Vertical Machining Centers

GENOS M series

GENOS M460-VE / GENOS M560-V
GENOS M660-V

Vertical Machining Centers
GENOS M series

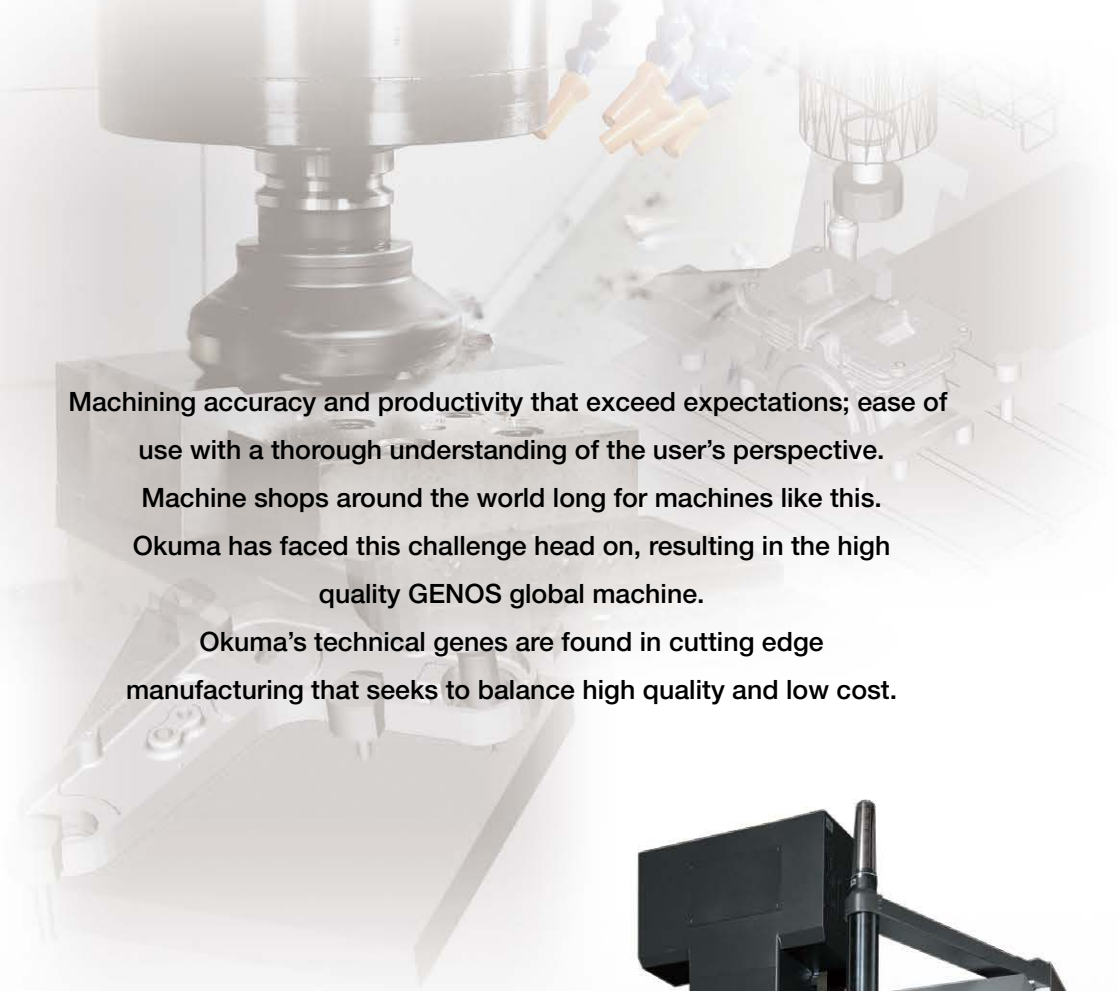## GENOS M460-VE / GENOS M560-V / GENOS M660-V

Intelligent Technology

Thermo-Friendly Concept

Collision Avoidance System

Machining Navi

Machining accuracy and productivity that exceed expectations; ease of
use with a thorough understanding of the user's perspective.
Machine shops around the world long for machines like this.
Okuma has faced this challenge head on, resulting in the high
quality GENOS global machine.
Okuma's technical genes are found in cutting edge
manufacturing that seeks to balance high quality and low cost.

GENOS technology carries Okuma's genetic heritage and takes you to the leading edge of global competition.

