

2-Spindle Horizontal CNC Lathe

# ***2SP-2500H***



## 2-Spindle Horizontal CNC Lathe **2SP-2500H**



### 4-Second Part Load/Unload Fastest in its class

In the effort to mass produce parts in the machine shop, there is a battle for every 0.1 second, and higher throughputs are required by demands for shorter production lead times, process-intensive machining for higher accuracy of parts, lower costs with laborsaving, unattended, operation and maximum floor-space utilization.

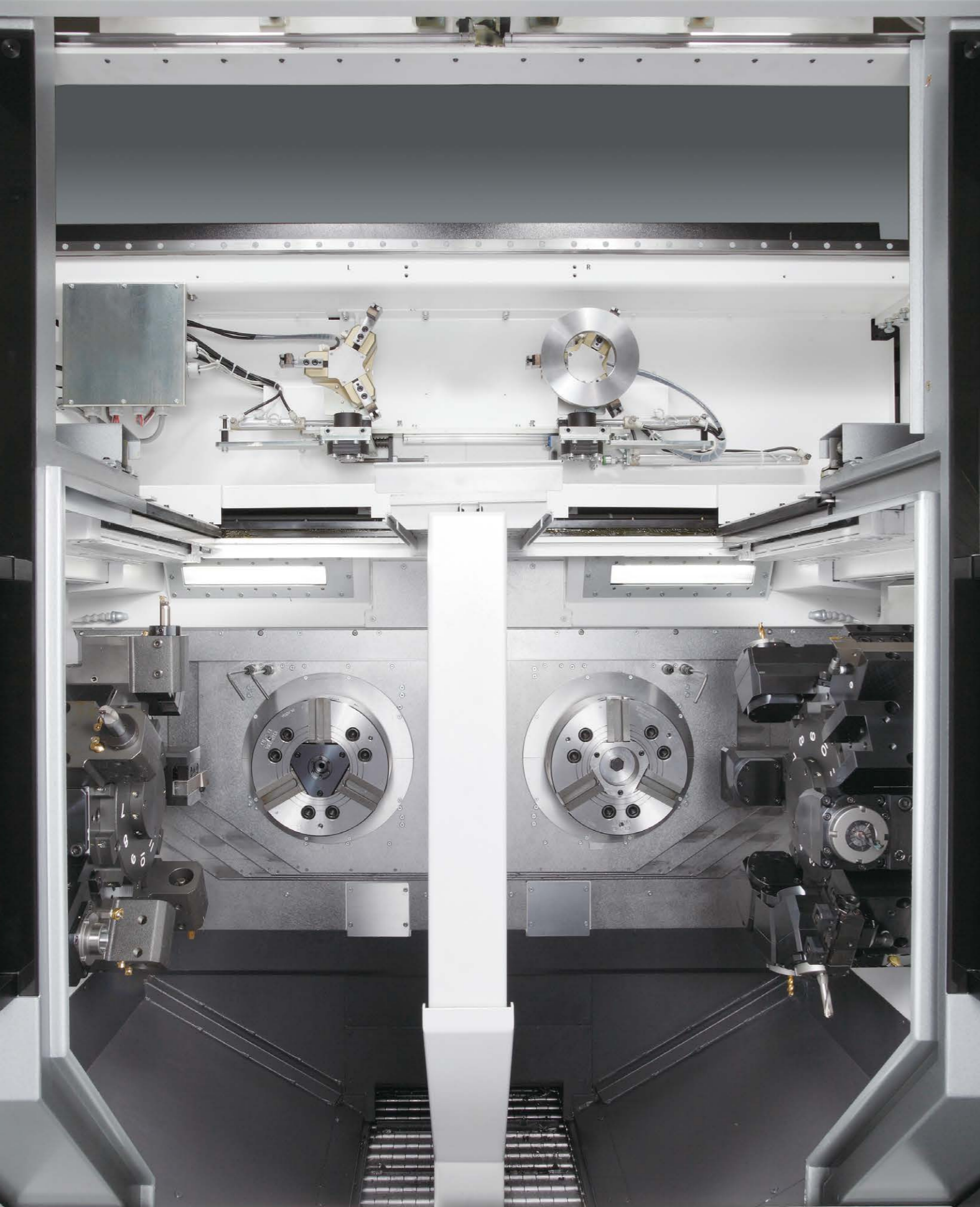
In response to the high demands of mass production, the 2SP-2500H shortens cycle times with powerful spindle capacity and achieves workpiece loading/unloading of 4 seconds\* with an improved loader and turret. The machine and spindle of the 2SP-2500H have been completely redesigned.

Okuma delivers with the highest production possible for manufacturers requiring innovative, mass-production applications.



**2SP-2500H**

Photos used in this brochure may show optional equipment.  
\* The time to open and close the upper door is not included in the workpiece load/unload time.



Stable machining accuracy, high machining capacity, and extended tool life

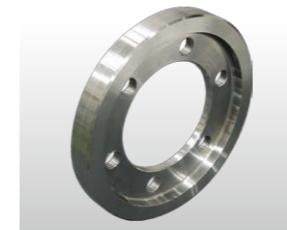
## Higher throughput of mass produced parts

The 2SP-2500H combines 2 lathes on a single automation-friendly machine, and a standard parts loader which can be incorporated into production lines for auto load/unload and lateral transport.

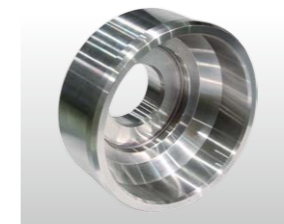
The combination of a machine with powerful, high accuracy machining capacity and a high-speed loader delivers the highest throughput for mass-production applications.

### Ideal for mass production of parts up to $\phi 250$ mm

The 2SP-2500H can take on loader-delivered workpieces up to  $\phi 250$  mm in size, and achieves minimum takt times for mass-produced parts. With M specifications, the milling tool spindle capacity is strengthened, enabling a greater diversity of process-intensive machining.



Final gear



Cylinder

### Shortest line takt times with new machine structure and high-speed loader

All loader movements have become faster, greatly reducing workpiece transport times. The new design allows the loader to enter the machine regardless of the turret position, and workpiece load/unload time has been shortened.

