OKUMA

OPEN POSSIBILITIES

2-Saddle CNC Lathe

SIMUL TURN LU7000EX

2-Saddle CNC Lathe

SIMUL TURN LU7000EX

Intelligent Technology | Thermo-Friendly Concept | Collision Avoidance System | Machining Navi

Best-in-class cutting capacity and workpiece load carrying capacity

With a large through-hole diameter of ø560 mm and a maximum turning diameter of ø900 mm, powerful heavy-duty machining is done with ease. The LU7000 EX has upper and lower turrets that can provide simultaneous cuts for highly efficient production in large component applications.

The high-performance of this two-saddle lathe includes process-intensive turning and milling. In addition to the strong lineup of spindle variations, power milling and long boring-bar specs are ready to improve productivity for the big workpieces.

SIMUL TURN LU7000EX

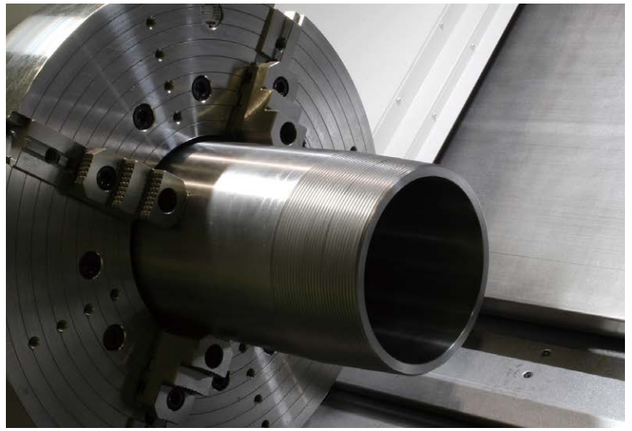
Photographs may include optional specifications.

How to innovate and be productive with heavy-industry applications

Meet the thoroughly redesigned, new and big smart machine with large working range, powerful turning, and process-intensive milling. For those heavy-industry, hard-to-cut jobs, Okuma offers a state-of-the-art workhorse to deliver the extra productivity you need today.

Example of a threaded workpiece

The LU7000 EX is an excellent choice for oil well casings like this and the large components used in construction, shipbuilding, and other industries.



An oil-and-gas component (steel pipe)

Higher productivity for power machining

At 10-mm² turning, heavy-duty cutting is delivered with satisfying power. An option for the upper turret is power milling (15-kW, 190 N-m max torque) to achieve shorter cycle times for the large workpieces too.

For a wide range of machining requirements

The maximum machining size is ø900 mm. In addition to the huge work envelope, a wealth of spec extensions are available for a wide range of machining requirements.

Upper/lower turrets deliver superb productivity

With highly efficient, simultaneous upper/lower turret applications, cycle times are minimized. A wide range of highly rigid lower turret specifications are available for even higher productivity. The upper/lower turrets move faster, so non-cutting times become even shorter.

Higher productivity for power machining

ø375-mm B15 spindle

Heavy cutting: 10 mm² (1,500 cm³/min)
(Workpiece: S45C)

Turning, OD

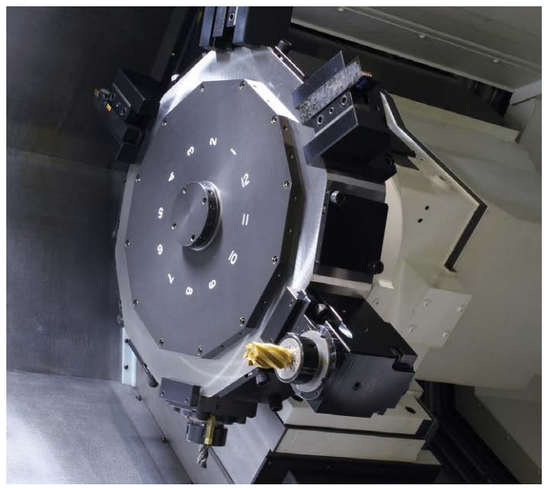
- Upper turret
  - Heavy cuts 10 mm² (1,500 cm³/min)
  - Cut speed 150 m/min
  - Depth 10 mm
  - Feed 1.0 mm/rev
- Lower turret
  - Heavy cuts 8 mm² (1,200 cm³/min)
  - Cut speed 150 m/min
  - Depth 10 mm
  - Feed 0.8 mm/rev

Turning, drilling

- Upper/lower turrets
  - ø80-mm carbide throw-away drill
  - Cut speed 126 m/min
  - Feed 0.2 mm/rev

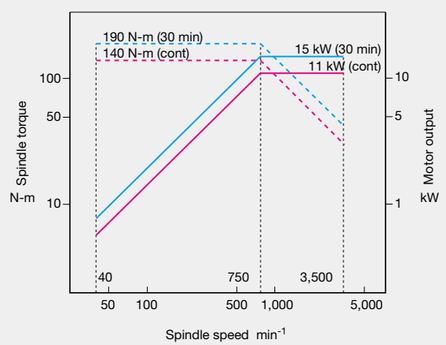
Note: The “actual data” referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting, and other conditions.