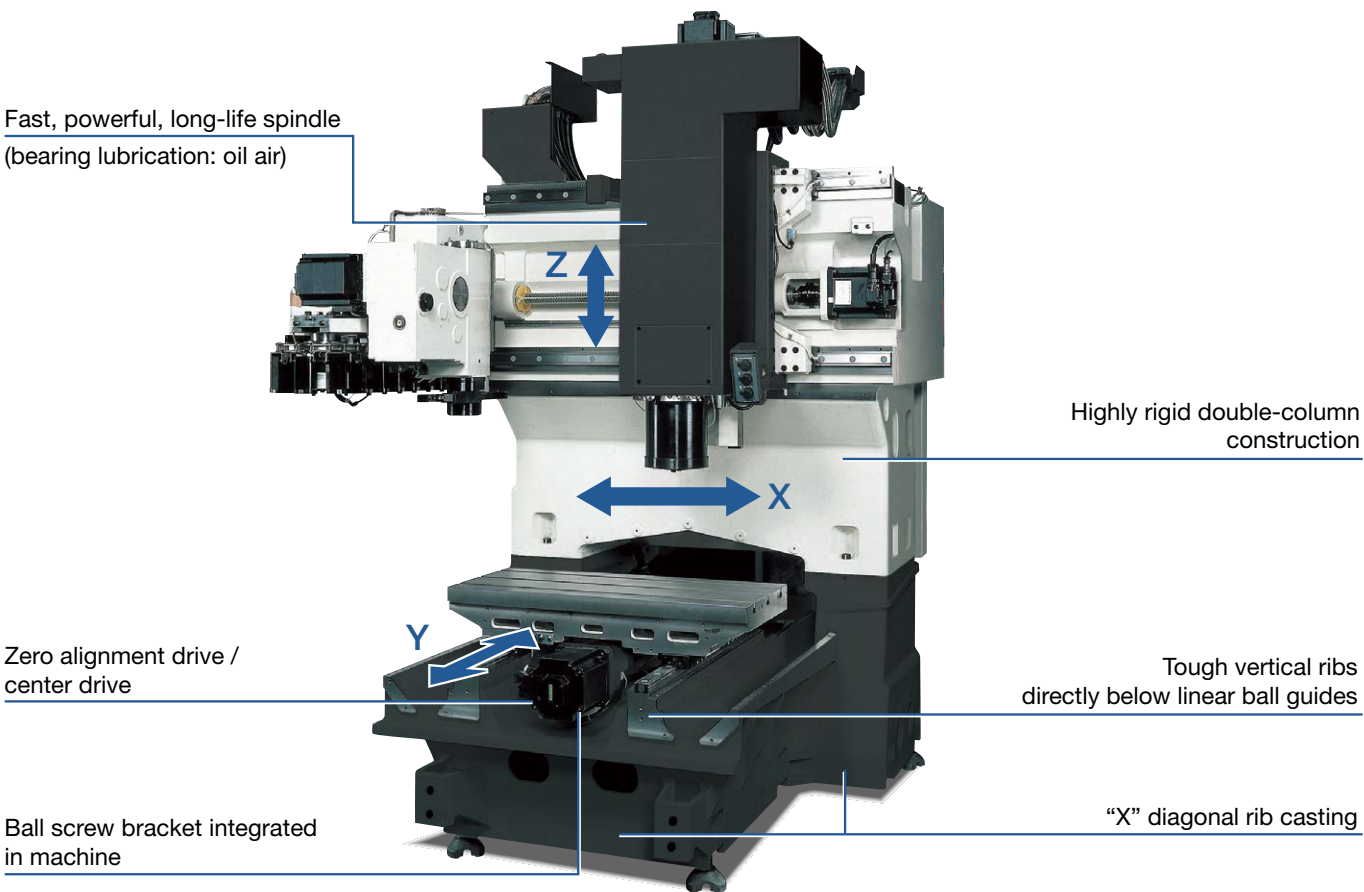GENOS M460-VE

GENOS M560-V

GENOS M660-V

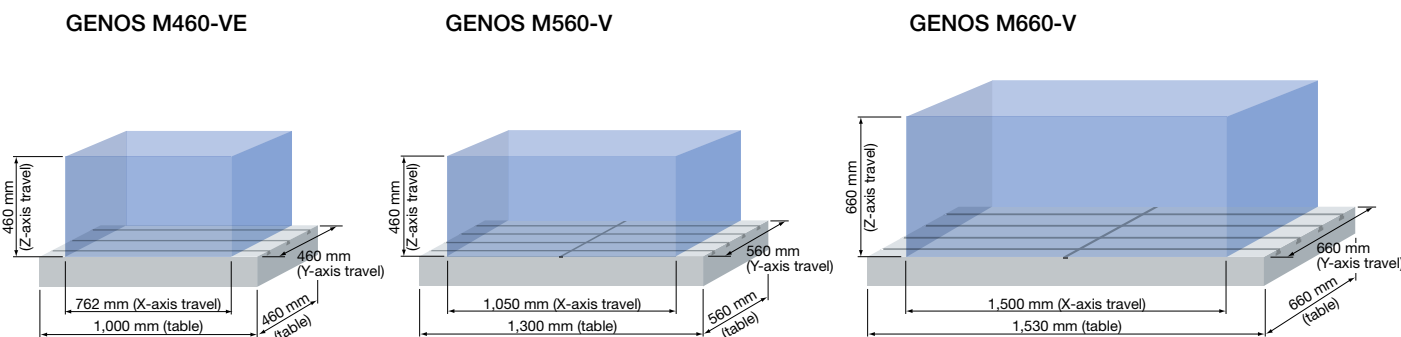Photos used in this brochure include optional equipment.

Highly rigid construction for productivity that exceeds expectations

■ Same double column structure as on the best-selling MB-V series

Maximum performance is achieved by limiting the options with the same high-rigidity structure.

Fast, powerful, long-life spindle
(bearing lubrication: oil air)

Z

X

Y

Highly rigid double-column construction

Zero alignment drive / center drive

Tough vertical ribs directly below linear ball guides

Ball screw bracket integrated in machine

"X" diagonal rib casting

■ Table size / machining area

GENOS M460-VE

460 mm (Z-axis travel)
762 mm (X-axis travel)
1,000 mm (table)
460 mm (Y-axis travel)
460 mm (table)

GENOS M560-V

460 mm (Z-axis travel)
1,050 mm (X-axis travel)
1,300 mm (table)
560 mm (Y-axis travel)
560 mm (table)

GENOS M660-V

660 mm (Z-axis travel)
1,500 mm (X-axis travel)
1,530 mm (table)
660 mm (Y-axis travel)
660 mm (table)

## ■ Fast machine movements reduce non-cutting time

Non-cutting time reduced 30% from previous machine with maximum acceleration/deceleration speeds of 0.7 G and high-speed rapid traverse.

- ■ Non-cutting time
  35% less
  (Compared with previous machine.)
- ■ Rapid traverse
  X,Y: 40 m/min, Z: 32 m/min
- ■ ATC time (T-T)
  1.2 sec (M460-VE, M560-V)
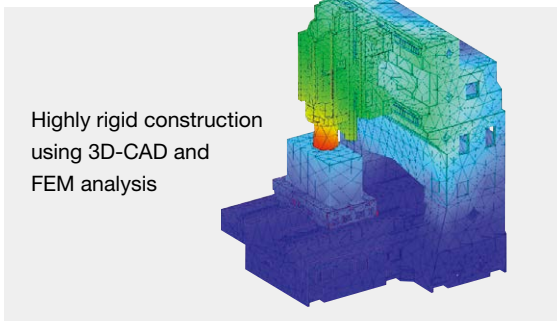 1.5 sec (M660-V)

■ Hi-G Control (standard)

Acceleration/deceleration during positioning is controlled by math functions linked to motor speed/torque characteristics, to provide both machine accel/decel and vibration control.

Hi-G control

Speed

Previous

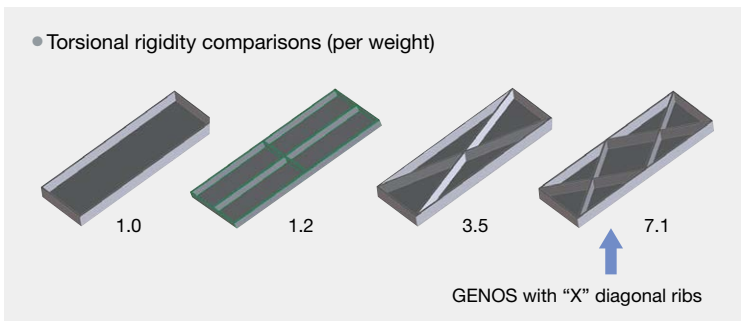Time

Reduced positioning time
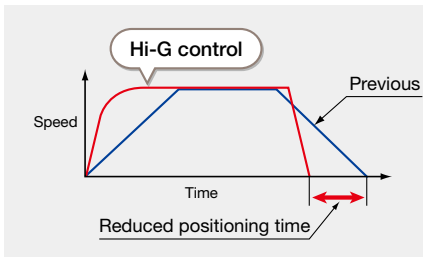
■ Highly rigid structure supports powerful cutting

In addition to the highly rigid double-column structure and the diagonal rib casting base section, Okuma's original design makes this a robust machine capable of stable, powerful cutting even with high-speed movement.

■ Highly rigid double-column construction

Highly rigid construction using 3D-CAD and FEM analysis

■ "X" diagonal rib casting

• Torsional rigidity comparisons (per weight)

1.0   1.2   3.5   7.1

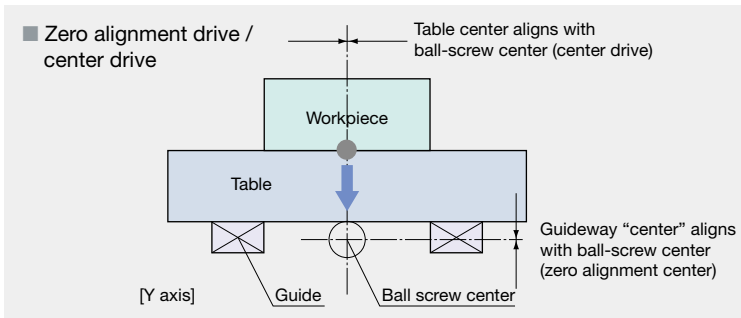GENOS with "X" diagonal ribs

■ Small overhang for more efficient machining

The overhang from the machining point to slideway is small, enabling efficient machining. For table movement, the Y-axis overhang also remains small regardless of the machining position.

