

5-Axis Vertical Machining Centers

UNIVERSAL CENTER *MU-V series*

***MU-5000V / MU-6300V
MU-8000V***



5-Axis Vertical Machining Centers
UNIVERSAL CENTER
MU-V series

MU-5000V / MU-6300V / MU-8000V



The MU-V series – Changing perceptions of what a 5-axis machine can do

Machining accuracy and capacity similar to 3-axis machines is achieved with a machine design that utilizes “M-E-I-K”*.

The MU-V series combines the above with ease of use and has changed the way people think about 5-axis machines.

* The merging of Mechanics - Electronics - Information (IT) - Knowledge (Creation) technologies, only Okuma can provide, as Your Single Source for Machine & Control.



UNIVERSAL CENTER
MU-5000V



UNIVERSAL CENTER
MU-6300V



UNIVERSAL CENTER
MU-8000V

Innovations in volumetric accuracy

- Highly rigid trunnion table supports high accuracy and quality
- High accuracy maintained over long times with synergistic effect of Okuma Intelligent Technology

A 5-axis machine that really cuts

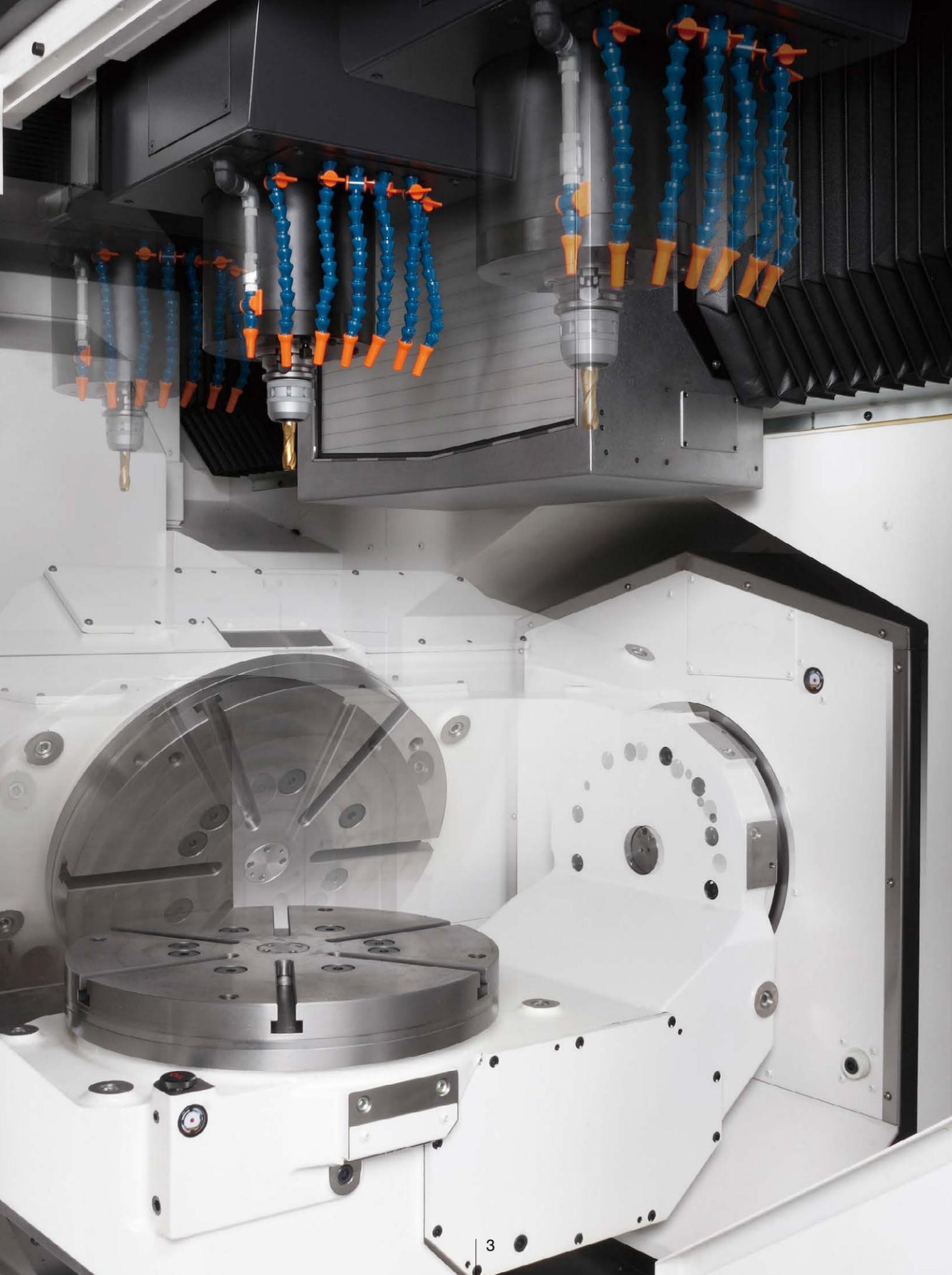
- Face milling: 504 cm³/min
- End milling: 672 cm³/min
- Process-intensive machining with turning: 3 mm²

Material: S45C

The value of good visibility and operability required in 5-axis machining

- Superb operator access to the machining chamber
- Even with long travel and large workpieces, machining with space to spare
- Tools can be changed even with the trunnion table swung out

Photos used in this brochure include optional equipment.



Next generation of 5-axis machining centers bring innovations to volumetric accuracy in 5-axis machining

High-accuracy machines that go beyond normal expectations of a 5-axis machine

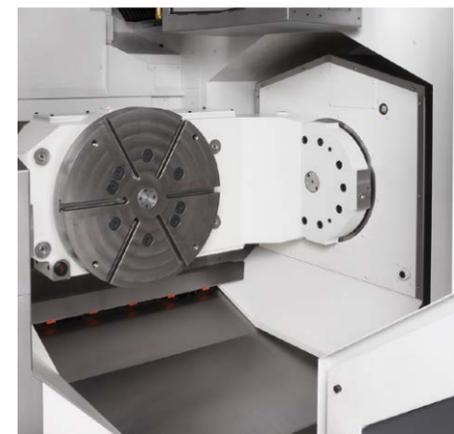
Highly rigid trunnion table supports high-accuracy 5-axis machining

The indexing accuracies that take 5-axis machining to higher accuracies (MU-5000V Actual data)

- Indexing accuracy
 - A-axis indexing accuracy/Indexing return accuracy: ± 0.68 sec/ ± 0.40 sec
 - C-axis indexing accuracy/Indexing return accuracy: ± 0.78 sec/ ± 0.14 sec
- Fast operation
 - A-axis/C-axis 90° clamp/unclamp indexing time: 1.0 sec/1.2 sec

High quality machined surfaces with the high following of 5-axis machining

- Highly-rigid trunnion table supports both ends
- With ball-screw cooling (Std), reduced following error is achieved while maintaining highly accurate machining.



Trunnion table

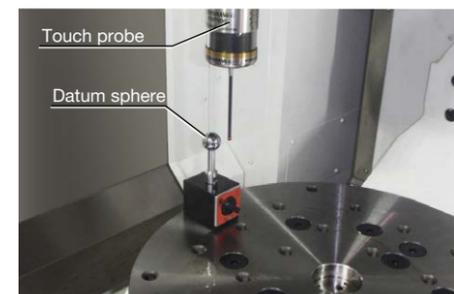
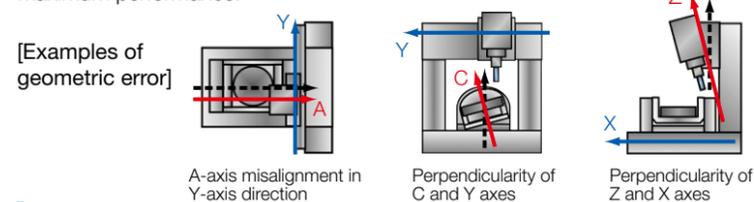
Maximized machining accuracies

Gauging and compensation of geometric error 5-Axis Auto Tuning System (Optional)

Automatic tuning for geometric error is quick, easy, and can be done by anyone

Automatic tuning of a total of 11 different kinds of geometric error, including spindle misalignment and inclination.

The accuracy of 5-axis machines is measured in less than 10 minutes to draw out maximum performance.



With just a touch probe and datum sphere —auto tuning completed.

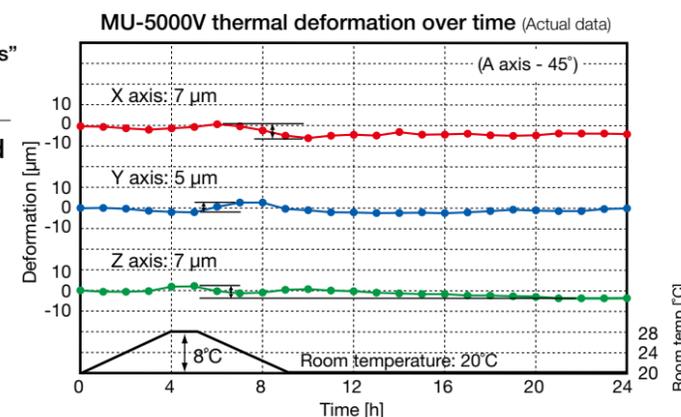
High accuracy maintained over long times in 5-axis machining

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

5-Axis Auto Tuning System accuracy maintained

Accuracy changes due to changes in ambient temperature or spindle heat are minimized. When the 5-Axis Auto Tuning System is also used, a synergistic effect is achieved with the two Intelligent Technologies and high accuracy is maintained in 5-axis machining even when the environmental temperature changes.

Note: The data mentioned in this brochure are "actual data" and do not represent guaranteed accuracies.





A 5-axis machine that really cuts

Beyond the limits of conventional 5-axis machining
Highly efficient machining with amazing machining capacity (MU-5000V, MU-6300V Actual data)

Face milling capacity: 504 cm³/min (S45C)

- ø80 face mill 8 blade (coating)
- Spindle speed: 895 min⁻¹
- Cutting speed: 225 m/min
- Feedrate: 2,250 mm/min
- Cut width x infeed: 56 × 4 mm



End milling capacity: 672 cm³/min (S45C)

- ø20 roughing end mill 7 blade (carbide)
- Spindle speed: 4,000 min⁻¹
- Cutting speed: 251 m/min
- Feedrate: 4,800 mm/min [2,800 mm/min]
- Cut width x infeed: 7 × 20 mm [12 × 20 mm]



Turning capacity: 3 mm² (S45C)

- Machining dia: ø164 mm [ø250 mm]
- Cutting speed: 130 m/min (table rotation: 252 min⁻¹)
- Feedrate: 0.6 mm/rev
- Infeed: 5 mm



[]: MU-6300V specs

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

Intelligent technologies draw out maximum machine and tool capabilities

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

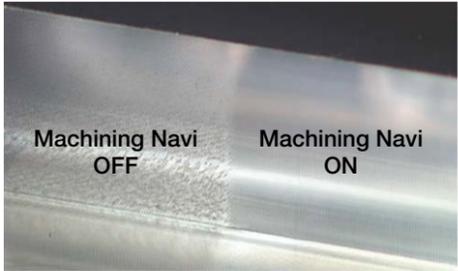
Automatically changes to optimum spindle speed (M-i)

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

Eliminate chatter with Machining Navi

Adjust cutting conditions while monitoring the data (M-g II+)

Navigates effective measures by detecting and analyzing machining chatter with a microphone attached to the machine.



w/ chatter

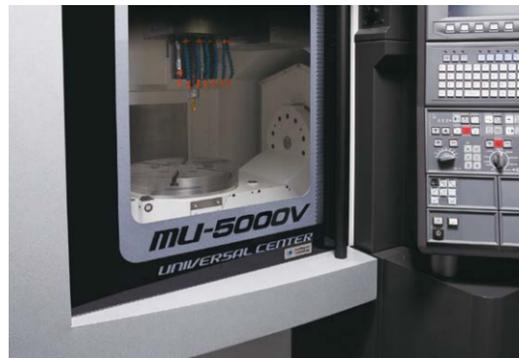
w/o chatter



Get a real sense of the good visibility and operability demanded in 5-axis machining

Superb operator access to the machining chamber

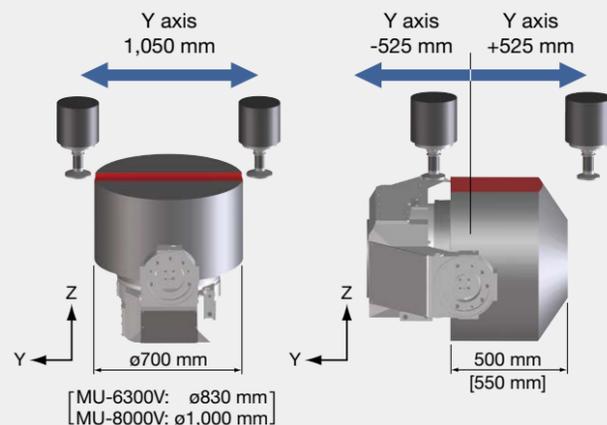
- Structure allows easy tool edge confirmation during setup and machining
 - Best table, spindle, and operation panel layout in terms of operability
- Large step platform for easy working
 - Operating stress reduced with large platform so that operator does not have to worry about footing
- Large window for good visibility in machining compartment



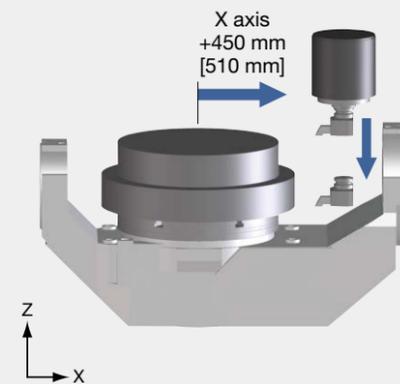
Large machining range; tools can be changed with trunnion still in swing position

The tool reaches the end of the workpiece even with the table at various inclination angles, enabling wide-range 5-axis machining. Tools can be changed with the trunnion still in a swing position, leading to reduced cycle times and higher machining accuracies.