Powerful milling possible on upper turret (Optional)



Milling tool spindle

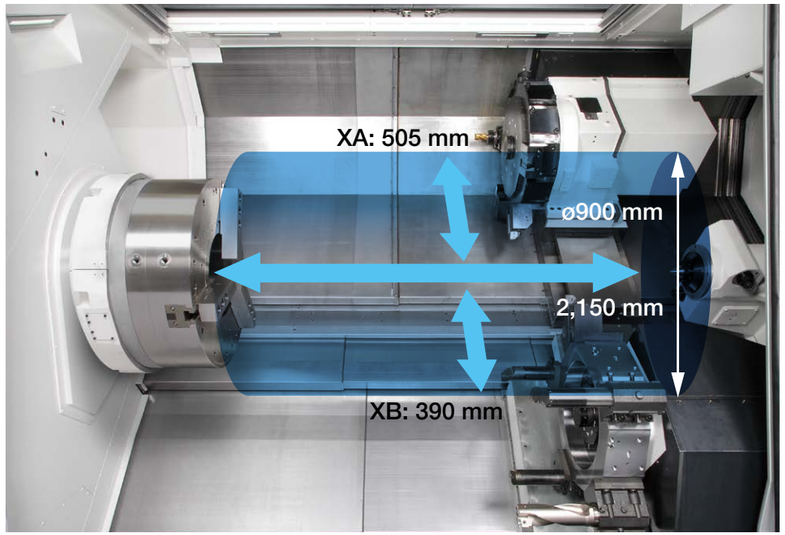
- Spindle speed 3,500 min⁻¹
- Max output 15/11 kW (30 min/cont)
- Max torque 190/140 N-m (30 min/cont)



For a wide range of machining requirements

Plenty of travel even for parts with extra large diameters and lengths

Largest-in-class cutting diameter (upper: ø900 mm, lower: ø670 mm), swing dia of ø1200 mm.
With a large work envelope to handle a wide range of applications.



Plenty of spindle variations

In four different sizes designed to fit a wide range of applications.

Spindle Size	B08	B12	B15	B22
Max spindle speed min⁻¹	1,500	750	500	350
Spindle nose type	A2-15	A2-20	A2-20	ø725 flat
Spindle bore dia mm	ø200	ø320	ø375	ø560
Spindle bearing dia mm	ø280	ø440	ø480	ø700
Spindle motor (30 min/cont) kW	45/37, 55/45 (Optional), 75/60 (Optional)			

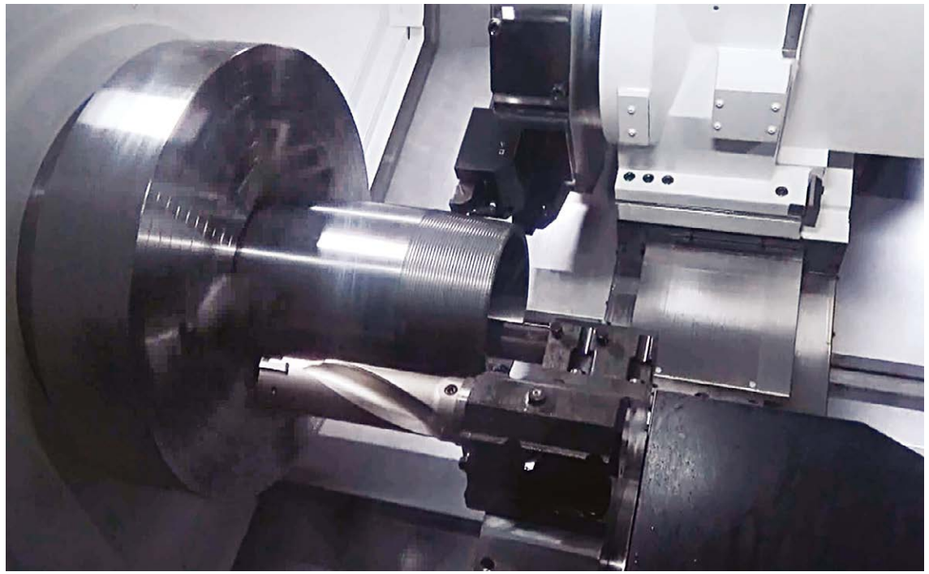
Highly rigid tailstock

The tailstock features a large diameter in its sturdy design. With high thrust, workpieces are firmly supported for steady, heavy-duty jobs. Moreover, the self-traveling feature lightens operator work loads and drastically shorten setup times.

An innovation in 2-saddle machining

Simultaneous ID/OD cutting

Highly efficient turning with simultaneous outer diameter threading and internal diameter boring is made possible by using the upper and lower turrets with simultaneous 4-axis control.
The benefit of course is shorter cycle times for big pipes and other large components.



Wide lower turret with more rigidity
(Optional)

Faster operations for shorter non-cutting times

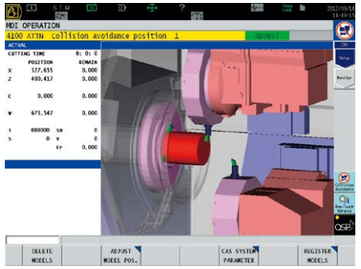
- **Rapids:** X axis 20 m/min
  Z axis 20 m/min
- **Turret indexing:** Upper 0.6 sec/index
  (rotation only) Lower 0.4 sec/index

Okuma Intelligent Technologies deliver excellent performance

Collision prevention
Collision Avoidance System (Optional)

Allowing operators to focus on making parts

NC controller (OSP) with 3D model data of machine components—workpiece, tool, chuck, fixture, headstock, turret, tailstock—performs real time simulation just ahead of actual machine movements. It checks for interference or collisions, and stops the machine movement immediately before collision. Machinists (novice or pro) will benefit from reduced setup and trial cycle times, and the confidence to focus on making parts.



Virtual machine (interference check)

Collision prevention during automatic operation

NC program is read in advance and axial travel commands are checked for interference with consideration of zero point and tool compensation values set in NC. Axial travel movement is stopped temporarily before collision occurs.

Collision avoidance in manual operation

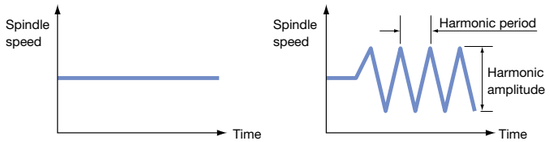
Especially useful for machine operators setting up a job, collision avoidance in manual mode provides collision-free confidence and faster machining preparations.

