OKUMA

OPEN POSSIBILITIES

5-Axis Vertical Machining Center

MU-S600V

5-Axis Vertical Machining Center

MU-S600V

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi | 5-Axis Auto Tuning System | SERVONAVI

A smart machine. The core technology of a smart factory.

From one machine—Open Possibilities. Endless Opportunities.

The MU-S600V is a 5-axis VMC that simultaneously achieves ease of use, great productivity as a stand-alone, and more innovation with two or more connected configurations.
It is a totally new concept of smart machine, offering complete control of applications from high-mix, low-volume production (HMLV) to mass production with just this "one-of-a-kind" machine.
As the core machine of a smart factory, productivity in every machine shop will be innovative.

A single machine

A super compact and easy-to-use smart machine

Connecting 2 machines

The tables collaborate in an innovative Work Handoff System, for smart production line system applications

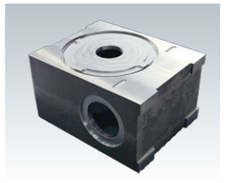
Photos in this brochure include optional specifications.

A 5-axis vertical that performs with ease, from HMLV to smart mass production

With the MU-S 600V, the complete range of applications from High-Mix, Low-Volume to automated mass production is possible.
As a compact and easy-to-use smart machine by itself, or in smart-connected production line systems of the future featuring a Work Handoff System, building agile systems to change factories is possible — by leveraging master craftsmanship to create breakthrough manufacturing systems.

Achieving process-intensive machining with 5-axis indexing

By rotating the machine table, workpiece indexing allows cuts on the top and sides of the workpiece in one chucking. Five-face machining without changing workpiece setups makes possible shorter lead time and better machining accuracy.


Gearbox case


Manifold


Cam box

Compact and easy-to-use machine as a stand-alone

The minimal space required with a machine width of 1,586 mm achieves best-in-class space utilization while providing 5-axis machining of workpieces up to ø600 mm. This slender-&-smart machine can handle parts in a wide range of sizes.

Connecting two machines — smart production line system

By connecting two MU-S600Vs, it is possible to transfer workpieces between machines by indexing the table.
That means using transport robots and loaders required in normal automated lines are no longer needed, so building compact and simple automated production lines is possible.

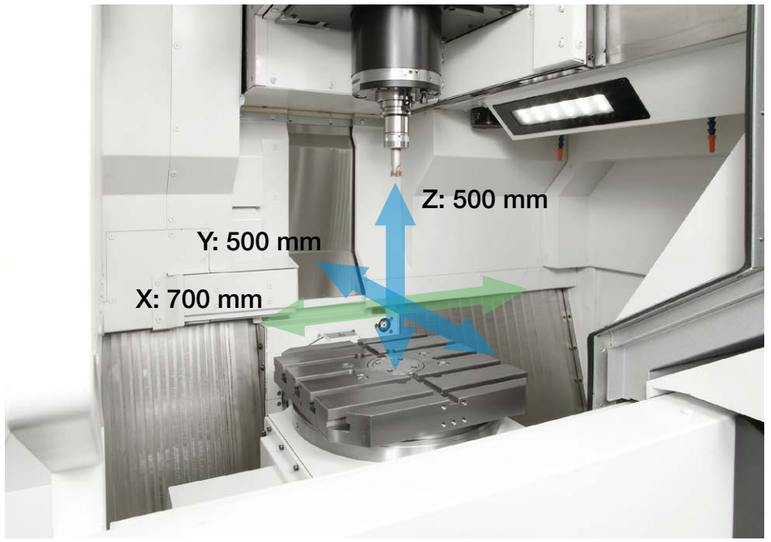
Striving for the ultimate in ease of use

It is a compact that assures excellent workability. Optimal structural designing eases operator burden with good access to the spindle and table, plus opened ceiling and retracted spindle make it possible to set up the workpiece with a crane.

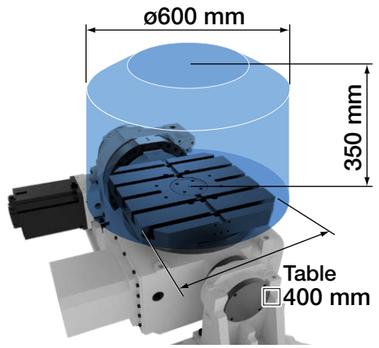
A wide range multiside application with one, smart, compact machine

Compact but with wide machining area

Built with a long X-axis travel of 700 mm in a machine width of just 1,586 mm.
In addition, it is possible to load workpieces up to 600 mm in diameter on the 400 mm square table.
As a 5-axis vertical, Okuma has achieved best-in-class floor space productivity.



Loadable workpiece size



Maximum workpiece dimensions:
ø600 × 350 mm*
Maximum table load: 200 kg

* For detailed dimensions, refer to the "Working range diagrams" on page 17. When transferring workpieces between machines, the maximum workpiece dimensions will differ.