■ Even the largest workpieces are machined with capacity to spare



■ Visibility of the cutting edge at the time of cutting also excellent



[]: MU-6300V, MU-8000V specs

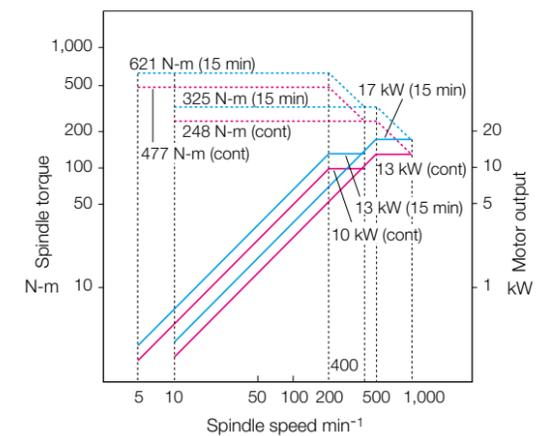
Process-intensive machining with turning capacity that approaches that of a lathe

Process-intensive machining and high-accuracy 1-chuck machining achieved with multitasking in which turning can also be done

MU-5000V-L

■ Turning spindle

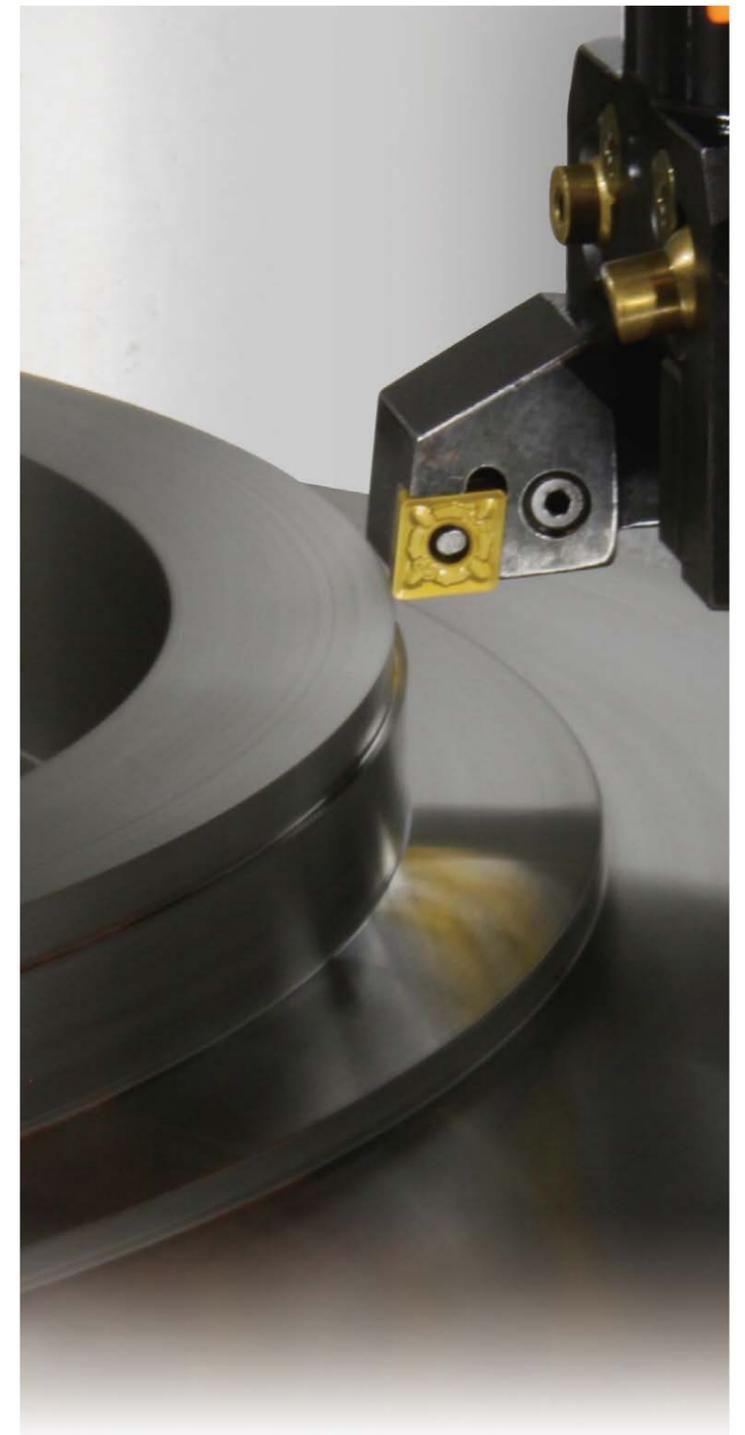
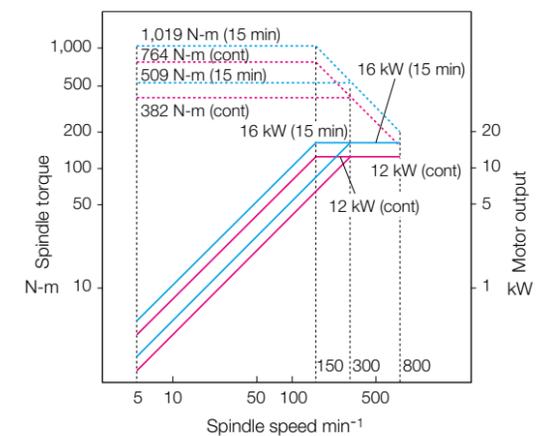
- Table spindle speed: 1,000 min⁻¹
- Max output: 17/13 kW (15 min/cont)
- Max torque: 621/477 N-m (15 min/cont)



MU-6300V-L, MU-8000V-L

■ Turning spindle

- Table spindle speed: 800 min⁻¹
- Max output: 16/12 kW (15 min/cont)
- Max torque: 1,019/764 N-m (15 min/cont)



Productivity can be further improved with a wide array of automation options

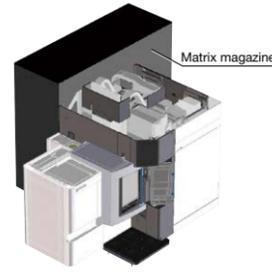
Flexible automation options

ATC magazines

- 48 tools, 64 tools: Chain magazine system
- Over 64 tools: Matrix magazine system



Matrix magazine
(Photographed without front covers)



Matrix magazine specifications
for No. 50, 64-166 tools

Auto pallet changer (APC)

- External setup of workpiece preparations improve machine utilization
- Good access to machine interior even with APC specs
- Turning specs can also be selected



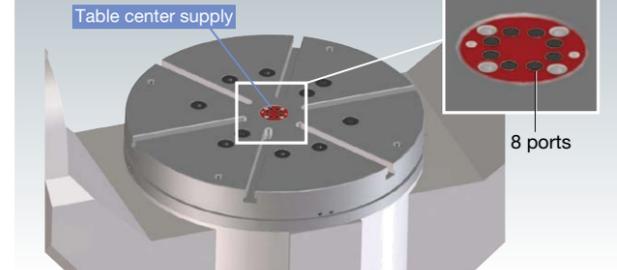
APC setup station



MU-6300V 2-pallet APC specs

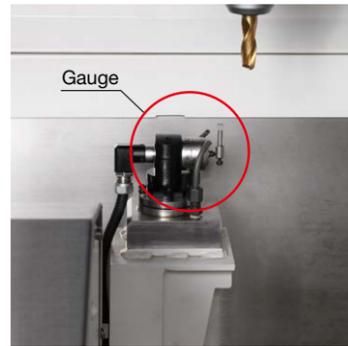
Extra ports for complex hydraulic/pneumatic fixture arrangements

- Max ports: 8 ports* (Optional)



*Different for turning specifications and APC specifications.

Auto tool gauging with workpiece mounted



Tool breakage detection/
Auto tool length compensation

Automatically measures workpiece alignment and dimensions



Auto zero offset / Auto gauging
(radio transmission)

Safe, reliable chip discharge

Excellent chip discharge

Quick and smooth chip discharge with saddle-mounted washer and in-machine coil chip conveyor



Washer on saddle (Standard)



In-machine chip discharge (coil) (Standard)



Off-machine chip discharge (lift-up chip conveyor)
(Optional)

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	Coil (Standard)	○	○ (Dry-Wet)	—	○
	Hinge	○	—	—	△ *4
Off-machine (Optional)	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				

High accuracy 5-axis machining is achieved with advanced technology



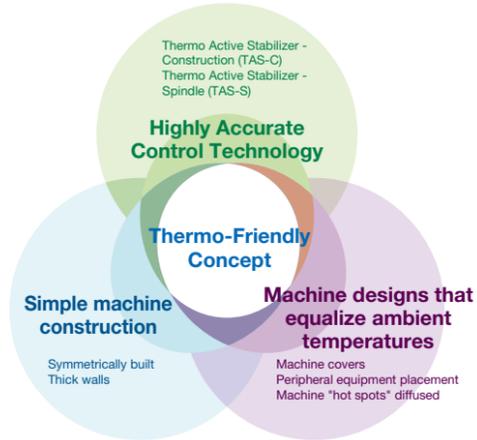
The unique approach of “accepting temperature changes”
Thermo-Friendly Concept

Thermo-friendly structure gives outstanding thermal stability

~~Forced cooling and restraining of thermal deformation~~

1. Minimal thermal deformation
2. Manageable thermal deformation
3. Accurate compensation

Thermo Active Stabilizer—Construction (TAS-C)
Thermo Active Stabilizer—Spindle (TAS-S)



Machining dimensional change over time minimized with outstanding dimensional stability

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

TAS-C (Thermo Active Stabilizer—Construction) [Optional]

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

Next-Generation Energy-Saving System **ECO suite**

A suite of energy saving applications for machine tools

Accuracy ensured, cooler off ECO Idling Stop

Intelligent energy-saving function with the Thermo-Friendly Concept. The machine itself determines whether or not cooling is needed and cooler idling is stopped with no loss to accuracy. 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)

TAS-S (Thermo Active Stabilizer—Spindle) [Optional]

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

On-the-spot check of energy savings ECO Power Monitor

Power is shown individually for spindle, feed axes, and auxiliaries on the OSP operation screen. The energy-saving benefits from auxiliary equipment stopped with ECO Idling Stop can be confirmed on the spot.

Intermittent/continuous operation of chip conveyor and mist collector during operation **ECO Operation** (Optional)

Energy-saving hydraulic unit using servo control technology **ECO Hydraulics** (Optional)



Gauging and compensation of geometric error
5-Axis Auto Tuning System (Optional)

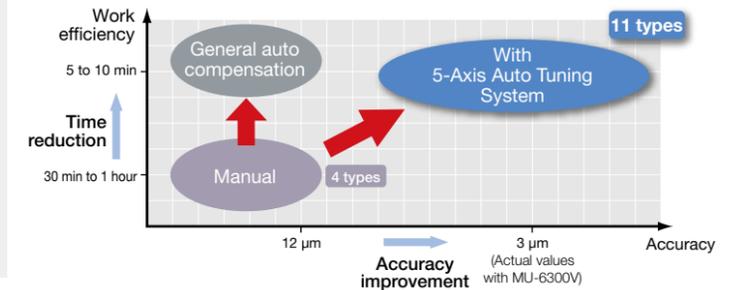
Higher accuracies in 5-axis machining

5-axis machining accuracy is greatly affected by misalignment and other “geometric errors” on the rotary axis. The 5-Axis Auto Tuning System measures geometric error using a touch probe and datum sphere, and performs compensation using measurement results to tune the movement accuracy on 5-axis machines. In this way 5-axis machining accuracy on a higher level is achieved.



