

 **OKUMA**

Vertical Machining Center

GENOS M460-VE



A purebred from the best selling MB-V.
Okuma's Global Machine
for today's world.

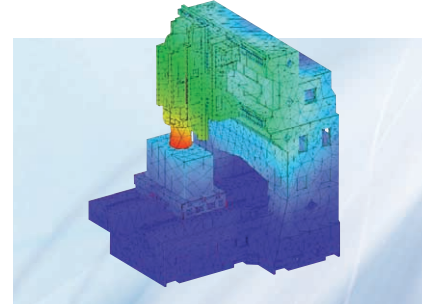
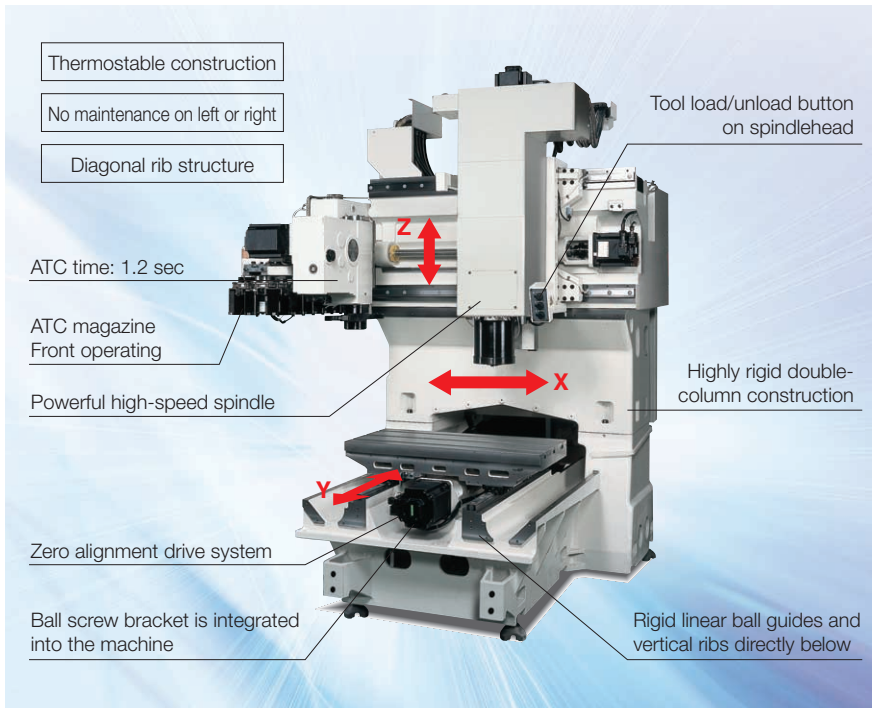
Vertical Machining Center

GENOS M460-VE

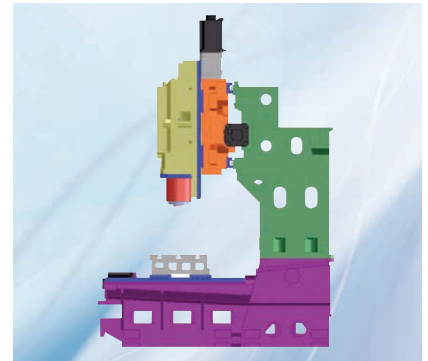
With world-class

Highly rigid construction

- Optimum design based on exhaustive structural analysis
- Uses diagonal ribs and highly rigid linear ball guides
- Bed with strong vertical ribs, and zero-alignment ball-screw drive system
- Long-life structure that maintains high accuracy and high rigidity over many years



3D-CAD, FEM analysis fully utilized



Small overhang from machining point to slideway for efficient cutting

Directly linked to profits

High accuracy, high productivity

- With Thermo-Friendly Concept
Extremely small machining dimensional change over time with high thermostability
- High speed operation and high power reduce machining time

Thermo-Friendly Construction

- Thermally symmetric and "box-build" structure
- Thermally balanced structure (no tilting)
- Heat dissipation from heat source and insulation from cutting heat



Thermal deformation over time $\leq 8\mu\text{m}$

Per 8°C room temp change (TAS-C)

