OKUMA

OPEN POSSIBILITIES

LB2500 EX II
SPACE TURN

1-Saddle CNC Lathe

At the Forefront of Monozukuri*

The LB series features our flagship CNC lathes, which have long been bestsellers. These global-standard machines open up possibilities for the next generation to meet the needs of the times, earn customers' trust, and respond to their expectations.

The SPACE TURN LB EX Ⅱ series, which offers constantly-evolving tools for creating new value, contributes to productivity growth.

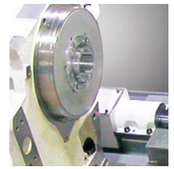
Okuma's craftsmanship does not change and it is found throughout all of our machining quality, speed, power & torque, process-intensive machining and automation, as well as in our energy-saving and carbon dioxide emissions reducing performance.

* Monozukuri means craftsmanship-based, sustainable manufacturing

SPACE TURN LB2500 EX Ⅱ

Photographs used in this brochure may show optional equipment.

How the world standard machine provides just what you need



Highest Quality

- **Application of Thermo-Friendly Concept**
- **Slanted-box bed construction**

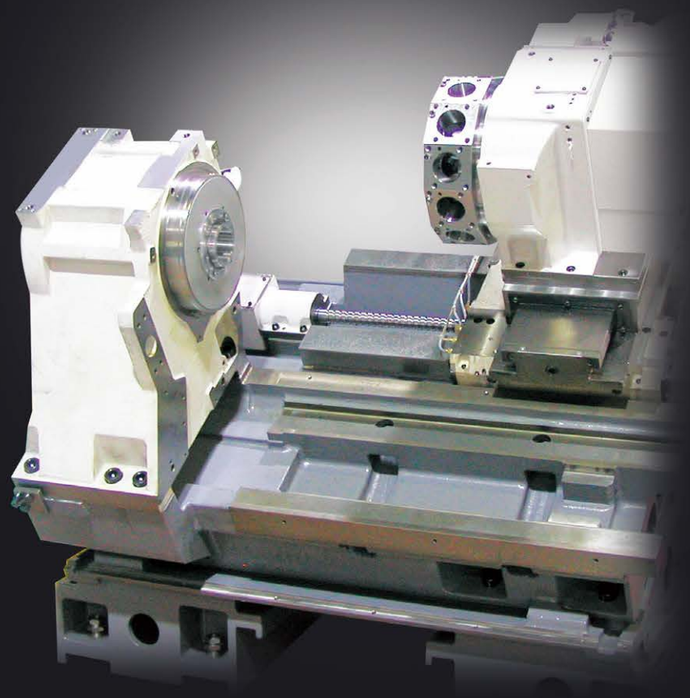
Super Rigidity & Speed

- **Equipped with new high-power, high-torque motor**
- **Combination of larger and faster spindle**
- **Large through-hole diameter, large working range**
- **Top rotation speed, horsepower, and torque in its class**

Easy Operation

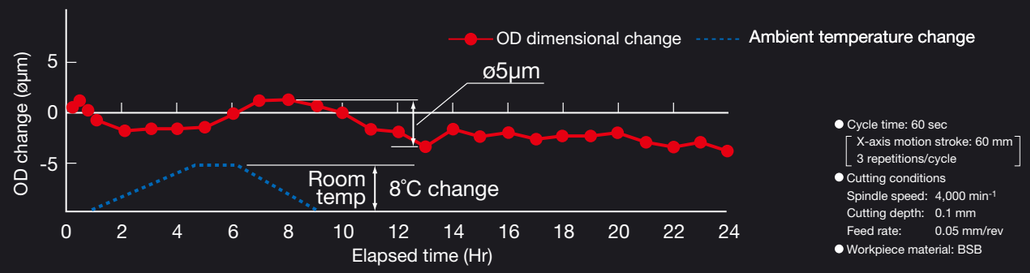
OSP suite OSP-P300LA
The Next-Generation Intelligent CNC

Highest Quality



Machining dimensional change over time: ø5 µm

Actual data [LB2500 EX Ⅱ (L) turning] (ambient temperature: 8℃ change)



- Cycle time: 60 sec
  - X-axis motion stroke: 60 mm
  - 3 repetitions/cycle
- Cutting conditions
  - Spindle speed: 4,000 min^{-1}
  - Cutting depth: 0.1 mm
  - Feed rate: 0.05 mm/rev
- Workpiece material: BSB

High accuracy specifications overall assure machining with high dimensional stability

Thermo-Friendly Concept for unparalleled dimensional stability

Okuma's Thermo-Friendly Concept is used on all the LB EX Ⅱ machines for extraordinary machining accuracy, using our unique machine design and thermal deformation control technology. Outstanding dimensional stability in long-time continuous operation and multitasking applications without troublesome compensation or warming up.