Quick and easy tuning by anyone

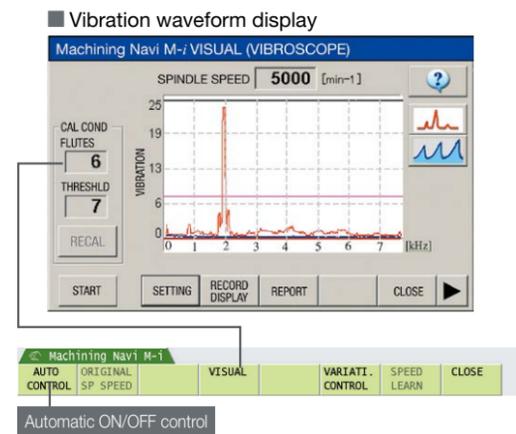
Previously, manual measurements of the indexing center were bothersome and time-consuming, but with the 5-Axis Auto Tuning System the measurements are made automatically by the machine. Measurements can therefore be done with stable accuracy in a short time by anyone. (Up to 11 geometric errors tuned automatically.) In addition, the results of tuning are applied regardless of whether the operation is auto, manual, or MDI and whether Tool Center Point Control is on or off. Setup and machining can therefore be done with the same operations as before.



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

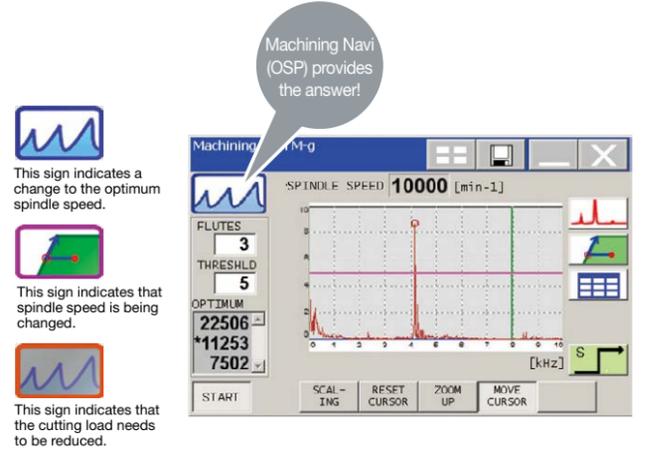
Automatically changes to optimum spindle speed (M-i)

Sensors built in to the machine detect and analyze machining chatter. Machining Navi then navigates to the effective measures in a wide range of spindle speeds, from low to high.



Adjust cutting conditions while monitoring the data (M-g II+)

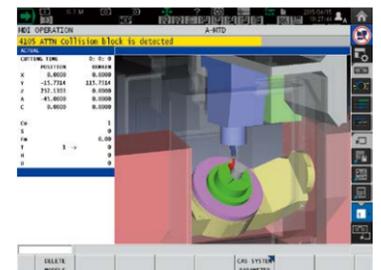
Based on the chatter noise captured by the microphone, Machining Navi displays a number of optimal spindle speed possibilities on the screen. The operator can change to the indicated spindle speed with a single touch and immediately confirm the result.



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.



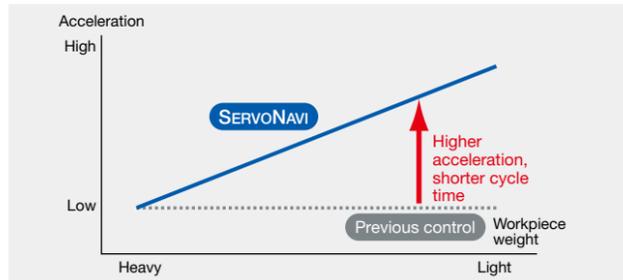
Achieves long term accuracy and surface quality

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.



- Maintaining high accuracy and stable operations

Inertia Auto Setting

When workpieces or fixtures are changed, inertia mass also changes, sometimes resulting in greater positioning error of the rotary axis. Inertia Auto Setting estimates workpiece/fixture inertia mass from acceleration torque and automatically changes servo parameter settings to the optimum values so that high accuracy and stable movement can be maintained.

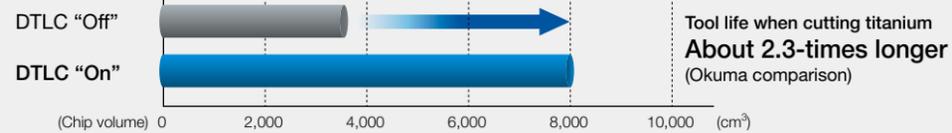
Dynamic Tool Load Control (Optional)

Prevents chipping, extends tool life

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

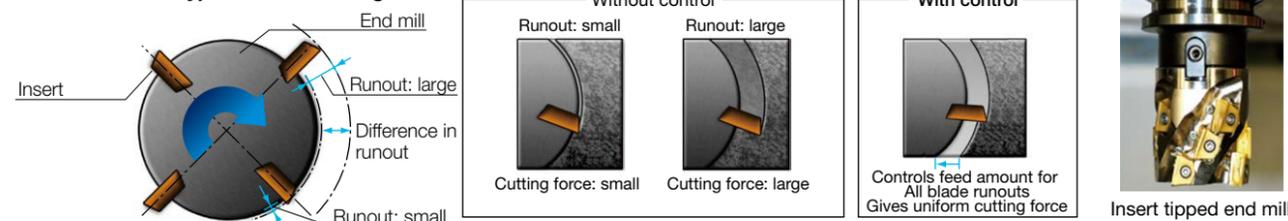
Dynamic Tool Load Control gives uniform cutting force with

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



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-type endmill tool edge



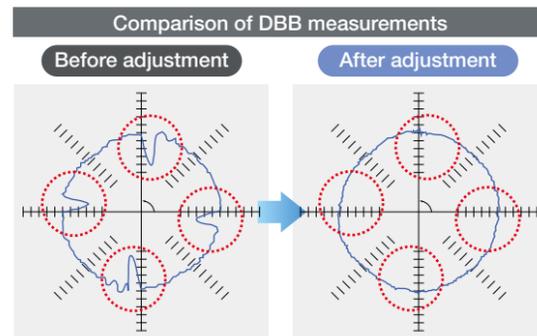
Note: The above are actual examples. Your results may vary due to differences in specifications, tooling and cutting conditions.

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

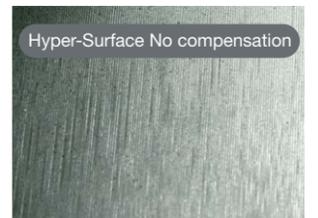
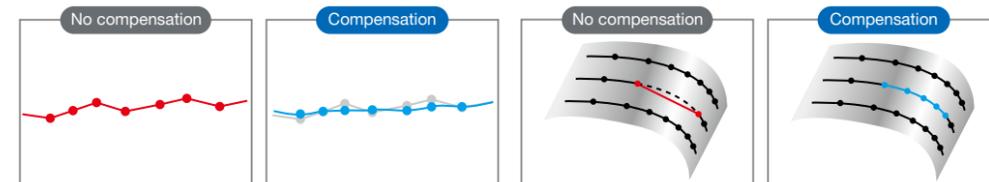
When aging changes machine performance, noise, vibration, crease marks, or fish scales may appear. Vibration Auto Adjustment can quickly eliminate noise and vibration even from machines with years of operation.

With simultaneous 5-axis control that produces excellent machined surface quality

Even easier to use with simultaneous 5-axis kits

Hyper-Surface (Optional) With auto machining data compensation

The machining data does not need to be revised. Crease marks and uneven edges are reduced and machined surface quality is improved, reducing the time for hand polished finishing. 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.



Comparison of machined surface quality

Tool center point control manual feed (Optional)

This feature will provide rotary operation with a tool point as the center when operating the rotary axes manually. When the table is swiveled, axis movement will occur with no change in the tool position on the workpiece.

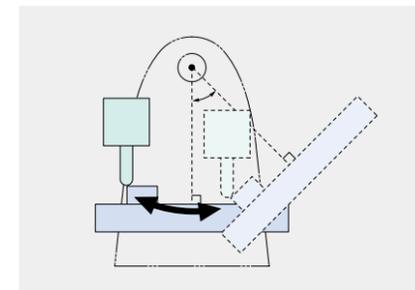
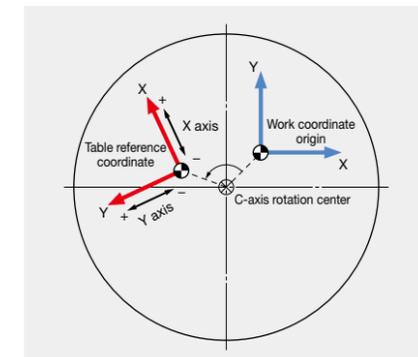


Table origin coordinate manual feed (Optional)

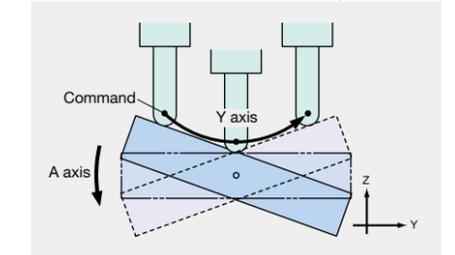
A feature to perform X-Y-Z-axis manual feed (rapid traverse, cutting feed, pulse handle) when origin coordinate systems shift on a swiveling table.



Tool center point control II (Optional)

Function controls the path of the tool tip with respect to the workpiece on each axis so that the tool tip trajectory is linear with the axis travel command including the A, B, and C axes.

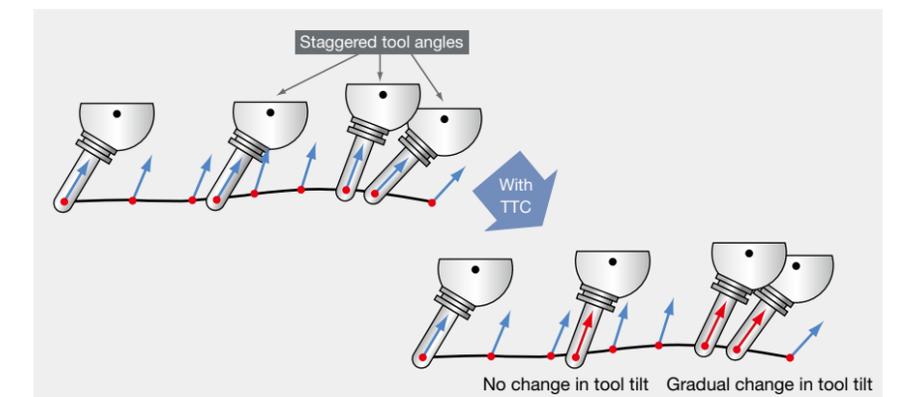
- In the case of simultaneous Y-axis and A-axis commands with the linear command (G01), the tool path is a straight line when viewed from the workpiece.



Tool tilt compensation

(Included in Tool Center Point Control II)

The tool angle on a workpiece (tool tilt) in 5-axis machining will change on a waving surface. CAM processing errors will cause the tool to stagger with unnecessary accel/decel and reverse angles during axis feed. Simul 5-Axis TTC will keep feedrates steady with a smooth sequence of commands to automatically correct tool tilt angles—resulting in shorter cycle times and smoother surface finishes.



