Matsuura
High Grade Linear Motor Machine
LX-160

MAXIA
Innovation by Matsuura
LX-160

Ultimate CNC Performance in High Speed and Accuracy
State of the Art Linear Motor Technology

- The cycle time can drastically be shortened thanks to 48% reduction in tool change time and optimal location of the tilting rotation center which is moved closer to the machining point.
- Optimised rigidity assures a stable machining platform.
- Matsuura’s proven software: Intelligent Protection System collision avoidance and next generation operating software MIMS.

Target Markets

- Expanding the boundaries of technology is at the heart of Matsuura. The era of ultra high speed and accuracy linear motor CNC machining began with the Matsuura LX-1.
- The LX Series continued to set the pace with the 3 axes LX-0 - a small footprint machine offering outstanding performance for small intricate molds and dies.

Maximum Workpiece Size

- Bullet shape (inch)
- Roundness 1μm (actual value) 0.000039in

Amazing measurement results prove high precision
Scalable and tailored options to the customer's process
Dedicated to the high-speed, high-accuracy market

Following on from the success of the LX-0 the 5 axes LX-0 5AX was launched delivering unmatched accuracy and speed to complex geometric components.

The LX-0 5AX built a reputation for excellence in a wide range of machining disciplines and industries - its legacy is the all new 5 axes LX-160.

The LX Series is constantly evolving and offers the ultimate platform in linear motor CNC technology.
Dedicated to the high-speed, high-accuracy market — with a focus on small workpiece processing and linear motor drive technology

**MAXIA Spindle**
- Maximum spindle speed is 46,000 min⁻¹.
- Spindle motor output is 7.5/15 kW.
- Spindle motor torque is 8.6 N·m.
- Spindle noise level is 75 dB.

**Even faster Steel and Aluminium cutting**

<table>
<thead>
<tr>
<th>Cutting Test Data</th>
<th>(inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FACE MILL</strong></td>
<td></td>
</tr>
<tr>
<td>A5052 Ø50mm (1.96)</td>
<td>3 teeth carbide</td>
</tr>
<tr>
<td>S45C Ø53mm (2.08)</td>
<td>5 teeth carbide</td>
</tr>
<tr>
<td><strong>END MILL</strong></td>
<td></td>
</tr>
<tr>
<td>A5052 Ø16mm (0.62)</td>
<td>2 teeth carbide</td>
</tr>
<tr>
<td>S45C Ø16mm (0.62)</td>
<td>4 teeth carbide</td>
</tr>
<tr>
<td><strong>DRILL</strong></td>
<td></td>
</tr>
<tr>
<td>A5052 Ø14.5mm (0.57)</td>
<td>HSS</td>
</tr>
<tr>
<td>S45C Ø6.8mm (0.26)</td>
<td>HSS</td>
</tr>
<tr>
<td><strong>TAP</strong></td>
<td></td>
</tr>
<tr>
<td>A5052 M12 x P1.75</td>
<td>HSS</td>
</tr>
<tr>
<td>S45C M8 x P1.25</td>
<td>HSS</td>
</tr>
</tbody>
</table>

Note: The data above is from examples of actual results. Depending on conditions, there may be cases where results equivalent to those of the catalog data may not be able to be obtained.

**Measurement results proving the high precision**

**Roundness 1μm**
- Material: Aluminium (A5052)
- Feed rate: 5,000mm/min (196.85ipm)
- Tool: 5 slot drill

*The actual value is not intended to guarantee the performance.
Control Axes

- All axes are driven by linear motors to achieve high speed and rapid acceleration/deceleration.

### Rapid Traverse Rate

<table>
<thead>
<tr>
<th>Axis</th>
<th>Speed (mm/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Axis</td>
<td>90,000</td>
</tr>
<tr>
<td>Y-Axis</td>
<td>90,000</td>
</tr>
<tr>
<td>Z-Axis</td>
<td>90,000</td>
</tr>
</tbody>
</table>

- B-Axis 100 min⁻¹
- C-Axis 200 min⁻¹

### B / C Axis

- The B and C axes are also driven by DD motors.

#### Rapid Traverse Rate

- B-Axis: 100 min⁻¹ / C-Axis: 200 min⁻¹

#### Table Rotation Torque

- B-Axis: 122 N•m / C-Axis: 45 N•m

#### Table Breaking Torque

- B-Axis: 230 N•m / C-Axis: 60 N•m

### High-rigidity Design

- Optimum rigidity is assured on all Matsuura products via FEM and our established track record for excellence in engineering.

- High rigidity, linear motors and exceptional spindle speeds identify the LX-160 as a unique solution for high precision high gain machining.

- Direct drives enable high speed, high accuracy processing.
- With the exception of the guide surface there are no two parts that create friction, vastly reducing mechanical wear and tear. Minimised component design assures reliability.
- High gain characteristics of linear motors enables positive loop gain of more than 10 times that of conventional motors, guaranteeing high accuracy.

### Linear Motor Drive

- With the exception of the guide surface there are no two parts that create friction, vastly reducing mechanical wear and tear. Minimised component design assures reliability.
- High gain characteristics of linear motors enables positive loop gain of more than 10 times that of conventional motors, guaranteeing high accuracy.
Scalable Options Tailored to Your Process. Designed for Unmanned Production.

**Chain Magazine**
- The standard 10-tool magazine can be extended to a 30-tool magazine with the addition of a 20-tool chain-type magazine (10 + 20 = 30), and 50 with the addition of a 40-tool magazine (10 + 40 = 50).

**Matrix Magazine**
- Up to 338 tools can be set at a time.
  (128 / 188 / 248 / 308 / 338 tools)

* Even if an additional magazine unit is installed, the machine still has the standard 10-tool drum-type magazine.