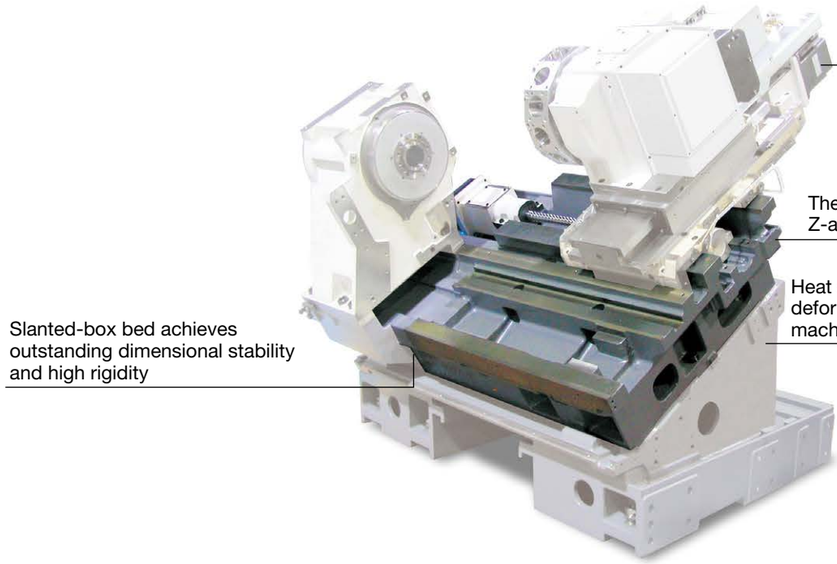
Slanted-box bed configuration with superior construction and rigidity

The next evolution of the slanted-box bed construction that has been highly praised as a "rugged, Okuma-like construction" in the SPACE TURN Series. The primary units of headstock and turret on a box bed is optimally placed for outstanding dimensional stability and high rigidity. Exhibits stable machining accuracy even in heavy cutting.

Machine startup
Machining restart
Room temp change

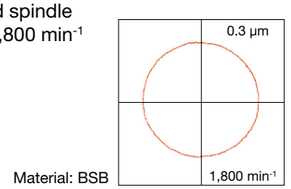
High dimensional stability

Thermo-Friendly Concept



Roundness (Actual data)

- Standard spindle 0.3 µm/1,800 min^{-1}

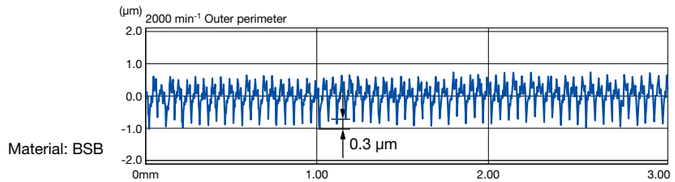


Material: BSB

Standard spindle

Surface roughness (for better surface roughness) (Actual data)

- Standard spindle: 0.3 µm/2,000 min^{-1}

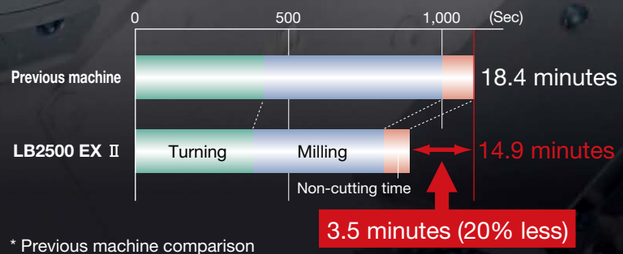


Material: BSB

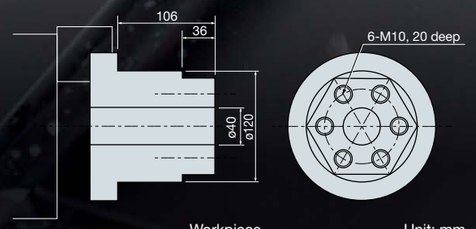
Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting and other conditions.

Super Rigidity & Speed

Improved productivity: 20% shorter cycle time*



* Previous machine comparison
Actual data

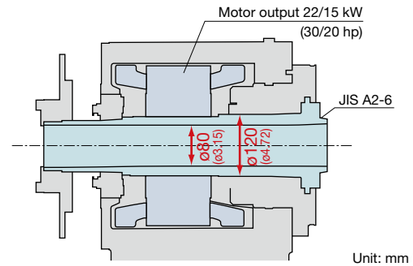


Drastically reduced cycle times have been achieved with Okuma-built high power motors and quick machine movements

Powerful motor on the spindle gives turning capacity of 4.4 mm²

Spindle with a larger bearing internal diameter of ø120 mm can accommodate larger workpieces, and a turning capacity of 4.4 mm² is achieved with a high-speed, wide-range full power motor. Stable, high quality machining, from heavy to high speed cutting.

● Spindle size	Bearing ID ø120 (bore ø80)
● Spindle speed	5,000 min^{-1}
● Output	22/15 kW (30/20 hp)
● Torque	427/281 N-m (314/207 ft-lbf)



Unit: mm (in)

Integral motor/spindle—Okuma's own powerful motor—retains full power over a wide area. There are no gears or belts that can cause vibration or bending, for stable machining without chatter.