Machine specifications

	Item	Unit	MU-5000V (-L) No. 40 spindle	MU-5000V (-L) No. 50 spindle	MU-6300V (-L) No. 40 spindle	MU-6300V (-L) No. 50 spindle	MU-8000V (-L) No. 40 spindle	MU-8000V (-L) No. 50 spindle
Travels	X axis (table L/R)	mm (in)	800 (31.50)		925 (36.42)		925 (36.42)	
	Y axis (spindle saddle front / back)	mm (in)	1,050 (41.34)		1,050 (41.34) (+100 ATC movements)		1,050 (41.34) (+100 ATC movements)	
	Z axis (spindle ram vertical)	mm (in)	600 (23.62)		600 (23.62)		600 (23.62)	
	A axis (trunnion swivel)	deg	+90 to -120		+90 to -120		+90 to -120	
	C axis (table swivel)	deg	360 (infinite)		360 (infinite)		360 (infinite)	
	Table surface to spindle nose	mm (in)	80 to 680 (3.15 to 26.77)		160 to 760 (6.30 to 29.92)		200 to 800 (7.87 to 31.50)	
Table	Table size	mm (in)	ø500 (19.69)		ø630 (24.80)		ø800 (31.50) × 630 (24.80) width <ø800 (31.50)>	
	Max work size	mm (in)	ø700 × H500 (ø27.56 × H19.69)		ø830 × H550 (ø32.68 × H21.65)		ø1,000 × H550 (ø39.37 × H21.65)	
	Floor to table top	mm (in)	1,140 (44.88)		1,150 (45.28)		1,210 (47.64)	
	Max load capacity*	kg (lb)	500 (1,100)		600 (1,320)		700 (1,540)	
	<Turning spindle speed>	min ⁻¹	<1,000>		<800>		<800>	
Spindle	Spindle speed	min ⁻¹	10,000 [15,000, 20,000, 25,000] <8,000, [12,000, 20,000]>	6,000 [12,000] <10,000>	10,000 [15,000, 20,000, 25,000] <8,000, [12,000, 20,000]>	6,000 [12,000] <10,000>	10,000 [15,000, 20,000, 25,000] <8,000, [12,000, 20,000]>	6,000 [12,000] <10,000>
	Tapered bore		7/24 taper No.40 <HSK-A63>	7/24 taper No.50 <HSK-A100>	7/24 taper No.40 <HSK-A63>	7/24 taper No.50 <HSK-A100>	7/24 taper No.40 <HSK-A63>	7/24 taper No.50 <HSK-A100>
	No. of spindle ranges		Infinitely variable		Infinitely variable		Infinitely variable	
	Bearing dia	mm (in)	ø70 (2.76)	ø90 (3.54)	ø70 (2.76)	ø90 (3.54)	ø70 (2.76)	ø90 (3.54)
Feed	Rapid traverse	m/min (ipm)	X-Y-Z: 50 (1,969)		X-Y-Z: 50 (1,969)		X-Y-Z: 50 (1,969)	
	Rapid traverse	deg/min	A: 18,000 (50 min ⁻¹) C: 18,000 (50 min ⁻¹) <36,000 (100 min ⁻¹)>		A: 10,800 (30 min ⁻¹) C: 32,400 (90 min ⁻¹)		A: 10,800 (30 min ⁻¹) C: 32,400 (90 min ⁻¹)	
	Cutting feedrate	mm/min	X-Y-Z: 1 to 50,000		X-Y-Z: 1 to 50,000		X-Y-Z: 1 to 50,000	
Motors	Spindle (10 min/cont)	kW (hp)	11/7.5 (15/10) [22/18.5 (30/25), 30/22 (40/30), 15/11 (20/15)] <11/7.5 (15/10), [22/18.5 (30/25), 30/22 (40/30)]>	11/7.5 (15/10) [26/18.5 (35/25)] <26/18.5 (35/25)>	11/7.5 (15/10) [22/18.5 (30/25), 30/22 (40/30), 15/11 (20/15)] <11/7.5 (15/10), [22/18.5 (30/25), 30/22 (40/30)]>	11/7.5 (15/10) [26/18.5 (35/25)] <26/18.5 (35/25)>	11/7.5 (15/10) [22/18.5 (30/25), 30/22 (40/30), 15/11 (20/15)] <11/7.5 (15/10), [22/18.5 (30/25), 30/22 (40/30)]>	11/7.5 (15/10) [26/18.5 (35/25)] <26/18.5 (35/25)>
	Feed axes	kW (hp)	X: 5.2 (6.9), Y-Z: 3.5 (4.7), A: 3.5 × 2 (4.7 × 2), C: 3.0 (4) <5.0 (6.7)>		X: 5.2 (6.9), Y-Z: 3.5 (4.7), A: 4.6 × 2 (6.1 × 2), C: 7.2 (9.6) <16.0 (21.3)>		X: 5.2 (6.9), Y-Z: 3.5 (4.7), A: 4.6 × 2 (6.1 × 2), C: 7.2 (9.6)	
ATC	Tool shank		MAS BT.40 <HSK-A63>	MAS BT.50 <HSK-A100>	MAS BT.40 <HSK-A63>	MAS BT.50 <HSK-A100>	MAS BT.40 <HSK-A63>	MAS BT.50 <HSK-A100>
	Pull stud		MAS2 <->		MAS2 <->		MAS2 <->	
	Tool capacity (magazine)		32-tool [48-tool, 64-tool: chain, Over 64-tool: matrix]		32-tool [48-tool, 64-tool: chain, Over 64-tool: matrix]		32-tool [48-tool, 64-tool: chain, Over 64-tool: matrix]	
	Max tool dia (w/adjacent / w/o adjacent)	mm (in)	ø90/ø125 (ø3.54/ø4.92)	ø100/ø152 (ø3.94/5.98)	ø90/ø125 (ø3.54/ø4.92)	ø100/ø152 (ø3.94/5.98)	ø90/ø125 (ø3.54/ø4.92)	ø100/ø152 (ø3.94/5.98)
	Max tool length	mm (in)	400 (15.75)		400 (15.75)		400 (15.75)	
	Max tool weight	kg (lb)	8 (17.6)	12 (26.4) [15 (33)]	8 (17.6)	12 (26.4) [15 (33)]	8 (17.6)	12 (26.4) [15 (33)]
	Tool selection		Memory random (matrix magazine is fixed address system)		Memory random (matrix magazine is fixed address system)		Memory random (matrix magazine is fixed address system)	
Machine size	Height	mm (in)	3,435 (135.24)		3,525 (138.78)		3,625 (142.72)	
	Floor space W x D (w/o operator platform)	mm (in)	3,995 × 2,750 (157.28 × 108.27)	3,995 × 2,840 (157.28 × 111.81)	4,850 × 2,990 (190.94 × 117.72)		5,280 × 2,990 (207.87 × 117.72)	
	Weight	kg (lb)	15,400 (33,880)	15,650 (34,430)	17,500 (38,500)	17,700 (38,940)	18,400 (40,480)	18,600 (40,920)
CNC		OSP-P300MA <OSP-P300SA>		OSP-P300MA <OSP-P300SA>		OSP-P300MA <OSP-P300SA>		

* With APC specifications, there are limits on maximum pallet load and maximum workpiece dimensions

[]: Optional
< >: Turning specifications

Standard specifications / accessories

No. 40 Spindle speed 50 to 10,000 min ⁻¹	11/7.5 kW (15/10 hp) [10 min/cont]
No. 50 Spindle speed 50 to 6,000 min ⁻¹	11/7.5 kW (15/10 hp) [10 min/cont]
Rapid feedrate	X-Y-Z: 50 m/min
Spindle - Spindlehead cooling system	Oil controller
Ball screw cooling	X-Y-Z-axis
Air cleaner (filter)	Including regulator
Operation panel with color LCD	
Pulse handle	
Tapered bore cleaning bar	
A/C axis rotary table	0.0001 deg, Including encoder
C axis table	MU-5000V ø500, 6 18H7 T-slots
	MU-6300V ø630, 6 18H7 T-slots
	MU-8000V ø800 × 630 width, 5 18H7 T-slots
Hand tools	
Tool release lever	
Washing device on saddle	
Coolant supply system*1	MU-5000V Tank: 440 L [Effective: 289 L] Pump: 390 W (50 Hz), 620 W (60 Hz)
	MU-6300V Tank: 770 L [Effective: 350 L] Pump: 390 W (50 Hz), 620 W (60 Hz)
	MU-8000V
ATC air blower	
Chip air blower	Nozzle type
Operator platform	
Work lamp	LED (installed on right and left sides)
In-machine chip discharge	Coil type
Chip pan	MU-5000V: Effective capacity 77 L
	MU-6300V, MU-8000V: Effective capacity 92 L
Foundation washer (with jack bolts)	MU-5000V: 11 pcs MU-6300V, MU-8000V: 12 pcs
3-lamp status indicator	Type C (LED signal tower) Red (alarm), Yellow (end) Green (running)
32-tool ATC	
ATC magazine shutter	
Full enclosure shielding	With ceiling (full enclosure)

Note: Oil-based coolants are highly flammable, so fire prevention measures must always be taken when using these coolants. Do not operate unattended.
*1. 800-W pump required with oil-based coolant.

Optional specifications / accessories

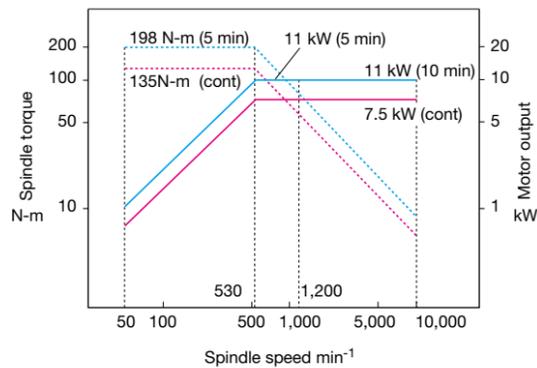
Wide-range sp 50 to 15,000 min ⁻¹ △	No. 40 22/18.5 kW (30/25 hp) (10 min/cont) ^{*2}
High-speed sp 50 to 20,000 min ⁻¹ △	No. 40 30/22 kW (40/30 hp) (10 min/cont) ^{*2}
High-speed sp 50 to 25,000 min ⁻¹ △	No. 40 15/11 kW (20/15 hp) (10 min/cont) ^{*2}
Multitasking sp 50 to 8,000 min ⁻¹ △	No. 40 11/ 7.5 kW (15/10 hp) (10 min/cont) ^{*3}
Multitasking sp 50 to 12,000 min ⁻¹ △	No. 40 22/18.5 kW (30/25 hp) (10 min/cont) ^{*3}
Multitasking sp 50 to 20,000 min ⁻¹ △	No. 40 30/22 kW (40/30 hp) (10 min/cont) ^{*3}
Wide-range sp 50 to 12,000 min ⁻¹ △	No. 50 26/18.5 kW (35/25 hp) (10 min/cont) ^{*4}
Multitasking axis 50 to 10,000 min ⁻¹ △	No. 50 26/18.5 kW (35/25 hp) (10 min/cont) ^{*5}
Dual contact spindle △	HSK, BIG-PLUS®
AbsoScale	X-Y-Z axes
Auto pallet changers*6	2P-APC, 6P-APC, FMS
ATC magazines △	48-tool, 64-tool (chain type) 64-tool or more (Matrix type)
Pull stud specs △	MAS 1, JIS, CAT, DIN
Table surface*7 △	Tapped table top MU-8000V: ø800 round table
Thru-spindle coolant*1	Specify 1.5 MPa or 7.0 MPa. 25,000 min ⁻¹ specs available for HSK-A63 only.
Chip air blower (adapter)	Unavailable with thru-spindle specifications
Oil mist coolant	
Shower coolant	Ceiling mounted, 5 nozzles
Workpiece wash gun	
Off-machine chip discharge △	Lift-up chip conveyors: floor type, drum filter type
Chip bucket for above △	
Hyper-Surface	
Tool breakage detection/Auto tool length compensation	Touch sensor (Renishaw) Laser sensor (Blum)
Auto zero offset/auto gauging	Touch probe (Renishaw)
5-Axis Auto Tuning System	Gauging, compensation for geometric error
Collision Avoidance System	Collision prevention
Machining Navi M-i, M-gII+	Cutting condition search function for milling/machining
Tool life management (time counter, etc)	
Overload monitor (w/ feed adaptive control)	
Automatic door	
Chemical anchors	
TAS-S	Thermo Active Stabilizer—Spindle
TAS-C	Thermo Active Stabilizer—Construction

△: Corresponding standard specification deleted.

- *1. Okuma pull stud required (End-face grinding, O-ring, and through-hole diameter differ from those of commercial pull studs.)
*2. Spindle accepts 7/24 No. 40 (BT40, BIG-PLUS®, CAT40, DIN40), or HSK-A63 tapers.
*3. Tapered bore on multitasking spindle is HSK-A63.
*4. For spindle tapered bore, 7/24 taper No. 50 (BT50, BIG-PLUS®, CAT50, DIN50, HSK-A100 or CAPTO-C6) is available.
*5. Tapered bore on multitasking spindle is HSK-A100, CAPTO-C6.
*6. Limitations to maximum workpiece dimensions, etc.
*7. With turning specifications, tapped holes only (no T slots).