Y-axis travel

Overhang
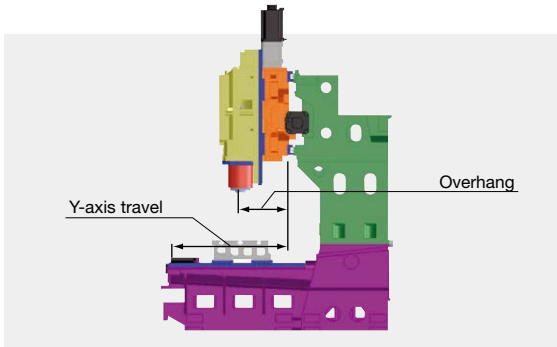
■ Highly accurate drive system

The ball screw is set at the center of the table. By aligning the positions of the center of the ball screw and the guideway, highly accurate drive and positioning are achieved with no collisions.
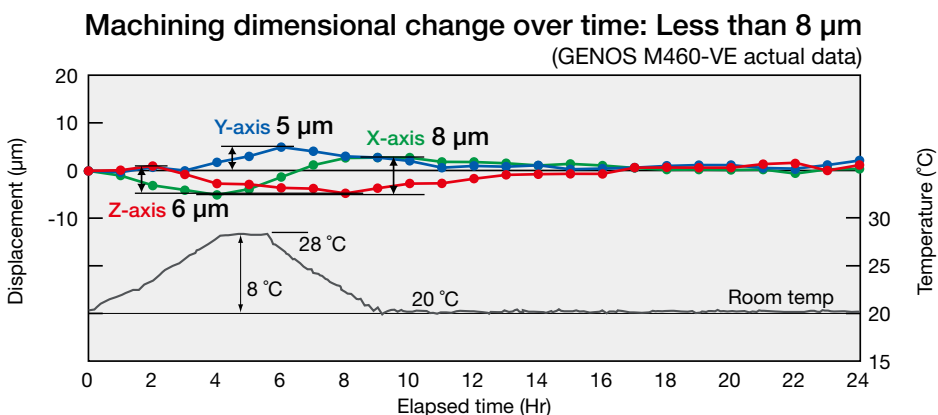
■ Zero alignment drive / center drive

Table center aligns with ball-screw center (center drive)

Workpiece

Table

Guideway "center" aligns with ball-screw center (zero alignment center)

[Y axis]   Guide   Ball screw center

High dimensional stability

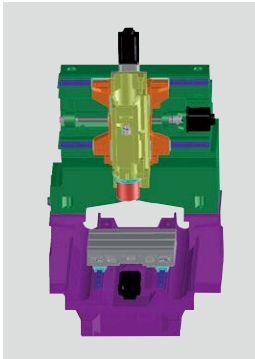Manageable Deformation—Accurately Controlled
Thermo-Friendly Concept

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.

Machining dimensional change over time: Less than 8 μm

(GENOS M460-VE actual data)

Y-axis 5 μm
X-axis 8 μm
Z-axis 6 μm

28 ℃
8 ℃
20 ℃
Room temp

■ **TAS-C: Thermo Active Stabilizer—Construction**

"Proactively" keeps the machine [construction] in optimum, stable condition during shop environment temperature change resulting in superb (stable) machining accuracies.

■ **TAS-S: Thermo Active Stabilizer—Spindle**

Accurate compensation during spindle start/stops, and speed changes.

Spindle speed: 8,000 min⁻¹
Coolant use: Yes
Tool: ø6 end mill

## ■ Simplified structure for thermal deformation / Design technology for uniform dissemination of heat

The machine expands and contracts in predictable directions, and manageable deformation is achieved with a machine structure that evenly transmits the temperature.

■ Insulation measures from coolant, chips

Chips with heat produced by machining are quickly removed before heat is transferred to machine.

Thermally symmetric structure
Equal left-right construction permits straightforward thermal distortion
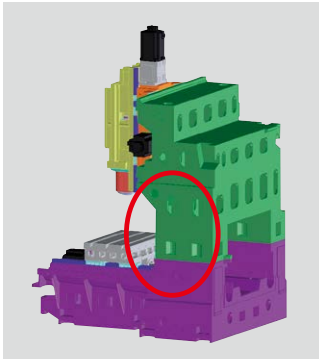
"Box-build" structure
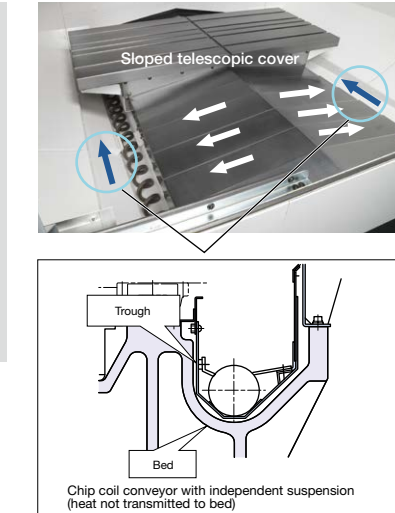Column structure built up of simple blocks is used to permit straightforward thermal distortion
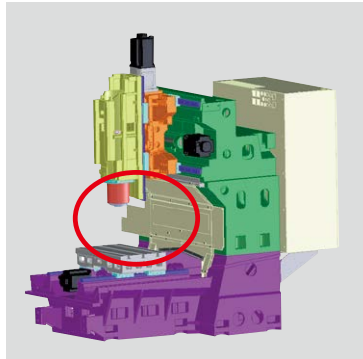
Thermally balanced structure
A cover is set on the front of the column and the control cabinet on the back for even conduction of temperature.

Sloped telescopic cover

Trough

Bed

Chip coil conveyor with independent suspension (heat not transmitted to bed)

Improved productivity with powerful machining
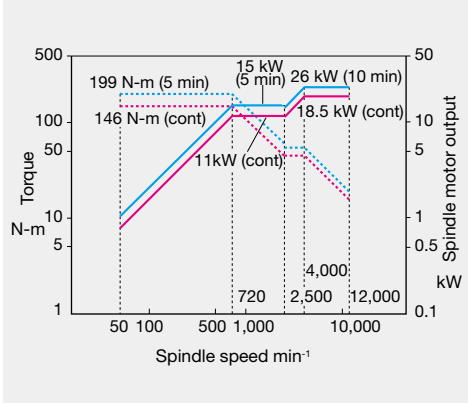
Spindle specifications

■ Wide-range spindle (standard)

Spindle speed: 15,000 min⁻¹
Spindle motor output: 22/18.5 kW (10 min/cont)
Torque: 199 N-m (146 ft-lbf)
Tapered bore: 7/24 taper No. 40
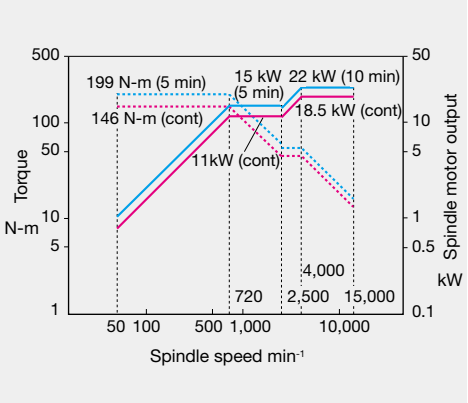
■ Wide-range spindle (option for M560-V, M660-V)

Spindle speed: 12,000 min⁻¹
Spindle motor output: 26/18.5 kW (10 min/cont)
Torque: 199 N-m (146 ft-lbf)
Tapered bore: 7/24 taper No. 50

