OKUMA

LOC Series CNC Lathes

LOC500
LOC650

[For Oil Country Applications]

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Collision Avoidance System

Machining Navi

Okuma's large capacity lathes bring heavy muscle to the oil industry

So precisely designed for the needs of the oil industry, the LOC500 and the LOC650 are named for the specifications driving their development: Lathe Oil Country.

The 4-axis configuration makes them possible to perform the tightest threading functions on big pipes with precision and speed.

Each machine has three spindle bore variations specifically designed for the series, and is able to accommodate large diameter pipes.

LOC500

LOC650

Machine photos may show optional equipment.

Tailored to the oil industry

Thick solid-body turrets (Opt)

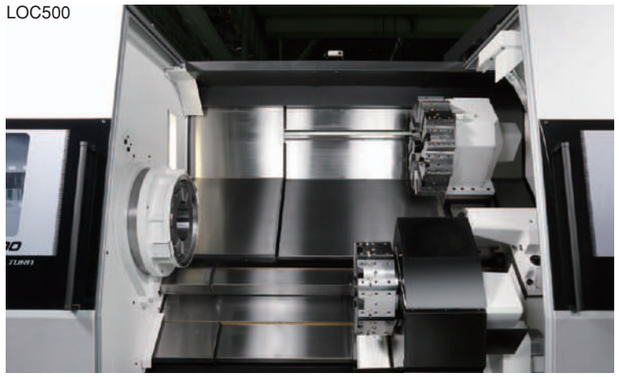
Upper/lower turrets: 200-mm thick (7.87 in.)

LOC500

Highlighted Specs	LOC500	LOC650
Featuring:		
• 4-axes productivity/simultaneous cutting using 2 tools		
• Spindle bores (max)	ø275 mm (10.8 in.)	ø560 mm (22 in.)
• Spindle power (max)	55 kW (75 hp)	45 kW (60 hp)
• Okuma's Oil Field (threading suite)		
Options: (partial list)		
• High pressure coolant		
• Auto door		
• Feed hold during threading		
• Collision Avoidance System (CAS)		
• Rear chuck		

LOC650

LOC500



Max turning dia x length: ø600 x 2,000 mm (ø23.63 x 78.74 in.)

Expansive turning area for big work envelopes

Improved turning accuracies

- That means better premium thread applications
- For high mechanical and hydraulic performance (with multiple sealing areas; particularly efficient in moderate- to high-pressure gas well applications)
- The programmable tailstock and auto door reduces operator intervention and adds to the efficiency of the part transfer.

Both machines also feature this Rear Chuck with manual clamp/unclamp operations

Featuring an extensive array of threading capabilities

Performing the tightest threading functions with 0.1 micron precision and speed

Okuma's Oil Field **"Threading Suite"** is custom designed to combine variable spindle speed threading (VSST) and harmonic spindle speed control (HSSC) that delivers an exact match between infeed patterns and cutting increments. Okuma lathes are known for their power and control. Though huge in scale, the LOC Series delivers Okuma precision with optimum efficiency.

LOC500

With effective thread chasing applications

Featuring	The Benefits
• Uniform helical threads (OD or ID)	• Better premium thread applications
• No backtracking	• Save time, less danger of thread damage
• More closely maintained limits	• Improved thread quality
• High mechanical and hydraulic performance (multiple sealing jobs)	• Efficient in moderate to high-pressure gas well applications

