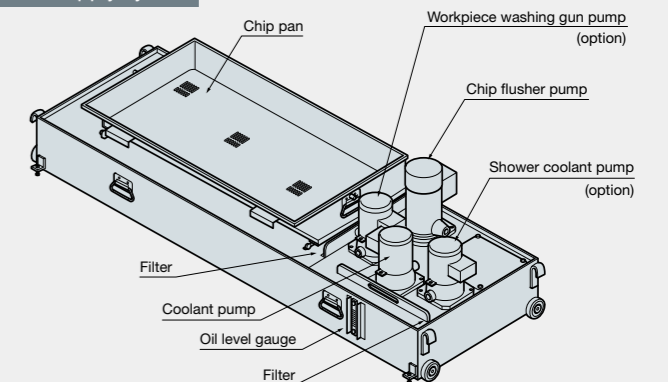


Full enclosure shielding

Chip flusher system



Coolant supply system



Optional specifications

Spindles available:	
Wide-range: 50 to 15,000 min ⁻¹	△ 22/18.5 kW, No. 40, HSK-A63
High-speed: 50 to 20,000 min ⁻¹	△ 30/22 kW, HSK-A63, BIG-PLUS® (No. 40)
High-speed: 50 to 25,000 min ⁻¹	△ 15/11 kW, HSK-A63, BIG-PLUS® (No. 40)
High-speed: 35,000 min ⁻¹ *1	△ 15 kW, HSK-F63
Wide-range: 50 to 12,000 min ⁻¹	△ 26/18.5 kW, No. 50
Dual contact spindle	△ HSK, BIG-PLUS®
Recommended die/mold specs	Die/mold & find-feed specs
	AbsoScale
	Hyper-Surface: X-Y-Z axes only*2
	Super-NURBS: X-Y-Z axes, rotational axis (up to 2)*2
	0.1 μm control
	DNC-DT (recommended)
Tool unclamp hydraulic unit*3	△ Separately mounted
ATC magazine capacity	△ 32-tool (48-tool available for 46VAE, 56V, 66V)
Pull stud specs	△ MAS 1, JIS, CAT, DIN
Attachment preps	Accelerator attachment
	Angle-head attachment
	Oil-hole supplier
AbsoScale	X-Y-Z axes
Die/mold & find-feed specs	△ X-, Y-, Z-axis rapids: 20 m/min
NC rotary table	Specify chuck, tailstock requirements, rotary table type
Preps for above	
Index table	
2-pallet parallel shuttle APC (right side)	46VAE/VBE, 56V, 66V Tapped or T-slot pallets available.
High crossrail (+200 mm)	△ Required with APCs
Thru-spindle coolant*4	Specify 1.5 or 7.0 MPa 25,000 min ⁻¹ specs for HSK-A63 only 35,000 min ⁻¹ specs (HSK-F63) available
Chip air blower (adapter)	Not available with thru-spindle coolant specs
Oil mist unit	
Mist collector	
Semi-dry machining	
Shower coolant systems	
Workpiece wash gun	
In-machine chip conveyor (coil)	△ Table L/R
Lift-up chip conveyor	△ See "Recommended chip conveyors" on page 14
Chip bucket for above	△
Dust collector	
Tool breakage detection / Auto tool length compensation	Touch sensor*5 (Metrol)
Auto zero offset / Auto gauging	Touch probe (Renishaw, Marposs)
Chemical anchors	
Sub-tables	
Work lamp	LED, added to left side
TAS-S (Thermo Active Stabilizer—Spindle)	Required for high-speed spindles
TAS-C (Thermo Active Stabilizer—Construction)	

△: Corresponding standard specification is deleted.

*1. Not available for MB-66VA

*2. Select Super-NURBS for simultaneous linear and rotational axis machining.

*3. Recommended for short and repetitive ATC operations.

For details, please contact your Okuma sales representative.

*4. Okuma pull studs required. (excluding HSK shanks)

*5. Table mounted; which may limit available working range.

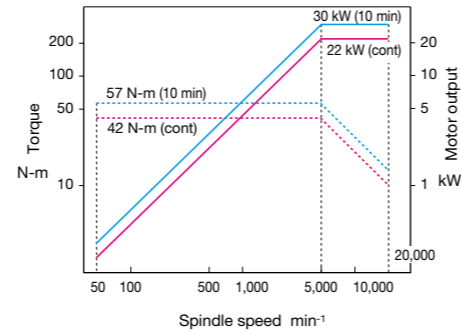
Wide-range spindle

See page 8

High-speed spindle

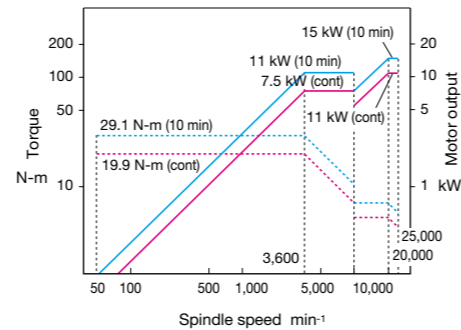
Die/mold, AI applications

- Spindle 50 to 20,000 min⁻¹
- Output 30/22 kW (10 min/cont)
- Torque 57/42 N-m (10 min/cont)

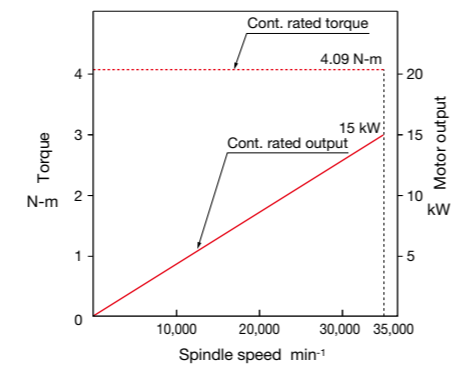


High-speed/-quality die/mold applications

- Spindle 50 to 25,000 min⁻¹
- Output 15/11 kW (10 min/cont)
- Torque 29.1/19.9 N-m (10 min/cont)