1
Minimal thermal deformation

2
Manageable thermal deformation

3
Accurate compensation

Reduced non-cutting time

- Rapid traverse X, Y axes: 40 m/min (1,575 ipm)
- Tool change time (T-T): 1.2 sec
- Rapid acceleration: Max 0.7 G

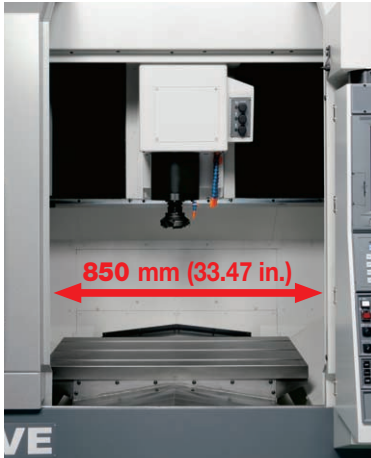
Shorter cutting times

- High output spindle motor: 12,000 min⁻¹ 22/18.5 kW (30/25 hp)
- Stock removal: 420 cm³/min (S45C, ø100 face milling)



Machinist oriented
Ease of use

- Smart & simple designing—that means easy-to-use component layout
- OSP-P200M provides both advanced functions and ease of use



- ATC magazine Front operation
- Tool load/unload button on spindlehead
- Large door opening: 850 mm
- Approach to table: 210 mm
- Table height: 800 mm
- No maintenance on left or right



Tool magazine



Tool load/unload button



Left side

Right side

■ **OSP-P200M**

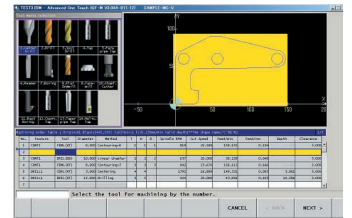
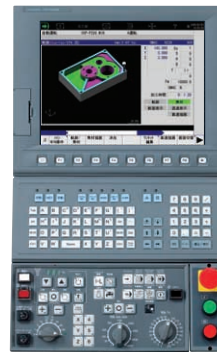
- Touch panel for smooth and comfortable operation
- Necessary indications on single screen with large display
- Large 2 GB program storage
- Can connect to network with RS-232-C, Ethernet, USB

[Optional]

Machining Navi M-g (finds best cutting conditions)

Collision Avoidance System (prevents interference)

Advanced One-Touch IGF (interactive operation)



Outstanding
Environmental friendliness

- Ecology & economy specs that eliminate waste



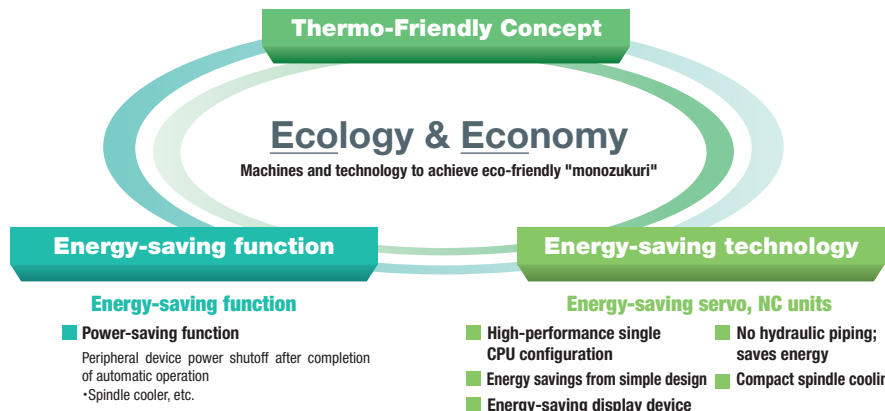
Environmental economic benefits of Okuma's Thermo-Friendly Concept

- No hydraulic unit
(Electric pump cylinder used for tool load/unload)
- Clean plant environment with full enclosure shielding with ceiling
- Low noise linear ball guides with (quiet motion)
- Oil controller controlled by power-saving inverter

In environments with normal temperature changes, machining accuracies equivalent to those in temperature-controlled rooms are achieved. As long as the operator is comfortable, there is no need for air conditioning to ensure accuracy.