■ Machining capacity

● **15,000 min⁻¹ wide-range spindle** [Actual data]

Tool	Spindle min⁻¹ (rpm)	Cutting m/min (fpm)	Feedrate mm/min (ipm)	Width mm (in)	Depth mm (in)	Amount cm³/min (in³/min)
ø80 face mill 8 blades (cermet)	895	225 (739)	3,000 (118)	56 (2.20)	3 (0.12)	504 (31)
ø20 roughing end mill 7 flutes (carbide)	4,000	251 (824)	4,800 (189)	7 (0.28)	20 (0.79)	672 (41)
ø63 insert drill (carbide)	720	142 (466)	108 (4.3)	—	—	—
M30 x 3.5 tap	318	30 (99)	1,113 (44)	—	—	—

Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting, and other conditions. (Workpiece: S45C)

Shorter cutting times and highly accurate machining

■ Hi-Cut Pro (standard)

A speed and acceleration controller to make sharper corners and smoother arcs—ideal for the extra accurate and quicker cycle time jobs.

Hi-Cut Pro Off

Hi-Cut Pro On

Round corners

Sharp corners
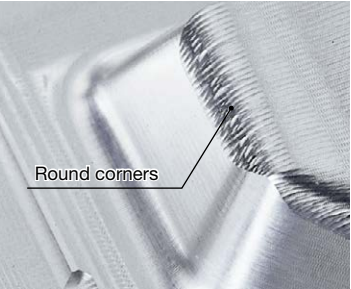
Truly machinist oriented, superb ease-of-use machine operation

For smooth machining preparations

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

- Tool load/unload button on spindlehead

- Simple and accurate zero setting with auto gauging (Optional)

- Simple and accurate tool information input with auto tool length compensation (Optional)

Actual required footprint

M460-VE 8.0 m²

Power line, chip disposal maintenance location

Air supply maintenance location

ATC magazine door

2,810 (110.63)
3,580 (140.94)
2,225 (87.60)

M560-V 10 m²

Power line, air supply and chip disposal maintenance location

ATC magazine door

3,194 (125.75)
3,875 (152.56)
2,564 (100.94)

M660-V 13 m²

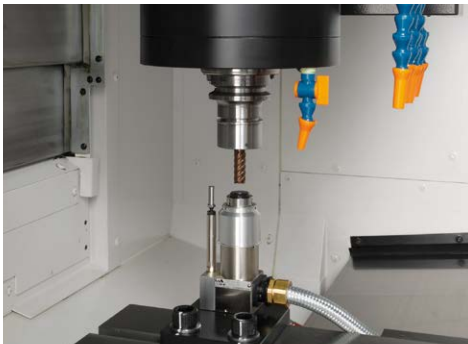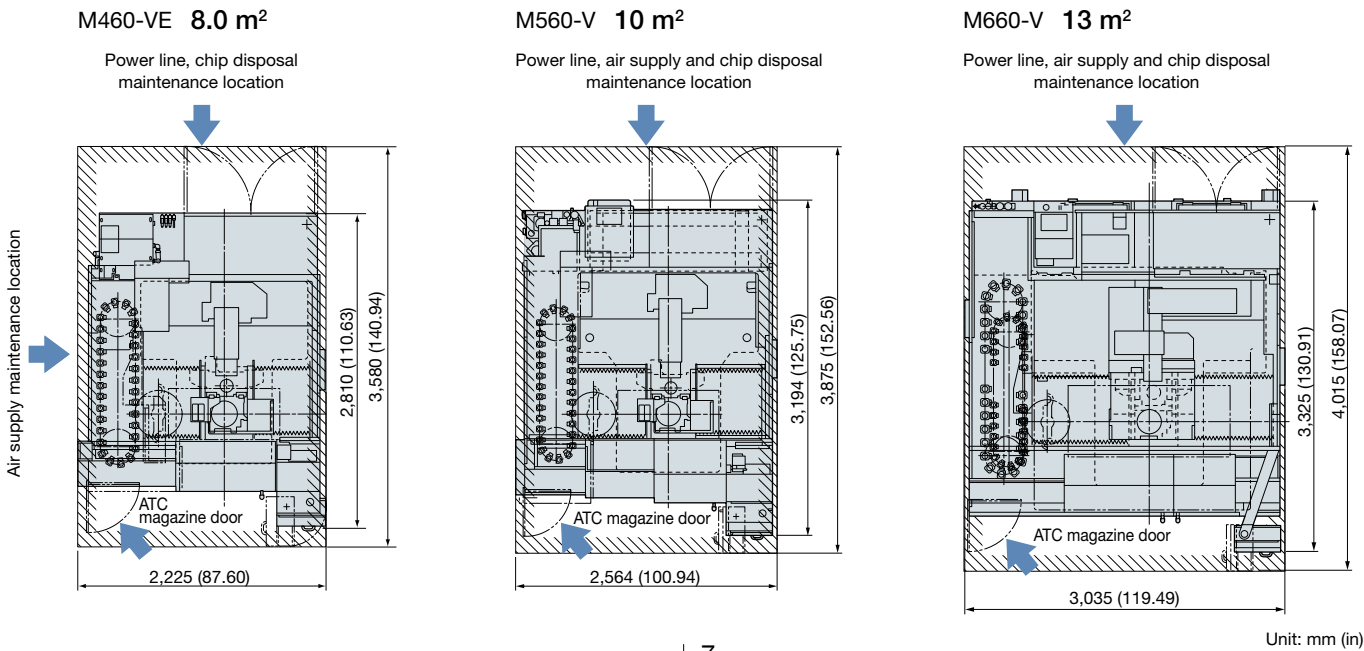Power line, air supply and chip disposal maintenance location

ATC magazine door

3,325 (130.91)
4,015 (158.07)
3,035 (119.49)

Unit: mm (in)

With wide opening for easy workpiece access and setup changes

■ **Outstanding ease of use**
- Wide door opening : 850 mm (1,323 mm/1,510 mm)
- Approach to table : 210 mm (215 mm/235 mm)
- Table height : 800 mm (800 mm/850 mm)   ( ) for M560-V/M660-V

Photo shows a M560-V

Wide opening

GENOS M460-VE : **850 mm**
GENOS M560-V : **1,323 mm**
GENOS M660-V : **1,510 mm**

460 Table
230 460 230
Travel Y travel Travel
800 Table top
210 Approach to table
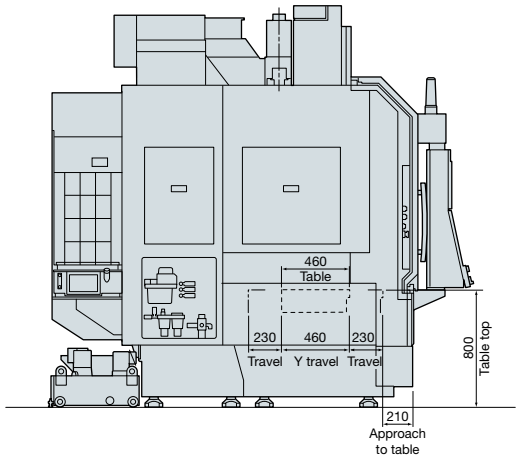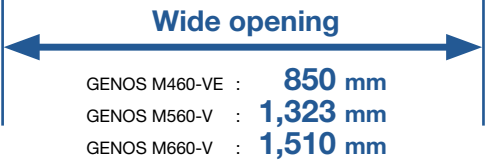
Unit: mm