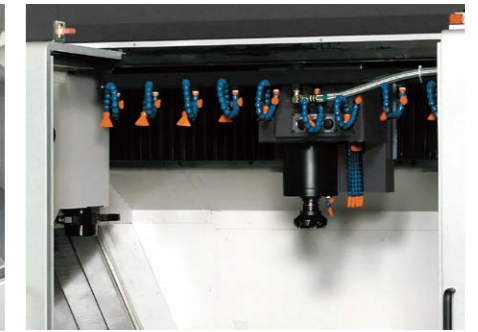
- Spindle 35,000 min⁻¹ (*1)
- Output 15 kW (cont)
- Torque 4.09 N-m (cont)



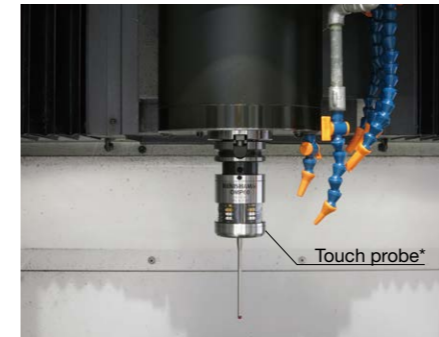
Hinge lift-up chip conveyor



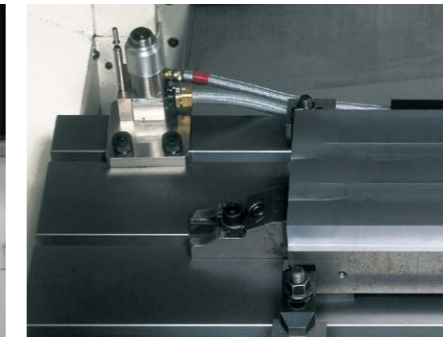
In-machine chip discharge (coil)



Shower coolant (ceiling)



Auto zero offset & auto gauging (*optical signal)



Auto tool length compensation



Workpiece washing gun

Recommended Chip Conveyors

(Please contact an Okuma sales representative for details.)

○: Recommended
△: Conditionally recommended

Workpiece material		Steel	Cast iron	Aluminum / Nonferrous	Mixed (general use)
Chip shape					
In-machine	Chip flusher (standard)	—	○ (Wet)	○	—
	Coil (option)	○	○ (Dry-Wet)	—	○
Off-machine (option)	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				

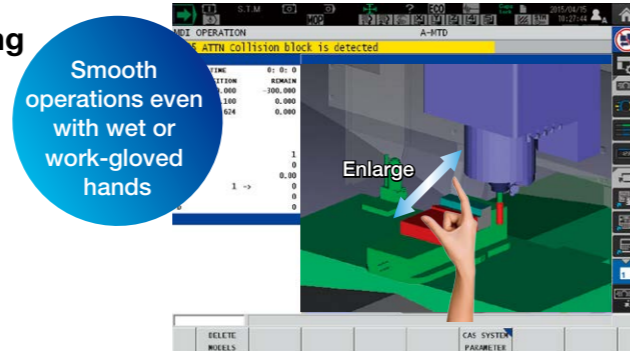
Note: The machine may need to be raised (platform) depending on the type of chip conveyor.

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

Smart factories are using advanced digitization and networking (IIoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed. The OSP suite also features a full range of useful apps that could only come from a machine tool manufacturer, making smart manufacturing a reality.

Smooth, comfortable operation with the feeling of using a smartphone

Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Moving, enlarging, reducing, and rotating 3D models, as well as list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smartphone. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.



Note: Collision Avoidance System (option) shown above.

“Just what we wanted.”— Refreshed OSP suite apps

This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brain power packed into the CNC, built by a machine tool manufacturer, will “empower shop floor” management.

Maintenance Monitor

Routine inspection support

The Maintenance Monitor displays items for inspections before starting daily operation and regular inspections and the rough estimate of inspection timing. Touching the [INFO] button displays the PDF instruction manual file of relevant maintenance items.

Spindle Output Monitor

Increased productivity through visualization of motor power reserve

E-mail Notification

Monitoring operating status even when away from the machine

Common Variable Monitor

Comment display for greater ease of use and faster work

Screen Capture

Automatic saving of recorded alarms

Scheduled Program Editor

Easy programming without keying in code

Connect Plan

Get Connected, Get Started, and Get Innovative with Okuma “Monozukuri”

Connect, Visualize, Improve

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

Standard Specifications

Basic Specs	Control	X, Y, Z, simultaneous 3 axis, spindle control (1 axis)
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Coordinate functions	Machine coordinate system (1 set), work coordinate system (20 sets)
	Min / Max command	±99999.999 mm, ±9999.9999° 8-digit decimal, command units: 0.001 mm, 0.01 mm, 1 mm, 0.0001°, 0.001°, 1°
	Feed	Cutting feed override 0 to 200%, rapid traverse override 0 to 100%
	Spindle control	Direct spindle speed commands override 30 to 300%, multi-point indexing
	Tool compensation	No. of registered tools: Max 999 sets, tool length/radius compensation: 3 sets per tool
	Display	15-inch color LCD + multi-touch panel operations
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
	Programming	Program capacity
Program operations		Program management, editing, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area machining, coordinate convert, programming help
Operations	“suite apps”	Applications to graphically visualize and digitize information needed on the shop floor
	“suite operation”	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	“Single-mode operation” to complete a series of operations, advanced operation panel/graphics facilitate smooth machine control
	Machine operations	MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operation help, alarm help, sequence return, manual interrupt/auto return, pulse handle overlap, parameter I/O, PLC monitor, easy setting of cycle time reduction
	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
Communications / Networking		USB (2 ports), Ethernet, DNC-T1
High speed/accuracy specs		Hi-G Control, Hi-Cut Pro, pitch error compensation, SERVONAVI, Machining Time Shortening Function
Energy-saving	ECO suite plus	ECO Idling Stop, ECO Power Monitor ^{*1}
	Power Regeneration System	Regenerative power is used when the spindle and feed axes decelerate to reduce energy waste.