Space-saving machine

Ideal for multi-sided indexing of castings and aluminum workpieces

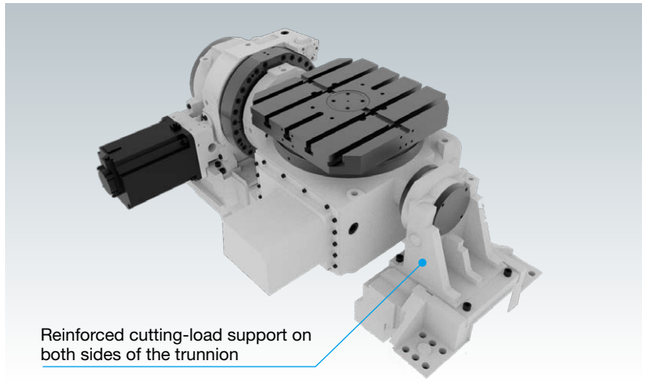
Multi-sided machining is possible with one chucking, making it possible to reduce setup time.
Also, work mounting errors between operations are eliminated, and high machining accuracy can be maintained.

Examples of 5-face machining of prismatic parts

- Workpiece: gearbox case
- Material: FC250
- Size: 360 × 284 × 176 mm

Highly rigidity trunnion table with minimal following error

Trunnion table rotary axes (B, C) have highly accurate zero-backlash rollers with gear-drive cams. Smooth and quick operation deliver high productivity.



Fast

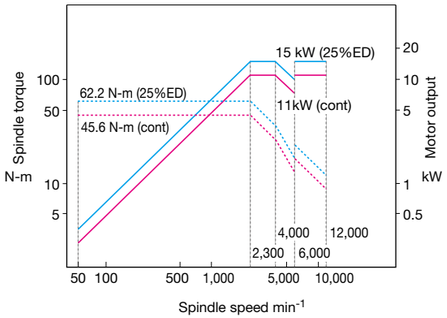
- B axis: 50 min^{-1}
- C axis: 100 min^{-1}

Indexing accuracy (actual data)

- B axis indexing / repeatability: ±1.37 / ±0.6 sec
- C-axis indexing / repeatability: ±1.92 / ±0.2 sec

Spindle torque, Power graph

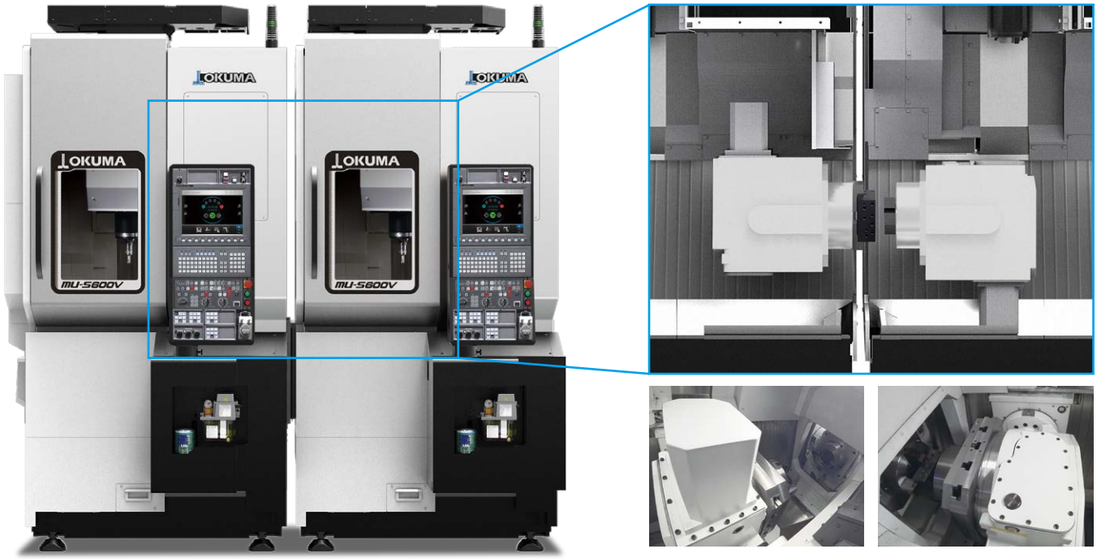
- Spindle speed 12,000 min^{-1}
- Max output 15/11 kW (25%ED/cont)
- Max torque 62.2/45.6 N-m (25%ED/cont)



"Smart production line system" connecting two machines

Building a compact & automated mass production line

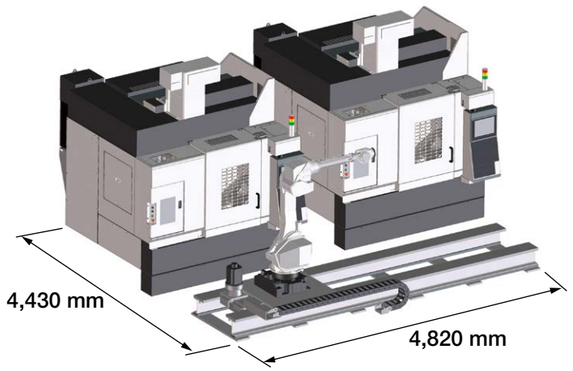
Compact 5-axis machining with a single machine — connected to another — a smart way to achieve mass production.
The MU-S600V features a built-in Work Handoff System, so the tables of machines connected to each other can transfer parts, eliminating the need for transfer equipment between machines.