■ Amount of energy consumed for temperature-controlled room per year **Savings of approximately 135,000 kWh** (*1)

Prevents CO2 emissions equivalent to about 7,500 beech trees



*1. Calculations are examples only, and may differ from actual circumstances. Temperature-controlled room capacity: 10 m × 10 m × H3 m ±2°C

Machine Specifications

Model		GENOS M460-VE	
Travels	X-axis (ram saddle R/L)	mm (in.)	762 (30.00)
	Y-axis (table B/F)	mm (in.)	460 (18.11)
	Z-axis (spindle U/D)	mm (in.)	460 (18.11)
	Table top to spindle nose	mm (in.)	150-610 (5.91~24.02)
Table	Max work dimension	mm (in.)	1,000 x 460 (39.37 x 18.11)
	Floor to table top	mm (in.)	800 (31.50)
	Max load capacity	kg (lb)	700 (15.40)
Spindle	Spindle speed	min ⁻¹	12,000
	Speed ranges		Infinately variable
	Tapered bore		7/24 taper No. 40
	Bearing dia	mm (in.)	ø70
Feedrate	Rapid traverse	m/min (ipm)	X-Y: 40, Z: 32 (X-Y: 1,575, Z: 1,262)
	Cutting feedrate	m/min (ipm)	X-Y-Z: 32 (1,260)
Motors	Spindle	kW (hp)	22/18.5 (30/25)
	Feed axes	kW (hp)	X-Y-Z: 4 (5.4)
ATC	Tool shank		CAT40 Big Plus
	Pull stud		CAT Special
	Tool capacity	tool	32
	Max tool dia (w/adjacent tool)	mm (in.)	ø90 (3.54)
	Max tool dia (w/o adjacent tool)	mm (in.)	ø125 (4.92)
	Max tool length	mm (in.)	300 (11.81)
	Max tool weight	kg (lb)	8 (18)
	Max tool moment	N-m (ft-lbf)	7.8 (5.7) [8 kg x 100 mm (17.6 lb x 3.94 in.)]
Machine Size	Tool selection		Memory random
	Height	mm (in.)	2,746 (108.11)
	Floor space	mm (in.)	2,160 x 2,805 (85.04 x 110.43)
	Weight	kg (lb)	6,500 (14,300)
Control			OSP-P200M

[]: Optional



GENOS M460-VE

Standard Specifications

Item	Description	Item
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		BIG-PLUS spindle system
Tool unclamp package		CAT-40U pull studs; 20 pcs (thru-spindle applications)
Coolant supply systems tank capacities *1	190 L (100 L effective), 250-W pump	In-machine chip conveyor (coil)
Coolant nozzle	Flexible nozzles (5)	Floor-type chip conveyor preparations (ConSep interface; electricals only; conveyor additional)
Chip flusher system *1	Table both sides	Chip pan; 60 L (16 gal) (effective)
ATC air blower		7.0 Mpa thru-spindle preparations (includes thru-spindle air blow during spindle rotation; system additional)
Chip air blower	Nozzle type	M codes: 8 signals
Foundation washers (with jack bolts)	8 pcs	IEC compliant (International Electrotechnical Commission)
3-lamp status indicator	Type C (LED signal tower)	Transformer preparations (transformer additional)
Work lamp	Fluorescent	OSP-P200M; 3-D E Kit (15-in. XGA panel)
Full enclosure shielding	With ceiling	Inch/metric unit 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.