Reduced operation time achieved with higher speed machine movements

● Rapid traverse	X: 25 m/min (984 ipm)
	Z: 30 m/min (1,181 ipm)
● Spindle start/stop	3 sec (5,000 min^{-1})
● Turret rotate	0.1 sec/index

Turning 4.4 mm²

(Workpiece: S45C)

(Actual data)

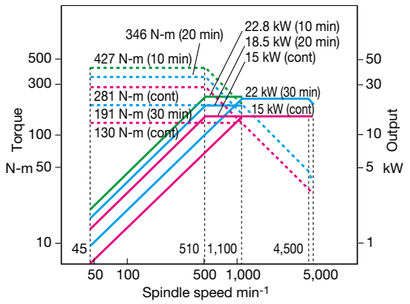
Cylindrical, heavy-duty cutting
4.4 mm² (0.007 in²)
Cutting speed V: 150 m/min (492 fpm)
Cutting depth t: 8 mm (0.31 in)
Feed rate f: 0.55 mm/rev (0.02 ipr)

Drilling
ø59 (ø2.32) carbide insert drill
Cutting speed V: 180 m/min (591 fpm)
Feed rate f: 0.25 mm/rev (0.01 ipr)

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.

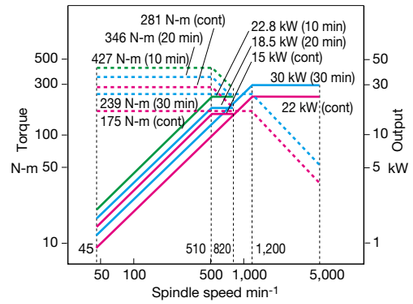
Spindle/motor variations

Standard spindle



ø120, 5,000 min^{-1}
22/15 kW (30 min/cont)
427/346/281 N-m (10 min/20 min/cont)

High power specs



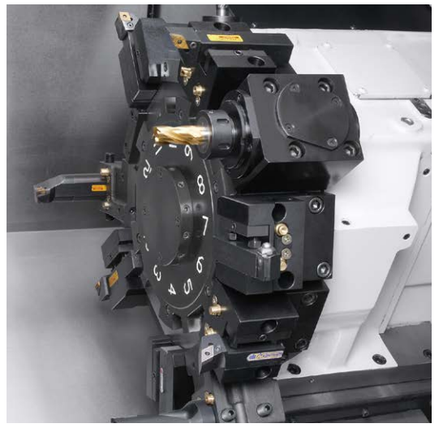
ø120, 5,000 min^{-1}
30/22 kW (15 min/cont)
427/346/281 N-m (10 min/20 min/cont)

Greater efficiency with highest milling performance in its class and fast tool change times

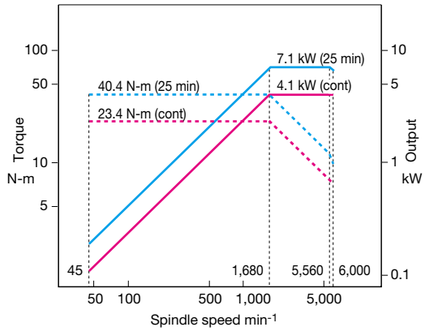
Compact new PREX motor gives milling performance of 200 cm³/min

Compact, high-power, high-torque PREX motor also used for milling spindle of the multitasking V12 radial turret. This combined with a powerful, highly rigid bolt clamp system greatly increases multitasking speed.

● M spindle	6,000 min^{-1}
● Output	7.1/4.1 kW (9.5/5.5 hp)
● Torque	40.4/23.4 N-m (29.7/17.2 ft-lbf)



■ Milling tool spindle



6,000 min^{-1}
7.1/4.1 kW (25 min/cont)
40.4/23.4 N-m (25 min/cont)

Reduced operation time achieved with higher speed machine movements

● Turret rotate	0.1 sec/index
● M-spindle start/stop	0.3 sec (6,000 min^{-1})
● M-M switch	0.7 sec

Milling capacity 200 cm³/min

(Workpiece: S45C)

(Actual data)

End milling
Chip volume 200 cm³/min (12.2 in³/min)
ø20 7-flute carbide
Cutting speed V: 200 m/min (656 fpm)
Cutting depth t: 20 x 2.5 mm (0.79 x 0.1 in)
Feed rate f: 1.26 mm/rev (0.05 ipr)

Drilling
ø20 carbide solid drill
Cutting speed V: 135 m/min (443 fpm)
Feed rate f: 0.3 mm/rev (0.01 ipr)

Tapping
M20 P2.5
(Synchronized Tapping)

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.

