1-Saddle CNC Lathe

SPACE TURN

LB4000 EX
Birth of the LB that transcends LB

Okuma’s LB series of NC lathes have always been pioneers, leaving a path for others to follow behind. The LB series thus has an obligation to respond to the needs of the times, open possibilities for the next generation, and deliver new value to customers worldwide. That means constantly developing LBs that transcend LB. Okuma’s advanced technology in its SPACE TURN EX series continues to write new pages in world standards for machining quality, speed, power & torque, multitasking, ease of operation, and more.

High accuracy specifications overall assure machining with high thermal stability

**Thermo-Friendly Concept for unparalleled thermal stability**

Okuma’s Thermo-Friendly Concept is used on all the LB EX machines for extraordinary machining accuracy, using our unique machine design and thermal deviation compensation system. Outstanding thermal stability in long-time continuous operation, multitasking, and even Y-axis machining 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 thermal stability and rigidity. Exhibits stable machining accuracy even in heavy cutting.

**Thermo-Friendly Concept for unparalleled thermal stability**

*Actual data* [LB4000 EX turning] (MY) (ambient temperature: 8°C change)

**Roundness***

- Standard spindle: 0.4 µm at 2,000 min⁻¹

- Standard spindle: 0.3 µm at 2,000 min⁻¹

* Actual data
Super Rigidity Speed

Huge reduction in machining time with an original high power motor and faster machine movements

New PREX motor on the spindle gives turning capacity of 4 mm²

Spindle with a larger bearing internal diameter of ø140 mm can accommodate larger workpieces, and a turning capacity of 4 mm² is achieved with a high-speed, wide-area full power PREX motor. Stable, high quality machining, from heavy to high speed cutting.

- Spindle size: ø140 (bore ø91)
- Spindle speed: 4,200 min⁻¹
- Output: 30 kW (40 hp)
- Torque: 700 Nm (515 ft-lbf)

Built-in PREX motor—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: 3.7 sec (4,200 min⁻¹)
- Turret rotate: 0.2 sec/index
- NC tailstock rapids: 12 m/min (472 ipm)

Turning 4 mm²

(Actual results)

Cylindrical, heavy-duty cutting

<table>
<thead>
<tr>
<th>Diameter (mm²)</th>
<th>Cutting speed V (m/min)</th>
<th>Cutting depth t (mm)</th>
<th>Feedrate f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø59 (ø2.32)</td>
<td>100 (395 ipm)</td>
<td>7 (0.28 in.)</td>
<td>0.6 (0.02 in./rev)</td>
</tr>
<tr>
<td>ø59 (ø2.32)</td>
<td>100 (395 ipm)</td>
<td>7 (0.28 in.)</td>
<td>0.6 (0.02 in./rev)</td>
</tr>
</tbody>
</table>

Drilling

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Cutting speed V (m/min)</th>
<th>Feedrate f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø59 (ø2.32)</td>
<td>100 (395 ipm)</td>
<td>0.6 (0.02 in./rev)</td>
</tr>
</tbody>
</table>

Improved productivity: 20% shorter cycle time*

Previous machine

<table>
<thead>
<tr>
<th>Machine</th>
<th>LB4000 EX</th>
<th>LB4000 EX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-cutting time</td>
<td>20.4 minutes</td>
<td>16.5 minutes</td>
</tr>
</tbody>
</table>

Workpiece

- ø140, 4,200 min⁻¹
- Spindle speed: 3002 kW (4500 hp)
- Torque: 700 Nm (515 ft-lbf)

Spindle/motor variations

- Standard spindle
  - ø140, 4,200 min⁻¹
  - 30/22 kW (30 min/cont)
  - 700 Nm (515 ft-lbf)

- High power specs
  - ø160, 3,000 min⁻¹
  - 37/30 kW (30 min/cont)
  - 1,178 Nm (866 ft-lbf)
Greater efficiency with highest milling performance in its class and fast tool change times

Compact new PREX motor gives milling performance of 75 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: 7.5 kW (10 hp)
- Torque: 58.1 Nm (42.7 ft-lbf)

Reduced operation time achieved with higher speed machine movements

- Turret rotate: 0.2 sec/ index
- M-spindle start/stop: 0.4 sec (6,000 min⁻¹)
- M-M switch: 1.5 sec

Milling capacity 75 cm³/min

(Actual results)