Spindle output/torque diagram

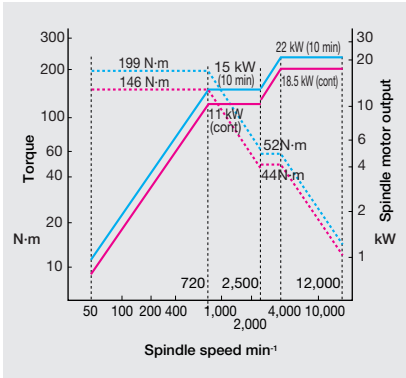
Wide-range spindle

Spindle speed: 12,000 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

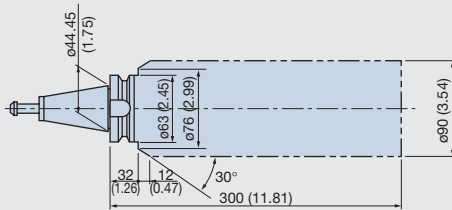


Optional specifications

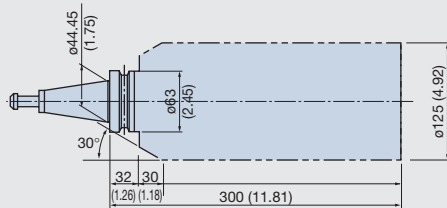
Item	Description
NC rotary table (A-axis)	Please specify type details
Preps for NC rotary table	Includes 1 additional axis
Lift-up chip conveyor (hinge)	Rear right side discharge
Lift-up chip conveyor (drum filter)	Rear right side discharge
Thru-spindle coolant system	1.5 MPa (217 PSI)
Thru-spindle coolant system	7 Mpa (1000 PSI)
Shower coolant system	190 L (100 L effective), 250-W pump
Workpiece washing gun	
Tool breakage detection	Touch sensor activated
Auto zero offset/auto gauging	With auto tool length offset (Renishaw touch probe)
Auto door (front operation)	
Transformer	

Maximum tool dimensions

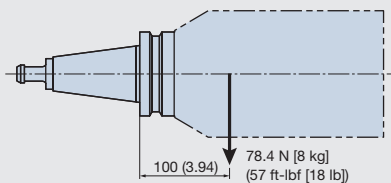
- **Max tool size (adjacent tools)**
In tool magazine



- **Max single tool size**
No adjacent tools



- **Max tool mass moment**



Machining capacity

12,000 min⁻¹ wide-range spindle

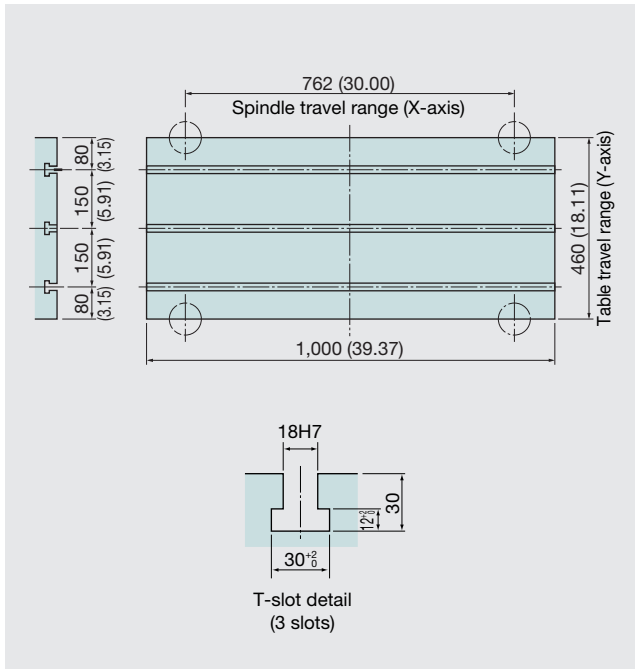
Tool	Spindle min ⁻¹ (rpm)	Cutting m/min (ipm)	Feedrate mm/min (ipm)	Width mm (in.)	Depth mm (in.)	Amount cm ³ /min (in. ³ /min)	
ø100 5-blade face mill (cermet)	650	205 (8,071)	1,500 (59)	70 (2.76)	4 (0.16)	420 (25)	
ø20 7-flute end mill (carbide)	3,660	230 (9,055)	2,560 (101)	Side	12 (0.48)	20 (0.79)	600 (35)
				Side	15 (0.59)	30 (1.18)	158 (9)
ø30 6-flute roughing end mill (HSS)	360	34 (1,338)	352 (14)	15 (0.59)	30 (1.18)	158 (9)	
ø40 drill (high speed steel)	ø40	160	20 (787)	45 (2)	—	56 (3)	

(Workpiece material: S45C)