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

Optional Specifications

Item	Kit Specs	NML		3D		AOT	
		E	D	E	D	E	D
Interactive functions							
Advanced One-Touch IGF-M (Real 3D Simulation included)							
Interactive Map (I-MAP)							
Programming							
Operation buffer 10 MB							
Auto scheduled program update							
Common variables	1,000 pcs						
(Std: 200 pcs)	2,000 pcs						
Program branch; 2 sets							
Program notes (MSG)							
Coordinate system selection	100 sets						
(Std: 20 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)							
Additional G/M code macros							
3D tool compensation							
Tool wear compensation							
Drawing conversion	Programmable mirror image (G62)						
	Enlarge/reduce (G50, G51)						
User task 2	I/O variables (16 each)						
Tape conversion*							
Monitoring							
Real 3D Simulation							
Simple load monitor	Spindle overload monitor						
NC operation monitor	Hour meter, work counter						
Hour meters	Power, spindle, NC, cutting						
Operation end buzzer	With M02, M30, and END commands						
Work counter	With M02 and M30 commands						
Machine Status Logger							
Cutting Status Monitor							
AI Machine Diagnosis ^{*1}	Spindle, feed axes / Spindle						
MOP-TOOL	Adaptive control, overload 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						
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, 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-precision							
AbsoScale detection	X-Y-Z axes						
Hyper-Surface ^{*2}	X-Y-Z axes only						
Super-NURBS ^{*3, *4}	X-Y-Z axes, rotational axis (up to 2)						
0.1 μm control (linear axis commands)							
TAS-S (Thermo Active Stabilizer—Spindle)							
TAS-C (Thermo Active Stabilizer—Construction)							
ECO suite plus (energy-saving functions)							
ECO Operation							
ECO Power Monitor	Wattmeter						
Energy-saving	Inverter						
hydraulic unit	ECO Hydraulics (APC specs)						
Other							
Control cabinet lamp (inside)							
Circuit breaker							
Sequence operation	Sequence stop						
Upgraded sequence restart	Mid-block return						
Pulse handle	2 pcs, 3 pcs (Std: 1 pc)						
External M signals	4 sets, 8 sets						
Collision Avoidance System ^{*2, *3}							
Machining Navi M-i, M-gII+ (cutting condition search)							
One-Touch Spreadsheet							
Block skip; 3 sets							
Additional axes	A, B, C axes [preps, specs]						
Fixture offset II							
OSP-VPS (Virus Protection System)							

Note 1. NML: Normal, 3D: Real 3D Simulation, E: Economy, D: Deluxe, AOT: Advanced One-Touch IGF-M

Note 2. *Technical consultation needed for specifications

*1. With AbsoScale detection specs, ball screw wear detection is possible.

*2. Hyper-Surface and the Collision Avoidance System may not operate simultaneously depending on the part program or the workpiece shape.

*3. Super-NURBS and the Collision Avoidance System may not operate simultaneously depending on the part program or the workpiece shape.

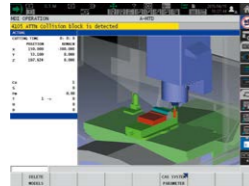
*4. Select Super-NURBS for simultaneous linear and rotational axis machining.

Okuma Intelligent Technology for competitive machine shops

Collision Avoidance System (option)
Collision prevention

**World's first
"Collision-Free Machine"**

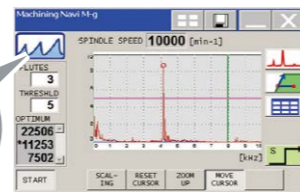
CAS prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.



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

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!

SERVONAVI
Optimized Servo Control

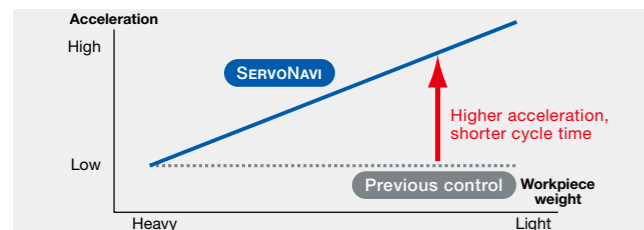
Achieves long term accuracy and surface quality

SERVONAVI AI (Automatic Identification)

Work Weight Auto Setting
Cycle time shortened with faster acceleration

On table travel type machining centers, the table feed acceleration with the previous system was the same regardless of weight, such as workpieces and fixtures loaded on the table.

Work Weight Auto Setting estimates the weight of the workpiece and fixture on the table and automatically sets the liner axis servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.