### Better productivity and longer tool life with highly rigid structure

A powerful integral motor/spindle and highly rigid structure in which the center of gravity of the moving body is positioned on a strong slide guide are used. The high output milling tool spindle also enables process-intensive machining of powerful milling, such as face milling, drilling, and tapping.

### Long-run, stable machining with high accuracy

The 2SP-2500H uses the Thermo-Friendly Concept, which provides high dimensional accuracy even in long-run and continuous mass production machining. A high accuracy integral spindle and a new head structure that minimizes the effect of machining vibration between spindles are also used for high surface quality.

### A wealth of expandable systems meet a variety of requirements

Okuma offers systems that meet customer needs, such as lines that occupy minimum space and have stackers for both blanks and finished products, or more advanced automated lines that incorporate post-process gauging and air blowers to eliminate chips adhering to workpieces.

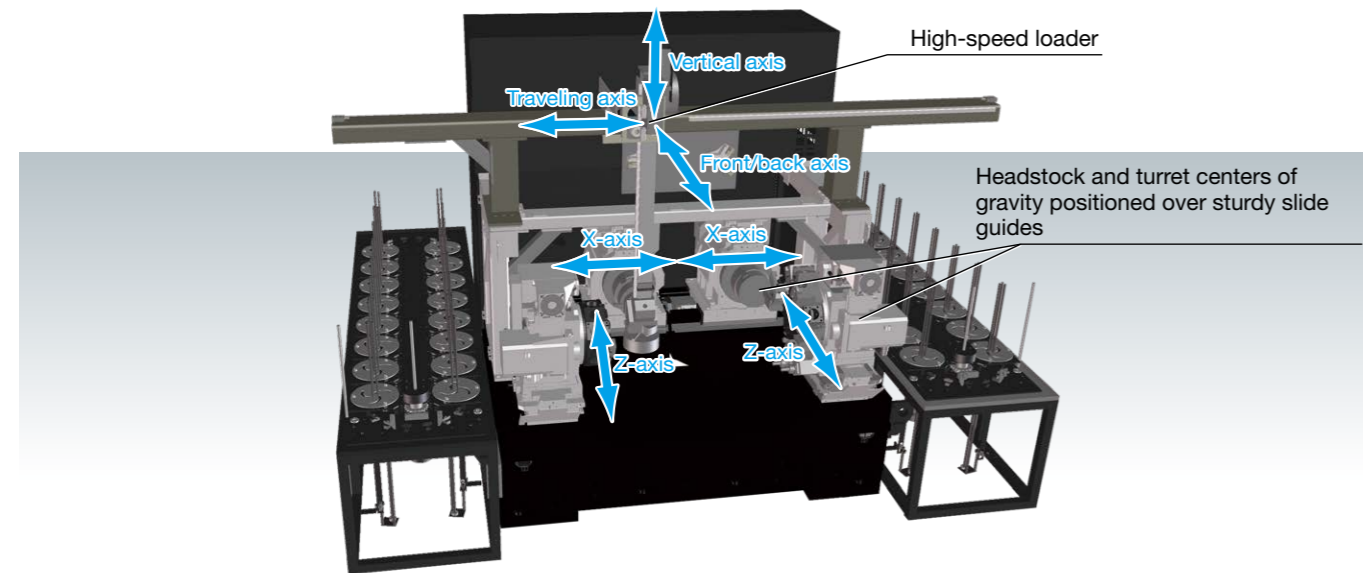


Standard chuck size	8-inch
Max turning diameter	$\phi 410$ mm
Transportable part size	$\phi 250$ mm
Spindle speed	45 to 5,000 $\text{min}^{-1}$
No. of tools	V12 + V12
Rapid feedrate	X, Z: 25 m/min
Loader rapid traverse	X, Y, Z: 180 · 110 · 48 m/min

# Cycle time minimized with high-speed loading and powerful milling

## Machine structure for high-speed loading and powerful machining

Workpiece load/unload time has been reduced to 4 seconds, and machining-to-part transport line takt time has been minimized. Moving component (headstock, turret) centers of gravity have also been positioned over sturdy slide guides. Powerful, accurate machining has been achieved with the best machine structure possible for mass production.



## Productivity improved with significantly stronger spindle

The spindles are faster and more accurate with integral motor/spindle drives. The milling tool spindles also have higher output of 7.1 kW, increasing torque to 1.25 times that of the previous machine and doubling end milling capacity to 65 cm<sup>3</sup>/min. Process-intensive mill/turn operations have become possible.



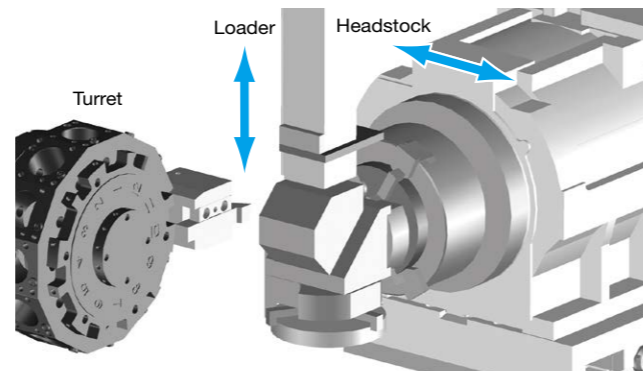
## The shortest line takt times with a high-speed loader

During workpiece load/unload, the headstock moves to that position. The loader can enter the machine regardless of turret position.

In addition, with servo-driven hand rotation and faster speeds of all movements, workpiece load/unload time of 4 seconds\* has been achieved.

\* Does not include upper door open/close time. The load/unload time of 4 seconds is actual data; different operating conditions may require more time.

Transportable weight	4 kg × 2 pcs	8 kg × 2 pcs
Workpiece dimensions	ø200 × L125	ø250 × L80



# Long-run, stable machining with high accuracy



## Machine deformation accurately controlled Thermo-Friendly Concept

Workpiece machining accuracy changes greatly depending on the temperature changes around the machine, heat generated by the machine, and heat generated in machining. The Thermo-Friendly Concept enables high-accuracy machining in regular factory environments without any special equipment or measures to deal with temperature changes. High dimensional stability is assured from the first to the last workpiece in mass applications.