LOC650

Major Specifications

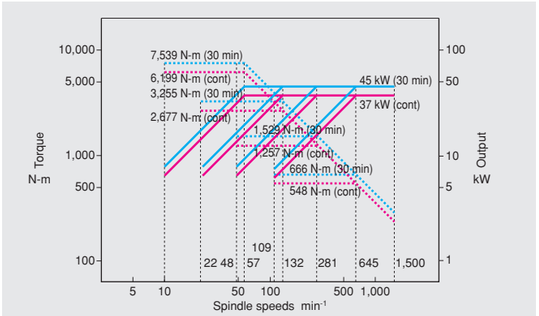
Model				LOC500 B5.5	LOC500 B07	LOC500 B11	LOC650 B15	LOC650 B22
Chuck size				15”	18”	24”	33”	40”
Capacity	Swing over bed		mm (in.)	ø840 (ø33.07)			ø800 (ø31.50) 〈chuck: ø1,030 (ø40.55)〉	
	Distance between centers		mm (in.)	1,990 (78.35)	1,980 (77.95)	1,930 (75.98)	1,750 (68.90)	
	Max turning diameter		mm (in.)	ø555 (ø21.85)			ø650 (ø25.59) (1ST), ø500 (ø19.69) (2ST, 2SC)	
	Max work length		mm (in.)	1,990 (78.35)	1,980 (77.95)	1,930 (75.98)	1,750 (68.90)	
Travels	X-axis travel	Upper turret	mm (in.)	440 〈+330 to -110〉 (17.32 〈+12.99 to -4.33〉)			470 〈+330 to -140〉 (18.50 〈+12.99 to -5.51〉)	
		Lower turret	mm (in.)	305 〈+230 to -75〉 (12.01 〈+9.06 to -2.95〉)			270 〈+255 to -15〉 (10.63 〈+10.04 to -0.59〉)	
	Z-axis travel	Upper turret	mm (in.)	2,075 (81.69)			2,040 (80.31)	
		Lower turret	mm (in.)	2,010 (79.13)			1,425 (56.10) (2ST), 1,015 (39.96) (2SC)	
Spindle	Spindle speed		min^{-1}	11 to 2,000	10 to 1,500	10 to 1,000	5 to 500	5 to 350
	Spindle speed ranges			Infinitely variable x Automatic 4 speeds		Infinitely variable x Automatic 2 speeds	Infinitely variable x Automatic 2 speeds	
	Type of spindle nose			JIS A2-11	JIS A2-15	JIS A2-20	ASA A2-20	ø725 flat
	Through spindle hole diameter		mm (in.)	ø142 (ø5.59)	ø185 (ø7.28)	ø275 (ø10.83)	ø375 (ø14.76)	ø560 (ø22.05)
	Spindle front bearing diameter		mm (in.)	ø220 (ø8.66)	ø280 (ø11.02)	ø380 (ø14.96)	ø476 (ø18.74)	ø700 (ø27.56)
Turret	Turret type	Upper turret		V12			V12	
		Lower turret		V10			V8	
	No. of tools	Upper turret		12 tools			12 tools	
		Lower turret		10 tools			8 tools	
	Tool shank height		mm (in.)	□32 (1.25)			□38.1 (1.5)	
	Boring bar shank diameter		mm (in.)	ø63 (ø2.48)			ø63.5 (2.5)	
Feedrate	Rapid feedrate	X axis	m/min (ipm)	15 (591)			5 (197)	
		Z axis	m/min (ipm)	20 (787)			10 (394)	
	Cutting feedrate	X/Z axis	mm/rev (ipr)	0.001 to 1,000.000 (0.001 to 40.0000)			0.01 to 1,000 (0.001 to 40.0000)	
Tailstock	Tailstock quill diameter		mm (in.)	ø130 (ø5.12)			ø180 (ø7.09)	
	Tailstock tapered bore type			MT No.5 (built-in)			MT No.6	
	Tailstock quill travel		mm (in.)	170 (6.69)			200 (7.87)	
Motor	Spindle drive (30 min/cont)		kW (hp)	37/30 [45/37*] (50/40 [60/50])	45/37 (60/50)	55/45 (74/60)	45/37 (60/50)	
	Axis drive motors	X axis	kW (hp)	Upper: BL5.2 (7), Lower: BL3.0 (4)			Upper and Lower: BL2.8 (4)	
		Z axis	kW (hp)	Upper and lower: BL5.2 (7)			Upper and lower: BL3.5 (5)	
	Coolant pump motors		kW (hp)	0.4 x 2 (0.5 x 2)			0.4 (0.5)	
Machine size	Height		mm	3,042 (119.76)			2,843 (111.93)	
	Floor space		mm	6,060 x 3,205 (238.58 x 126.18)		6,160 x 3,205 (242.52 x 126.18)	3,129 x 7,055 (123.19 x 277.76)	
	Weight (including CNC)		kg (lb)	21,500 (47,300)	22,000 (44,000)	23,300 (51,260)	20,700 (45,540) (1ST) 21,800 (47,960) (2ST) 23,300 (51,260) (2SC)	22,900 (50,380) (1ST) 24,000 (52,800) (2ST) 25,500 (56,100) (2SC)
Control				OSP-P300L				