SERVONAVI SF (Surface Fine-tuning)

Reversal Spike Auto Adjustment
Maintains machining accuracy and surface quality

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

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

Vibration Auto Adjustment
Contributes to longer machine life

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

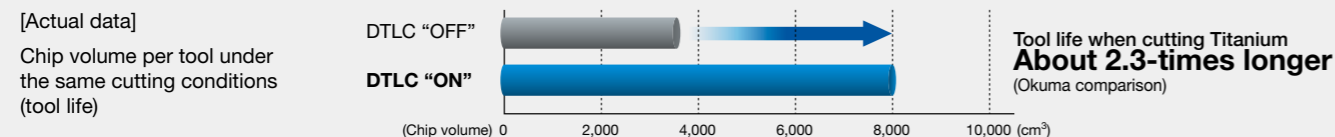
Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.

Dynamic Tool Load Control (option)

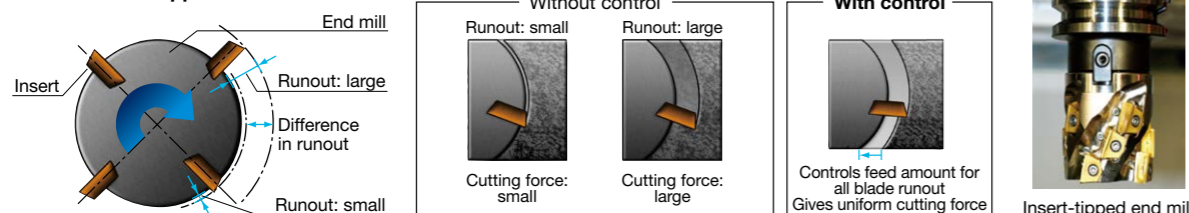
Prevents chipping, extends tool life

When machining of difficult-to-cut material, chipping from blade runout often occurs with insert-type 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 insert-type 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

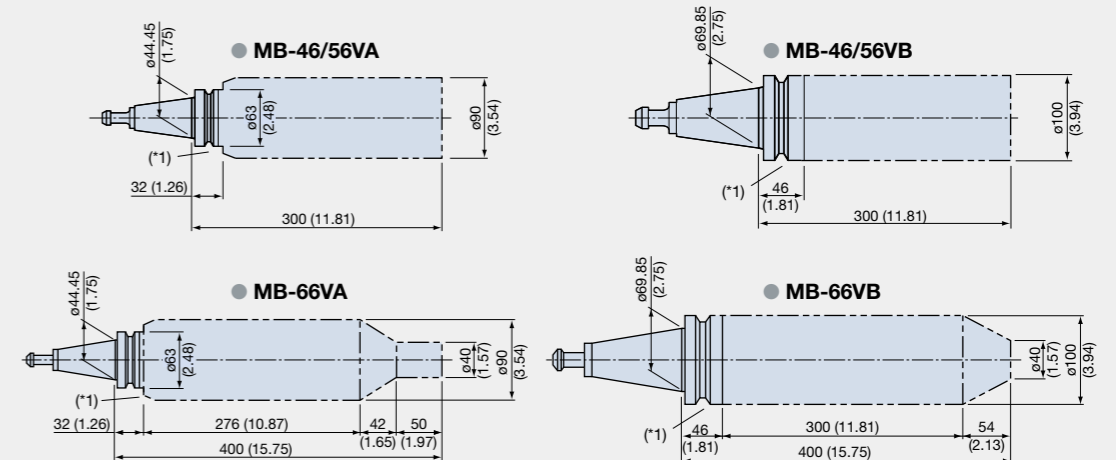


Note: The above are actual examples. Your results may vary due to differences in specifications, tooling and cutting conditions.

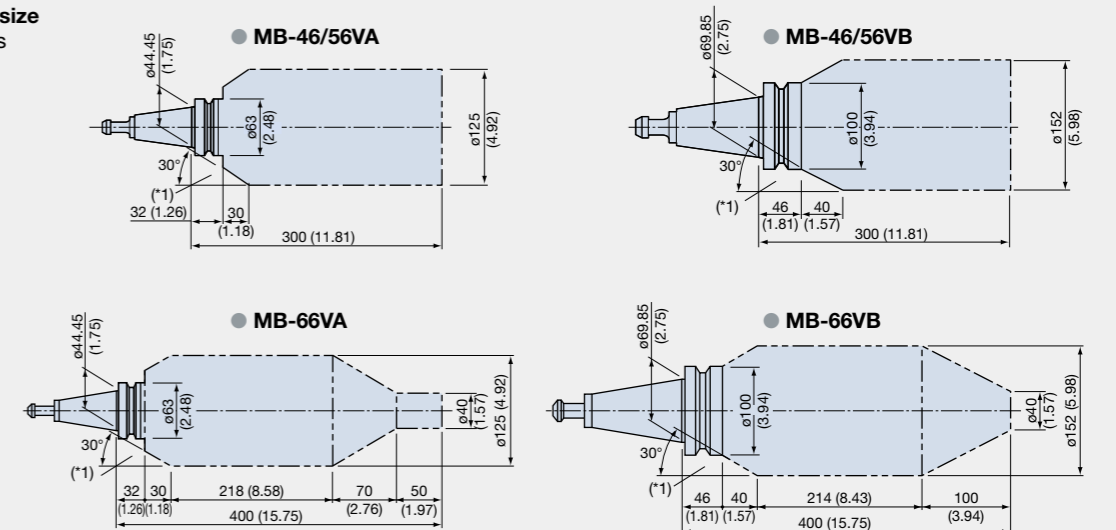
Maximum tool dimensions

Unit: mm (in)