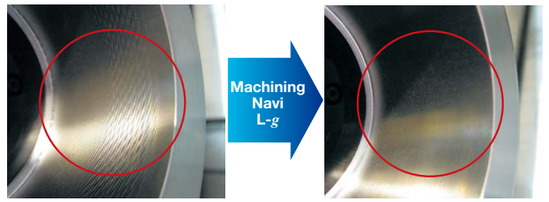
Cutting condition search for turning
Machining Navi L-*g* (Harmonic Spindle Speed Control) (Optional)

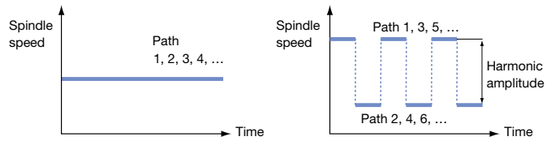
Varying the spindle speed in accordance with the best amplitude and period makes it possible to suppress chatter during turning operations. Tool life can be extended and cycles times reduced with use of the optimum cutting conditions, producing significant effects in deep-hole boring bar, threading,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

Cutting condition search in threading
Machining Navi T-*g* (Threading) (Optional)

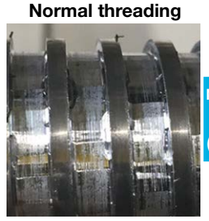
When chatter occurs in threading, general methods to resolve the problem have been to either lower cutting conditions at the expense of productivity, or to use special chatter-resistant tools at some cost. Machining Navi T-*g* (threading) provides optimum control, increasing or decreasing spindle speed on each path to inhibit the periodic vibrations that are a cause of chatter.



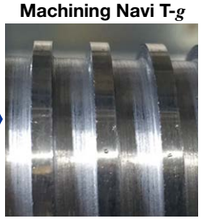




Normal threading


Chatter marks

Machining Navi T-*g*


Smooth surface, clean finished threads

Achieves steady machining with high dimensional stability

Manageable Deformation—Accurately Controlled
Thermo-Friendly Concept

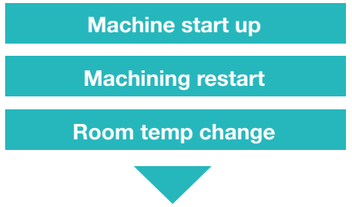
Okuma's Thermo-Friendly is a structurally designed system that provides astonishing machining accuracy.
It frees the machinist from troublesome offsets and machine warm-ups—is superb for long runs, multitasking, front/backend work, plus Y-axis applications.

Machining dimensional change over time: ø19 µm

LU7000 EX turning actual data (8°C ambient temperature change)

Fewer tool compensation checks

Compensation due to ambient temperature changes and temporary midday or evening machine stops is performed fewer times thanks to outstanding dimensional stability. This leads to better machine utilization, improving efficiency especially for mass-production machining.



Next-Generation Energy-Saving System
ECO suite

A suite of energy saving applications for machine tools

Operation only for the time required for each unit
ECO Idling Stop

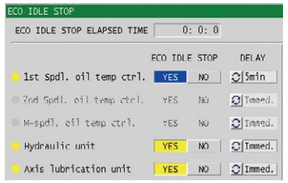
Idling time can be set by individual unit for the spindle, feed shaft, and peripheral equipment. By reducing the idling time, power consumption can also be reduced.

On-the-spot check of energy savings
ECO Power Monitor

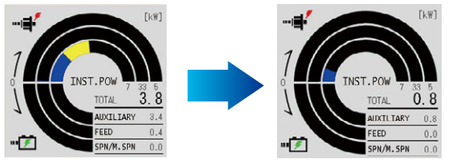
Power is shown individually for spindle, feed axis, and peripheral equipment on OSP operation screen. The energy-saving effect from peripheral equipment stopped with ECO Idling Stop can be confirmed on the spot.

- Intermittent/linked operation of chip conveyor, or mist collector during machining
  "ECO Operation" (Optional)