*High-power motor

High-torque motor plus gear driven spindles

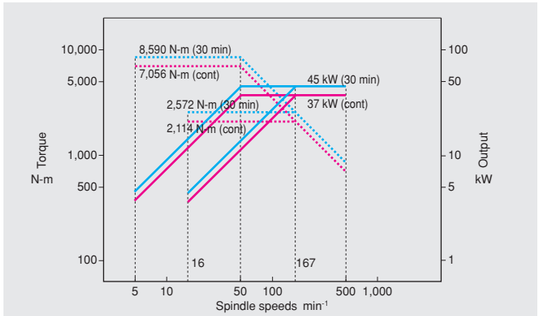
LOC500 [B-07]

- Spindle 1,500 min^{-1}
- Output 45/37 kW (30 min/cont)
- Torque 7,539/6,199 N-m (30 min/cont)



LOC650 [B-15]

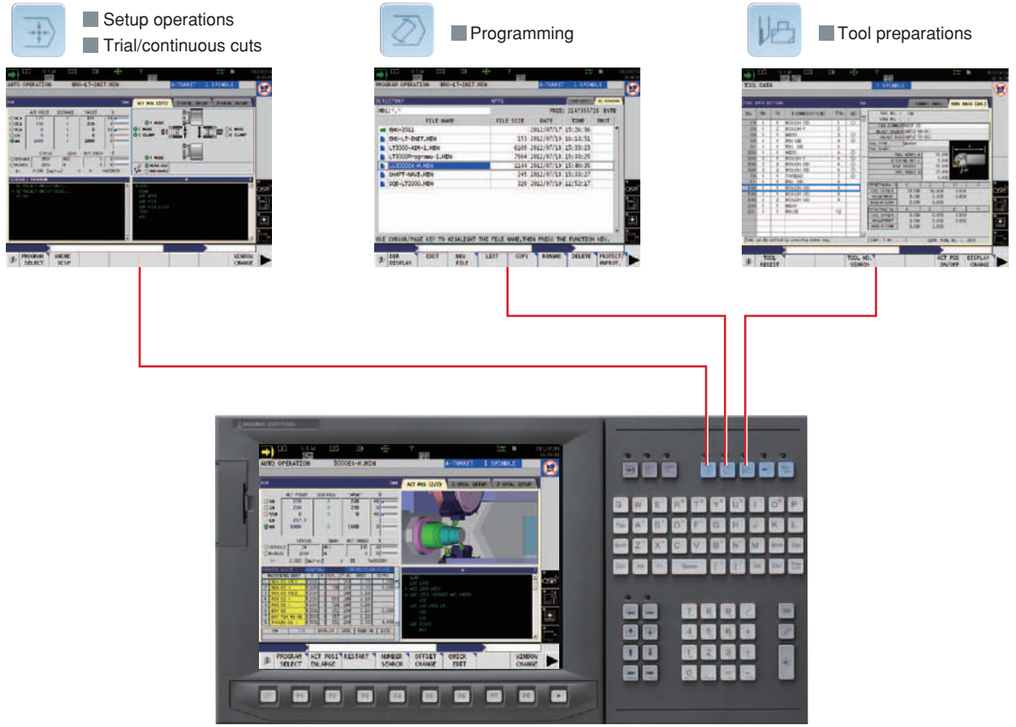
- Spindle 500 min^{-1}
- Output 45/37 kW (30 min/cont)
- Torque 8,590/7,056 N-m (30 min/cont)



Okuma Control OSP-P300L

Satisfaction from complete control of a machine tool

As a “machine & control” builder, Okuma makes further strides in machine tool manufacturing with this superb Control featuring “Easy Operation.” Okuma took a close look at the way machinists actually operate machine tools, to help them create smoother and more effective ways of producing parts. Novice operators as well as professional machinists get complete control—and satisfaction. Moreover, what you want to see and do conveniently come together in a “single-mode operation.” First, select one of three operation screens. Then simply touch the screen or press a function key to see and do your job.

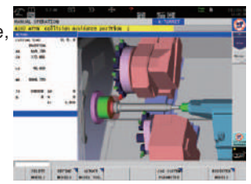


Collision prevention

Collision Avoidance System (Optional)

World’s first “Collision-Free Machines”

CAS prevents collisions in automatic or manual mode, providing risk-free protection for the machine and great confidence for the operator.