## Machining dimensional change over time: $\phi 10 \mu\text{m}$

Actual data for 2SP-2500H right machining chamber (ambient temperature: 8°C change)

- Machine start-up time
- Machining restart time
- During room temperature change

High dimensional stability

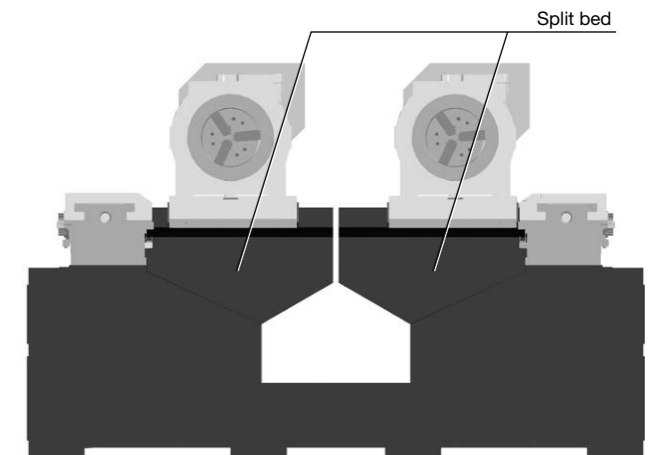
## Highly visible stacker

A large acrylic window is used in the 16-station work table. Blanks or finished part volumes can be seen at a glance, and machining stoppages from insufficient material preparation are prevented.



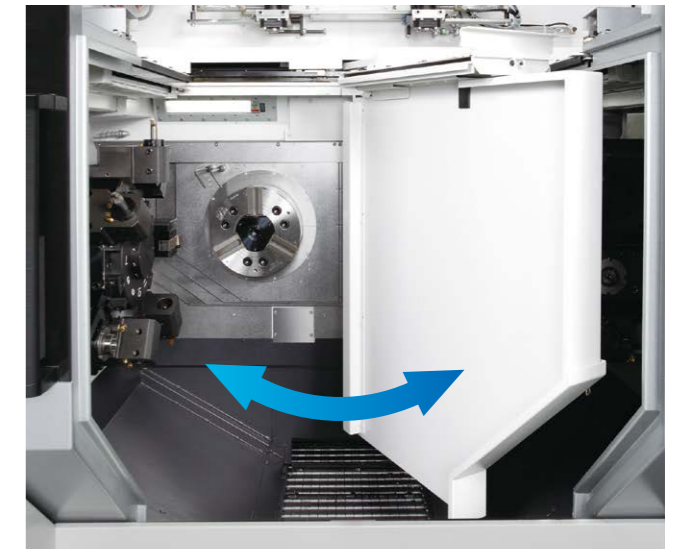
## Split bed for high-quality machining

A split construction is used for the bed. Transmission of vibration during cutting is inhibited by separating the right and left sides. This is also effective when high surface roughness is required.



## Large machine width makes insert replacement easy

The divider in the center of the machining chamber can be angled out of the way when replacing tool inserts. Machining preparation time is reduced with smooth tool changing.



# A full lineup of system applications ready for a variety of requirements

## System solutions to meet the demand

Okuma offers systems that meet customer needs, such as production lines requiring a minimum of space with stackers for both materials and finished parts, or more advanced automated lines that include post-process gauging and air blowers.



### Quality check station

Spot checks can be done by taking a part from the finished work flow line and bringing it to the quality check station.



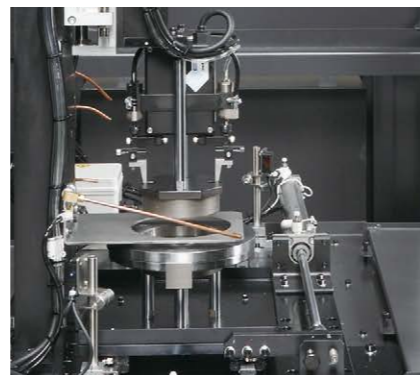
### Air blower station

Air (blast) cleaning of finished parts can be done after machining. Chips still clinging to completed parts are blasted off.



### Gauging station

Finished part dimensions are automatically gauged. Tolerance pass/fail and automatic compensation (feedback to machine) are possible.



## Your choice of two great controls

Either the Okuma OSP or the FANUC control is available for the 2SP-2500H. And they are both ready to handle your existing part programs that match the selected system.

The Next-Generation Intelligent CNC

# OSP suite OSP-P300LA

## Machine shops get top priority with easy-to-use OSP control— Operator-friendliness revamped, responsiveness re-innovated!

Smart factories are using advanced digitization and networking (IoT) in manufacturing to enhance productivity and create even more added value. The OSP has evolved tremendously as a CNC control 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 needs from beginning to veteran operator.

## Features you wanted – loaded with new OSP suite apps!

Okuma made these features a reality by building on its machining expertise, based on requests received from customers in the machine shop. These features are filled with intelligence that enhance the "strength in the field" that the CNC control can accomplish because they are created by the premier machine-tool manufacturer.



Increased productivity through visualization of motor power reserve

### Spindle Output Monitor

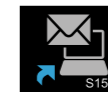
The specified spindle output (red line: short time rating, green line: continuous rating) and the spindle output in current cutting (blue circle) are simultaneously displayed on the screen, for real-time view of power reserve during cutting. This allows speeding up cutting by increasing the spindle speed or feed rate while monitoring the graph to ensure that the blue circle does not cross the lines.



Easy programming without keying in code

### Scheduled Program Editor

Selecting program files from an index creates a file list, and the scheduled program is automatically output from the file list.



Monitoring utilization status even when away from the machine

### E-mail Notification

When cutting is completed, or an alarm occurs, or at specified intervals, this e-mails a notification of machine status to a supervisor's smart phone or computer. This makes it possible to monitor utilization status even when away from the machine, enabling immediate response in the event of a problem.