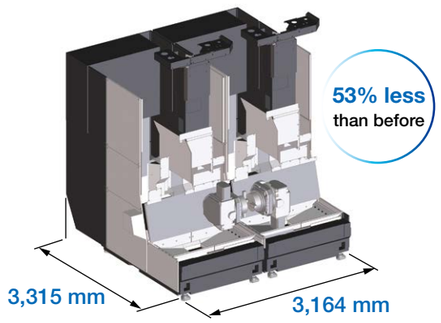
Tables themselves directly transfer parts

Smart production line systems

Conventional production line layouts can now be redesigned, to dramatically reduce the floor space of the automated systems.



Conventional production line: 22.4 m²
(Two 5-axis VMCs + traveling robot)



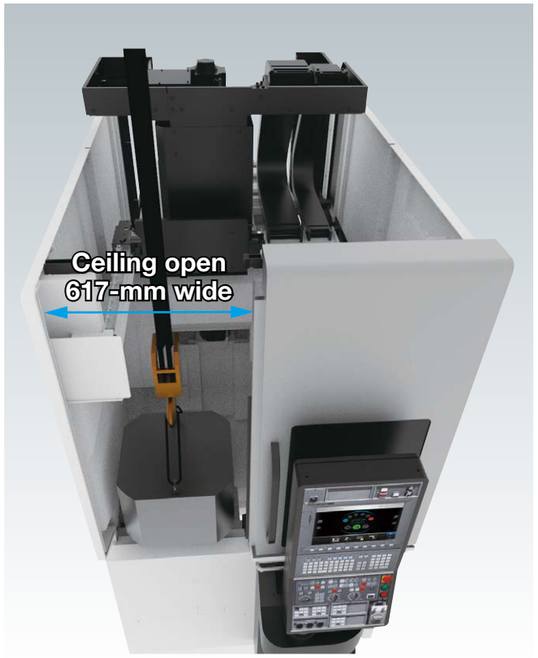
Smart production line: 10.5 m²
(Two MU-S600Vs)

A compact that assures excellent workability

Striving for absolute ease of use to reduce the burden on operators

Crane work is also easier

For crane work, the ceiling can be opened and the spindle retracted toward the tool magazine to make it easier to get the job done.



Spindle access is outstanding

Spindle and table right next to operator. Tool load/unload and setup work is possible with good ergonomics.

Machine front to table center
560 mm

Visibility under good machining conditions

Even with large table tilt, good visibility with no hidden cutting points.

Good maintainability

Maintenance for the machine can done from the front and the back, ensuring good workability even when two machines are connected.

Machine front

Machine back

Safe and reliable chip discharge

Striving for highly reliable machine structural designs

- **Armored bellows way covers**

  Designed to prevent fine chips from getting under sliding components

- **Coil type chip conveyor**

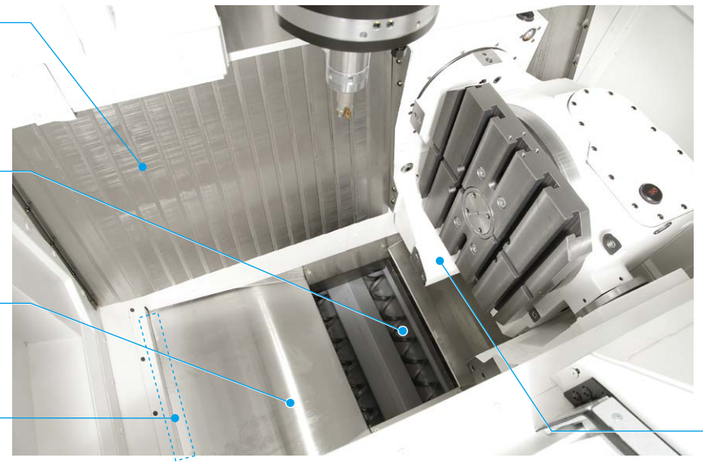
  (Optional)

- **Stainless steel chute**

  Good chip discharge by coolant flows

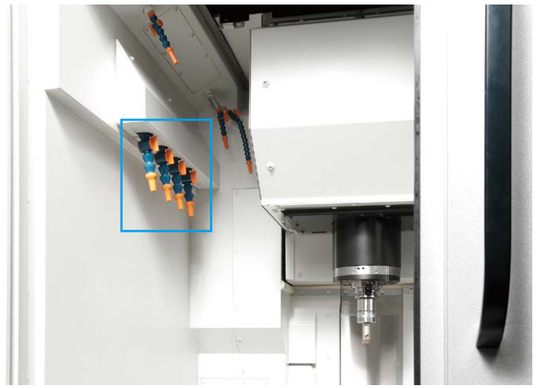
- **Chute flush**

  Linked with in-machine conveyor operation



Chips collected right under the cutting point

■ **Shower coolant system** (Optional) *



■ **Lift-up chip conveyor** (Optional)