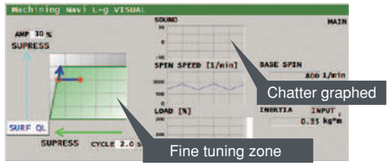
Virtual machine (collision check)

Cutting condition search for turning

Machining Navi L-*g* (Optional)

Chatter-free applications for lathes

Chatter in a lathe can be suppressed by changing spindle speeds to the ideal amplitude and wave cycle—without decreasing spindle speed.



Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 2-axis + 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 ~0.001 mm (±3937.0078~0.0001 in.), 0.001° Decimal:1 µm, 10 µm, 1 mm (0.0001,1 in.) (1º, 0.01º, 0.001º)
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands, Override 50~200% Constant cutting speed, optimum turning speed designate
	Tool compensation	Tool selection: 32 sets, tool offset: 32 sets
	Display	15-inch color display operational panel, touch panel
	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	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, 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, manual cutting feed, pulse handle), load meter, operations help, alarm help, sequence, return, manual interrupt & auto return, threading slide hold, data I/O, chuck open/close during spindle rotation, spindle orientation (electric)
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Communications/Networks		USB ports, Ethernet, RS232C interface (1 channel)
High speed/accuracy		Hi-G control

Optional Specifications

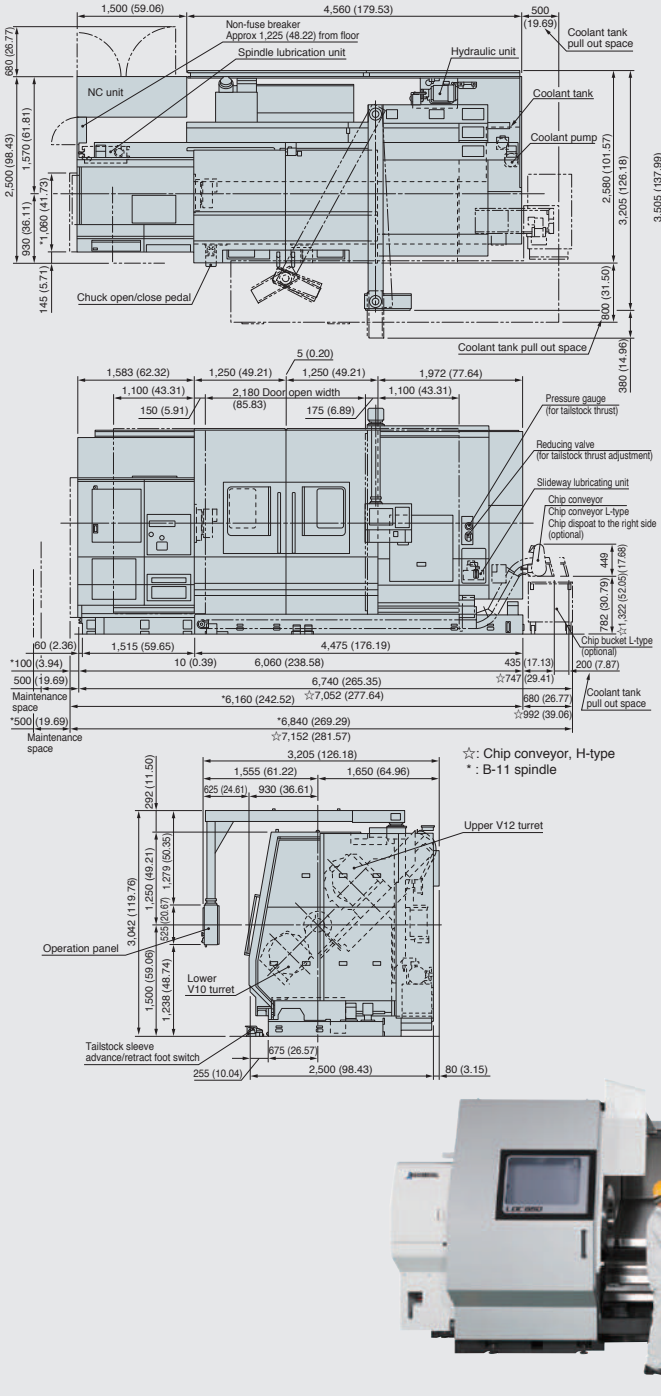
Item		Kit Specs *1	NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D
New Operations								
Advanced One-Touch IGF-L *2							●	●
Advanced One-Touch IGF-L Multitasking *2								
Programming								
Circular threading				●		●		●
Program notes				●		●		●
User task 2	I/O variables, 8 ea							
Work coordinate system 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								
Spindle synchronized tapping (rigid tapping)								
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)								
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]			●	●	●	●	●	●
Measuring								
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					