- Example of equipment that can use Idling Stop



- Example of Power Monitor check



Before ECO Idling Stop　　After ECO Idlling Stop

Machine Specifications

Model			Unit	LU7000 EX (L)	LU7000 EX (M)
				2SC × 2000	
Capacity	Swing over bed	Upper/Lower turret	mm (in.)	ø1,200 (ø47.24)*1	
	Swing over saddle	Upper/Lower turret	mm (in.)	ø770/ø780 (ø30.31/ø30.71)	
	Max turning diameter	Upper/Lower turret	mm (in.)	ø900/ø670 (ø35.43/ø26.38)	ø900/ø670 (ø35.43/ø26.38) (L radial)
	Max work length		mm (in.)	2,000 (78.74)	
	Max workpiece weight (including chuck)	Cantilever support	kg (lb)	B08: 1,850 (4,070) [B12: 4,000 (8,800), B15: 4,000 (8,800), B22: 11,000 (24,200)] (when L/D=1.0*2) B08: 1,300 (2,860) [B12: 2,900 (6,380), B15: 2,900 (6,380), B22: 8,000 (17,600)] (when L/D=2.5*2)	
		Double-centered support	kg (lb)	2,600 (5,720)	
Travels	X-axis	Upper/Lower turret	mm (in.)	505/390 (19.88/15.35)	
	Z-axis	Upper/Lower turret	mm (in.)	2,150/2,150 (84.65/84.65)	
	C-axis control		deg	—	360° (min control angle 0.001°)
Spindle	Speed		min^{-1}	B08: 10 to 1,500 [B12: 8 to 750, B15: 5 to 500, B22: 5 to 350]	
	Speed ranges			B08: Auto 4-speed (4 gears) [B12·B15·B22: Auto 2-speed (2 gears)]	
	Spindle torque (30 min/cont)	B08	N-m (ft-lbf)	45 kW: 9,511/7,820 (6,993/5,750) [55 kW: 10,146/9,511 (7,460/6,993), 75 kW: 10,146/10,146 (7,460/7,460)]	
		B12	N-m (ft-lbf)	45 kW: 8,189/6,733 (6,021/4,950) [55 kW: 10,009/8,189 (7,359/6,021), 75 kW: 10,919/10,919 (8,028/8,028)]	
		B15	N-m (ft-lbf)	45 kW: 8,595/7,067 (6,319/5,196) [55 kW: 10,505/8,595 (7,724/6,319), 75 kW: 10,505/10,505 (7,724/7,724)]	
		B22*3	N-m (ft-lbf)	45 kW: 8,883/7,304 (6,531/5,370) [55 kW: 10,857/8,883 (7,983/6,531), 75 kW: 11,567/11,567 (8,505/8,505)]	
	Spiindle nose type			B08: JIS A2-15 [B12: JIS A2-20, B15: JIS A2-20, B22: ø725 flat]	
	Spindle bore dia		mm (in.)	B08: ø200 (ø7.87) [B12: ø320 (ø12.60), B15: ø375 (ø14.76), B22: ø560 (ø22.05)]	
	Spindle bearing dia		mm (in.)	B08: ø280 (ø11.02) [B12: ø440 (ø17.32), B15: ø480 (ø18.90), B22: ø700 (ø27.56)]	
Turret	Type	Upper/Lower turret		V12/V10	Multitasking V12/V10
	No. of tools	Upper/Lower turret		12/10	L, M: 12/L: 10
	OD tool shank dimensions		mm (in.)	□40 (1.57)	
	ID tool shank diameter		mm (in.)	ø63 (ø2.48)	
Milling Tool	Speed range		min^{-1}	—	40 to 3,500
	Milling tool speed range			—	Infinitely variable
Rapid traverse	Rapid traverse	X, Z-axis	m/min (fpm)	X: 20, Z: 20 (X: 6.10, Z: 6.10)	
	Rapid traverse	C-axis	min^{-1}	—	50
Tailstock	Quill diameter		mm (in.)	ø180 (ø7.09)	
	Quill bore taper			MT No. 6 (built-in)	
	Quill travel		mm (in.)	350 (13.78)	
	Maximum tailstock thrust		kN	26	
Motors	Spindle motors (30 min/cont)		kW (hp)	45/37 [55/45, 75/60] (60/49 [73/60, 100/80])	
	Milling tool spindle motors		kW (hp)	—	15/11 (20/15) (30 min/cont)
	Axis drive motors	X-axis	kW (hp)	XA: 5.2 (6.93), XB: 5.5 (7.33)	
		Z-axis	kW (hp)	ZA: 7.3 (9.73), ZB: 7.3 (9.73)	
	Coolant motors (50/60 Hz)		kW (hp)	0.55/0.75 (0.73/1) (turret), 2.2/2.2 (3/3) (washining)	
Machine size	Height		mm (in.)	3,300 (129.92)	
	Floor space (width × depth) (including tank)		mm (in.)	7,842 × 3,256 (308.74 × 128.19)	
	Machine weight		kg (lb)	40,000 (88,000)	
CNC				OSP-P300LA	

[ ]: Optional　*1. With Touch Setter mounted, the spindle nose to 30-mm range only is limited to ø1,030 mm.　*2. L: Workpiece length, D: Workpiece diameter
*3. B22 spindle is not available on M specification.

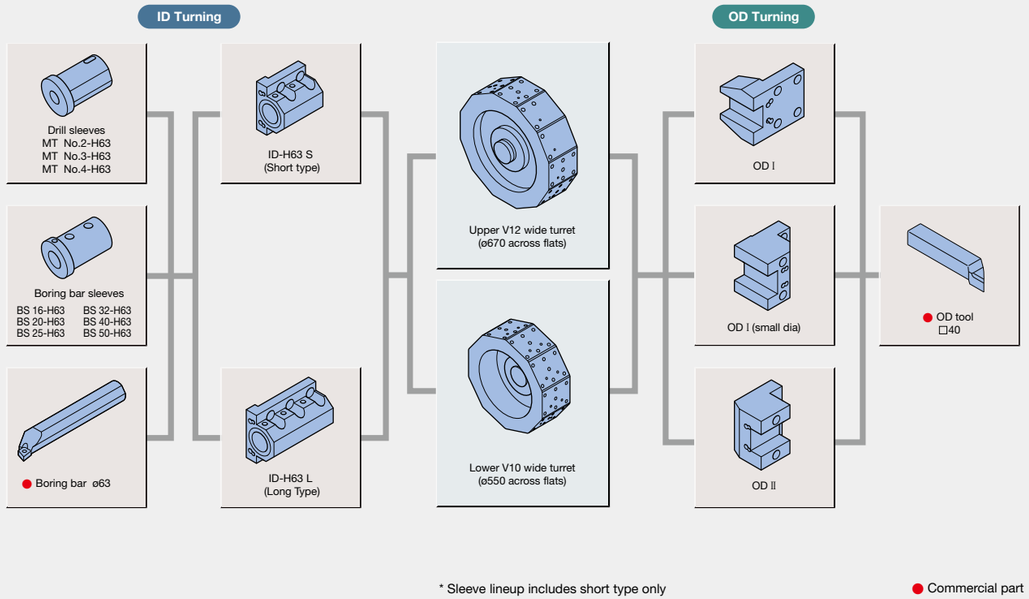
Mountable chuck sizes example

Solid/Hollow Chucks	18 inch, 21 inch, 24 inch
Pneumatic Chucks	ø500-mm OD, ø685-mm OD, ø850-mm OD, ø1,000-mm OD

For other chuck sizes, please consult your Okuma representative.