## Machine Specifications

Model		Unit	2SP-2500H (L)	2SP-2500H (M)
Capacity	Standard chuck size		8 [10]	
Travels	X- / Z-axis	mm (in.)	210 (8.27) / 200 (7.87)	
	C-axis control angle	deg	—	360 (minimum control angle 0.001)
Spindles	Spindle speed	min <sup>-1</sup>	45 to 5,000	
	Spindle speed ranges		2 auto ranges (2-speed motor coil switching)	
	Spindle nose type		JIS A2-6	
	Spindle bore dia/Spindle bearing dia	mm (in.)	ø62 (2.44) / ø100 (3.94)	
Turrets	Turret type		V12 + V12	Multitasking V12 + Multitasking V12
	No. of turret tools	tools	12 + 12	For both L, M 12 + 12
	OD tool shank size	mm (in.)	□25 (0.98)	
	ID tool shank diameter	mm (in.)	ø40 (1.57)	
Milling tool	Milling tool spindle speed	min <sup>-1</sup>	—	45 to 6,000
	Milling tool speed range		—	Infinitely variable
Feed rates	Rapid feed rate X, Z-axis	m/min (fpm)	X: 25 (82), Z: 25 (82)	
	Rapid feed rate C-axis	min <sup>-1</sup>	—	200
	Cutting feed rate X, Z-axis	mm/rev	0.001 to 1,000.000	
Motors	Motor spindle	kW (hp)	15 (20) / 11 (15) (20 min/cont)	
	Milling tool spindle motor	kW (hp)	—	OSP: 7.1 (9) / 4.1 (5) (25 min/cont) FANUC: 5.5 (7.5) (cont)
	Axis drive motors (X / Z)	kW (hp)	OSP: 3.0 (4) / 2.8 (4) FANUC: 2.7 (3.6) / 4.5 (6)	
	Coolant motor (50/60 Hz)	kW (hp)	0.55 (0.7) / 0.75 (1)	
Machine size	Machine height	mm (in.)	3,259 (128.31) (maximum loader height)	
	Required floor space: length x width (including tank)	mm×mm (in. × in.)	2,200 × 2,734 (86.61 × 107.64) (w/o loader)	
	Machine weight	kg (lb)	8,000 (17,600) (w/loader)	
CNC			OSP-P300LA/FANUC 0i-TF [Twin loader specs: FANUC 31i-B]	

[ ] : Optional

## Loader Specifications

Model		Unit	2SP-2500H (L)	2SP-2500H (M)
Loader	Transportable parts size (dia x length)	mm (in.)	4 kg specs: ø200 × 125 (7.87 × 4.92), [8 kg specs: ø250 × 80 (9.84 × 3.15)]	
	Transportable parts weight × number	kg (lb) × pts	4 (8.8) × 2, [8 (17.6) × 2]	
	X-axis travel (traveling axis)	mm (in.)	2,838 (111.73) (with work tables on right and left)	
	Y-axis travel (vertical axis)	mm (in.)	750 (29.53)	
	Z-axis travel (front/back axis)	mm (in.)	290 (11.42)	
	Rapid feed rate X, Y, Z-axis	m/min (fpm)	X: 180 (591), Y: 110 (361), Z: 48 (157)	
	Hand type		Swivel-type double hand, 3-jaw air chuck	
Work table	Gripper open/close travel	mm (in.)	ø32 (1.26) (effective travel: ø24 (0.94))	
	Loaded workpiece diameter	mm (in.)	ø40 (1.57) to ø250 (9.84)	
	Loaded workpiece mass	kg (lb)	50 (110) /1 station	
	Stacking height	mm (in.)	450 (17.72)	
	No. of stations		16	

[ ] : Optional

## Standard Specifications

Spindles	A2-6 5,000 min <sup>-1</sup> 15/11 kW
Turrets	V12 + V12
Coolant tank	330L
Front door interlock	
Lubrication monitor	
Chuck open/close button	
Jack screws, foundation pads	
Interior lighting	LED
Tool kit	

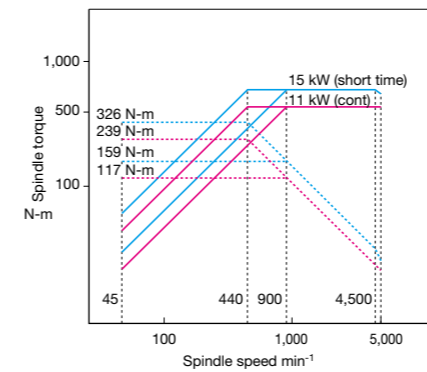
## Optional Specifications

Hydraulic chuck		Raised machine height	50 mm, 100 mm, 150 mm
Chip conveyor	Rear hinge type	Mist collector	
Chip bucket	With tilt, without tilt	Coolant gun mounted	
Chucking miss detection		In-process work gauging	
Chuck auto open/close confirm		Touch setter	
Air blower (blast)	Chuck, spindle ID, turrets	Automatic extinguisher	
Shower coolant		Fire damper	
Spindle ID coolant blower (blast)		Loader	Transportable weight: 8 kg
High pressure coolant		Loader point data	No part program linkage: 10 types, 15 types Part program linkage: 5 types, 10 types, 15 types
Coolant pump	1.5 kW × 2, 2.2 kW × 2	Temperature regulator	Coolant (cooling only) Hydraulic oil (cooling only)
Coolant sensors			
Coolant high/low pressure switch			

## Spindle output/torque diagrams

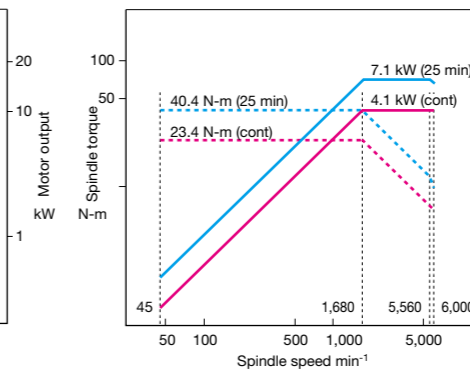
### Turning spindle (OSP, FANUC)