- End milling
  - Chip volume: 75 cm³/min (4.5 in³/min)
  - ø25 5-blade roughing end mill
  - Cutting speed: V: 35 m/min (115 fpm)
  - Cutting depth: t: 9 mm (0.35 in.)
  - Feedrate: 1 : 0.75 mm/rev (0.03 ipr)

- Drilling
  - ø23
  - Cutting speed: V: 30 m/min (98 fpm)
  - Feedrate: 1 : 0.45 mm/rev (0.02 ipr)

- Tapping M24 P3
  - (Synchronized tapping)

Wide working range

- Max machining dia: ø480 mm (M turret: ø430 mm)
  - Standard spindle: JIS A2-8
  - Big-bore spindle: JIS A2-11
  - Standard spindle: ø91 mm (3.59 in.)
  - Big-bore spindle: ø112 mm (4.41 in.)
- Distance between centers: 770/1,520 mm
- Spindle thru hole: Bigger
  - Standard spindle: ø49.1 mm (1.94 in.)
  - Big-bore spindle: ø54.4 mm (2.14 in.)
Large 15-inch display
The display area is 2.1 times larger than previous models, increasing operation efficiency with the display of abundant machining information.

Touch panel
A tough dirt- and scratch-resistant panel is used so that data can be directly manipulated for huge improvement in work efficiency.

USB ports
Two USB ports are standard. Various peripheral devices can be connected for the intended use, such as USB memory for the transfer of large NC programs or bar recorders for production control.

Collision Avoidance System for peace of mind
Collision avoidance in all settings, including manual and automatic operation, and huge reductions in setup and first part machining time. Various setting methods are provided in modeling as well, from simple dimension input to 3-dimensional CAD data.

Advanced One-Touch IGF minimizes bothersome input
Programs can be created and run from a single process sheet, for easy use even without memorizing the G/M codes. Windows the operator wants to work on can be moved directly as with personal computer shortcut keys. Work operations are reduced up to 76%, greatly increasing work efficiency.

One-Touch Spreadsheet for standardization of process control and setup
Excel files can be operated on the OSP, so that machining guidelines can be created in Excel files and referenced during setup work. Zero point, tools, and common variables can also be set and referenced from an Excel file.
Up to 10 pairs of tailstock positions can be set, enabling continuous machining of workpieces with 10 different lengths without setup. In addition, thrust can be switched between high and low without resetting the workpiece. High accuracy positioning is also possible with a high speed linear guide employing a ball screw guide.

**NC tailstock that shortens setup and automates center work is standard equipment**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailstock thrust</td>
<td>1<del>7.5 kN (Opt: 1.5</del>10 kN)</td>
</tr>
<tr>
<td>Rapid traverse</td>
<td>12 m/min (472 ipm)</td>
</tr>
<tr>
<td>Approach</td>
<td>10 m/min (394 ipm)</td>
</tr>
<tr>
<td>Retract</td>
<td>12 m/min (472 ipm)</td>
</tr>
</tbody>
</table>

Note: Please select a hydraulic quill for face driver machining applications.

**Complete multitasking with Y-axis functions**

One chuck machining even with irregularly shaped workpieces

A variety of milling operations can be accommodated with high-accuracy, wide-range Y-axis travel using a double slide system. Achieves complete multitasking with a single chucking (MY specifications).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel</td>
<td>140 mm (+70~70)</td>
</tr>
<tr>
<td></td>
<td>[5.51 in. (+2.76~2.76)]</td>
</tr>
<tr>
<td>Y-axis rapid traverse</td>
<td>12.5 m/min (492 ipm)</td>
</tr>
</tbody>
</table>
### Machine Specifications

#### Capacity
- Spindle nose: ø70 (ø2.68)
- Spindle nose: ø95 (ø3.74)
- U-drum between centers: ø70 (ø2.76) - ø75 (ø2.95) - ø75 (ø2.95)
- Max turning dia.: ø460 (18.11) - ø450 (17.72) - ø450 (17.72)
- Max tool length: 900 (35.43) - 750 (29.53) - 1,500 (59.06)
- X axis (mm): 840 (33.07) - 1,550 (61.02) - 840 (33.07)
- Y axis (mm): 840 (33.07) - 840 (33.07)