	M460-VE	M560-V	M660-V
Table	460	560	660
Table top	800	800	850
Y travel	460	560	660
Travel	230	280	330
Approach to table	210	215	235

Drawing shows GENOS M460-VE

Chip discharge

Large coolant tank with max 190 L (230 L / 460 L) [effective 100 L (120 L / 270 L)]

Large 60 L (69 L / 92 L) chip pan   ( ) for M560-V / M660-V

In-machine chip conveyor (coil)

(Machine front)   (Machine rear)

Table
Bed
Chip pan
Coolant tank

Coolant system

Chip Pan
Workpiece washing gun pump (Optional) 250 W
Chip flusher pump (Optional) 400 W
Shower coolant pump (Optional) 250 W
Filter
Coolant nozzle pump 250 W
Oil level gauge
Filter
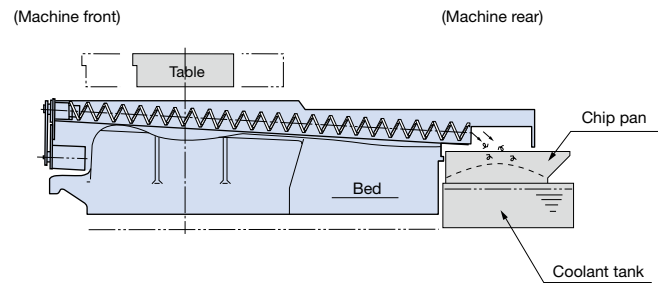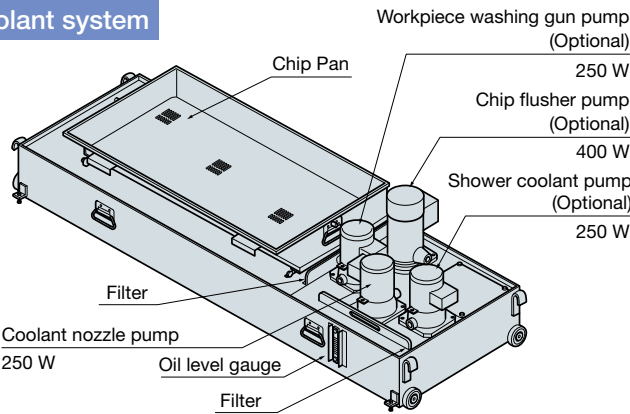
Drawing shows GENOS M460-VE

Hi-tech Okuma mechatronics for advanced machining applications

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

Push cutting conditions higher to increase profit

Machining Navi instantly determines the optimal cutting conditions for highly efficient machining.

Range with chatter (gray area)

Axial cutting

Range without chatter
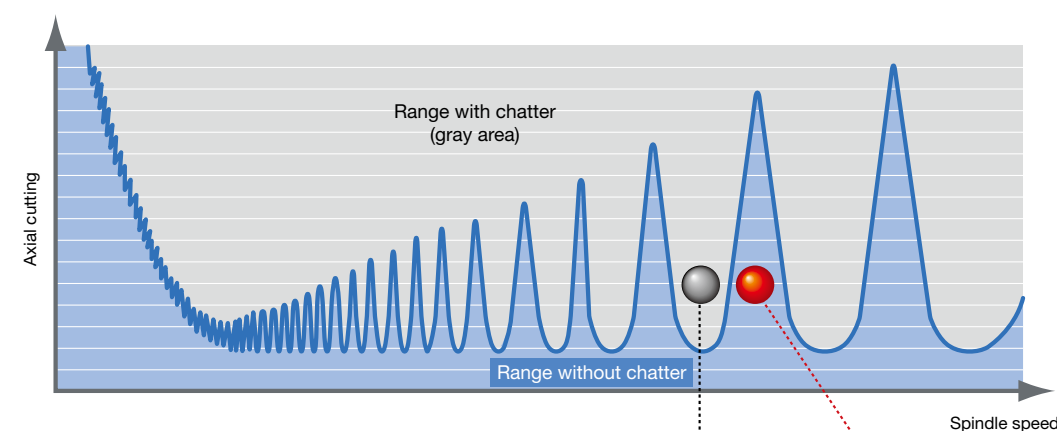
Spindle speed

Spindle speed and chatter are linked in a periodic manner, manifesting as alternating ranges with and without chatter. This means that there will be cases in which chatter cannot be suppressed with a reduction in spindle speed, and other cases where increasing the spindle speed will eliminate the chatter. Machining Navi navigates the extremely difficult process of finding the optimal spindle speed value by analyzing chatter and instantly determining (powerful computing) the best spindle speed.

Machining Navi OFF

Machining Navi ON

Cutting conditions can be changed while looking at analysis results

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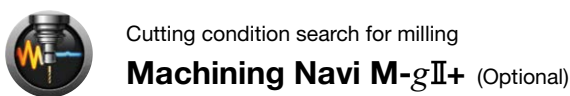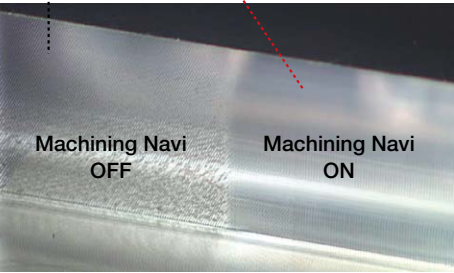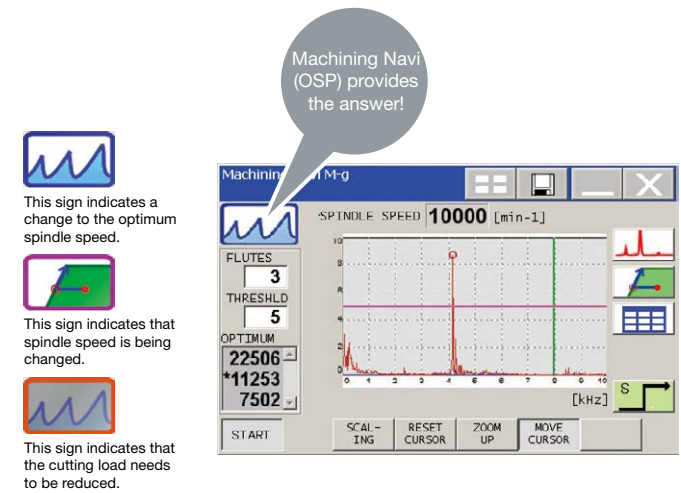e screen. The operator can change to the indicated spindle speed with a single touch and immediately confirm the result.

Machining Navi (OSP) provides the answer!

This sign indicates a change to the optimum spindle speed.

This sign indicates that spindle speed is being changed.

This sign indicates that the cutting load needs to be reduced.