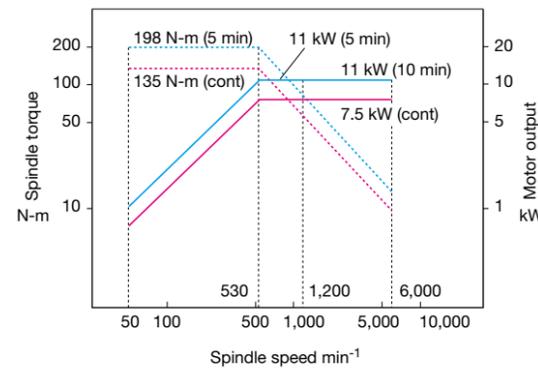
Standard spindle No. 40

- Speed 10,000 min⁻¹ (8,000 min⁻¹ with turning specifications)
- Max output 11/7.5 kW (10 min/cont)
- Max torque 198/135 N-m (5 min/cont)



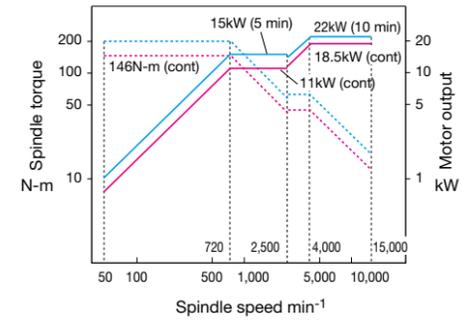
Standard spindle No. 50

- Speed 6,000 min⁻¹
- Max output 11/7.5 kW (10 min/cont)
- Max torque 198/135 N-m (5 min/cont)



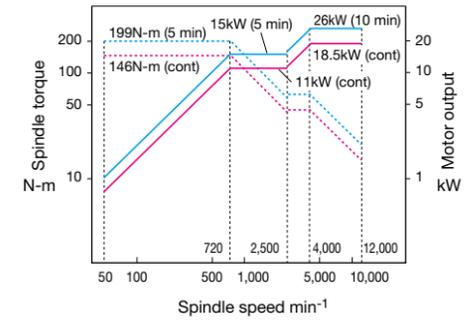
Wide-range spindle No. 40 (Optional)

- Speed 15,000 min⁻¹ (12,000 min⁻¹ with turning specifications)
- Max output 22/18.5 kW (10 min/cont)
- Max torque 199/146 N-m (5 min/cont)



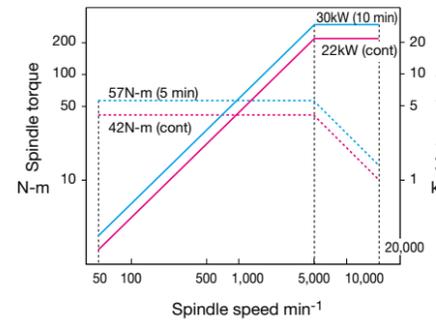
Wide-range spindle No. 50 (Optional)

- Speed 12,000 min⁻¹ (10,000 min⁻¹ with turning specifications)
- Max output 26/18.5 kW (10 min/cont)
- Max torque 199/146 N-m (5 min/cont)



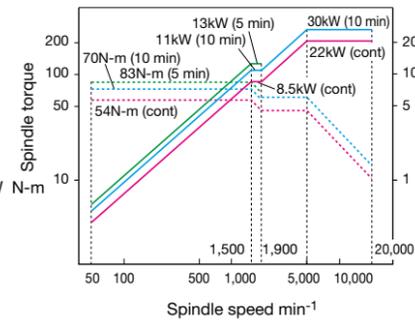
High-speed spindle No. 40 (Optional)

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



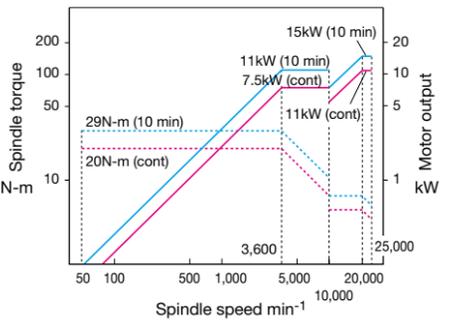
High-speed spindle No. 40 (Optional)

- Speed 20,000 min⁻¹ (Turning specifications)
- Max output 30/22 kW (10 min/cont)
- Max torque 83/70/54 N-m (5 min/10 min/cont)



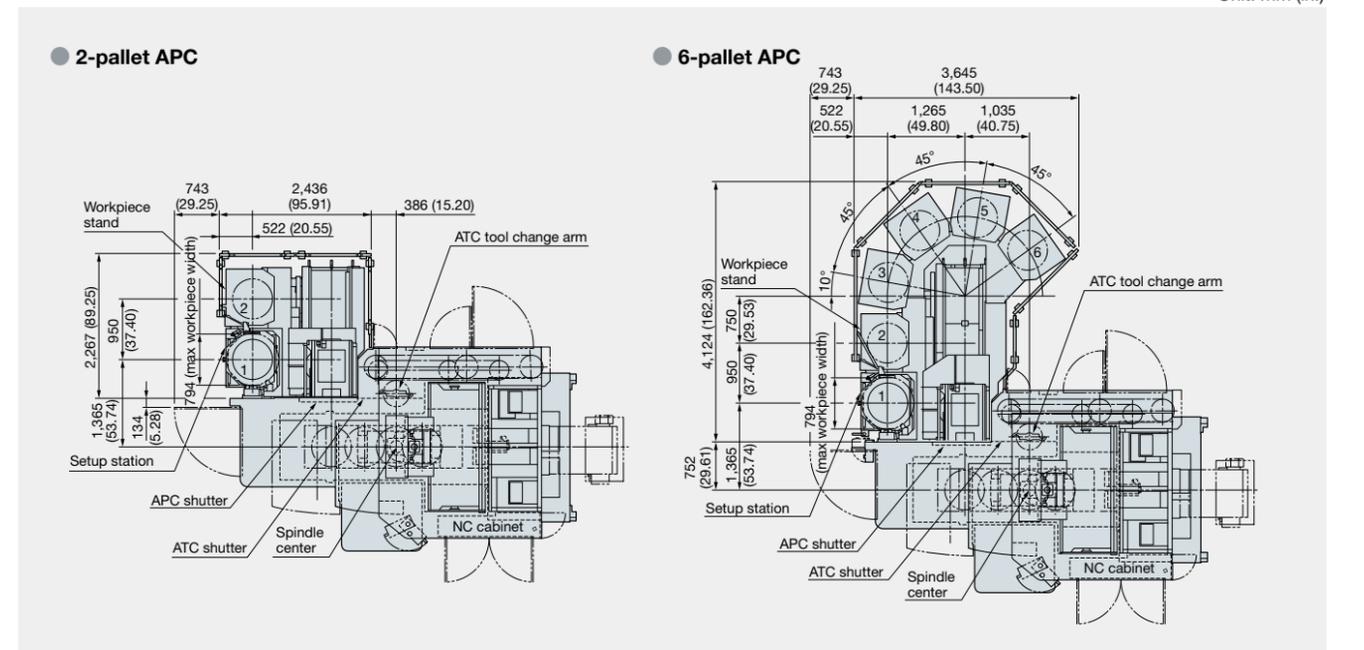
High-speed spindle No. 40 (Optional)

- Speed 25,000 min⁻¹
- Max output 15/11 kW (10 min/cont)
- Max torque 29/20 N-m (10 min/cont)



Multi-pallet APC dimensional drawing (with MU-6300V) (Optional)

Unit: mm (in.)



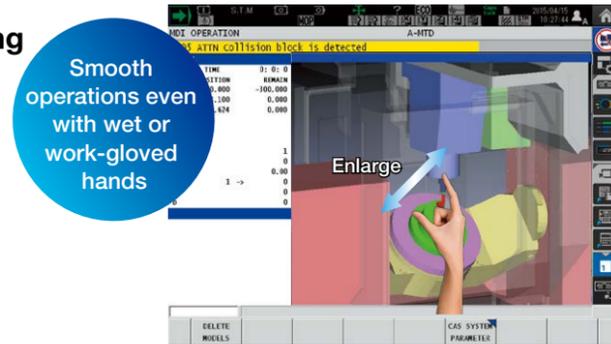
OSP suite OSP-P300MA/SA

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

Smart factories implement advanced digitization and networking (IoT) 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: 15-in. operation panel screen shots. 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.

PERIODICAL MAINTENANCE	DAILY INSPECTION	CHANGE MODE
300	301	302
303	304	305
411	412	413
421	422	

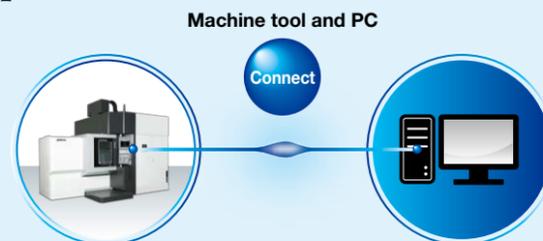


- Increased productivity through visualization of motor power reserve
Spindle Output Monitor
- Monitoring operating status even when away from the machine
E-mail Notification
- Comment display for greater ease of use and faster work
Common Variable Monitor
- Automatic saving of recorded alarms
Screen 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, A, C simultaneous 5-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, 1mm, 0.0001°, 0.001°, 1°
	Feed	Override: 0 to 200%
	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, multitasking, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area calculate, coordinate convert, programming help, fixture offset II, Turning function (with P300SA), lathe auto programming (M-LAP) (with P300SA)
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
High speed/accuracy specs		Hi-Cut Pro, pitch error compensation, Hi-G Control, ServoNavi, Machining Time Shortening Function
Energy-saving		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.

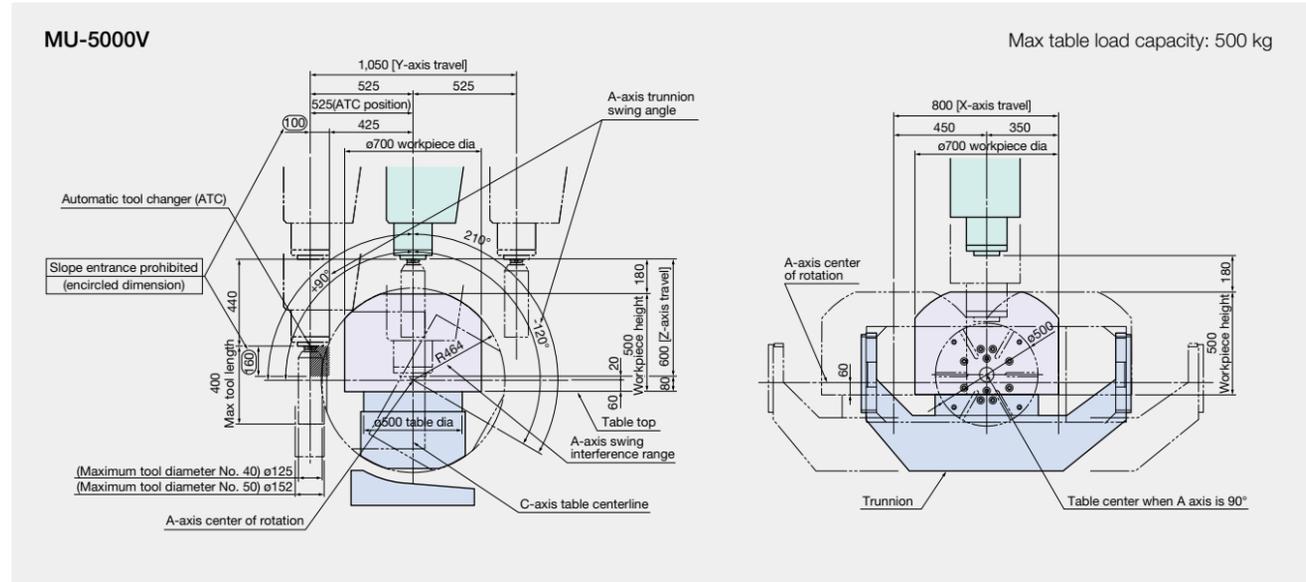
Optional Specifications

Item	Kit Specs ^{*1}	NML		3D		AOT-M	
		E	D	E	D	E	D
Interactive functions							
Advanced One-Touch IGF-M (w/Real 3-D simulation)							
Interactive MAP (I-MAP)							
Programming							
Auto scheduled program update							
Common variables (Std: 200 pcs)	1,000 pcs						
	2,000 pcs						
Program branch; 2 sets							
Program notes (MSG)							
Coordinate system select (Std: 20 sets)	100 sets						
	200 sets						
	400 sets						
Helical cutting (within 360°)							
3-D circular interpolation							
Synchronized Tapping II							
Arbitrary angle chamfering							
Cylindrical side facing							
Inverse time feed							
Tool grooving (flat-tool free-shaped grooving)							
Tool center point control II (TCP-II) (w/ tool tilt comp)							
Tool tilt command							
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							
3-D 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 3-D simulation							
Simple load monitor	Spindle overload monitor						
NC operation monitor	Hour meter, work counter						
Hour meters	Power, spindle, NC, cutting						
Operation end buzzer	M02, M30, and END commands						
Work counter	With M02 and M30 commands						
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						
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						
Warm-up (calendar timer)							
External program select	Button, rotary, Digital switches, BCD (2-digit, 4-digit)						
Cycle time reduction (Ignores certain commands)							
Pallet pool control (PPC) (Required for multi-pallet APC)							
Robot, loader I/F							
High-speed, high-precision							
AbsoScale detection	X-, Y-, Z-axis						
5-Axis Auto Tuning System	Standard, high spec						
Straightness compensation							
0.1 μm control (linear axis commands)							
Hyper-Surface ^{*2} (X-, Y-, Z-axis)							
Simultaneous 5-axis kit	Tool Center Point Control II (w/tool tilt comp) Tool Center Point Control manual feed Table origin coord manual feed Hyper-Surface (5-axis spec) ^{*2} Slope machining Inverse time feed Tool tilt command DNC-DT						
TAS-S (Thermo Active Stabilizer—Spindle)							
TAS-C (Thermo Active Stabilizer—Construction)							
ECO suite							
ECO Operation							
ECO Power Monitor	Wattmeter						
Energy-saving hydraulic unit	Inverter ECO Hydraulics						
Other							
Control cabinet lamp (inside)							
Circuit breaker							
Sequence operation	Sequence stop						
Upgraded sequence restart	Mid-block return						
Tool point center manual feed							
Table reference coord manual feed							
Pulse handle	2 pcs, 3 pcs (Std: 1 pc)						
External M signals	4, 8 signals						
Collision Avoidance System (CAS) ^{*2}							
Machining Navi M-i, M-gII+(cutting condition search)							
One-Touch Spreadsheet							
Block skip; 3 sets							
Leading edge offset							
OSP-VPS (Virus Protection System)							
19-inch variable angle operating panel							