Wide working range

■ Max machining dia: ø410 mm (M-turret: ø340 mm)

● Standard spindle	JIS A2-6	8-in chuck
		10-in chuck

■ Spindle thru hole: ø80 mm

Okuma's Intelligent Technology reduces operator burden

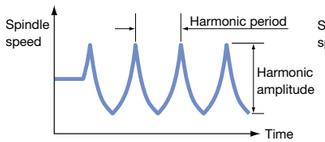
Intelligent Technology

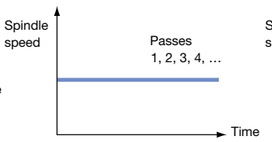
Machining Navi L-gⅡ (guided, harmonic spindle speed control)

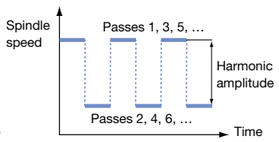
Cutting condition search function for turning

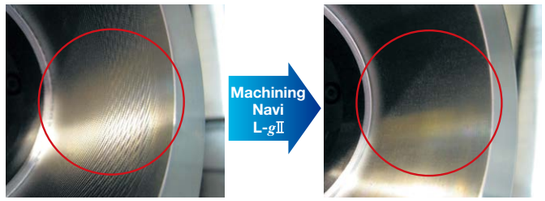
(option)

Varying the spindle speed in accordance with the best amplitude and period makes it possible to suppress chatter during turning operations. Tool life can be extended and machining time reduced with use of the optimum cutting conditions, producing significant effects in drilling/boring bar, threading, and grooving applications.









Chatter marks

Smooth surface

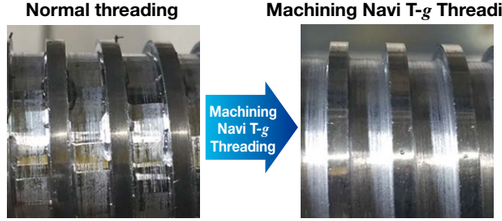
Machining Navi T-g Threading

Cutting condition search for threading

(option)

When chattering occurred during threading, it was common to lower the cutting conditions or use special tools that resist chattering. Okuma's Machining Navi T-g (threading) breaks the vibration periodicity with a different spindle speed for each threading pass, and suppresses chatter growth. The machining capacity of your normally used tools can be maximized for stable machining.

Normal threading **Machining Navi T-g Threading**



ECO suite plus

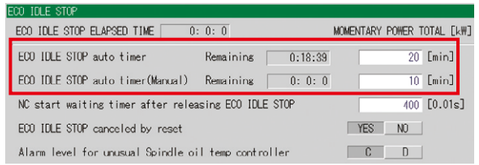
Next-Generation Energy-Saving System

A suite of energy saving applications for machine tools

ECO Idling Stop

Each unit operates only when required

Auxiliary equipment consume a substantial portion of the power used in a factory. This function enables each of them to be turned off when not needed to reduce power consumption. In addition to when automatic operation is suspended, it is now possible to stop idling during manual operation. Power consumption and carbon dioxide emissions are reduced without conscious effort by the operator.



ECO Operation (option)

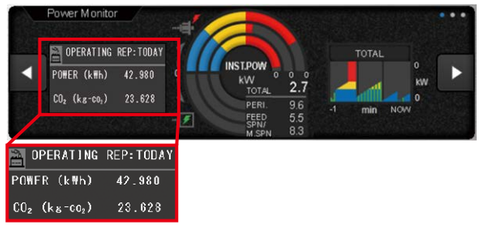
Intermittent/continuous operation of chip conveyor and mist collector during operation

ECO Power Monitor

On-the-spot check of energy savings

Spindle, feed axis, and auxiliary equipment power indicators are displayed separately on the OSP operation panel. The operation status of each device and power consumption/ carbon dioxide emissions can be checked on the spot.

● Power Monitor check example



	INTE.POW[kWh]	INST.POW[kW]	-1 [min] CURRENT
Spdl. oil temp ctrl.	14.0	0.6	
Axis oil temp ctrl.	14.0	0.6	
Coolant temp ctrl.	20.6	0.8	

The displayed values are examples.

OSP suite OSP-P300LA

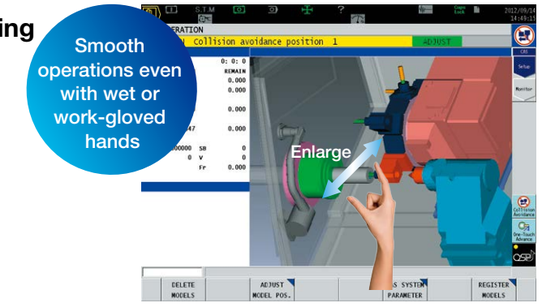
The Next-Generation Intelligent CNC

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

Smart factories are using advanced digitization and networking (IIoT) 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 smartphone

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 smartphone. 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.



"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.

Spindle Output Monitor

S11

Increased productivity through visualization of motor power reserve

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.