With a variety of eco-friendly features

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 technology

■ **Energy-saving NC unit**
· Computer in a flat panel with a high-performance CPU
· Power-saving design
· LCD (Liquid Crystal Display) used

Power consumption
Reduced 60% (compared to previous Okuma machine)

NC unit power consumption (%)

(%)
120
100
80
60
40
20
0

1990s OSP	2000s OSP	OSP-P300
136%	100%	40%
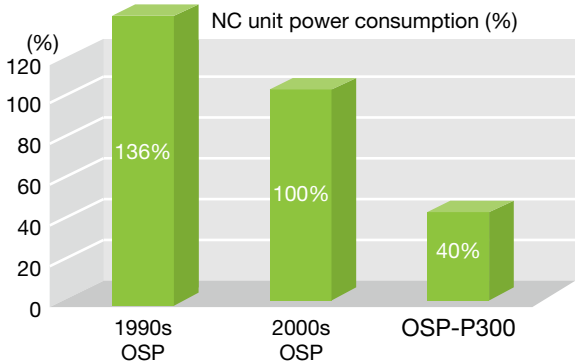
■ **Energy-saving drive unit**
· Low-loss power transistor used
· Power regeneration system used

Power consumption
Reduced 15% (compared to previous Okuma machine)

Servo unit power consumption (%)

(%)
100
80
60
40
20
0

Previous Okuma machine	GENOS M460-VE
100%	85%
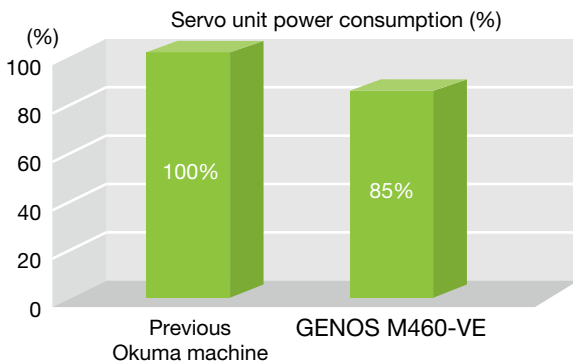
Machine Specifications

Model			GENOS M460-VE	GENOS M560-V	GENOS M660-V
Travels	X axis (ram saddle horizontal) mm (in)		762 (30.00)	1,050 (41.34)	1,500 (59.06)
	Y axis (table front/back) mm (in)		460 (18.11)	560 (22.05)	660 (25.98)
	Z axis (spindle vertical) 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 to 31.89)
Table	Max work dimension mm (in)		1,000 x 460 (39.37 x 18.11)	1,300 x 560 (51.18 x 22.05)	1,530 x 660 (60.24 x 25.98)
	Floor to table top mm (in)		800 (31.50)		850 (33.46)
	Max load capacity kg (lb)		700 (1,540)	900 (1,980)	1,500 (3,300)
Spindle	Max spindle speed min^{-1}		15,000 [12,000]		
	Speed ranges		Stepless		
	Tapered bore		7/24 taper No. 40 [7/24 taper No. 50]		
	Bearing dia mm (in)		ø70 (2.76) [ø90 (3.54)]		
Feedrate	Rapid traverse m/min (ipm)		X-Y: 40, Z: 32 (X-Y: 1,575, Z: 1,260)		
	Cutting feedrate m/min (ipm)		X-Y-Z: 32 (1,260)		
Motors	Spindle (5 min/cont) kW (hp)		22/18.5 (30/25) [26/18.5 (35/25)]		
	Feed axes kW (hp)		X-Y-Z: 3.5 (4.7)		X-Y-Z: 4.6 (6.1)
ATC	Tool shank		CAT40 BIG-PLUS® [CAT50 BIG-PLUS®]		
	Pull stud		CAT [CAT Special]		
	Tool capacity tool		32		
	Max tool dia (w/adjacent tool) mm (in)		ø90 (3.54) [ø100 (3.94)]		
	Max tool dia (w/o adjacent tool) mm (in)		ø125 (4.92) [ø152 (5.98)]		
	Max tool length mm (in)		300 (11.81)		400 (15.75)
	Max tool weight kg (lb)		8 (18) [12 (26)]		
	Max tool moment N-m (ft-lbf)		7.8 (5.7) <8 kg x 100 mm (17.6 lb x 3.94 in)> [15.3 (11.3) <12 kg x 130 mm (26.4 lb x 5.12 in)>]		
	Tool selection		Memory random		
Machine Size	Height mm (in)		2,746 (108.11)		3,295 (129.72)
	Floor space length x width mm (in)		2,225 x 2,810 (87.60 x 110.63)	2,564 x 3,194 (100.94 x 125.75)	3,035 x 3,325 (119 x 131)
	Weight kg (lb)		7,000 (15,400)	8,300 (18,260) [8,500 (18,700)]	11,500 (25,300) [12,200 (26,840)]
Control			OSP-P300MA		

[ ]: M560-V, M660-V No. 50 Spindle (Optional)

Standard Specifications and Accessories

Item	Description	Item	Description
Spindle cooling system	Oil controller	TAS-S	Thermo Active Stabilizer–Spindle
Air cleaner (filter)	Including regulator	TAS-C	Thermo Active Stabilizer–Construction
Spindle oil-air lubrication system		CAT-40U tool shank	
ATC magazine shutter		Dual contact spindle	BIG-PLUS®*2 (spindle nose)
Tool unclamp package		CAT-40U pull studs	20 pcs (thru-spindle applications)
Coolant supply systems tank capacities *1 — M460-VE	190 L (50 gal) (100 L (26 gal) effective), 250 W pump	In-machine chip conveyor	Coil
		Floor-type chip conveyor preparations	ConSep interface; electricals only
M560-V	230 L (61 gal) (120 L (32 gal) effective), 250 W pump	Chip pan*3 — M460-VE	60 L (16 gal) (effective)
		M560-V	69 L (18 gal) (effective)
M660-V	460 L (122 gal) (270 L (71 gal) effective), 390 W pump	M660-V	92 L (24 gal) (effective)
		7.0 MPa thru-spindle preparations	Includes thru-spindle air blow during spindle rotation; system additional
Coolant nozzle	Flexible nozzles (5)		
ATC air blower (blast)		M codes	8 signals
Chip air blower (blast)	Nozzle type	IEC compliant	International Electrotechnical Commission
Foundation washers (with jack bolts)	8 pcs		
3-lamp status indicator	Type C (LED signal tower)	Transformer	
Work lamp		OSP-P300MA	3D-D Kit (15-in XGA panel)
Full enclosure shielding	With ceiling	Inch/metric switchable settings	
Tapered bore cleaning bar		API library 1	
Hand tools			
Tool box			
Operation panel with color LCD			
Pulse handle			

*1. Use water-based coolant.
*2. Please select this optional BIG-PLUS® specification when using BIG-PLUS® toolholders.
*3. A required option.

Optional Specifications

Item	Description	Item	Description
Wide-range spindle (Option for M560-V, M660-V)	50 to 12,000 min^{-1} VAC 26/18.5 kW NT50	Shower coolant system	
NC rotary table (A-axis)	Please specify type details	Workpiece washing gun	
Preps for NC rotary table	Includes 1 additional axis	Tool breakage detection	Touch sensor activated
High crossrail (Option only for 560-V)	+200 mm	Auto zero offset/auto gauging	W/auto tool length offset (Renishaw probe)
Lift-up chip conveyors	Rear right side discharge See "Recommended" below	Auto door (front operation)	
		Machining Navi	M-gⅡ+
Thru-spindle coolant system*	1.5 MPa (217 psi)		
	7 MPa (1,015 psi)		

* Okuma pull studs required.
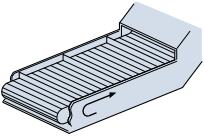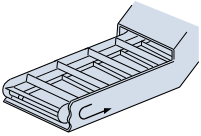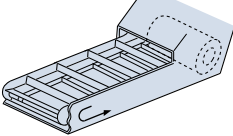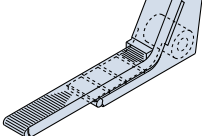
Recommended chip conveyors

Please contact an Okuma sales representative for details.