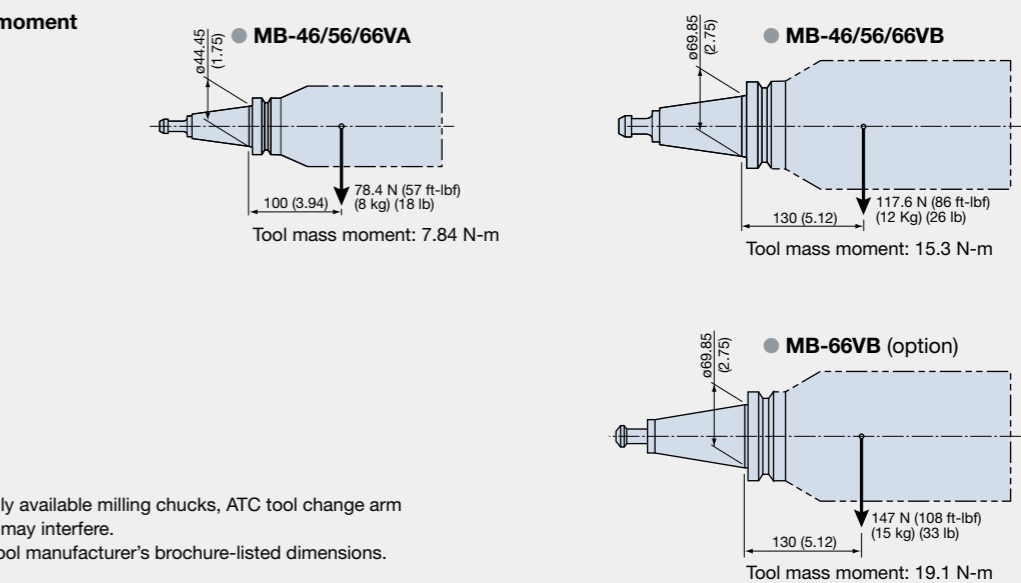
Max tool size (adjacent tools)
In tool magazine



Max single tool size
No adjacent tools



Max tool mass moment

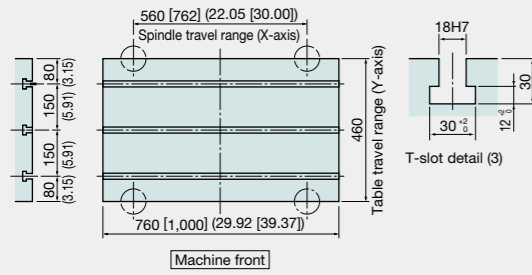


*1. With commercially available milling chucks, ATC tool change arm and tooling ODs may interfere. Please confirm tool manufacturer's brochure-listed dimensions.

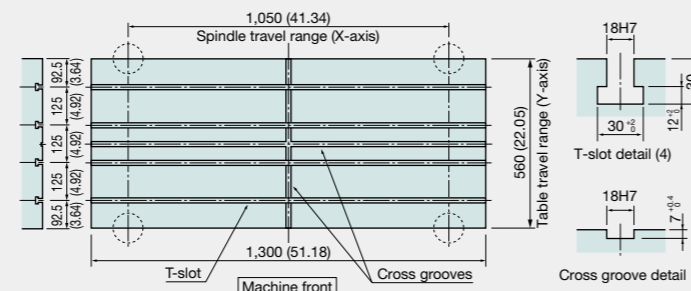
Table size

Unit: mm (in)

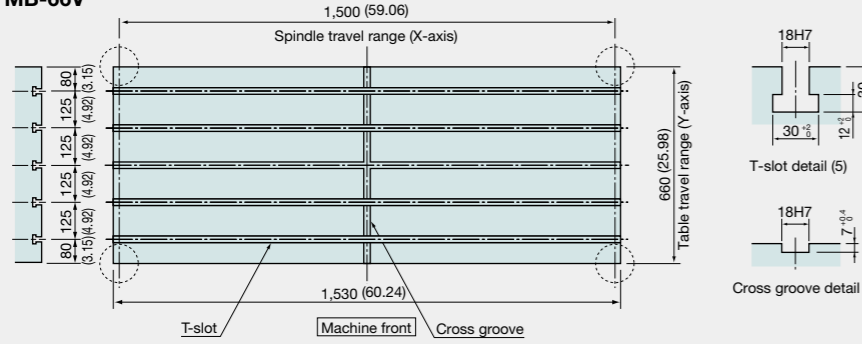
● MB-46V [] dimensions are for MB-46VE



● MB-56V



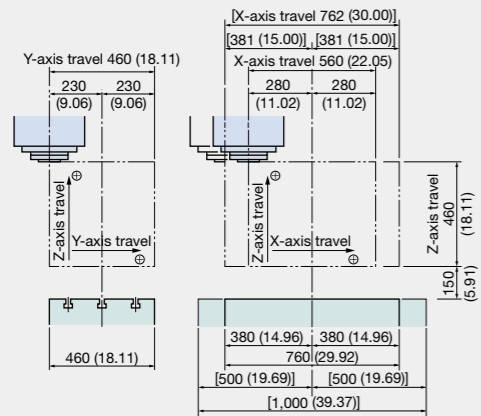
● MB-66V



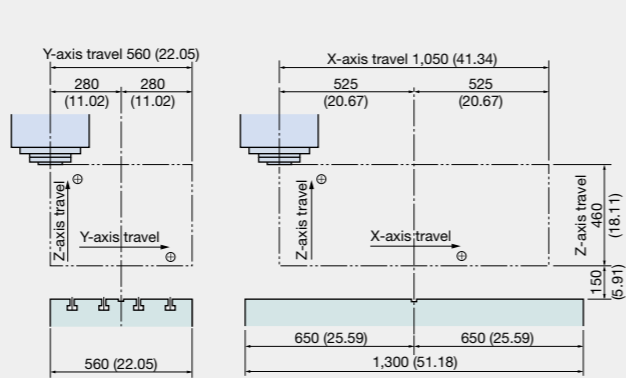
Working ranges

Unit: mm (in)