Scheduled Program Editor

S10

Easy programming without keying in code

E-mail Notification

S15

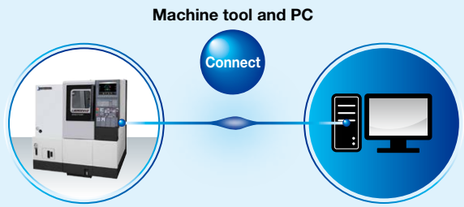
Monitoring utilization status even when away from the machine

Connect Plan

Get Connected, Get Started, and Get Innovative with Okuma "*Monozukuri*"

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 Specifications

Item	Model		LB2500 EX Ⅱ(L)	LB2500 EX Ⅱ(M)
			T	
Capacity	Swing over bed	mm (in)	ø580 (22.83)	
	Swing over saddle	mm (in)	ø470 (ø18.5)	
	Max turning dia	mm (in)	ø410 (ø16.14)	ø340 (ø13.39)
	Max work length	mm (in)	150 (5.91)	
Travels	X axis	mm (in)	260 (10.24)	
	Z axis	mm (in)	350 (13.78)	
	C axis (0.001 increments)	deg	–	360
Spindle	Speed	min^{-1}	45 to 5,000	
	Speed ranges		2 auto ranges*1	
	Nose		JIS A2-6	
	Bore dia	mm (in)	ø80 (ø3.15)	
	Front bearing ID	mm (in)	ø120 (ø4.72)	
Turret	Type		V12 NC turret	M-V12 NC turret
	No. of tools		L: 12	L/M: 12
	OD tool shank	mm (in)	□25 (1)	
	ID tool shank dia	mm (in)	ø40 (ø1-1/2)	
	Turret rotation	sec/index	0.1	
Milling tool	Spindle speed	min^{-1}	–	45 to 6,000
	Speed range		–	Infinitely variable
Feed rates	Rapid traverse (X, Z)	m/min (fpm)	X: 25, Z: 30 (82, 98)	
	Rapid traverse (C)	min^{-1}	–	200
Motors	Spindle	kW (hp)	22/15 (30/20)*2	[30/22 (40/30)]*2
	Milling tool spindle	kW (hp)	–	7.1/4.1 (9.5/5.5)*3
	Axis drive	kW (hp)	X: 2.8, Z: 3.5 (3.7/4.7)	
	Coolant (discharge)	kW (hp)	0.25 (0.33)	
Machine size	Height	mm (in)	1,770 (70)	
	Floor space (side discharge)	mm (in)	1,880 × 1,734 (74 × 68)	
	Mass (w/CNC)	kg (lb)	3,400 (7,480)	3,500 (7,700)
CNC			OSP-P300LA	

*1. 2-range motor coil switching *2. 15 min/cont *3. 25 min/cont [ ]: High-power specs

Chucking Kit/Tooling Kit

Model	LB2500 EX Ⅱ			
Specifications	L			M
	Chucking Kit Standard	Tooling Kit Standard	Chucking Kit	Chucking Kit
Chuck	Solid 8 in N-08A6		BR kit E kit D kit	BR kit E kit D kit
Soft jaws, A			5	5
Soft jaws, B			3	3
Hard jaws			1	1
OD-Ⅰ		4	6	6
OD-Ⅱ		2	3	2
ID-H40		6	6	3
DS MT No. 1-H40			1	
DS MT No. 2-H40			1	
DS MT No. 3-H40		1	1	1
DS MT No. 4-H40			1	
BS 10-H40			2	2
BS 12-H40			2	2
BS 16-H40			2	2
BS 20-H40		2	2	2
BS 25-H40		2	2	2
BS 32-H40			2	2
Axial mill/drill				2
Radial mill/drill				2
Dummy holder				3

Standard Specifications & Accessories

Model	LB2500 EX Ⅱ(L)	LB2500 EX Ⅱ(M)
	T	
Spindle	A2-6 45 to 5,000 min^{-1} 22/15 kW (15 min/cont)	
Turret	NC indexing	
	V12 bolt clamp	M-V12 radial
Milling tool (25 min/cont)	–	45 to 6,000 min^{-1} 7.1/4.1 kW
Standard accessories	Coolant system (water soluble)	
	Work lamp (LED)	
	Full enclosure shielding	
	Jack screws, foundation washers	
	Hand tools	
Standard specifications	Door interlock (standard)	
	Lube monitor (A-1) + oil source pressure detector	
CNC	OSP-P300LA	
	NC operation panel, 15-in color TFT (touch panel)	
	Program storage; 4 GB	
	Operation buffer; 2 MB	

Optional Specifications & Accessories

Headstock	(Big-Bore spindle) High-power spindle 30/22 kW (15 min/cont)
Chucking	Chuck auto open/close confirm Chuck high/low pressure switch Chucking miss detection Workpiece stopper in spindle
Turret	V12 turret (VDI)
Gauges	In-process gauging system Touch Setter M (manual), A (auto)
Lubrication	Lube monitor B-2, C-1, C-2
Coolant	Shower coolant A, B Spindle ID coolant A, B Special coolant pump High/low coolant pressure switch Coolant sludge control Coolant detection; flow volume, level Mist collector Coolant gun
Air	Air blow (blast; chuck, spindle ID, turret)
Cover	Front door auto open/close
Chip handling	Chip pan; side, rear Chip conveyor; side, rear discharge L, H Chip bucket; L, H
Dustproofing	Air purge, double wiper
Automation	Bar feeder NC robots NC loaders Parts catcher, workrest
High accuracy specifications	AbsoScale Turcite® lining Temperature regulators (spindle, hydraulic oil, coolant) Z-axis pre-tensioned ball-screw