○: Recommended
△: Recommended w/with conditions

Material		Steel	FC	AL/Nonferrous metal	Mixed (general use)
Chip shape					
In-machine	Chip flusher (Opt)	—	○(wet)	○	—
	Coil (Std)	○	○(dry/wet)	—	○
Off-machine (Optional)	Hinge	○	—	—	△ (*4)
	Scraper	—	○(dry)	—	—
	Scraper (drum filter)	—	○(wet) with magnet	△ (*3)	—
	Hinge + Scraper (drum filter)	△ (*1)	△(wet) (*2)	○	○

*1. When there are many fine chips
*2. When chips are longer than 100 mm
*3. When chips are not longer than 100 mm
*4. When there are few fine chips
Caution: fire prevention measures are necessary when using oil-based coolants.

■ Off-machine lift-up chip conveyors

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

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

OSP suite OSP-P300MA

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.

Smooth operations even with wet or work-gloved hands

Enlarge

Note: Collision Avoidance System (Optional) shown above.

"Just what we wanted."— Refreshed OSP suite apps

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

Routine inspection support
Maintenance Monitor

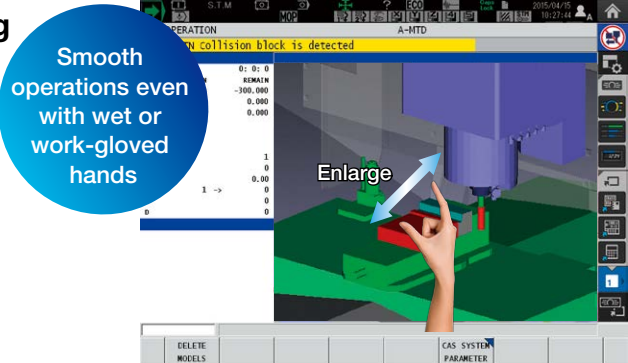The Maintenance Monitor displays items for inspections before starting daily operation and regular inspections and the rough estimate of inspection timing. Touching the [INFO] button displays the PDF instruction manual file of relevant maintenance items.

[INFO] button

Increased productivity through visualization of motor power reserve
Spindle Output Monitor
S11

Monitoring operating status even when away from the machine
E-mail Notification
S15

Comment display for greater ease of use and faster work
Common Variable Monitor
S17

Automatic saving of recorded alarms
Screen Capture
S16

Easy programing without keying in code
Scheduled Program Editor
S10

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.

Machine tool and PC

Connect
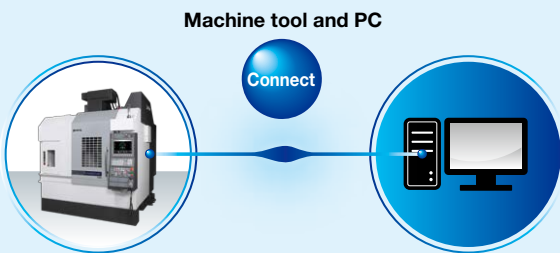
Interactive operations
Advanced One-Touch IGF-M (Optional)

The objective: simple programming

Machining processes can be newly added or revised on the Machining Order Table.
Each process can be set freely with tool units, and knowhow can be input with the edit function with a high degree of freedom.
The recommended value is automatically set when new additions are made.

Processes can be added or have their order changed for each tool on the Machining Order Table

■ Tool path, cutting conditions...

Details are established in window

■ Approach/relief, cutting depth movement

Key items changed directly on Machining Order Table

Simple operations for 1st part machining jobs

Can be operated directly from Machining Order Table.
When a problem is detected it can be quickly corrected and checked, speeding up first part machining.

Mid-cycle start/single cycle start by simply selecting target on Machining Order Table

Immediate editing from Machining Order Table

Selected overall

Selected range

Cycle start

Tool path, cutting conditions...

Approach/relief, cutting depth movement

■ Standard Specifications

Basic Specs	Control	X, Y, Z simultaneous 3-axis, spindle control (1 axis)
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Coordinate functions	Machine coordinate system (1 set), work coordinate system (20 sets)
	Min / Max command	±99999.999 mm, ±9999.9999°, 8-digit decimal, command unit: 0.001 mm, 0.01 mm, 1 mm, 0.0001°, 0.001°, 1°
	Feed	Cutting feed override 0 to 200%, rapid traverse override 0 to 100%
	Spindle control	Direct spindle speed commands, override 30 to 300%, multi-point indexing
	Tool compensation	No. of registered tools: Max 999 sets, tool length/radius compensation: 3 sets per tool
	Display	15-inch color LCD + multi-touch panel operations
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
Programming	Program capacity	Program storage: 4 GB, operation buffer: 2 MB
	Program operations	Program management, editing, scheduled program, fixed cycle, G-/M-code macros, arithmetic, logic statements, math functions, variables, branch commands, coordinate calculate, area machining, coordinate convert, programming help
Operations	"suite apps"	Applications to graphically visualize and digitize information needed on the shop floor
	"suite operation"	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	"Single-mode operation" 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, self-diagnostics, 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		TAS-S (Thermo Active Stabilizer—Spindle), TAS-C (Thermo Active Stabilizer—Construction), Hi-G Control, Hi-Cut Pro, pitch error compensation
Energy-saving function	ECO suite	ECO Idling Stop*1, ECO Power Monitor*2

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

■ 3D-D Kit Specifications

OSP-P300MA

Item	Description	3D-D
Auto program schedule update	To change a part program during a scheduled run	○
Program notes (MSG)	To show notes in part program screens	○
Coordinate system selection	200 sets (Std: 20 sets)	○
Helical cutting (within 360°)	To machine large-diameter screws with angular cutters	○
Synchronized Tapping II	Fast & accurate rigid tapping (synchronized spindle speed, angle, feed axis position)	○
Programmable travel limits	Per G22, G23	○
Arbitrary angle chamfering	Easy any-angle chamfering (C, R)	○
Programmable mirror image		○
Enlarges and reduces drawings		○
Tool life management	Tools automatically replaced per No. of workpieces or cycle times	○
Auto power shut-off	At auto run end or preset times	○
Sequence stop	Machining stopped at designated sequence No.	○
Mid-block sequence return	Restart sequence from mid-block	○
Real 3-D simulation	Real time simulation of all machining modes (auto, MDI, manual)	○
I-MAP	Easy part program editing per guide maps (with drawing calculate)	○
Simple load monitor	Spindle load (stops machining at overload)	○
NC operation monitor	Time totals (cutting, operation, spindle rotation, external input, etc) and 4 workpiece counters	○
Cycle time reduction	Reduces/shortcuts operation procedures	○
Manual gauging (w/o sensor)		○
Tool wear compensation	Corrects tool edge position per amount of tool wear (No. of comp sets same as tool comp)	○

3D: Real 3-D simulation

■ Control OSP-P300MA Optional Specifications

Item	Description	Item	Description
Machning Navi M-gII+	Recorded chatter analyzed for optimum cutting condition	Hyper-Surface*	Fast, high-precision applications (shape comp, adaptive control)
Collision Avoidance System*	Auto/manual modes (blank stock removal)	Warm-up	Auto power ON at preset times
Common variables	1,000 (standard is 200)	External program selection	Pushbutton, rotary switch, BCD, digital switch
Program branch	ON/OFF external switch (part program)	Tool grooving	Flat-tool free-shaped grooving (XY/spindle)
Cylindrical side facing	Easier to execute	Circuit breaker	
User task 2	Input/output variables (16 each)	Monitor display language	Multiple language specifications
3-D tool compensation	Offset directions per I-J-K commands	Rotary table additional axes	2 or more axes
RS-232C interface		OSP-VPS	Virus Protection System
DNC	-T3, -B (232C→Ethernet converter required), -DT		

* There are limitations when Hyper-Surface and Collision Advance System are used simultaneously.