Tooling System

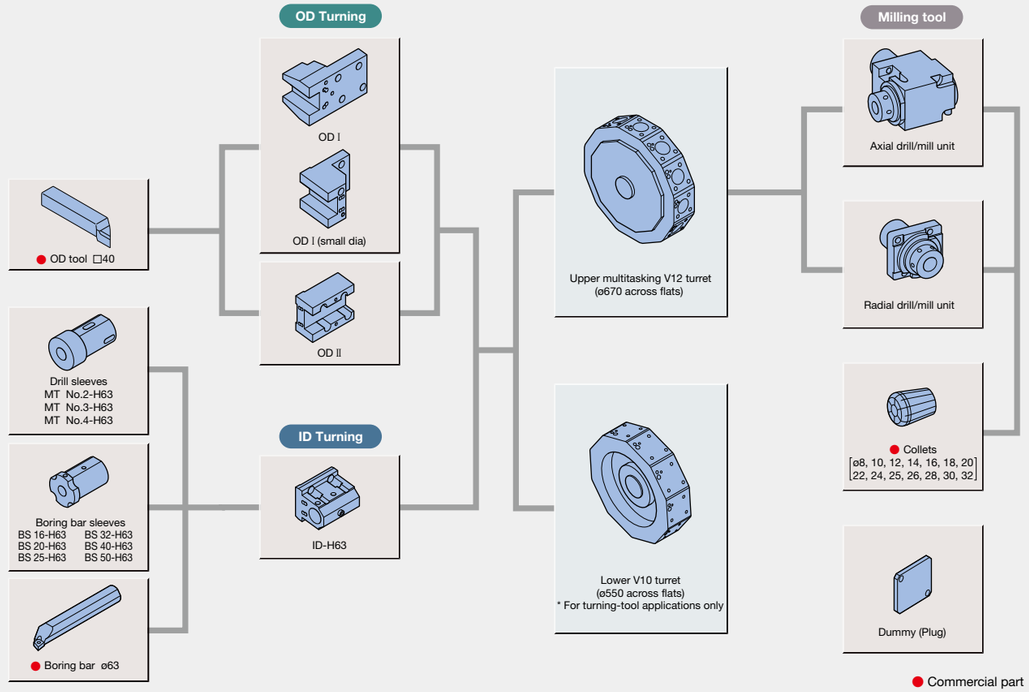
LU7000 EX (L)



* Sleeve lineup includes short type only

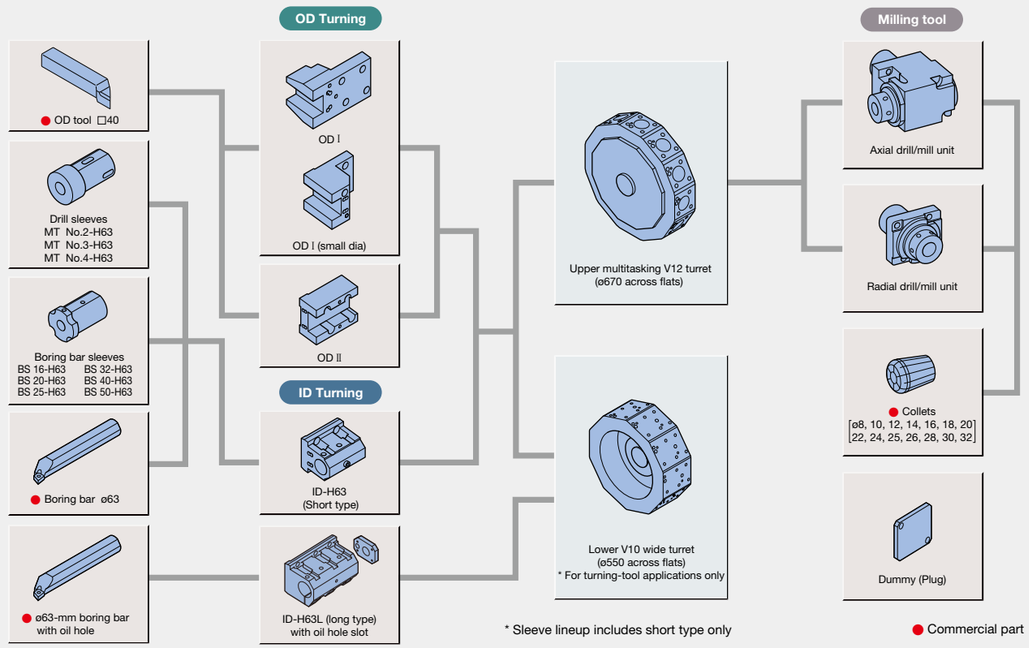
● Commercial part

LU7000 EX (M) Standard lower turret



● Commercial part

LU7000 EX (M) Optional lower wide turret



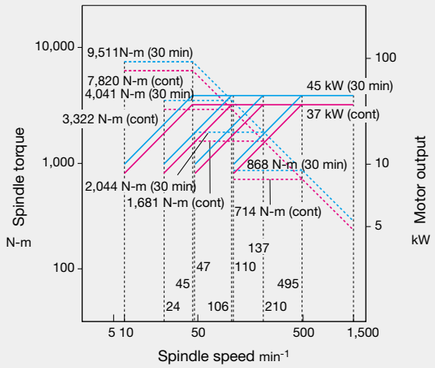
* Sleeve lineup includes short type only