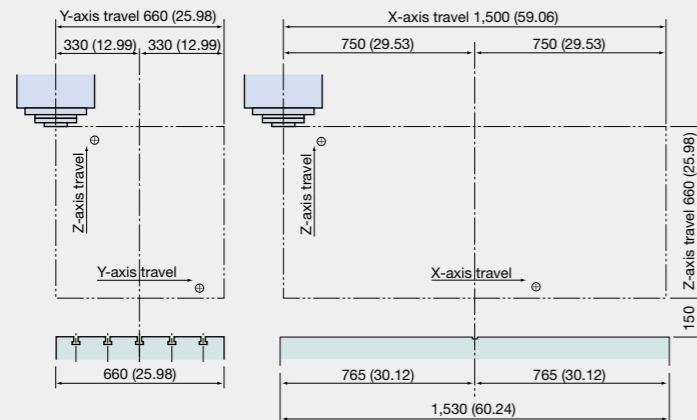
● MB-46V [] dimensions are for MB-46VE



● MB-56V

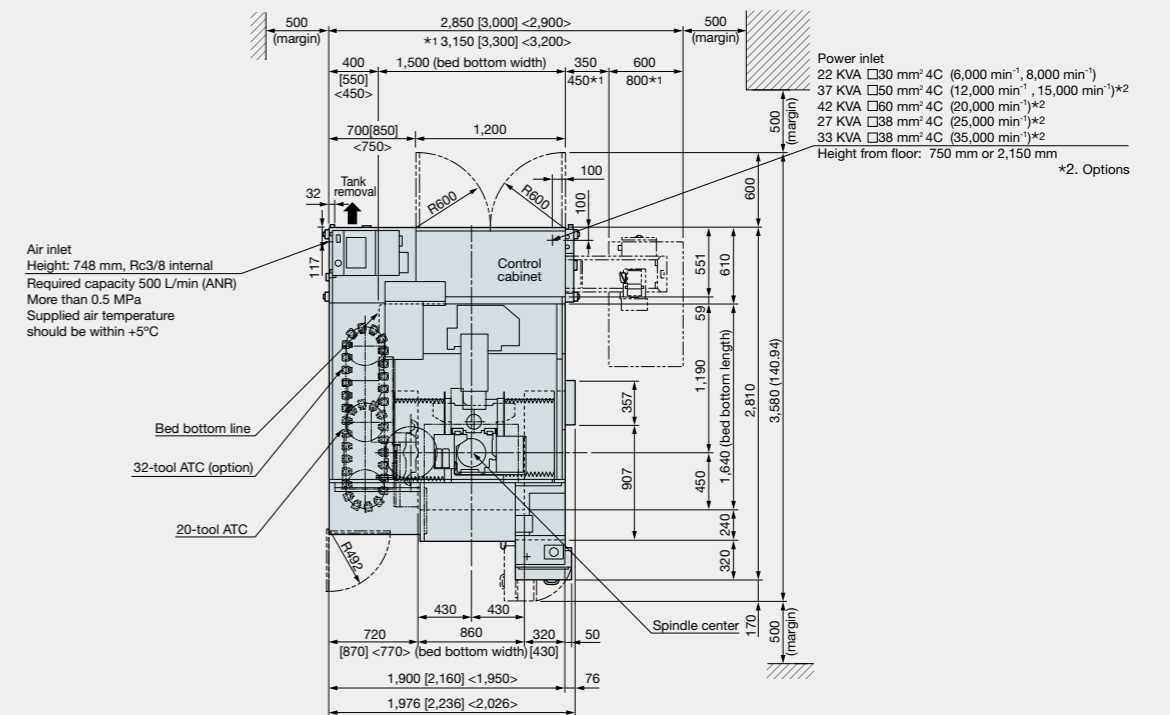
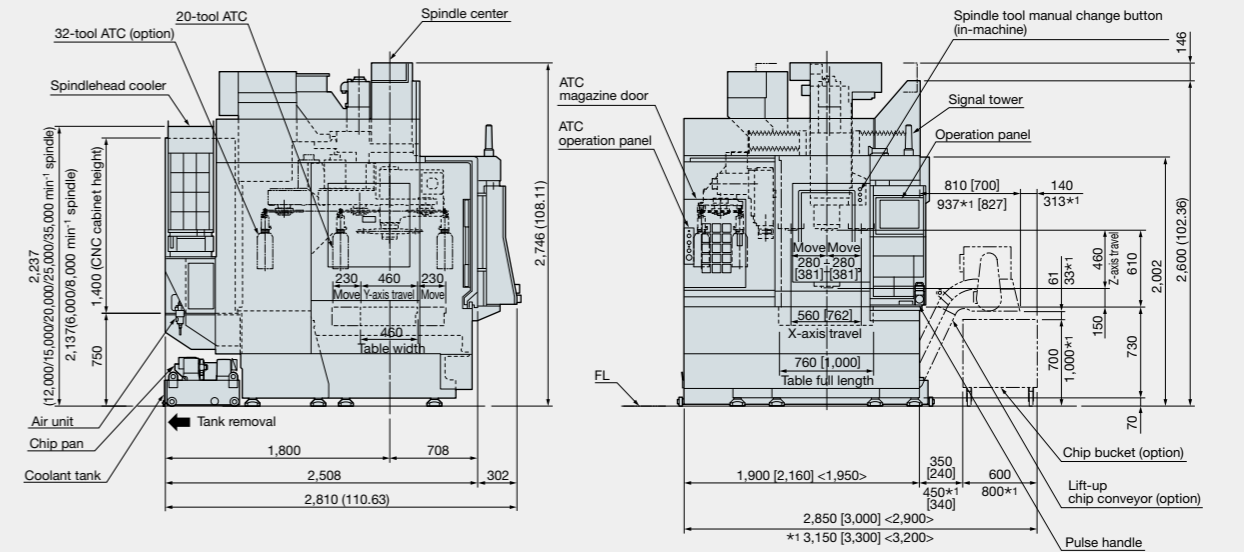