■ Table size

T-slot detail (Unit: in)
(3 slots)

■ Working ranges

■ Dimensional drawing / Installation drawing

Power inlet
37 KVA □ 50 mm² 4C
Height from floor: 750 mm or 2,150 mm

Air inlet
Height: 456 mm, Rc3/8 internal
Required capacity 500 L/min (ANR)
More than 0.5 MPa
Supplied air temperature should be within +5°C

1.5-MPa thru-spindle coolant unit
(Opt)

* H1000 lift-up chip conveyor specifications

■ Table size

■ Working ranges

1,050 (41.34)
Spindle travel range (X axis)

92.5 (3.64)
125 (4.92)
125 (4.92)
125 (4.92)
125 (4.92)
92.5 (3.64)

560 (22.05)
Table travel (Y axis)

1,300 (51.18)
Table length

T-slot
Cross groove

0.81H7 +0.0008/0
0.28

Cross groove detail (Unit: in)

0.81H7 +0.0008/0
0.79 -0.02

1.38 +0.091/-0.003
0.61 +0.015/-0.016

T-slot detail (Unit: in)
(4 slots)

Travel 560 (22.05)
280 (11.02)   280 (11.02)

Travel 1,050 (41.34)
525 (20.67)   525 (20.67)

Z-axis travel (spindle vertical)
Y-axis travel (table F/B)
Z-axis travel (spindle vertical)
X-axis travel (ram saddle horizontal)

Travel 460 (18.11)
150 (5.91)

560 (22.05)
Table width

650 (25.59)   650 (25.59)
1,300 (51.18)
Table width

■ Dimensional drawing / Installation drawing

Power inlet
37 KVA □ 50 mm² 4C
Height from floor: 750 mm or 2,150 mm

500 (Margin)
3,840 *4,190 (151.18 *164.96)
500 (Margin)
500 (Margin)

Transformer

130 1,230 (48.42) 1,200 (47.24)
450 (17.72) 870 (34.25)
100

Air inlet
Height: 954 mm, Rc3/8 internal
Required capacity 500 L/min (ANR)
More than 0.5 MPa
Supplied air temperature should be within +5°C

Tank removal direction

NC cabinet

430 (16.93)
89
600 (23.62)
100

1,330 (52.36)

1.5-MPa thru-spindle coolant unit (Opt)

357

3,194 (125.75)
3,875 (152.56)

1,185

32-tool ATC

Spindle center

10
310

90 (3.54) 2,430 (95.67) 44 (1.73)
2,564 (100.94)
170 (6.69)
500 (Margin)

32-tool ATC
Spindle center
Spindlehead cooler
Air unit
Chip pan

2,150 (84.65)
1,400 (55.12) CNC cabinet height
2,746 (108.11)

750 (29.53)
490 (19.29)

Tank removal direction
Coolant tank

89 (3.50)
280 Move 560 280 Move
Y-axis travel
845 (33.27)

560 Table width

1,950 (76.77)
511 (20.12)
2,884 (113.54)
310 (12.20)

ATC magazine door
ATC operation panel
FL

Tool load/unload button (in-MC)
Signal tower
Pulse handle
Operation panel

146 (5.75)

525 Move 525 Move

Z-axis travel
460
61 *33
610
730
150
700 *1000

2,295 (90.35)
2,600 (102.36)

1,050 X-axis travel
1,300 Table full length

70

380 (14.96) 667 (26.26) 743 580 440
1,323 (52.09) (Doors open) 200 1,020(40.16)
1,410 (55.51) 230 *380 (17.32)
3,840 *4,190 (151.18 *164.96)

600 *800 (23.62 *31.50)
Lift-up chip conveyer (Opt)
Chip bucket (Opt)

* H1000 lift-up chip conveyor specifications

■ Table size

■ Working ranges

1,500 (59.05)
Spindle travel range (X axis)

80 (3.15)
125 (4.92)
125 (4.92)
125 (4.92)
125 (4.92)
80 (3.15)

660 (25.98)
Table travel (Y axis)

1,530 (60.24)
Table length

T-slot
Cross groove

0.81H7 +0.0008/0
0.28

Cross groove detail (Unit: in)

0.81H7 +0.0008/0
0.79 -0.02

1.38 +0.091/-0.003
0.61 +0.015/-0.016

T-slot detail (Unit: in)
(4 slots)

Travel 660 (25.98)
330 (12.94)   330 (12.94)

Travel 1,500 (59.06)
750 (29.53)   750 (29.53)

Z-axis travel (spindle vertical)
Y-axis travel (table F/B)
Z-axis travel (spindle vertical)
X-axis travel (ram saddle horizontal)

Travel 660 (25.98)
150 (5.91)

660 (25.98)
Table width

765 (30.12)   765 (30.12)
1,530 (60.24)
Table length

■ Dimensional drawing / Installation drawing

500 (Margin)
4,350 4,670* (171.26 183.86*)
500 (Margin)

Power inlet
38 KVA □ 50 mm² 4C
Height from floor: 770 mm or 2,170 mm

Transformer

450 (17.72) 130
200 430 (16.93) 1,740 (68.50) 1,200 (47.24)
56

Air inlet
Height: 943 mm, Rc3/8 internal
Required capacity 500 L/min (ANR)
More than 0.5 MPa
Supplied air temperature should be within +5°C

Tank removal direction

NC cabinet

45
86
600 (23.62)
551
610 (24.02)
59

1,330 (52.36)

1.5-MPa thru-spindle coolant unit (Opt)

No. 50 32-tool ATC (Opt)
No. 40 32-tool ATC

3,325 (130.91)
4,015 (158.07)

Spindle center

50 2,940 (115.75) 45
515 515
3,035 (119.49)
180
500 (Margin)

Spindlehead cooler
ATC operation panel
Air unit
Chip pan

2,170 (85.43)
1,400 CNC cabinet height
770 (30.31) 490

Tank removal direction
Coolant tank

3,295 (129.72)

330 Move 330 Move

660 Table width
660 Y-axis travel

430 85/95 2,985 (117.52) 340
3,420 (134.65)
3,935 (154.92)

ATC magazine door
Operation panel

Tool load/unload button (in-MC)
Signal tower

695 (27.36)

722 *849 108 *301

750 Move 750 Move
1,500 X-axis travel

Pulse handle
Table top

660 Z-axis travel
2,455 (96.65)
67 *39
810

1,235 (48.62)

1,530 Table full length

150
700 *1000
760
2,600 (102.36)

FL

70

Chip bucket (Opt)
Lift-up chip conveyor (Opt)

380 932 1,510 (Doors open[2]) 498
200 607 103
1,031 1,302 (Doors open[1])
230 *350 (9.06 *13.78)
600 *800 (23.62 *31.50)
4,350 *4,670 (171.25 *183.86)

* H1000 lift-up chip conveyor specifications
*1. Door opening operation
*2. Maximum door open width

GENOS

The origin of gene, from Greek *genos*

meaning race, offspring, origin

(pronounced "*γένος*" as in "generous")

Global
Efficient
No.1
Standard

OKUMA

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