Item		Kit Specs *1	NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D
External Input/Output and Communication Functions								
Additional RS-232-C channel								
2 channels (Std 1 channel)								
DNC link	DNC-T3							
	DNC-C/Ethernet							
	DNC-DT							
USB (additional)	2 additional ports possible							
Automation/Untended Operation								
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							
Okuma loader (OGL) interface			Including loader specs					
Third party robot and loader interface *3	Type B (machine)							
	Type C (robot and loader)							
	Type D							
	Type E							
Bar feeders	Bar feeder		Included in machine specs					
	Interface only							
Cycle time reduction *3	Operation time reduction		●	●	●	●	●	●
	Chuck open/close during spindle rotation							
	Spindle rotating auto tailstock advance/retract							
High-Speed/High-Accuracy Functions								
1/10 µm control *3								
Pitch error compensation								
AbsoScale detection *3								
Hi-Cut Pro			▲	▲	▲	▲		
Super-NURBS	Linear axis							
	Linear axis + rotary axis							
Other Functions								
Collision Avoidance System (CAS)								
One-Touch Spreadsheet								
Machining Navi L-*g*								
Harmonic spindle speed control (HSSC)			●	●	●	●	●	●
Spindle dead-slow cutting								
Spindle speed setting								
Spindle S command 0.1 min^{-1}								
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)								

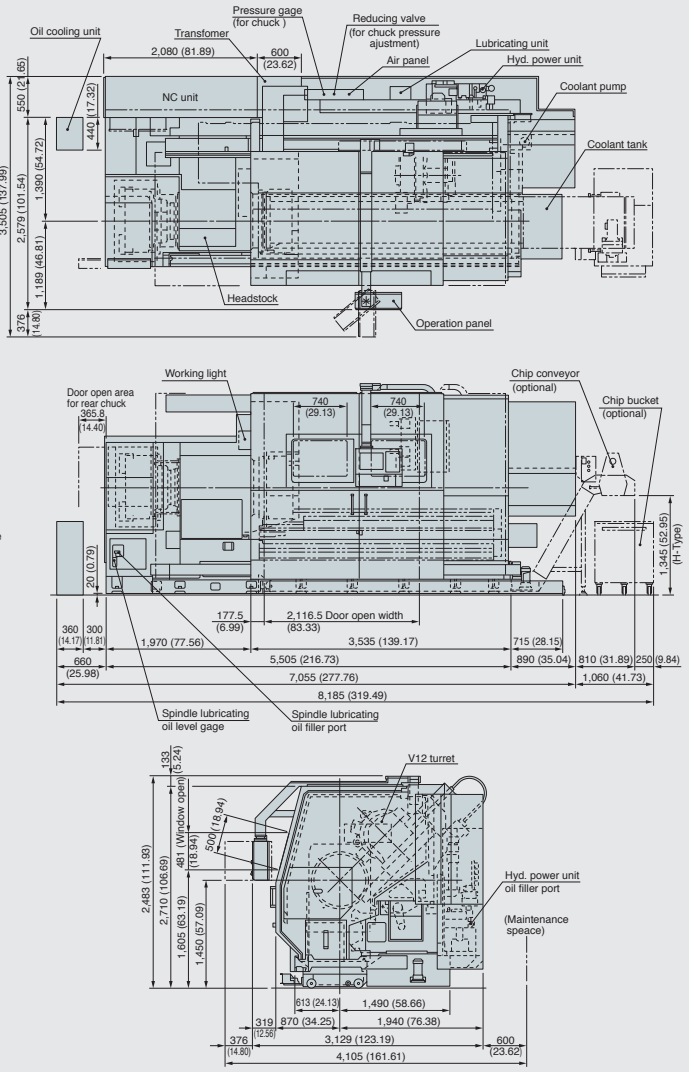
*1. NML: Normal, 3D: Real 3D simulation, OT-IGF: One-Touch IGF
E: Economy, D: Deluxe
*2. Real 3-D Simulation included
*3. Engineering discussions required.
Note: ▲ Triangle items for M function (milling tool) machines only.

Dimensional/Installation Drawings

LOC500



LOC650



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