● Commercial part

Spindle Output / Torque Diagram

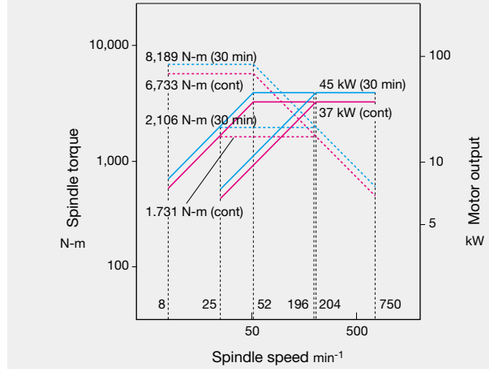
B08 ø280 spindle

Spindle speed 1,500 min^{-1}
Output 45/37 kW (30 min/cont)
Torque 9,511/7,820 N-m (30 min/cont)



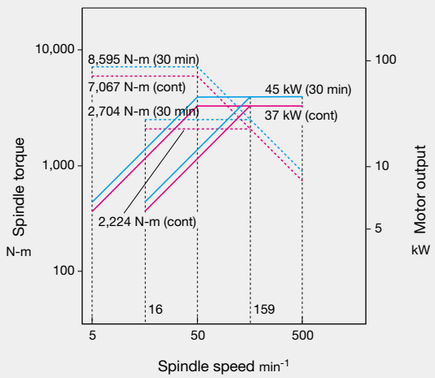
B12 ø440 spindle

Spindle speed 750 min^{-1}
Output 45/37 kW (30 min/cont)
Torque 8,189/6,733 N-m (30 min/cont)



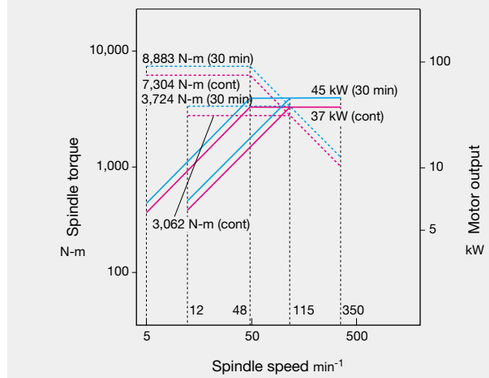
B15 ø480 spindle

Spindle speed 500 min^{-1}
Output 45/37 kW (30 min/cont)
Torque 8,595/7,067 N-m (30 min/cont)



B22 ø700 spindle

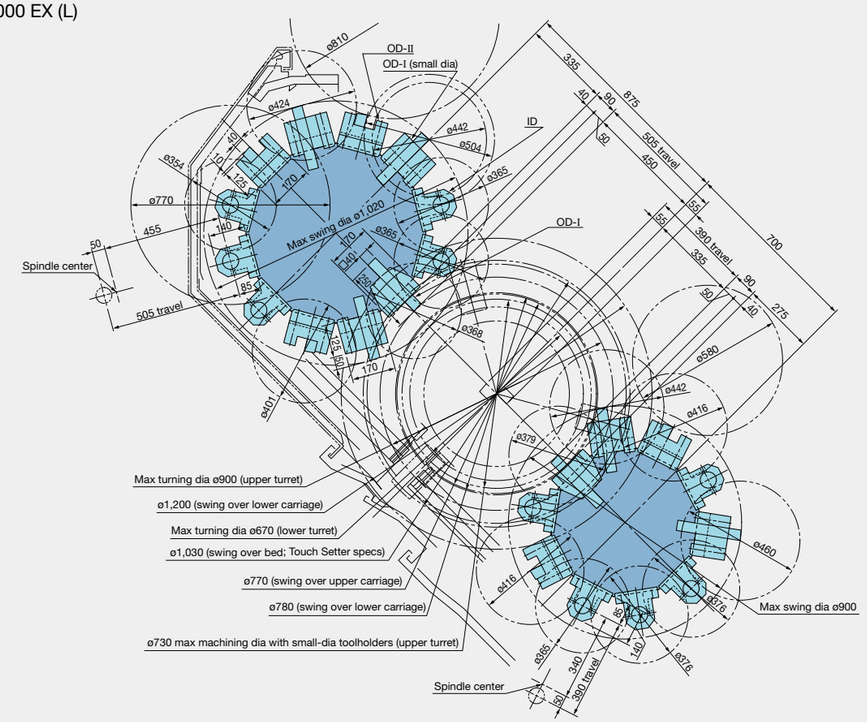
Spindle speed 350 min^{-1}
Output 45/37 kW (30 min/cont)
Torque 8,883/7,304 N-m (30 min/cont)



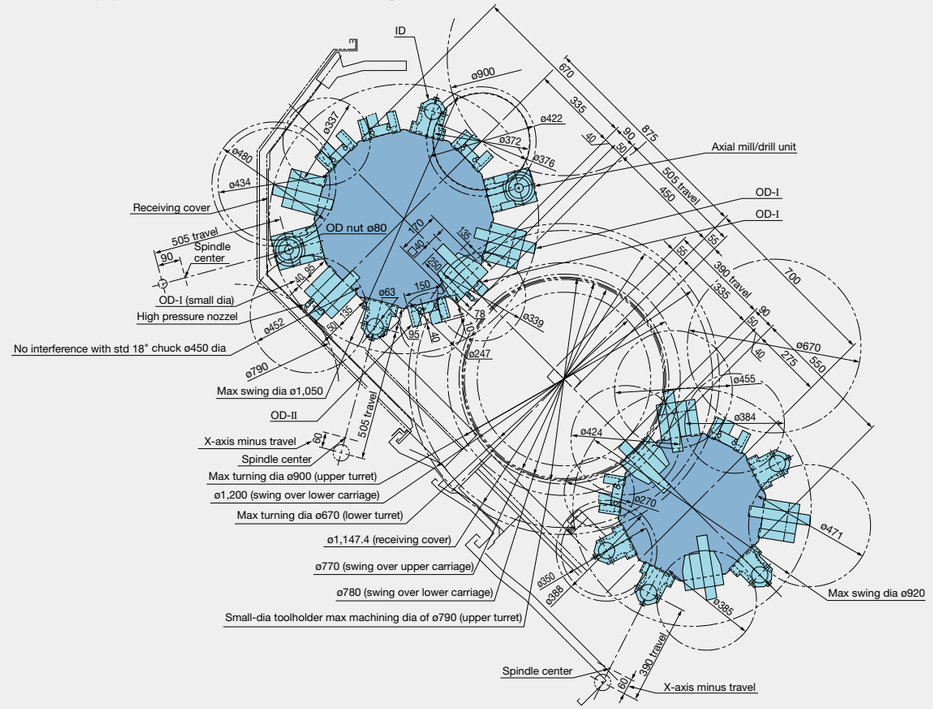
Turret Interference Diagrams

Unit : mm

LU7000 EX (L)