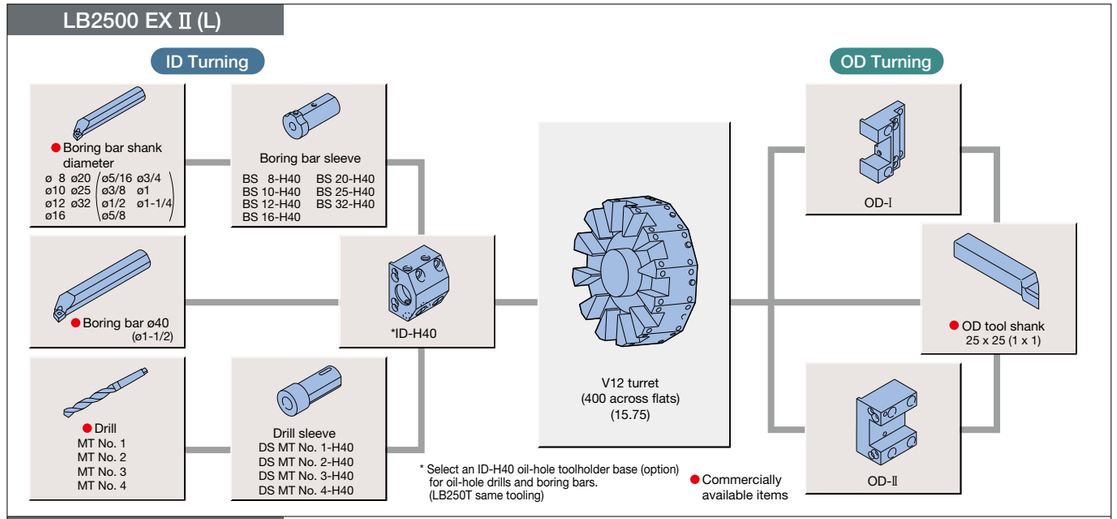
Chucking Kit Chuck Table

	BR kit	E kit	D kit
Chuck	Hollow 8 in BR08A6*	Hollow 8 in B-208A6	Hollow 10 in B-210A6

* Special 'Tnut-Plus' (option) T-nuts maintain improved "jaw change accuracy" with formed jaws, and are available alternatives for the BR chuck standard T-nuts. ('Tnut-Plus' T-nuts do not improve workpiece gripping accuracy.)

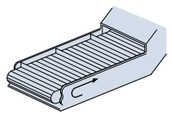
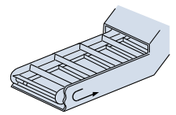
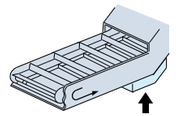
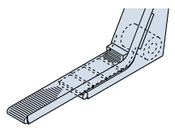
Tooling System

Unit: mm



Various chip conveyors

Chip conveyor types and application

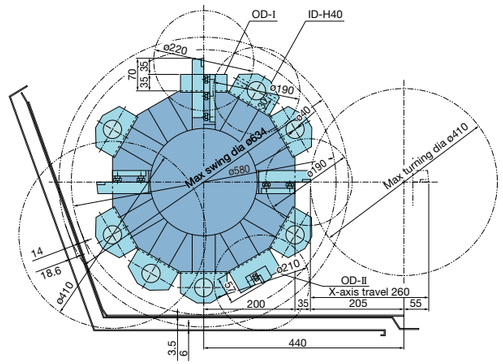
Type	Hinge	Scraper	Magnet scraper	Hinge + Scraper (with drum filter)
Application	● For steel	● For castings	● For castings	● For steel, castings, nonferrous metal
Features	● General use	● Magnet scraper more effective for sludge disposal ● Easy maintenance ● Blade scraper	● Effective with sludge ● Not suited for nonferrous metals	● Filtration of long and short chips and coolant
Shape				

Note: Machine platform may be necessary depending on the type of conveyor.