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

Working range

Unit: mm



Max workpiece dimensions (with APC)

Unit: mm

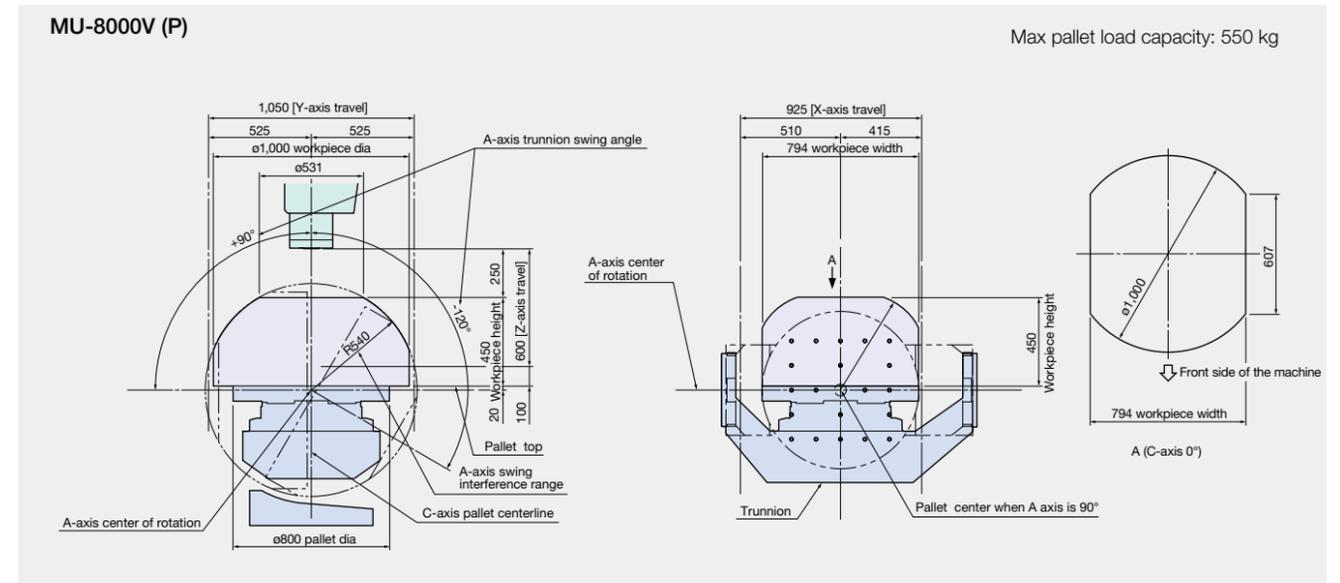
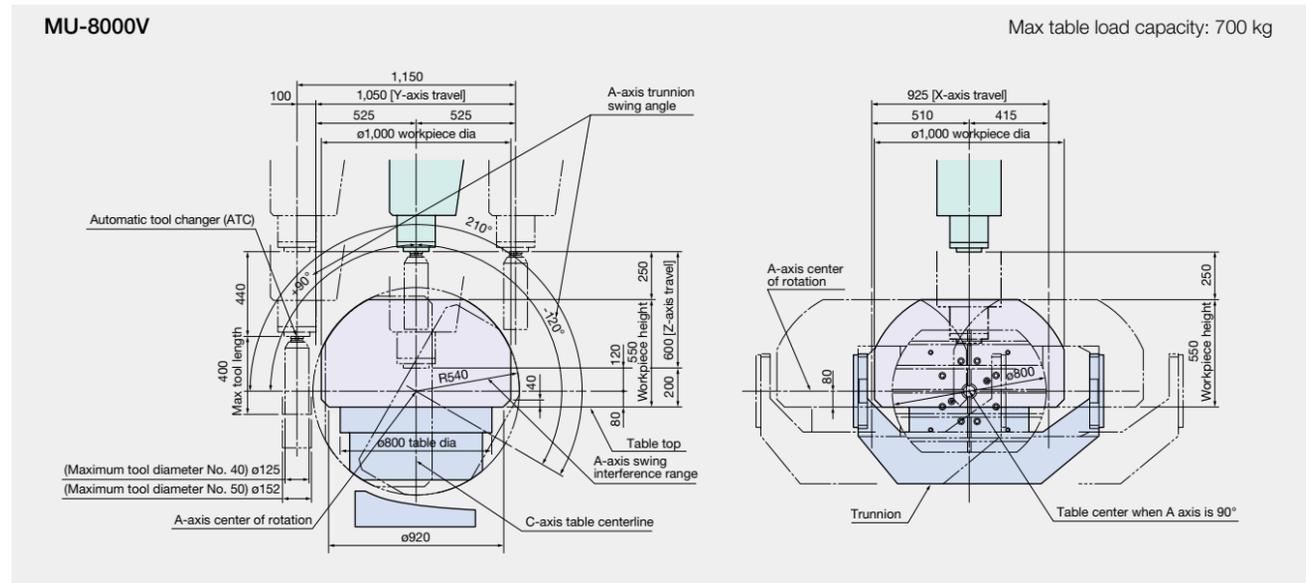
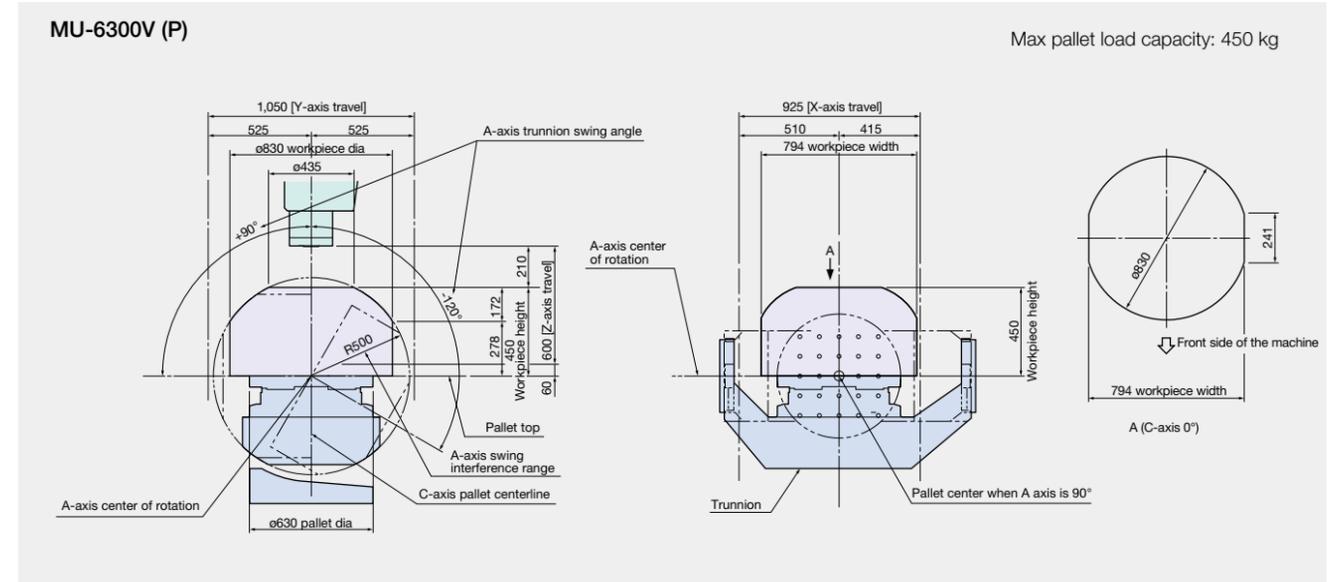
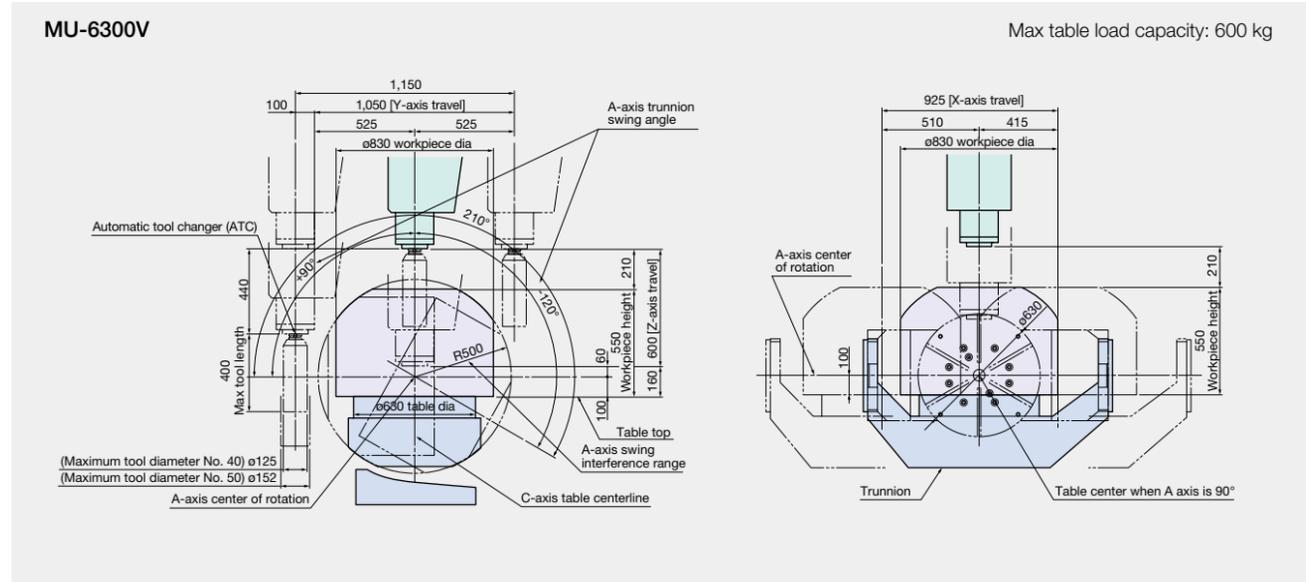