LU7000 EX (M) Standard lower turret / Wide range lower turret

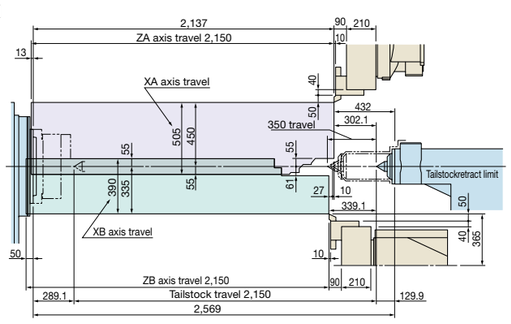


Working Ranges Self-travering tailstock (Op)

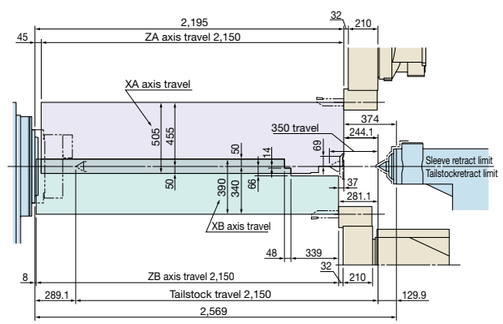
Unit : mm

LU7000 EX (L)

OD I

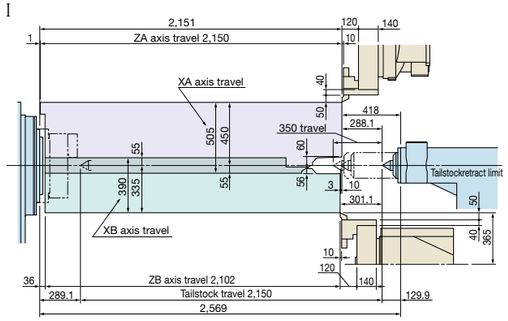


ID

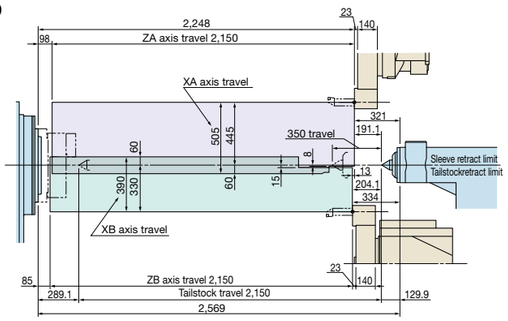


LU7000 EX (M)