● MB-66V



MB-46V Dimensional/Installation Drawings

(Dimensions for MB-46VA, [MB-46VAE/46VBE], <MB-46VB>)

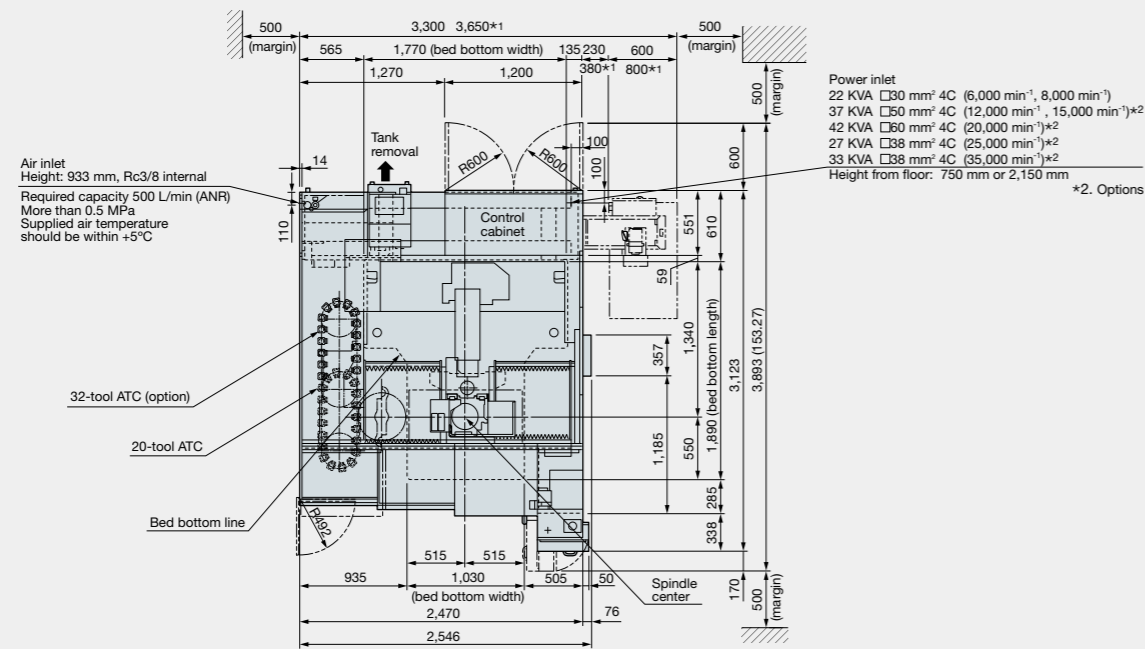
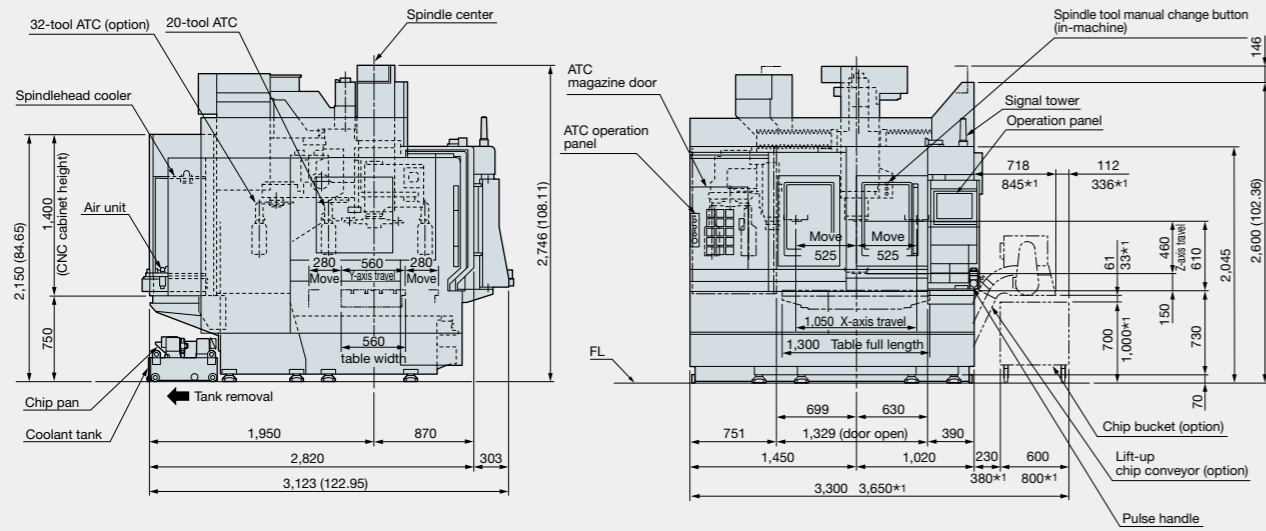


● Lift-up chip conveyor Height: 750 mm
*1. Height: 1,000 mm

Unit: mm (in)

MB-56V Dimensional/Installation Drawings

(Dimensions are for MB-56VA, installation drawing for MB-56VA and MB-56VB)