- Spindle speed: 5,000 min<sup>-1</sup>
- Output: 15/11 kW (20 min/cont)
- Torque: 326/239 N-m



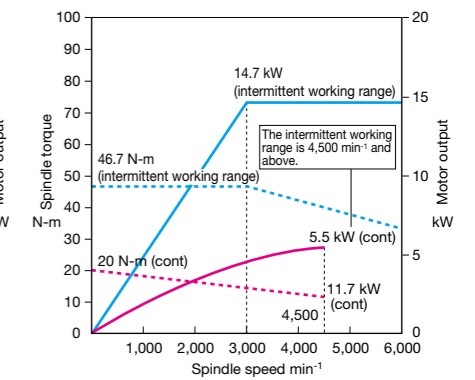
### Milling spindle (OSP)

- Spindle speed: 6,000 min<sup>-1</sup>
- Output: 7.1/4.1 kW (25 min/cont)
- Torque: 40.4/23.4 N-m (25 min/cont)



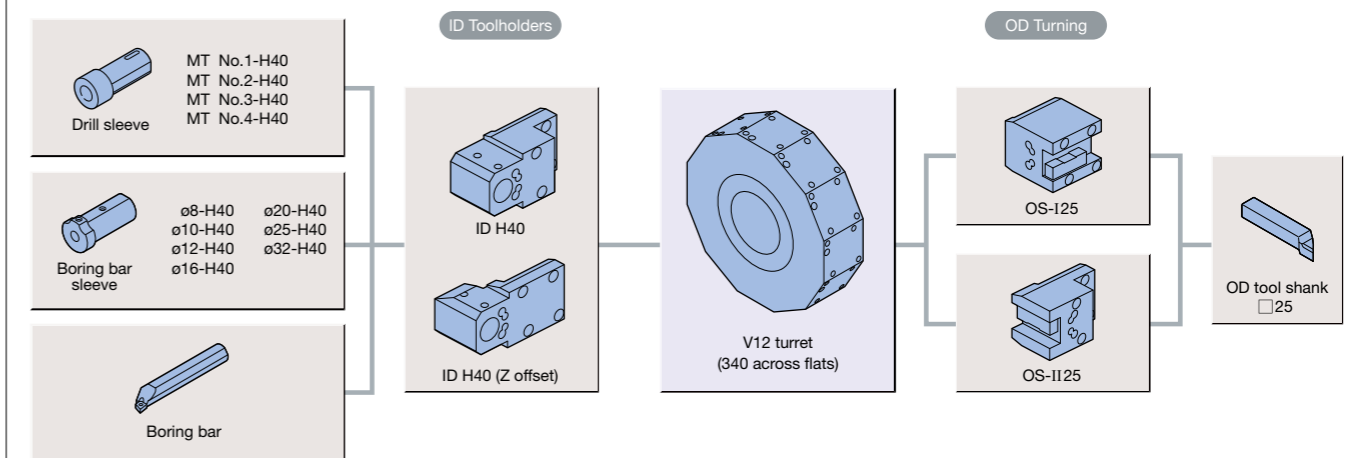
### Milling spindle (FANUC)

- Spindle speed: 6,000 min<sup>-1</sup>
- Output: 5.5 kW (cont)
- Torque: 20 N-m (cont)