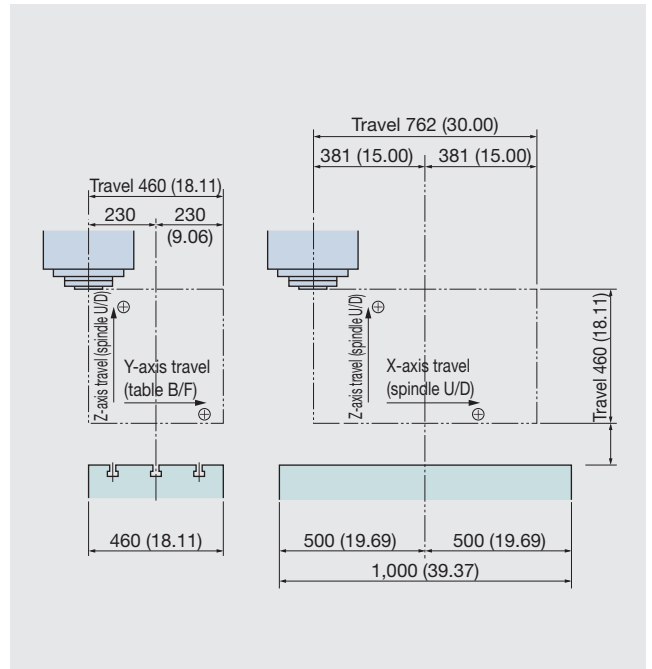


GENOS M460-VE

Table size



Working ranges



Recommended chip conveyors

Please contact an Okuma sales representative for details

○: Standard △: Selectable

Material		Steel	FC	AL/Nonferrous metal	Mixed (general use)
Chip shape					
In-machine chip disposal	Chip flusher (Std)	—	○(wet)	○	—
	Coil (Std)	○	○(dry/wet)	—	○
Off-machine chip disposal (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.

Typical off-machine chip disposal (lift-up conveyors)

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

** Standard with Standard Kit specifications

High Performance & Highly Reliable

A Machine Control and Windows® Collaboration

OSP-P200M

Standard Specifications

Item	Description	
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 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 (S5) override 50~200%, multi-point indexing
	Tool compensation	Tool length/tool dia compensation (100 sets)
	Display	15-inch color display operation panel, OSP-Win X
Programming	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system faults
	Program capacity	Program storage: 2 GB, operation buffer: 2 MB
Operations	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
	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
	MacMan	Machining management: machining results, machine utilization, fault data compile & report, external output
Communications / Networking	USB ports, Ethernet	
High speed/accuracy specs	TAS-S (Thermo-Active Stabilizer—Spindle), TAS-C (Thermo-Active Stabilizer—Construction), Hi-Cut Pro, pitch error compensation	