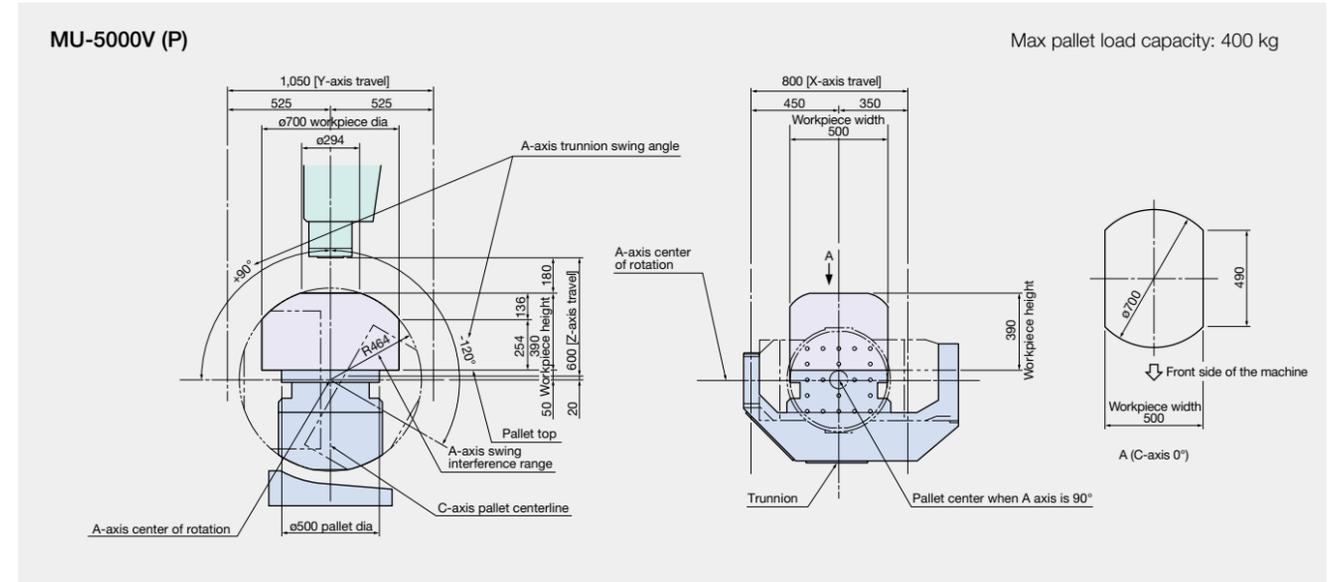
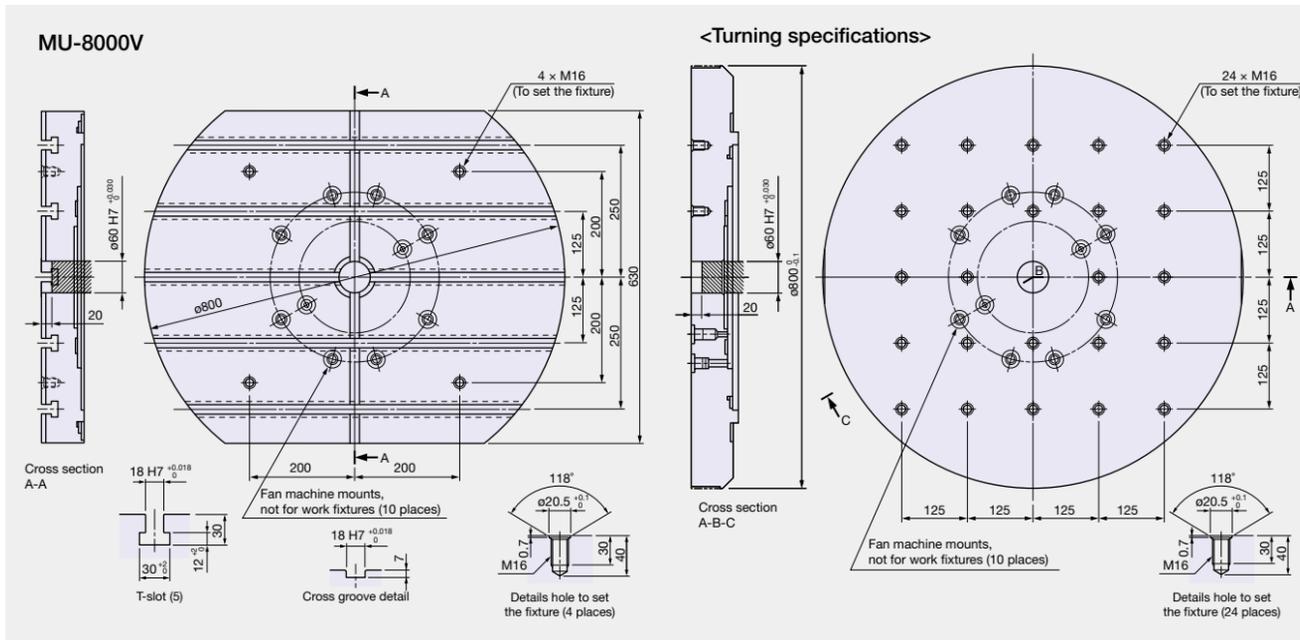
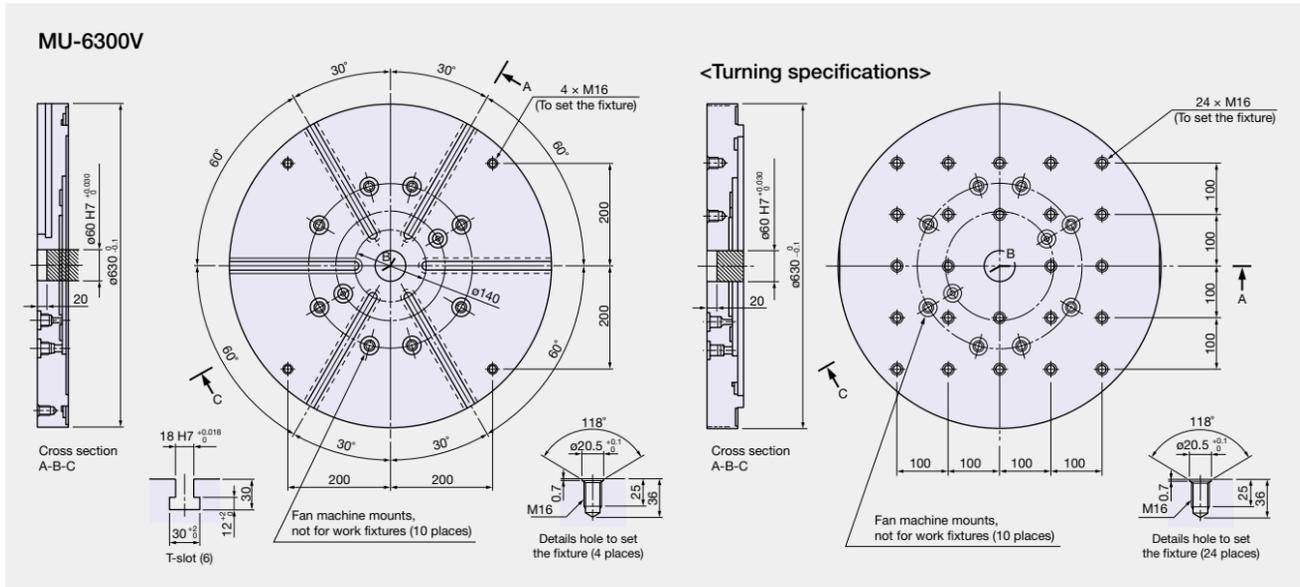
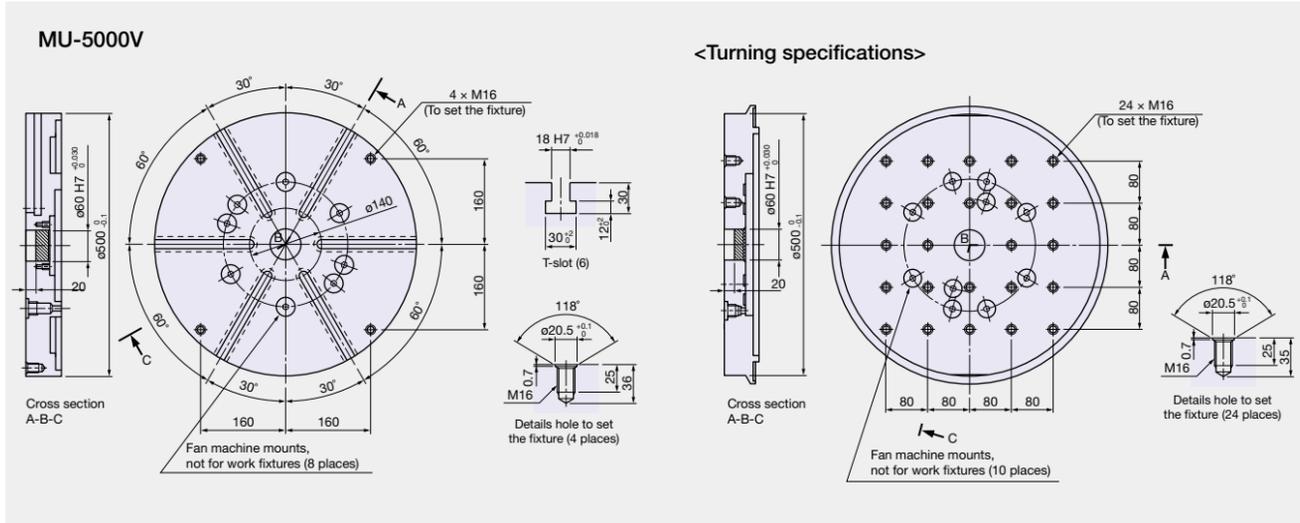
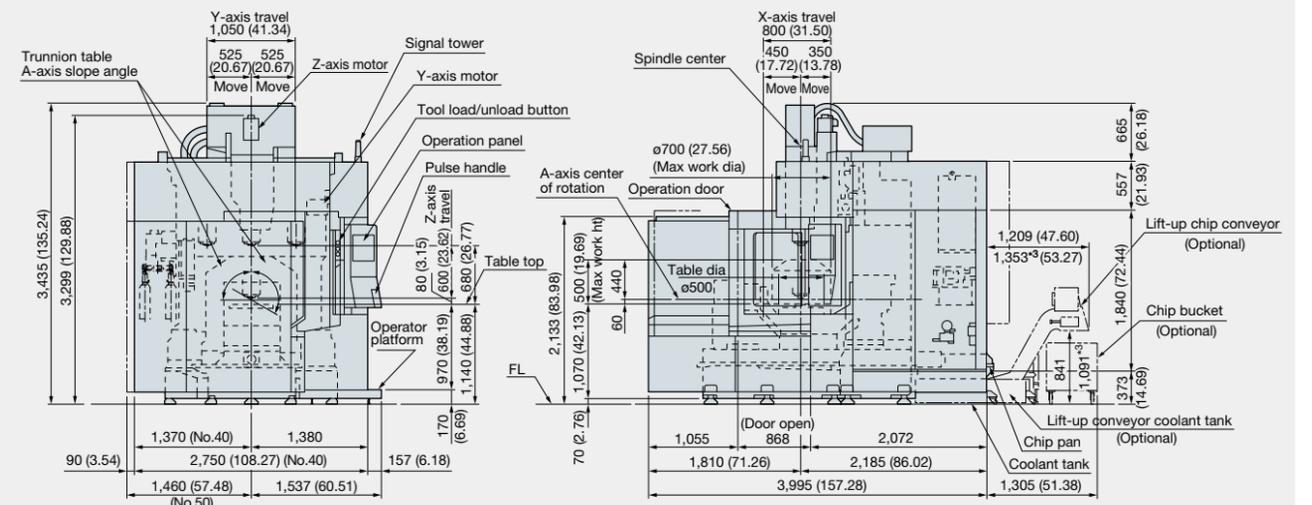
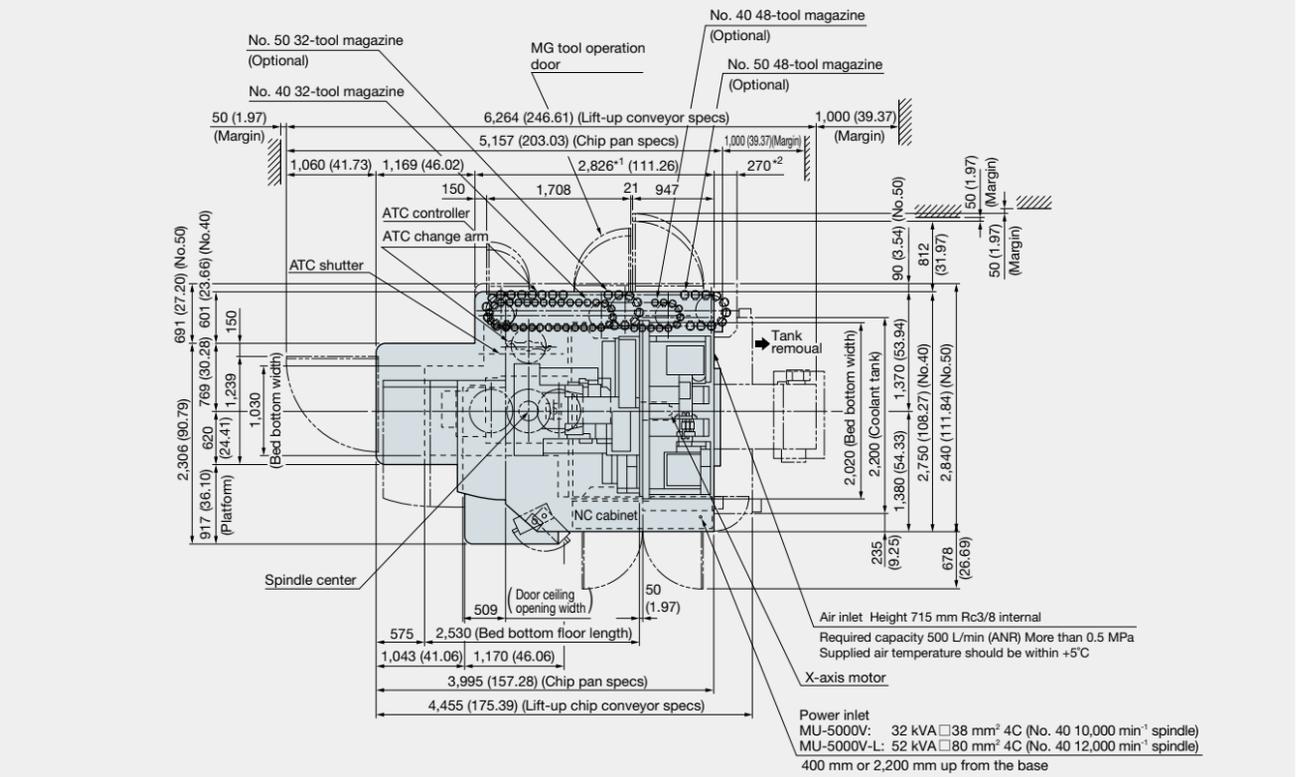


Table dimensions (In the case of APC specification it is different.)