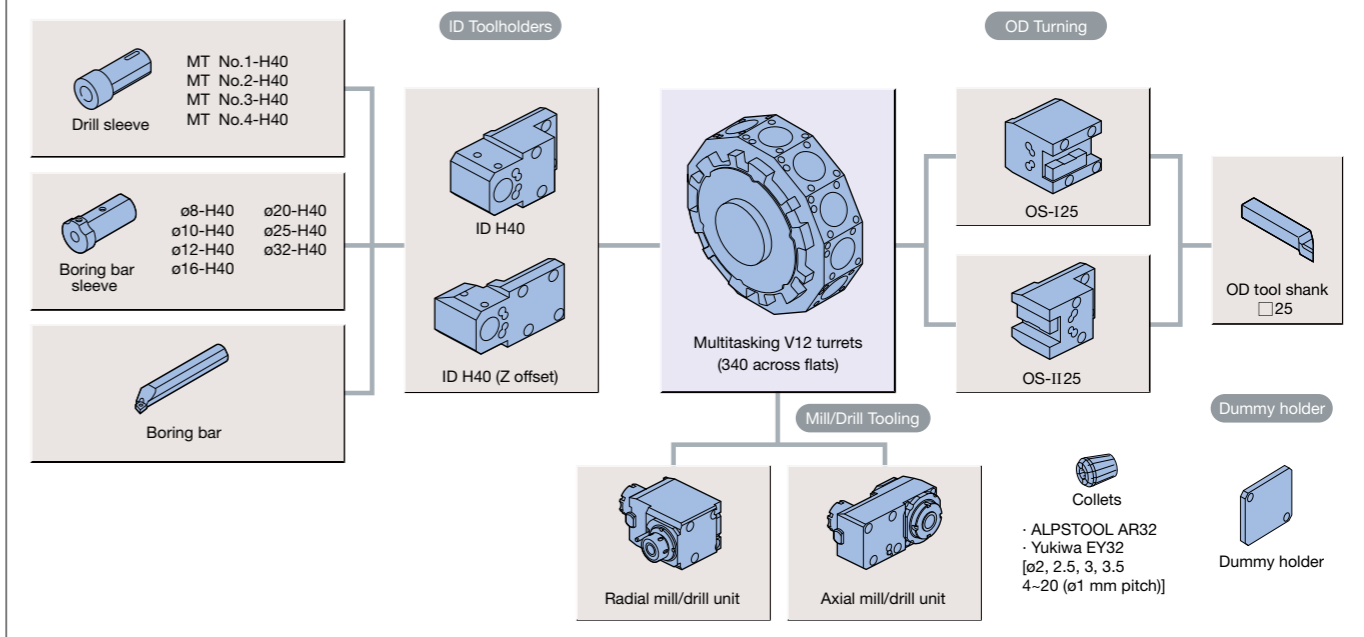


## Tooling System

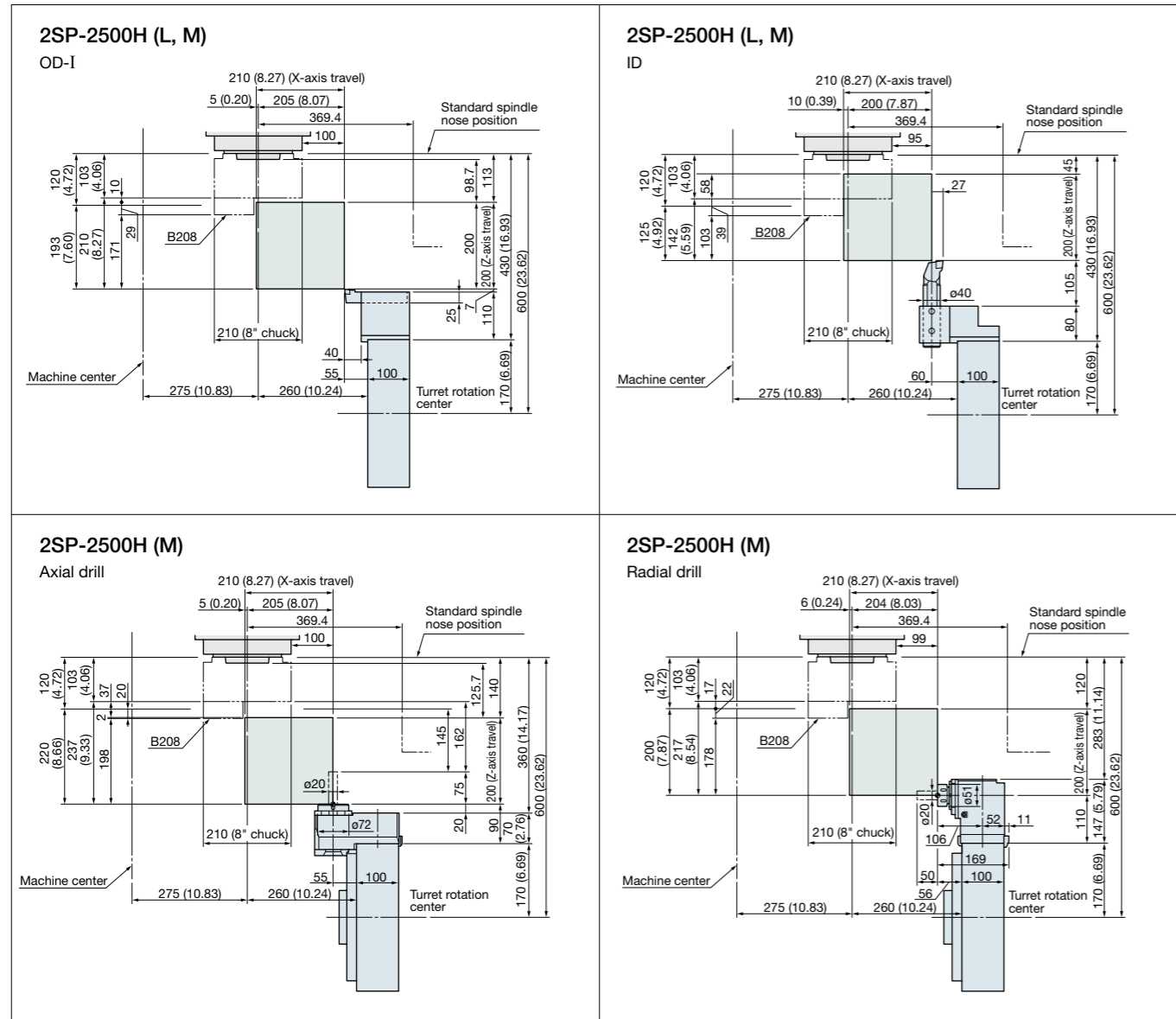
### L specs (V12 turrets)



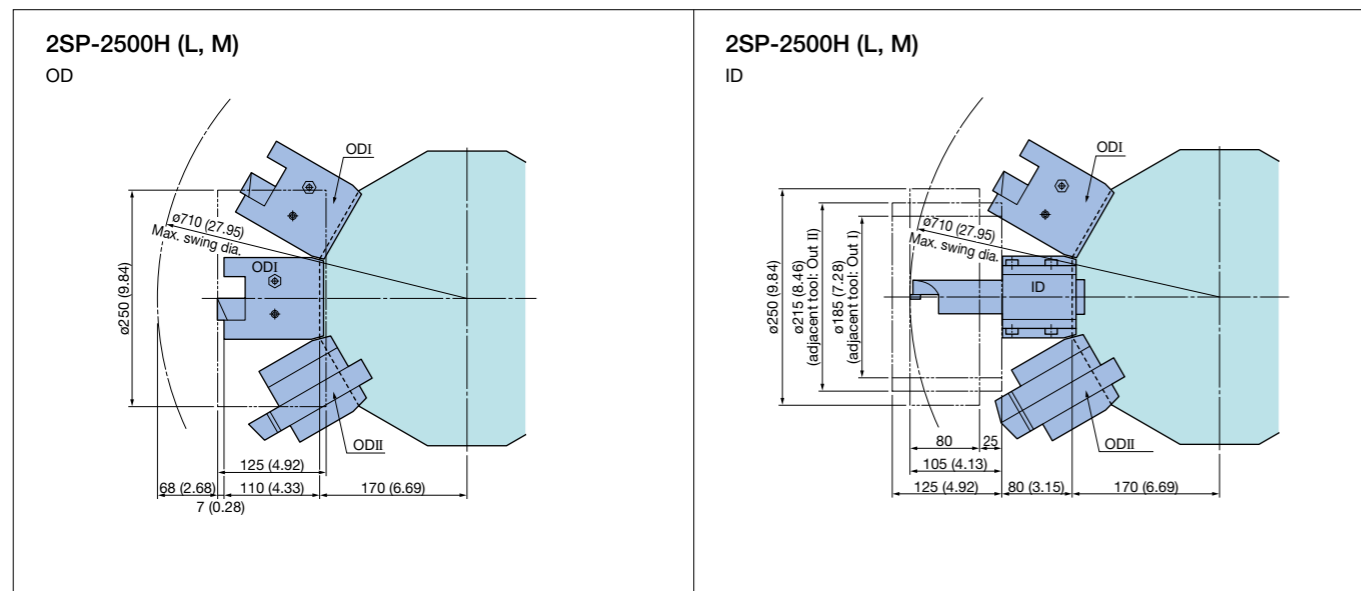
### M specs (Multitasking V12 turrets)