3D-E Kit Specifications

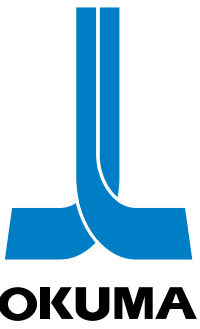
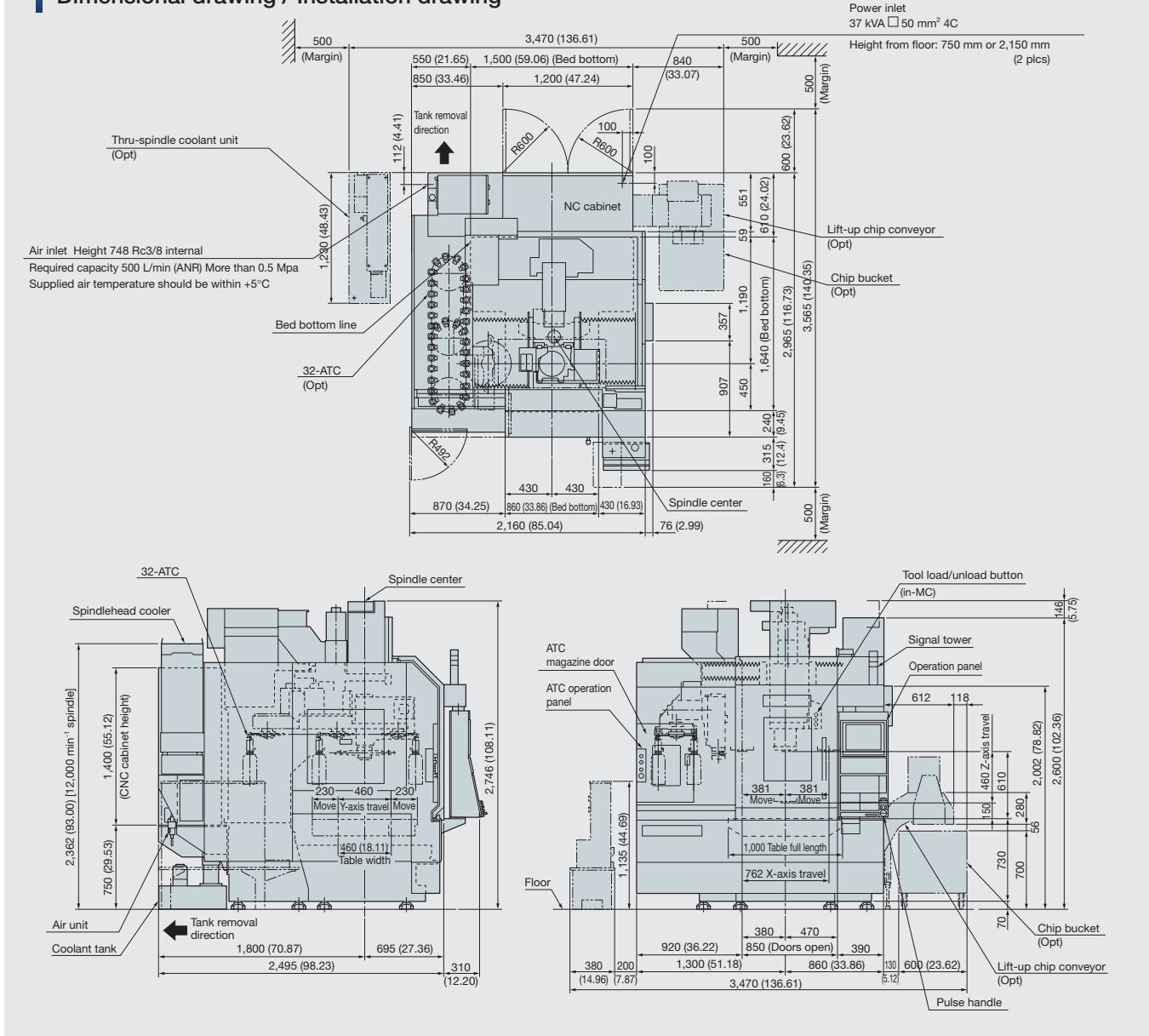
Item	OSP-P200M 3D-E
Auto program schedule update	<input type="radio"/>
Coordinate system selection (Std: 20 sets) 100 sets	<input type="radio"/>
Helical cutting	<input type="radio"/>
Synchronized Tapping II	<input type="radio"/>
Programmable travel limits	<input type="radio"/>
Arbitrary angle chamfering	<input type="radio"/>
Tool length/tool dia compensation (Std: 100 sets each) 200 sets each	<input type="radio"/>
Tool life management	<input type="radio"/>
Auto power shut-off	<input type="radio"/>
Sequence stop	<input type="radio"/>
Real 3-D simulation	<input type="radio"/>
I-MAP	<input type="radio"/>
Simple load monitor	<input type="radio"/>
NC operation monitor	<input type="radio"/>

Control OSP-P200M Optional Specifications

Item	Description	Item	Description
Machning Navi M-g	Finds best cutting conditions	Super-NURBS	
Collision Avoidance System	Collision prevention function	Warm-up	Includes operation end buzzer with calendar timer
Common variables	1,000 (standard is 200)	External program selection	Pushbutton, rotary switch, BCD
Program branch	2 sets	Tool grooving	Flat-tool free-shaped grooving
Cylindrical side facing		Spindle path control	
Inverse time feed		Circuit breaker	
3-D tool compensation		Monitor display language	Multiple language specifications
Tool wear compensation		Rotary table additional axes	2 or more axes
DNC	-T3, -B (232-C→Ethernet converter required), -DT		

GENOS M460-VE

Dimensional drawing / Installation drawing



When using Okuma products, always read the safety precautions mentioned in the instruction manual and attached to the product.

This product is subject to the Japanese government Foreign Exchange and Foreign Trade Control Act with regard to security controlled items; whereby Okuma Corporation should be notified prior to its shipment to another country.