#### Transvers
- Spindle speed: 40-4,200 (167-1,686) rpm
- Spindle range: infinitely variable + 2 auto-ranges
- Feedrates: X: 25, 30 (0.98, 1.18)
- X, Y, Z: 0, 12 (0.0, 0.47)

#### Spindle
- Tapered hole type: MT 9
- Tailstock taper: Built-in center MT 4
- Spindle nose: 750 (29.53) - 770 (30.31) - 1,520 (59.84)
- Tailstock travel: 750 (29.53) - 1,520 (59.84)
- Tailstock rapids: 750 (29.53) - 1,520 (59.84)

### Standard Specifications & Accessories

#### Model
- LB4000 EX
- LB5000 EX

#### Specifications
- T / C: 750 / 1,500
- T / C: 750 / 1,500

#### Options
- Spindle: A2-8 40-4,200 mm
- Sub-spindle: V12 ball clamp
- Tooling box: 30° / 0° (45° / 0°)
- Tablestock: NC travel
- Coolant: M: 250, M: 780
- Chuck: Ø600 (23.62)

### Optional Specs & Accessories

- Feedstock: Big-Bore spindle
- Chucking: ISB A11 30-3,000 mm
- Chucking: ISB A11 150-3,000 mm
- Chucking: ISB A11 150-3,000 mm
- Chucking: ISB A11 150-3,000 mm
- Chucking: ISB A11 150-3,000 mm

### Chucking Kit / Tooling Kit

- Chucking Kit 1: B-210A8
- Chucking Kit 2: B-210A8
- Chucking Kit 3: B-210A8
- Chucking Kit 4: B-210A8
- Chucking Kit 5: B-210A8
- Chucking Kit 6: B-210A8
- Chucking Kit 7: B-210A8
- Chucking Kit 8: B-210A8

### Standard Accessories

- Work lamp
- Jack screw
- Hand tool
- Chuck
- Full enclosure shielding
- Tube
- Wire gauge
- N/C
- Operation panel: 15 in. color TFT (touch panel)
- Operation button: over 2 MB

### Standard Specifications

- Diameter: 3 / 4 / 5
- Spindle: A2-8 40-4,200 mm
- Tooling box: 30° / 0° (45° / 0°)
- Tablestock: NC travel
- Spindle: M: 250, M: 780
- Chuck: Ø600 (23.62)
Fire Safety Precautions

To protect your factory and equipment from fire and assure continued safe operation, observe the following fire safety precautions whenever you operate machinery. Whenever possible, avoid the use of oil-based coolants for cutting operations. Sparks caused by hot chips, tool friction, and grinding can cause fires. Always observe the following safety measures to ensure safe operation when machining flammable materials or when performing dry machining.

1. Oil-based coolant
   (1) Use nonflammable cutting fluid coolant.
   (2) When the use of an oil-based coolant is unavoidable:
      - Before you begin machining, check cutting tools to make sure of their service life and the condition of the tool edge, and choose cutting conditions that will not cause a fire.
      - Periodically clean the coolant filter to maintain sufficient coolant discharge, and frequently verify that coolant is discharging normally.
      - Take measures to control the outbreak of fire: Place a fire extinguisher near the machine, have an operator constantly monitor operation, and install an automatic fire extinguishing system.
      - Do not place flammable materials near the machine.
      - Do not allow chips to over accumulate.
      - Periodically clean the inside of the machine and the area surrounding it.
      - Check that the machine is operating normally.
      - Never run the machine unattended.
      - Since an automatic fire extinguishing system and other peripherals are needed for grinding operations, please let us know as soon as possible if you plan to perform such operations.

2. Precautions regarding machining of potentially flammable materials
   Before machining any material designated by law as a flammable substance, e.g., plastic, rubber, wood, acquaint yourself with the special characteristics of the material in terms of fire prevention, and observe the precautions given in (2) above to ensure safe operation. Example: When machining magnesium, there is a danger that magnesium chips and water-soluble coolants will react to produce hydrogen gas, resulting in an explosive fire if any chip should ignite.

3. Dry machining
   Dry machining is a fire hazard because workpieces, tools, and chips are not cooled. To ensure safe operation, do not place any flammable objects near the machine and do not allow chips to over accumulate. In addition, be sure to check cutting tools to make sure of their service life and the condition of the tool edge, and observe the precautions regarding oil-based coolants given in (2) above.