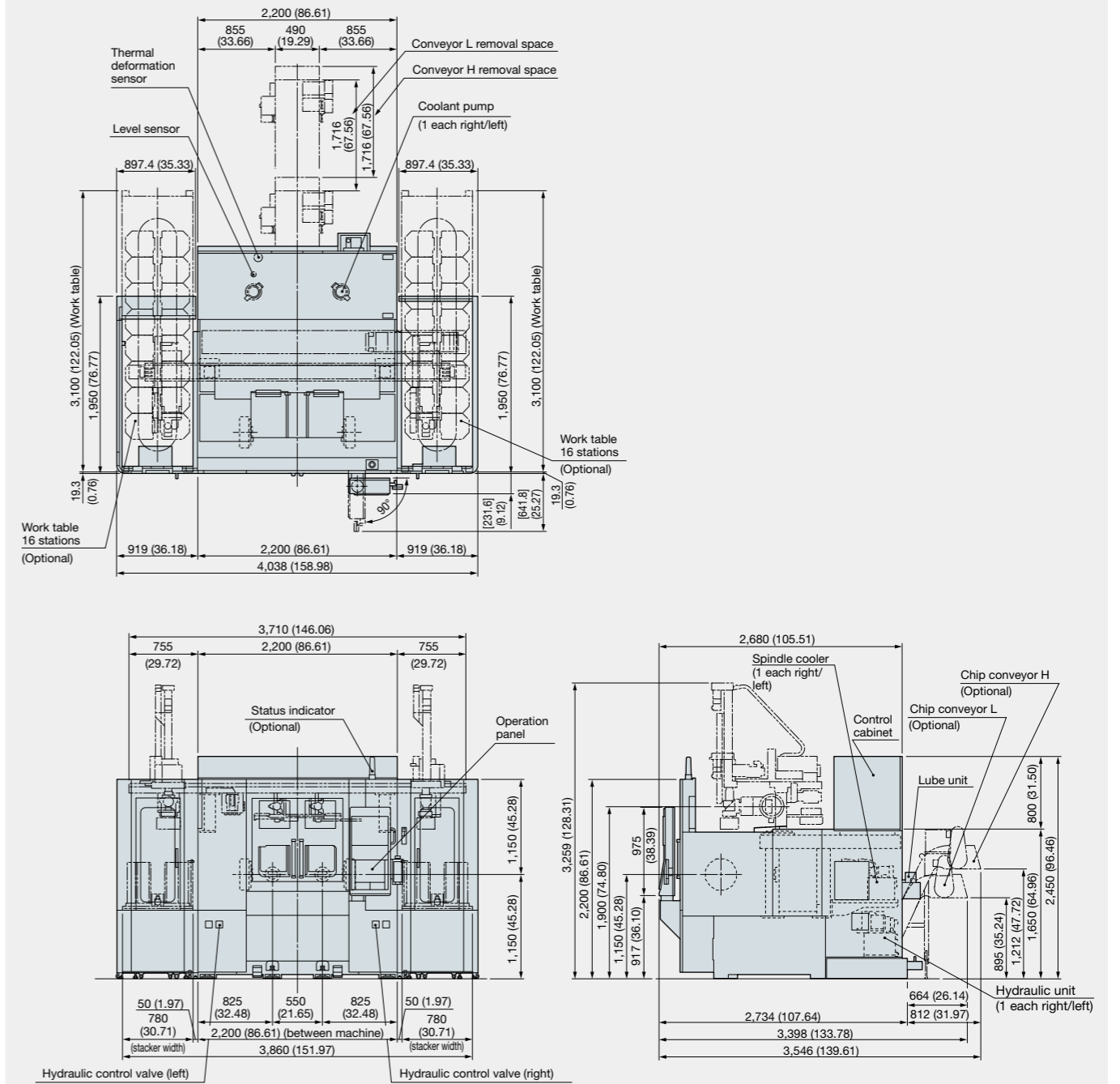
## Working Ranges



## Tool Interference Drawings



## 2SP-2500H (L, M) Dimensional / Installation Drawings



Unit: mm (in.)

**Standard Specifications**

Basic Specs	Control	Turning: X, Z simultaneous 2-axis, Multitasking: X, Z, C simultaneous 3-axis
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	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 (S4) override 50 to 200%, Constant cutting speed, optimum turning speed designate
	Tool compensation	Tool selection: 32 sets, tool offset: 32 sets
	Display	15-inch color display operational panel, multi-touch panel operations
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
	Program capacity	Program storage: 2 GB, operation buffer: 2 MB
	Operations	suite apps
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
Programing		Program management, edit, multitasking, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, fixed drilling cycles, arithmetic functions, logic statements, trig functions, variables, branch statements, auto programming (LAP4), programming help
Machine operations		MDI, manual (rapid traverse, manual cutting feed, pulse handle), load meter, operations help, alarm help, sequence, return, manual interrupt & auto return, threading slide hold, data I/O, spindle orientation (electric)
MacMan		Machining Management: machining results, machine utilization, fault data compile & report, external output
Communications/Networks	USB ports, Ethernet	
High speed/accuracy	Thermo Active Stabilizer-Construction (TAS-C)	Compensates for thermal deformation error in the machine structure due to ambient temperature changes
	High speed/accuracy	Hi-G control
Energy-saving function	ECO suite	ECO Idling Stop, ECO Power Monitor