High accuracy 5-axis machining is achieved with advanced technology

The unique approach of “accepting temperature changes”

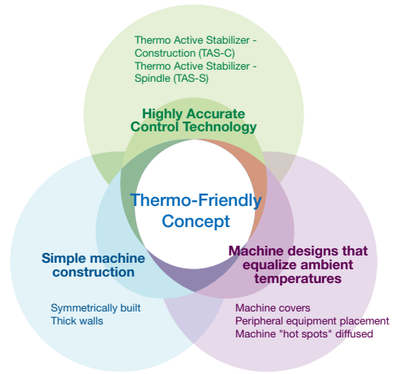
Thermo-Friendly Concept

■ 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.

■ 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.

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)

■ 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)

Intelligent Technology exhibits powerful effect on machine shop floors

Optimized Servo Control
SERVONAVI

Achieves long term accuracy and surface quality

Optimum settings automatically identified
SERVONAVI AI (Automatic Identification)

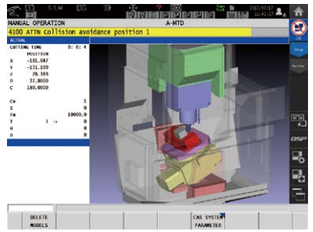
On table travel type machining centers, the table feed acceleration with the previous system was the same regardless of weight, such as workpieces and fixtures loaded on the table.
Work Weight Auto Setting estimates the weight of the workpiece and fixture on the table and automatically sets servo parameters, including acceleration, to the optimum values. Cycle times are shortened with no changes to machining accuracy.

Enables longer machine use
SERVONAVI SF (Surface Fine-tuning)

When decreased machining accuracy is recognized to have occurred with many years of use, SERVONAVI restores machined surface accuracy. It can improve crease marks in machined surfaces that occur where the feed axis reverses with worn ball-screws or guideways.
Even noise or vibration that occurs when there are large changes in the machine state can be immediately eliminated.

Collision prevention
Collision Avoidance System (Optional)

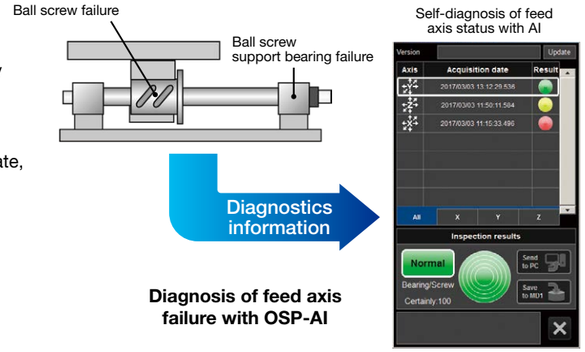
World's first "Collision-Free Machine"
CAS prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.



AI diagnostics for machine tools
OSP-AI Machine Diagnostics (Optional)

With predictive maintenance, prevent machine stoppages just in time
The AI embedded in Okuma's OSP-P300MA CNC makes an early diagnosis of machine feed axes to pinpoint a fault.
Predictive maintenance (PdM) is possible without expertise in machine maintenance or special equipment. Downtime from machine stoppage is minimized, so the benefits are highly accurate, productive, and stable operations over the long term.
The operators themselves can easily diagnose the machine by following simple screen guidelines on the Okuma control, with normal/abnormal condition lamp colors providing the results.

Notes:
1. Connect Plan is required.
2. AbsoScale specs are required to diagnose ball screw failures.



Diagnosis of feed axis failure with OSP-AI

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.

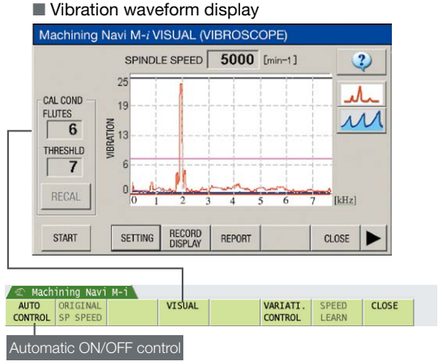
Quick and easy tuning by anyone
Previously, manual measurements of the indexing center were bothersome and time-consuming, but with the 5-Axis Auto Tuning System the measurements are made automatically by the machine. Measurements can therefore be done with stable accuracy in a short time by anyone. In addition, the results of tuning are applied regardless of whether the operation in 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.

5-axis machining accuracies maintained over long runs
With the synergetic benefits provided by Okuma's built-in Thermo-Friendly Concept, ambient temperature changes will have little affect on highly accurate 5-axis machining even during long periods of operation.