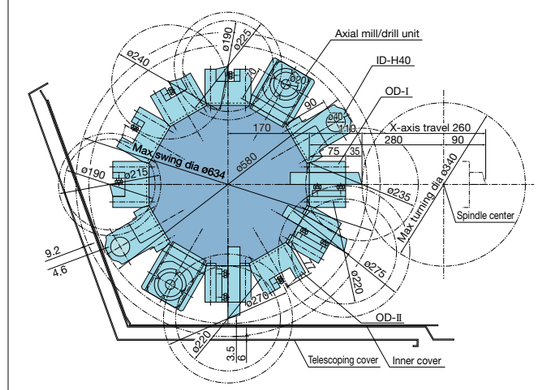
Tool Interference Drawings

Unit: mm

LB2500 EX Ⅱ (L)



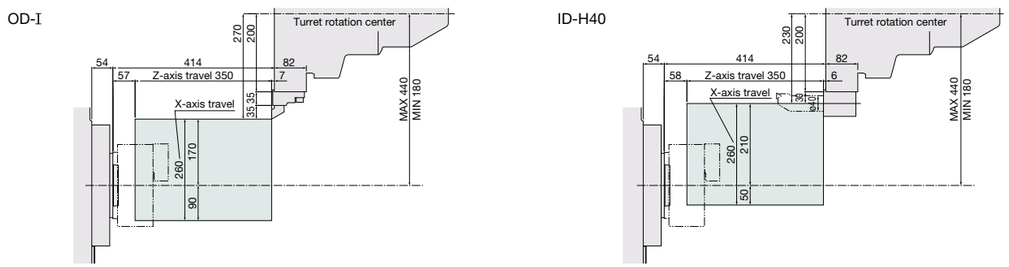
LB2500 EX Ⅱ (M)



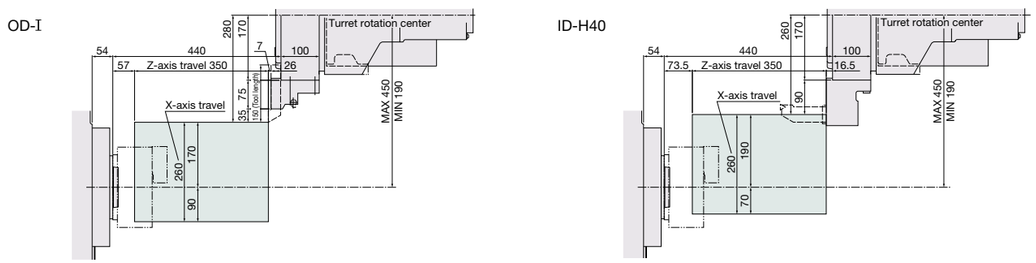
Working Ranges

Unit: mm

LB2500 EX Ⅱ (L)



LB2500 EX Ⅱ (M)



OSP suite OSP-P300LA

The Next-Generation Intelligent CNC

Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 2-axis, Multitasking: X, Z, C simultaneous 3-axis control
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Min / Max command	±99999.999 mm, 99,999.999° 8-digit decimal, command units: 0.001 mm, 0.01 mm, 1 mm, 0.001°, 0.01°, 1°
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands 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
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
	Program capacity	Program storage: 4 GB, operation buffer: 2 MB
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
	Programming	Program management, edit, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, M-spindle synchronized tapping, fixed drilling cycles, arithmetic functions, logic statements, trig functions, variables, branch statements, auto programming (LAP4), programming help
	Machine operations	MDI, manual (rapid traverse, pulse handle), load meter, operations help, alarm help, sequence restart, manual interrupt & auto return, data I/O, oriented spindle stop (electric), easy setting of cycle time reduction
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Communications/Networks		USB ports, Ethernet, DNC-T1
High speed/accuracy		Hi-G control
Energy-saving functions	ECO suite plus	ECO Idling Stop, ECO Power Monitor
	Power Regeneration System	Regenerative power is used when the spindle and feed axes decelarate to reduce energy waste.

Optional Specifications

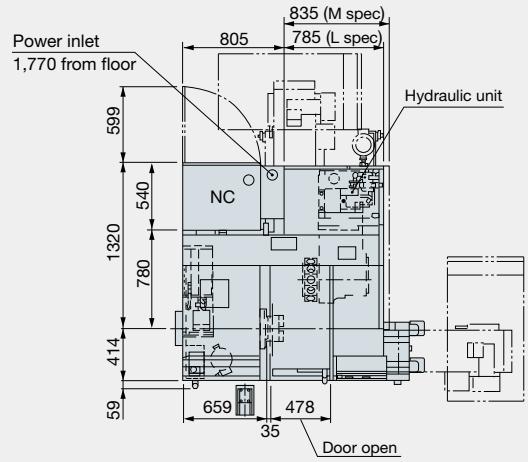
Item		Kit specs*1	NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D	OTM E	OTM D
New Operations										
Advanced One-Touch IGF-L *2							●	●		
Advanced One-Touch IGF-L Multitasking *2									●	●
Programming										
Circular threading				●		●		●		●
Program notes				●		●		●		●
User task 2 I/O variables, 8 each										
Work coordinate system select		10 sets, 50 sets, 100 sets								
Tool compensation (Std: 32 sets)		64 sets, 96 sets, 200 sets, 999 sets								
Common variables		1,000 sets (Std: 200 sets)								
Thread matching										
Threading slide hold (G34, G35)										
Variable Spindle Speed Threading (VSST)										
Inverse time feed										
Spindle synchronized tapping (rigid tapping)										
Milling machine specs	Coordinate convert		▲	▲	▲	▲			●	●
	Profile generate		▲	▲	▲	▲			●	●
	Flat turning									
	Helical Contour Generation									
	C-axis Torque Skip									
Helical cutting (within 360 degrees)										
Monitoring										
Real 3-D Simulation					●	●	●	●	●	●
Cycle time over check			●	●	●	●	●	●	●	●
Load monitor (spindle, feed axis)					●	●	●	●	●	●
Load monitor no-load detection (load monitor ordered)										
AI machine diagnostics (feed axes) *3										
Status Logger										
Tool life management				●		●		●		●
Tool life warning										
Operation end buzzer										
Work counters	Count only									
	Cycle stop									
	Start disabled									
Hour meters	Power ON									
	Spindle rotation									
	NC operating									
NC operation monitor (counter, totaling)			●	●	●	●	●	●	●	●
Status indicator (triple lamp) Type C [Type A, Type B]			●	●	●	●	●	●	●	●
Measuring										
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-232C (dedicated channel)									