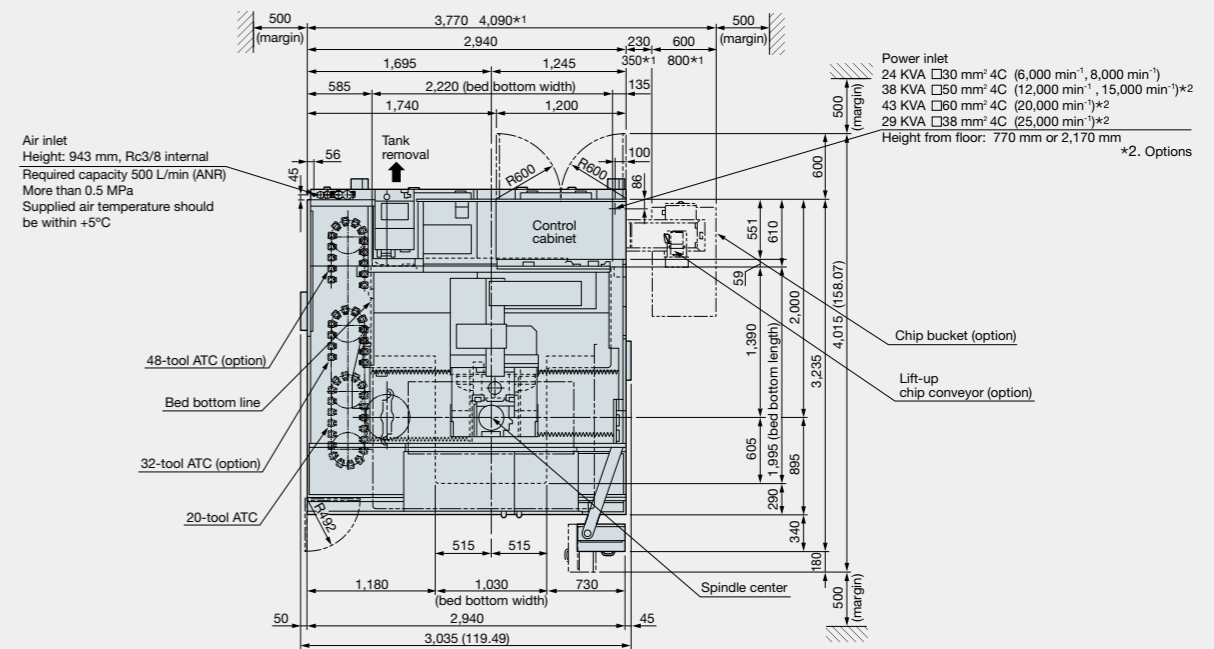
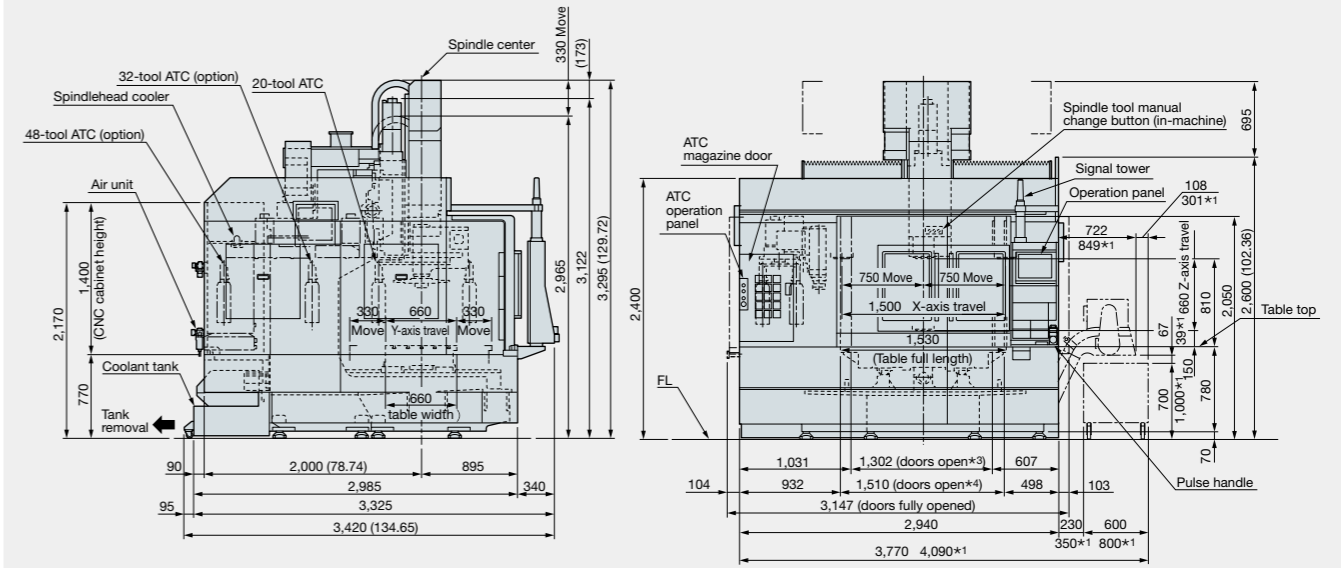


• Lift-up chip conveyor Height: 750 mm
*1. Height: 1,000 mm

Unit: mm (in)

MB-66V Dimensional/Installation Drawings

(Dimensions are for MB-66VA, installation drawing for MB-66VA and MB-66VB)



• Lift-up chip conveyor Height: 750 mm
*1. Height: 1,000 mm
*3. Door opening operation
*4. Maximum door open width

Unit: mm (in)

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.
Pub No. MB-V series-E-(27a)-100 (Nov 2022)

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.



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