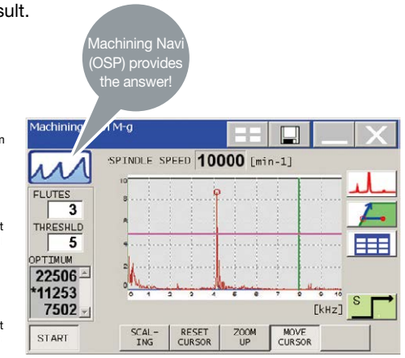
Cutting condition search for milling
Machining Navi M-*i*, M-*g*Ⅱ+ (Optional)

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.

■ Vibration waveform display



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.



Machine specifications

Item		Unit	MU-S600V
Travels	X-axis (table L/R)	mm (in.)	700 (27.56)
	Y-axis (spindle ram front/back)	mm (in.)	500 (19.69) (+280 (11.02) ATC operation)
	Z-axis (spindle ram vertical)	mm (in.)	500 (19.69)
	B-axis (trunnion swivel)	deg	+92 to 0 [+92 to -92 (connected machine specs)]
	C-axis (table swivel)	deg	±360 (infinite)
	Table surface to spindle nose	mm (in.)	10 to 510 (0.39 to 20.08)
Table	Table size	mm (in.)	400 × 400 (15.75 × 15.75)
	Max work size	mm (in.)	ø600 × H350 [ø500 × H350 (auto open/close side shield)]
	Floor to table top	mm (in.)	1,110 (43.70)
	Max load capacity	kg (lb)	200 (440)
Spindle	Spindle speed	min^{-1}	50 to 12,000
	No. of spindle ranges		Infinitely variable
	Taper bore		7/24 taper No. 40
	Bearing dia	mm (in.)	ø60 (2.36)
Feedrate	Rapid traverse	m/min	X-Y-Z: 60
	Rapid traverse	deg/min	B: 18,000 (50 min^{-1}), C: 36,000 (100 min^{-1})
	Cutting feedrate	mm/min	X-Y-Z: 1 to 60,000
Motor	Spindle (25% ED/cont)	kW (hp)	15/11 (20/15)
	Feed axes	kW (hp)	X-Y-Z: 3.5 (4.7), B: 3.6 (4.8), C: 3.0 (4)
ATC	Tool shank		MAS BT40
	Pull stud		MAS 2
	Tool capacity (magazine)	tool	16 (drum) [30 (chain)]
	Max tool dia (W/ adjacent)	mm (in.)	ø80 (ø3.15)
	Max tool dia (W/O adjacent)	mm (in.)	ø115 (ø4.53)
	Max tool length	mm (in.)	300 (11.81)
	Max tool weight	kg (lb)	6 (13)
	Tool selection		Fixed address
Machine size	Height	mm (in.)	2,994 (117.87) *1
	Floor space W × D (machine only)	mm (in.)	1,586 × 3,315 (62.44 × 130.51)
	Weight	kg (lb)	8,800 (19,360) *2
CNC			OSP-P300MA

[ ]: Optional *1. With lift-up chip conveyor, machine height becomes 3,114 mm.
*2. Machine mass increases with optional equipment. Ex: coil conveyor (rear discharge); 140 kg, auto open/close side shield (both sides); 80 kg

Standard specifications / accessories

No. 40 spindle speed 50 to 12,000 min^{-1}	15/11 kW [10 min./cont.]	Chip air blower (blast)	Nozzle type
Rapid traverse	X-Y-Z: 60 m/min	Work lamp	LED lamp (Installed on the right side)
Spindle/spindlehead cooling unit	Oil temperature controller	In-machine chip discharge	Cleaning chute in the machine
Air cleaner (filter)	Including regulator	Chip pan	25 L effective*
Operation panel with color LCD		Foundation washer (with jack bolt)	6 pcs
Pulse handle		3-step status indicator lamp	Type C (LED signal tower)
Tapered bore cleaning bar			Red (Alarm), Yellow (Operation end)
B/C-axis rotary table	0.0001°		Green (Running)
C-axis table	400 × 400, T-slot 18H8 five pieces	16-tool ATC	
Coolant system	Tank 250 L (effective 160 L),	ATC magazine shutter	
	Coolant pump (60 Hz/50 Hz) 550 W/700 W,	Full-enclosure shielding	
	Washer pump (in-machine washing) 400 W,	Chemical anchors	
	Washer pump (machine upper part washing) 400 W	Hand tool	
ATC air blower (blast)		Tool box	

Note: When using the oil based coolant, take all the possible measures for preventing fire and never attempt untended operation.
* Chip pan capacity before the commodification is 15 L effective.