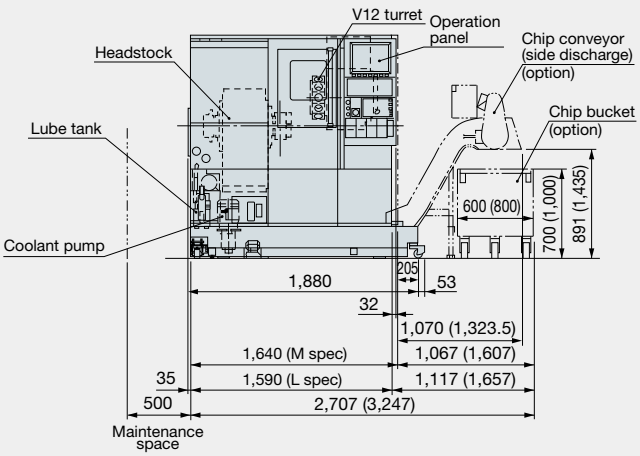
Item		Kit specs*1	NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D	OTM E	OTM D
External Input/Output and Communication Functions										
RS-232C connector										
DNC link	DNC-T3									
	DNC-C/Ethernet									
	DNC-DT									
USB (additional)	2 additional ports possible									
Automation/Unattended Operation										
Auto power shutoff M02, alarm										
Warm-up 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									
Okuma loader (OGL) interface			Including loader specs							
Third party robot and loader interface *4	Type B (machine)									
	Type C (robot and loader)									
	Type D									
	Type E									
Bar feeders	Interface									
Cycle time reduction *4	Operation time reduction		●	●	●	●	●	●	●	●
	Spindle rotating chuck open/close									
High-Speed/High-Accuracy Functions										
0.1 µm control *4										
Pitch error compensation										
AbsoScale detection *4										
Hi-Cut Pro			▲	▲	▲	▲			●	●
ECO suite plus (energy-saving function)										
ECO Operation	Chip conveyor intermittent/ linked operation									
	Mist collector intermittent/ linked operation									
	Spindle Power Peak Limiter									
ECO Power Monitor	Wattmeter									
Other Functions										
Collision Avoidance System (CAS)										
One-Touch Spreadsheet										
Machining Navi L-*g*II, T-*g* (threading)										
Harmonic Spindle Speed Control (HSSC)			●	●	●	●	●	●	●	●
Spindle dead-slow cutting										
Spindle speed setting										
Spindle S command 0.1 min^{-1}										
Manual cutting feed										
Short circuit breaker										
External M signals [2 sets, 4 sets, 8 sets, 16 sets]										
Edit interlock										
OSP-VPS (Virus protection system)										

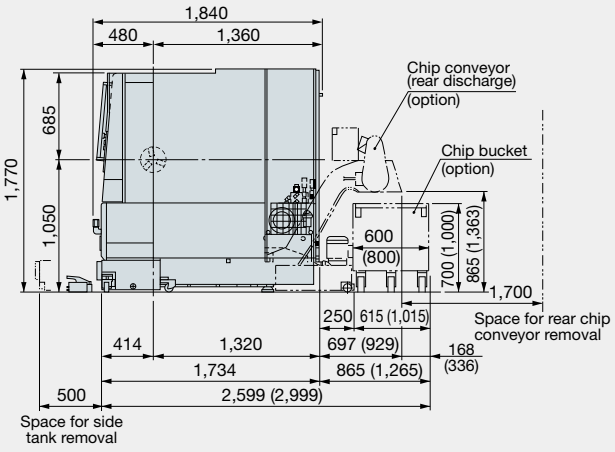
*1. NML: Normal, 3D: Real 3-D Simulation, OT-IGF: One-Touch IGF, OTM: One-Touch M
E: Economy, D: Deluxe
*2. Real 3-D simulation is included
*3. With AbsoScale detection specs, ball screw wear detection is possible.
*4. Engineering discussions required.
Note. ▲Triangle items for M function (milling tool) machines only.

LB2500 EX Ⅱ
Dimensional Drawings/Installation Drawings

( ): H chip conveyor







Unit: mm

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