**Optional Specifications**

Optional	*1	NML		3D		OT-IGF		OTM	
		E	D	E	D	E	D	E	D
<b>New Operations</b>									
Advanced One-Touch IGF-L *2						●	●		
Advanced One-Touch IGF-L Multitasking *2								●	●
<b>Programming</b>									
Circular threading			●		●		●		●
Program notes			●		●		●		●
User task 2 I/O variables, 8 ea									
Work coordinate system select	10 sets								
	50 sets								
	100 sets								
Tool compensation (Std: 32 sets)	Tool compensation 64 sets								
	Tool compensation 96 sets								
	Tool compensation 200 sets								
	Tool compensation 999 sets								
Common variables 1,000 sets (Std: 200 sets)									
Thread matching (spindle orientation required)									
Threading slide hold (G34, G35)									
Variable spindle speed threading (VSST)									
Inverse time feed									
Milling machine specs	Coordinate convert	▲	▲	▲	▲				●
	Profile generate	▲	▲	▲	▲				●
<b>Monitoring</b>									
Real 3-D simulation				●	●	●	●	●	●
Cycle time over check		●	●	●	●	●	●	●	●
Load monitor (spindle, feed axis)				●	●	●	●	●	●
Load monitor no-load detection (load monitor ordered)									
Tool life management			●		●		●		●
Tool life warning									
Operation end buzzer									
Chucking miss detection									Included in machine specs
Work counters	Count only								
	Cycle stop								
	Start disabled								
Hour meters	Power ON								
	Spindle rotation								
	NC operating								
NC operation monitor (counter, totaling)		●	●	●	●	●	●	●	●
NC work counter (stops at full count with alarm)									
Status indicator (triple lamp) Type C [Type A, Type B]		●	●	●	●	●	●	●	●
<b>Measuring</b>									
In-process work gauging									Included in machine specs
Z-axis automatic zero offset by touch sensor									
C-axis automatic zero offset by touch sensor									
Gauge data output	File output								
Post-process work gauging interface	Set levels (5-level, 7-level)								
	BCD								
	RS-232-C (dedicated channel)								
Touch setter [M, A]									Included in machine specs

Optional	*1	NML		3D		OT-IGF		OTM	
		E	D	E	D	E	D	E	D
<b>External Input/Output and Communication Functions</b>									
Additional RS-232-C channel									
DNC link	DNC-T3								
	DNC-C/Ethernet								
	DNC-DT								
USB (additional)	2 additional ports possible								
<b>Automation/Untended Operation</b>									
Auto power shutoff MO2, alarm									
Warmup function (by calendar timer)									
Tool retract cycle									
External program selections	A (pushbutton) 8 types								
	B (rotary switch) 8 types								
	C (digital switch) BCD, 2-digit								
	C2 (external input) BCD, 4-digit								
Third party robot and loader interface *3	Type B (machine)								
	Type C (robot and loader)								
	Type D								
	Type E								
Cycle time reduction *3	Operation time reduction	●	●	●	●	●	●	●	●
<b>High-Speed/High-Accuracy Functions</b>									
Pitch error compensation									
AbsoScale detection *3									
Hi-Cut Pro		▲	▲	▲	▲			●	●
<b>ECO suite (energy saving function)</b>									
ECO Operation									
<b>Other Functions</b>									
One-Touch Spreadsheet									
Machining Navi L-g									
Harmonic spindle speed control (HSSC)		●	●	●	●	●	●	●	●
Spindle dead-slow cutting									
Spindle speed setting									
Manual cutting feed									
Spindle power peak cutting									
Short circuit breaker									
External M signals [2 sets, 4 sets, 8 sets, ( )]									
Edit interlock									
OSP-VPS (virus protection system)									
Illumination in control panel									
Air conditioning in control panel									
AV 100V 1A plug									

\*1. NML: Normal, 3D: Real 3D simulation, OT-IGF: One-Touch IGF, OTM: One-Touch M

E: Economy, D: Deluxe

\*2. Real 3-D Simulation included

\*3. Engineering discussions required.

Note: ▲ Triangle items for M function (milling tool) machines only.

**FANUC 0i-TF**

**Standard Specifications**

No. of controlled axes	2 simultaneous axes with X and Z axes, 3 simultaneous axes with multitasking on X, Z, and C axes.	Program input	Program memory capacity 1MB
Interpolation system	Positioning, straight line, taper, arc, threading, taper		No. registered programs: 800
	Fine coordinate interpolation, Cylindrical interpolation		Chamfering/corner radius
Command system	Parallel absolute incremental command		Complex shape fixed cycle (I + II)
Minimum input increment	Both X, Z axes 0.001 mm		Extension program editing
Min command value	±99999.999 mm, decimal point input		USB memory input/output (program input/output only)
Operating panel	10.4 in color LCD		Custom macro
Monitoring	Display language: English / Japanese		Custom macros, additional common variables (total is 500)
	Operating time, no. of parts display		Programmable data input
	Electronic buzzer		High-speed skip
	Graphic display	Program protection key switch	
Machine operations	Tool life management (FANUC software)	Background editing	
	Constant peripheral speed control	Fixed drilling cycle (M spec)	
	Spindle orientation (1 point, M19)	Inch/metric conversion	
Continuous threading		Compensation	Thermal deformation compensation
			Nose-radius comp
			tool dimensions/wear compensation
			Tool compensations (L64/R64)
			AI contouring control I

**Optional Specifications**

Monitor	Tool counter	
	Work counter	
	Multi-counter	
	Hour meters	
	Status indicator	3-step
Machine operations	Tool life management	Okuma software, spare tool jump
	Abnormal load detection	Spindle + feed axes
	Oriented spindle stop	4-point (M19, 119, 129, 139)
Program input	Auto power shut-off	
	Circuit breaker	
	External program selection	Digital switch with 2-digit indicator
	System selection, tool compensation	G54 to G59
	Program restart	
Automation	Spare M codes	2, 4, 8 pairs
	Memory type pitch error compensation	
	RS232C input/output interface	
Other	Robot interface	
	Bar feeder interface	
	Illumination in control panel	LED
	Air conditioning within control panel	Temperature regulator (cooler only), dehumidifier
	AV 100V 1A plug	In operation panel, control panel

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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