Optional specifications / accessories

Item	Remark	Item	Remark
Dual contact spindle	BIG-PLUS®	Off-machine chip discharge	Lift-up chip conveyors: floor type, drum filter type
AbsoScale	X-Y-Z axes		
Auto pallet changers	2P-APC, 4P-APC	Chip bucket for above	
ATC magazines	30-tool (chain type)	Super-NURBS	
Pull stud specs	MAS 1, JIS, CAT, DIN	Tool breakage detection/ Auto tool length compensation	Touch sensor (Metrol)
Table surface	T slots, 11/16, 5 slots (in.)		
Thru-spindle coolant*	Specify 1.5 MPa or 7.0 MPa	Auto zero offset/auto gauging	Touch probe, sphere (Renishaw)
Chip air blower (Through type during rotation)		5-Axis Auto Tuning System	
		Collision Avoidance System	
Oil skimmer		Machining Navi M-*i*, M-*g*Ⅱ+	With harmonic control
Shower coolant	Left side mounted (4 nozzles), left/right side outed (8 nozzles)	Tool life management (time counter, etc)	
		Thermo Active Stabilizer — Spindle (TAS-S)	
Workpiece wash gun		Thermo Active Stabilizer — Construction (TAS-C)	

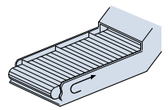
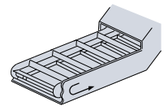
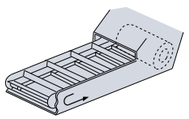
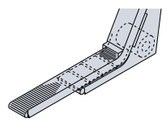
* Okuma pull stud required.
"Commercially available and end-face ground pull studs, O-rings, and thru-hole diameters may vary," but Okuma pull studs are required for this application.

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	Chip flusher (Standard)	—	○ (Wet)	○	—
	Coil (Optional)	○	○ (Dry-Wet)	—	○
Off-machine (Optional)	Hinge	○	—	—	△ (*4)
	Scraper	—	○ (Dry)	—	—
	Scraper (with drum filter)	—	○ (Wet) with magnet	△ (*3)	—
	Hinge + scraper (with drum filter)	△ (*1)	△ (Wet)(*2)	○	○

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

*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

Major Optional Specifications

● Auto zero offset and auto gauging (wireless touch probe)

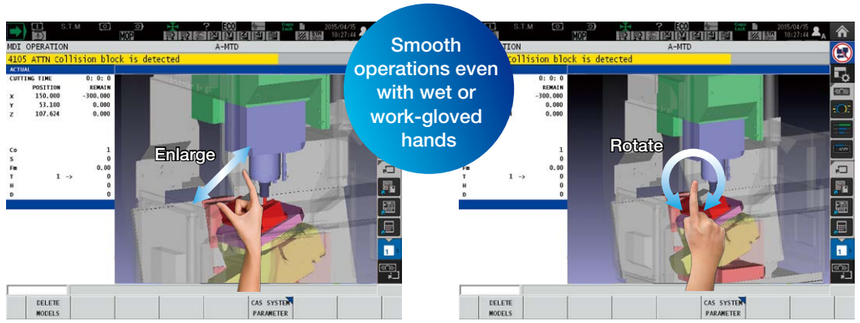
● Tool breakage detection, auto tool length compensation

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.

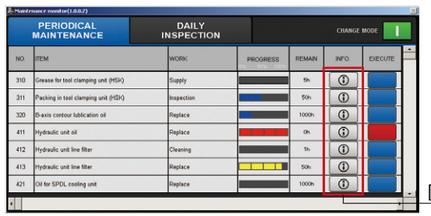


Features you wanted – loaded with OSP suite apps!

We made these real through the addition of Okuma's machining expertise based on requests we heard from customers in the machine shop. These are filled with intelligence that enhances the "strength in the field" that CNC control can accomplish because it's created by a machine-tool manufacturer.

Routine inspection support
Maintenance monitor

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



[INFO] button

Increased productivity through visualization of motor power reserve
Spindle Output Monitor

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

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

Automatic saving of recorded alarms
Screen Capture

Easy programing without keying in code
Scheduled Program Editor

Standard Specifications

Basic Specs	Control	X, Y, Z, B, C, 5-axis control, 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 inputs	8-digit decimal, ±99999.999 to 0.001 mm (3937.0078 to 0.0001 in.), 0.001° Decimal:1 µm, 10 µm, 1 mm (0.0001,1 in.) (1°, 0.01°, 0.001°)
	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 storage capacity: 4 GB; operation backup capacity: 2 MB
	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
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, alignment compensation
	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 suite	ECO Idling Stop*1, ECO Power Monitor*2

*1. Spindle cooler Idling Stop is used on TAS-S machines.
*2. The power display shows estimated values. When precise electrical values are needed, select the wattmeter option.