Unit: mm



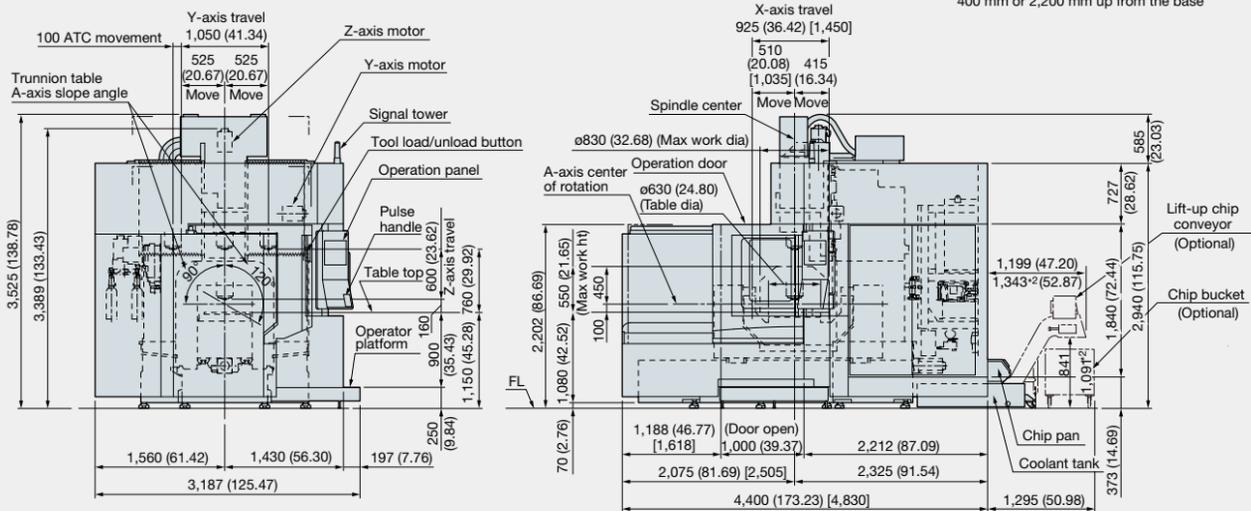
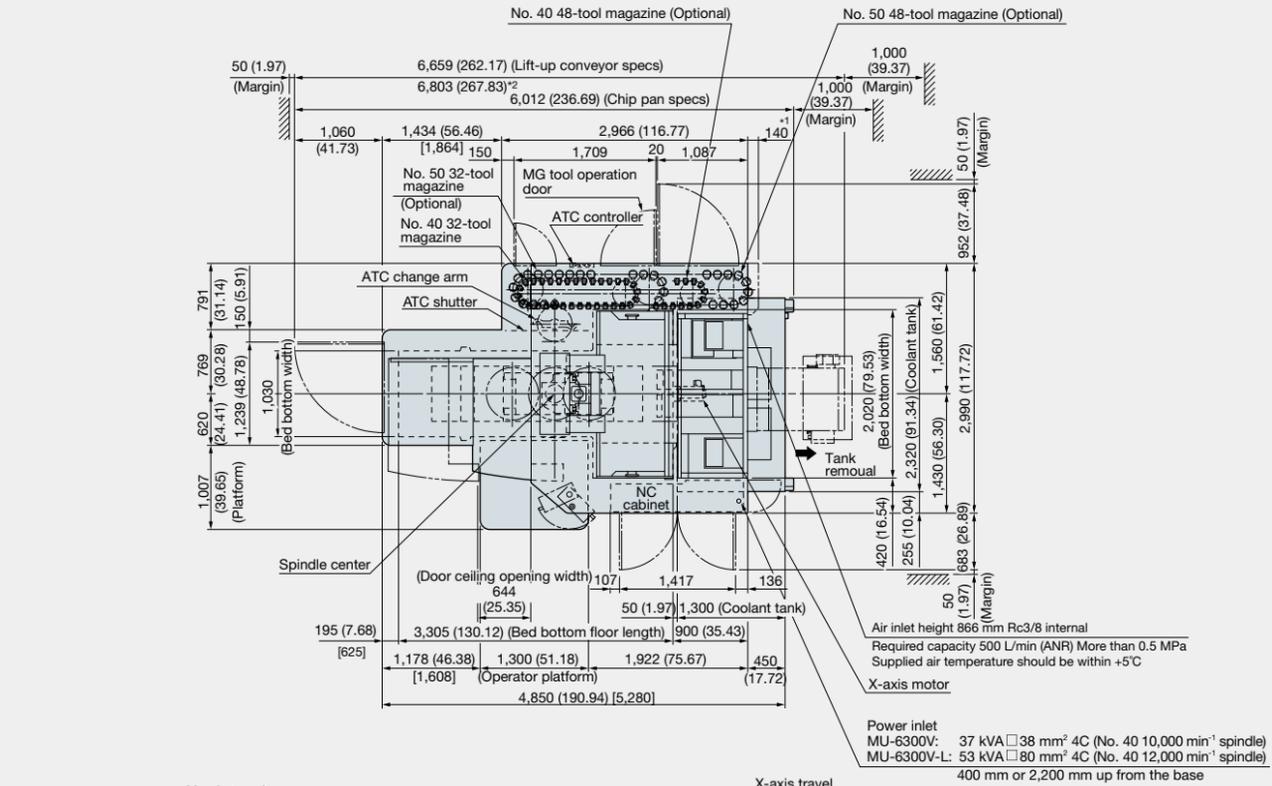
UNIVERSAL CENTER MU-5000V Dimensional and Installation Drawings



- *1. No. 40 32/48-tool magazine, No. 50 32-tool magazine
- *2. No. 50 48-tool magazine
- *3. Floor lift-up chip conveyor
Height: 1,000 mm (Opt)

Unit: mm (in.)

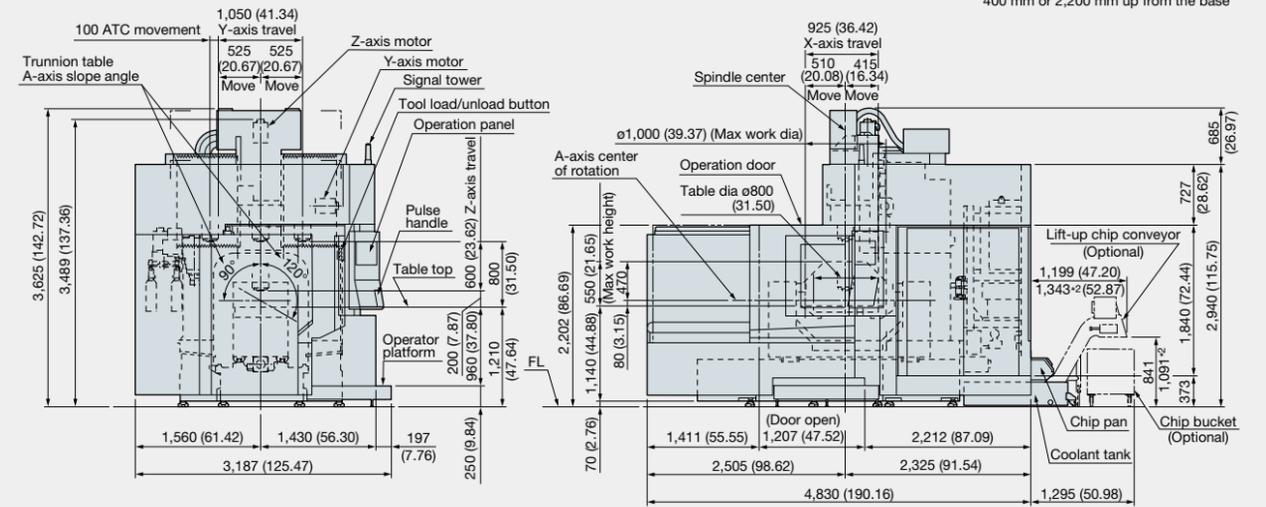
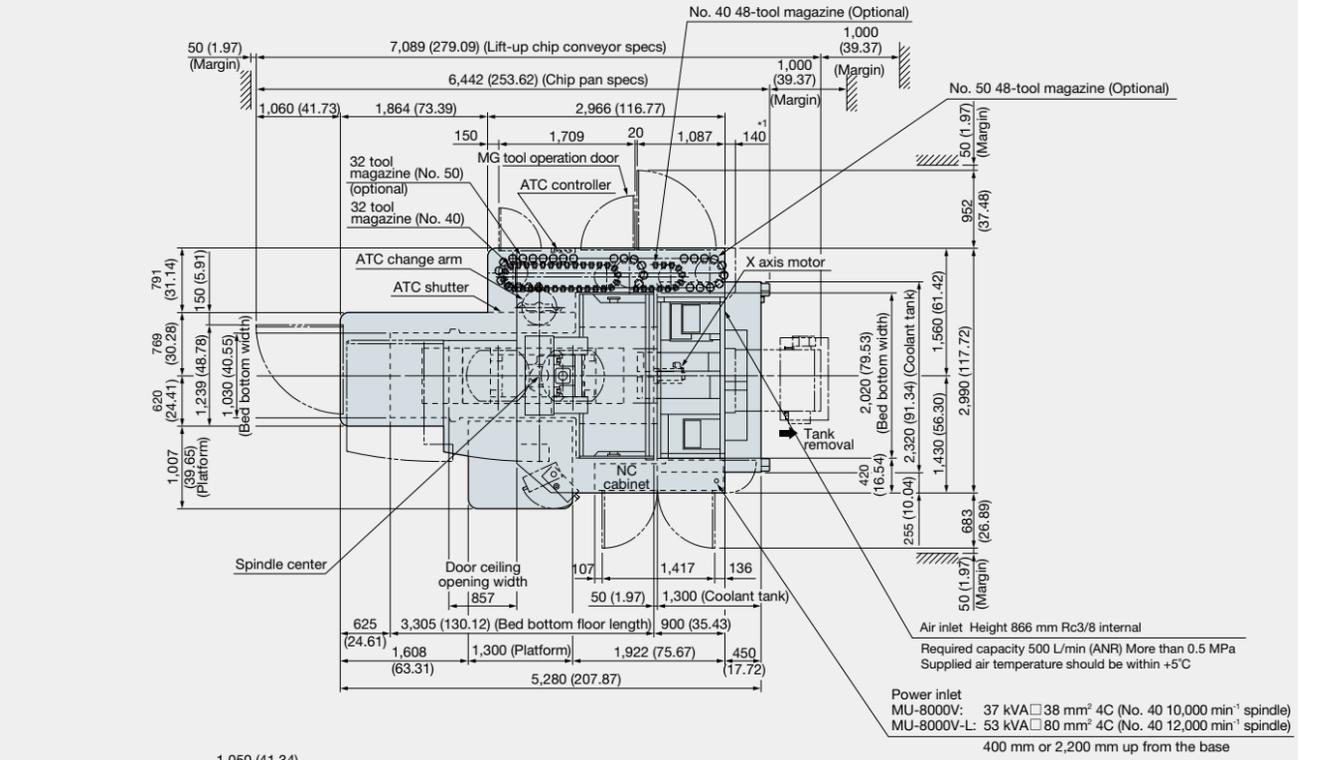
UNIVERSAL CENTER **MU-6300V**
Dimensional and Installation Drawings



[] X-axis extension specifications (APC)
 *1. No. 50 48-tool magazine
 *2. Floor lift-up chip conveyor
 Height: 1,000 mm (Opt)

Unit: mm (in.)

UNIVERSAL CENTER **MU-8000V**
Dimensional and Installation Drawings



*1. No. 50 48-tool magazine
 *2. Floor lift-up chip conveyor
 Height: 1,000 mm (Opt)

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.
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