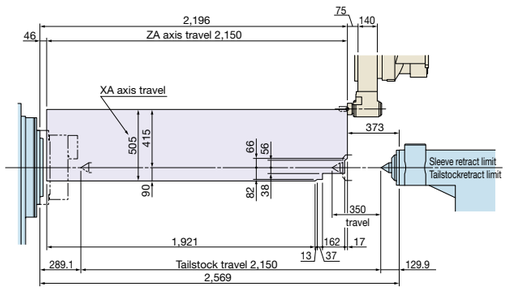
OD I



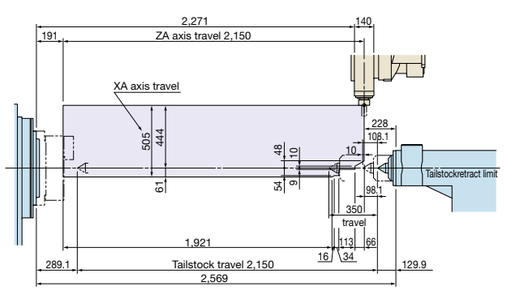
ID



Axial mill/drill unit

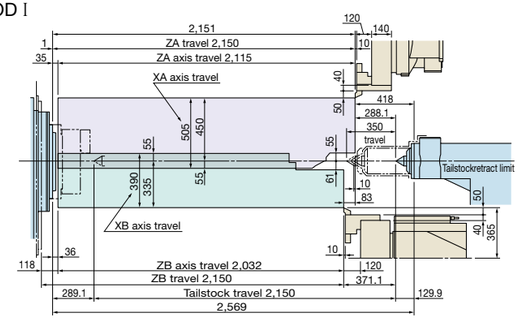


Radial mill/drill unit

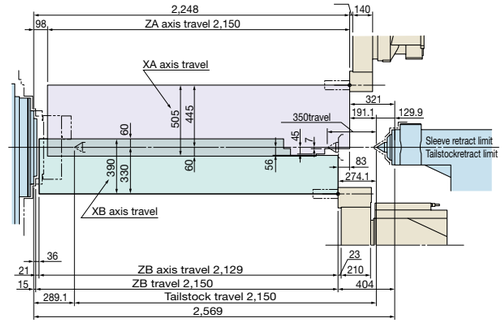


LU7000 EX (M) Wide lower turret

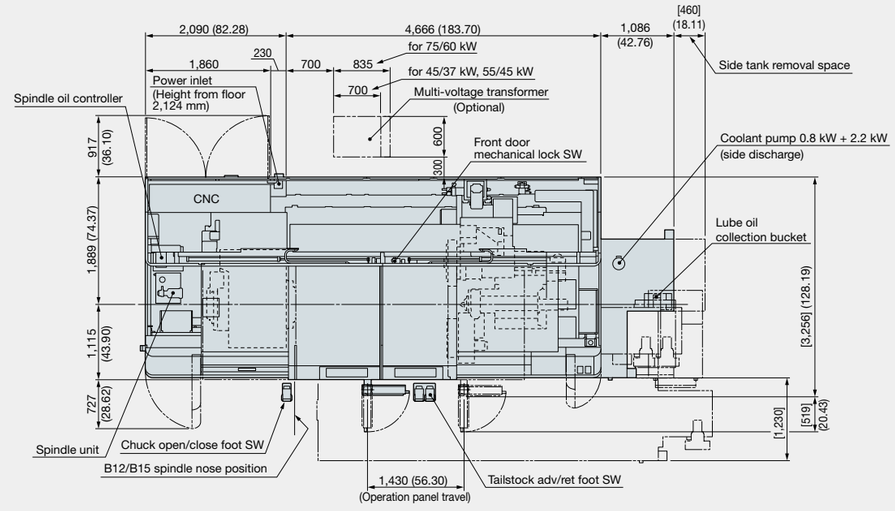
OD I

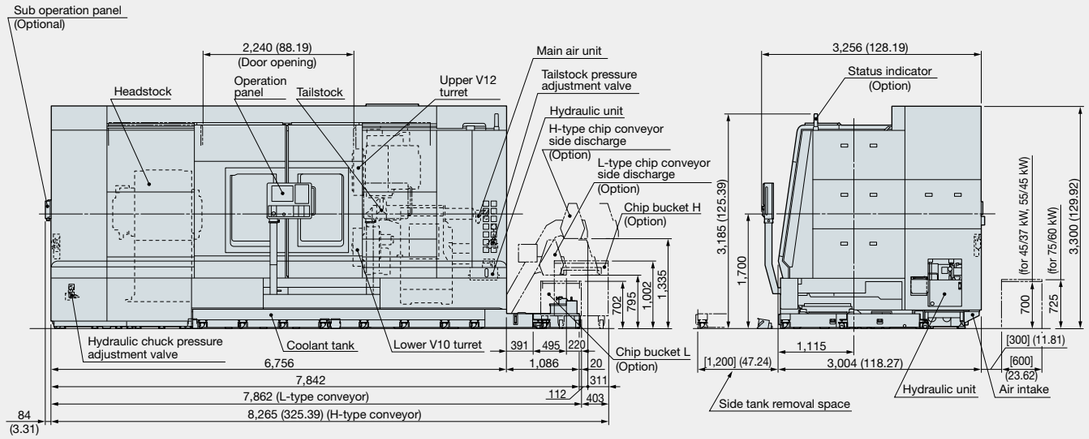


ID



LU7000 EX B15 55/45 kW spindle specifications
Dimensional / Installation Drawing





Unit : mm (in.)

The Next-Generation Intelligent CNC

OSP suite OSP-P300LA

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.

"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.

S11

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.

SDF S10

Easy programing without keying in code

Scheduled Program Editor

S15

Monitoring operating status even when away from the machine

E-mail Notification

Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 4-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, 0.001° Decimal:1 µm, 10 µm, 1 mm (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, 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 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
	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, spindle orientation (electric)
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Communications/Networks		USB ports, Ethernet
High speed/accuracy		Hi-G control
Energy-saving functions	ECO suite	ECO Idling Stop, ECO Power Monitor

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)	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)									
Milling machine specs	Coordinate convert	▲	▲	▲	▲			●	●
	Profile generate	▲	▲	▲	▲			●	●
	Flat turning								
Helical cutting (within 360 degrees)									
Helical Contour Generation									
Monitoring									
Real 3-D simulation				●	●	●	●	●	●
Cycle time over check		●	●	●	●	●	●	●	●
Load monitor (spindle, feed axis)				●	●	●	●	●	●
Load monitor no-load detection (load monitor ordered)									
Status Logger									
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 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									
Y-axis gauging									
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	OTM E	OTM D
External Input/Output and Communication Functions									
OSP-MTConnect *4									
RS-232-C connector									
DNC link	DNC-T3								
	DNC-C/Ethernet								
	DNC-DT								
USB (additional)	2 additional ports possible								
Automation/Untended Operation									
Auto power shutoff M02, 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								
	Tailstock adv/ret during spdl								
High-Speed/High-Accuracy Functions									
Thermo Active Stabilizer–Construction TAS-C									
0.1 µm control *3									
Pitch error compensation									
Hi-Cut Pro		▲	▲	▲	▲			●	●
Y-axis alignment compensation									
Energy-saving function ECO suite									
ECO Operation	Chip conveyor intermit/link op								
	Mist collector intermit/link op								
	Spindle Power Peak Limiter								
Other Functions									
Collision Avoidance System (CAS)									
One-Touch Spreadsheet									
Machining Navi L-*g*, T-*g* (threading)									
Variable spindle speed control (VSSC)		●	●	●	●	●	●	●	●
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, 16 sets]									
Edit interlock									
OSP-VPS (Virus Protection System)									

*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 is included *3. Engineering discussions required.
*4. API library (THINC-API) needed when adding OSP-MTConnect.
Note. ▲Triangle items for M function (milling tool) machines only.

SIMUL TURN
LU7000EX

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.
Pub.No. LU7000 EX-E-(2b)-100 (Jan 2019)

OKUMA

OKUMA Corporation

Oguchi-cho, Niwa-gun,
Aichi 480-0193, Japan
TEL: +81-587-95-7825 FAX: +81-587-95-6074