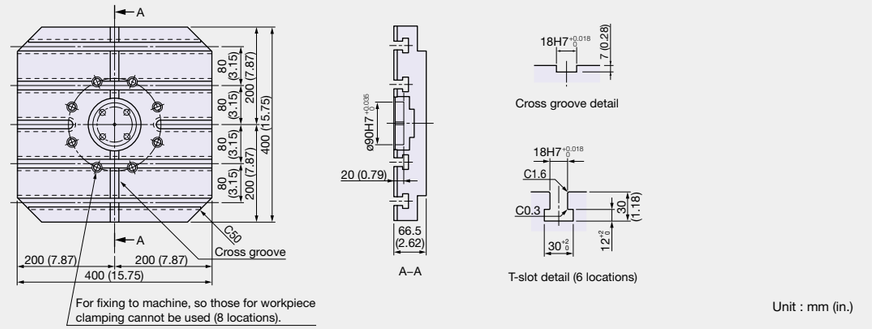
Optional Specifications

Item		Kit Specs*1	NML E	NML D	3D E	3D D	AOT-M E	AOT-M 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								
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								
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)	Included in machine specs						
Auto zero offset	Includes auto gauging	Included in machine specs						
Tool breakage detection	(touch sensor) (G31) Includes auto tool offset	Included in machine specs						
Gauging data printout	File output							
Manual gauging (w/o sensor)			●	●	●	●	●	●
Interactive gauging (touch sensor, touch probe required)								

Item		Kit Specs*1	NML E	NML D	3D E	3D D	AOT-M E	AOT-M D
External I/O communication								
RS-232-C 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)								
Super-NURBS								
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			●		●		●
Pulse handle	2 pcs, 3 pcs (Std: 1 pc)							
External M signals	4, 8 signals							
Collision Avoidance System (CAS)								
Machining Navi M-*i*, M-*g*Ⅱ+(cutting condition search)								
One-Touch Spreadsheet								
Block skip; 3 sets								
OSP-VPS (Virus Protection System)								

Note 1. NML: Normal, 3D: 3D simulation, E: Economy, D: Deluxe
AOT-M: Advanced One-Touch IGF-M
Note 2. ★Technical consultation needed for specifications

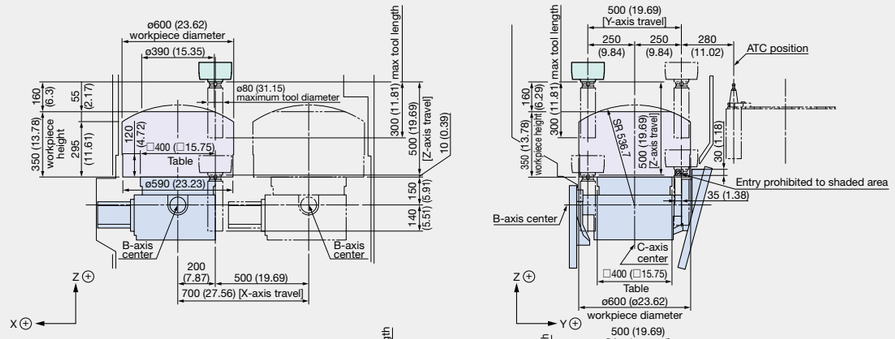
Table dimensions



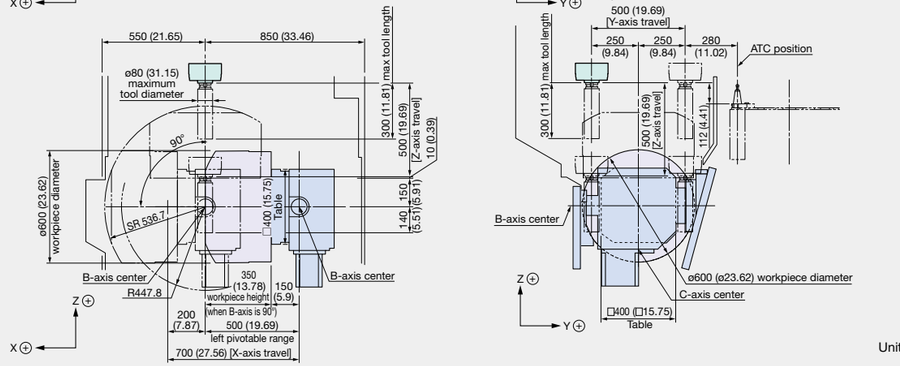
Unit : mm (in.)

Working Ranges

B-axis 0°

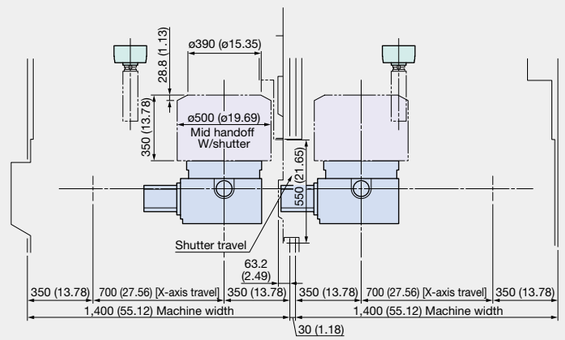


B-axis 90°



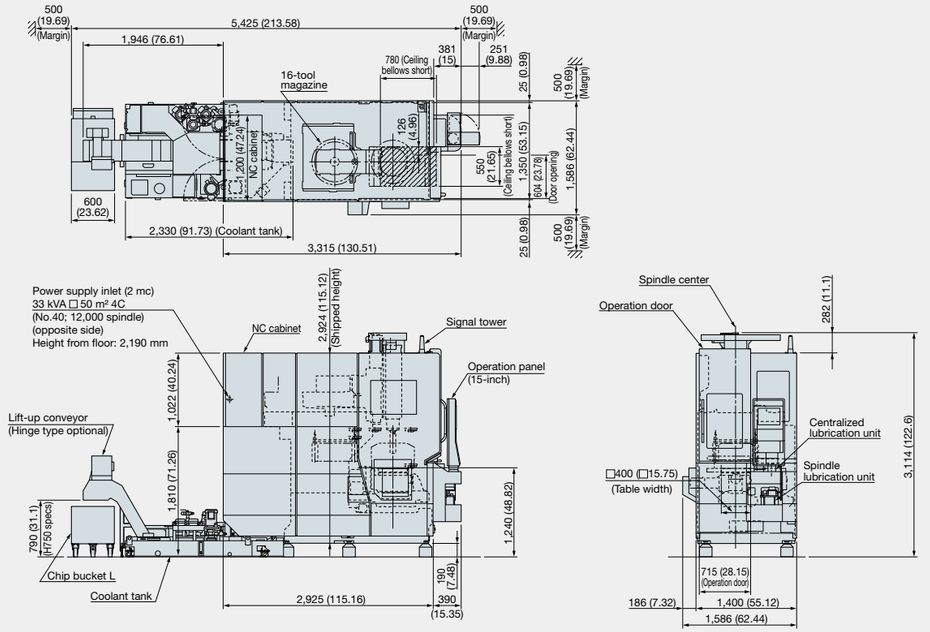
Unit : mm (in.)

Max workpiece dimensions (Work Handoff System)



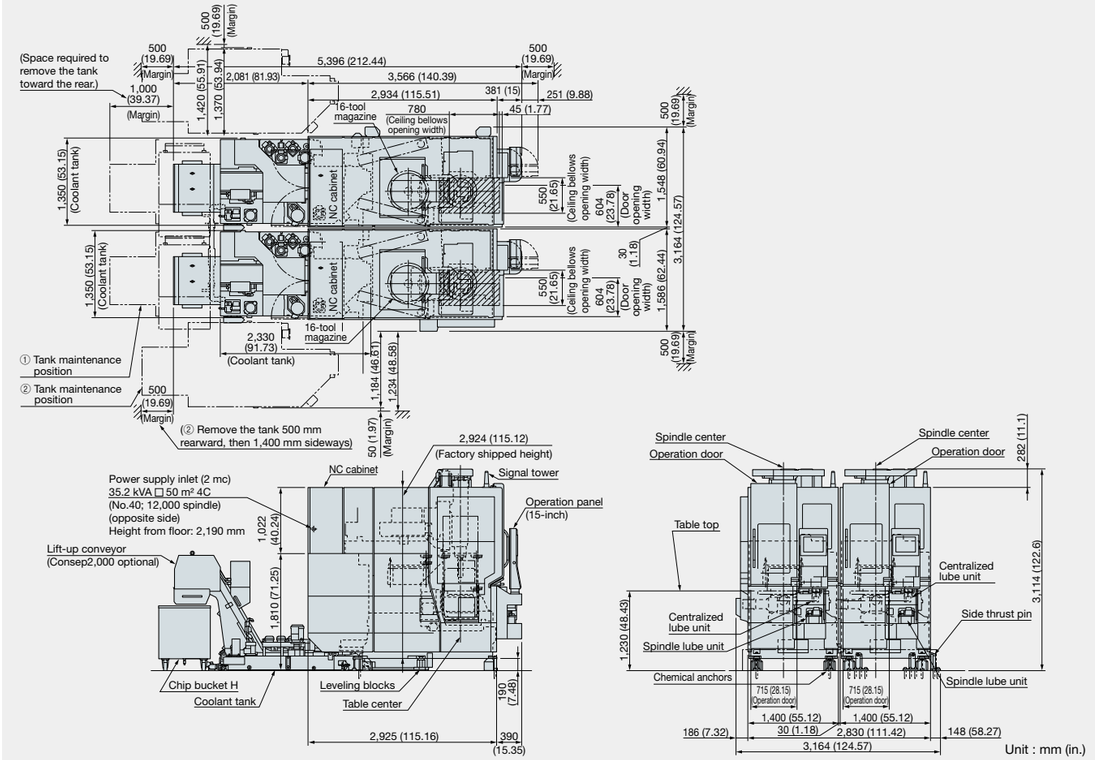
Unit : mm (in.)

Dimensional Drawing / Installation Drawing



Unit : mm (in.)

Dimensional / Installation Drawings (2 connected machines)



Unit : mm (in.)

MU-S600V

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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