**Pallet magazine**
- PC is integrated design for compact space.

- **PC2**
  - W-grip type
  
- **PC42**
  - PC91
  - Linear pallet systems PC 42 and PC 91 are included in the lineup.

- Pallet is Matsuura made.
  - Pallet clamping device can be selected from "system 3R" and "EROWA".

  - system 3R: the Pioneer
  - EROWA
**Ergonomic Design**

The front guard is designed with comfort in mind, providing a space for the operators' feet allowing close positioning to the machine.

- The NC can be slid and revolved for maximum operator comfort and control.

**Easy access maintenance at the rear of the machine.**

- Opening width of the operator door is 580mm (22.83), offering superb unfettered access to the machining enclosure.

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**Swarf Management**

- Reliable and proven chip flow management unit as standard.

- The chip flow unit discharges directly to the rear of the machine. A chip collection & 350L coolant tank are provided as standard.

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**Installation Area**

- The machine footprint is 15% smaller than that of our previous model LX-0 5AX, yet offers a larger workpiece envelope.

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**NC System**

- Dynamic state of the art NC offering outstanding control, versatility and accuracy.
Ultra Safe Collision Protection

On-Line Link with PC
- Intelligent Protection System simulates your programmed component alerting the user to any interference or collision before any actual machining.
- Requires end user PC - consult Matsuura for full specifications.

Collision Avoidance during Setup
Tool length compensation data is linked with the Intelligent Protection System. As NC data changes, PC compensation data is automatically updated.

Collision Avoidance during Automatic Operation
Collision check can be activated during simulation. The collision check function renders the part in real time on screen.

Standard Accessories
- Software
- Communication cable
- Machine model data
- PC communication board
- High quality cable provided to route from the NC to your PC Communication Board
Meister's knowledge, skills, and ideas combined

- **Environment**
  - Eco Meister
  - Power Saving
    - Power cut-off function
    - Energy-saving devices installed

- **Accuracy**
  - Thermal Meister
  - Stable Accuracy
    - Spindle thermal displacement compensation

- **Operability Meister**
  - Fuss-Free Simple Operation
    - Tool setup support
    - Workpiece setup support
    - Restart after machining stop

- **Reliability Meister**
  - Machine Down Time Reduction
    - Preventive maintenance support functions
    - Machine restoration support functions
  - Reliability Meister Plus
    - Increased Security Provided
      - Electronic manual
      - E-mailing function

※ Reliability Meister Plus requires a PC. Consult Matsuura for more information.
### Standard Machine Specifications

#### Movement and Range

<table>
<thead>
<tr>
<th>Movement</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Axis Travel</td>
<td>mm (in.) 500 (19.69)</td>
</tr>
<tr>
<td>Y-Axis Travel</td>
<td>mm (in.) 250 (9.84)</td>
</tr>
<tr>
<td>Z-Axis Travel</td>
<td>mm (in.) 300 (11.81)</td>
</tr>
<tr>
<td>B-Axis Travel</td>
<td>deg -125 – +125</td>
</tr>
<tr>
<td>C-Axis Travel</td>
<td>deg 360</td>
</tr>
<tr>
<td>From Table Surface To Spindle End</td>
<td>deg 30 – 330 (B-Axis 0 degree)</td>
</tr>
</tbody>
</table>

#### Table

<table>
<thead>
<tr>
<th>Table</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Surface</td>
<td>mm (in.) Ø100 (Ø3.94)</td>
</tr>
<tr>
<td>Loading Capacity</td>
<td>kg (lb.) 20 (44.09)</td>
</tr>
<tr>
<td>Max. Work Size</td>
<td>mm (in.) Ø160×H230 (Ø6.30×H9.06)</td>
</tr>
</tbody>
</table>

#### Spindle

<table>
<thead>
<tr>
<th>Spindle</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed Range</td>
<td>min⁻¹ 400 - 46,000</td>
</tr>
<tr>
<td>Taper</td>
<td>7 / 24 taper BT30 (Double contact type)</td>
</tr>
<tr>
<td>Motor Power</td>
<td>kW 7.5 / 15</td>
</tr>
<tr>
<td>Max. Spindle Motor Torque</td>
<td>N·m 8.68 (16,500min⁻¹)</td>
</tr>
</tbody>
</table>

#### Feed Rate

<table>
<thead>
<tr>
<th>Feed Rate</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid Traverse Rate</td>
<td>mm/min (ipm) 90,000 (3543.31)</td>
</tr>
<tr>
<td>Rapid Traverse Rate</td>
<td>min⁻¹ 100</td>
</tr>
<tr>
<td>Rapid Traverse Rate</td>
<td>min⁻¹ 200</td>
</tr>
</tbody>
</table>

#### Automatic Tool Changer

| Tool Shank        | JS B 6339 30T |
| Tool Storage Capacity | pcs. 10 |
| Max. Tool Diameter | mm (in.) Ø 46 (1.81) |
| Max. Tool Length | mm (in.) 150 (5.91) |
| Max. Tool Mass   | kg (lb.) 1.5 (3.31) |

#### Power Sources

| Power Source      | Power Capacity | A/V 43 |

#### NC System

| Control System   | Matsuura L-Tech 2D |

## Standard Accessories

- 01. Total Splash Guard
- 02. ATC Magazine Guard
- 03. Auto Door
- 04. Spindle Oil Cooler
- 05. Auto Grease Supply Unit for X/Y/Z
- 06. Air Dryer
- 07. Synchronized Tapping
- 08. AD-TAP Function
- 09. IPC Function
- 10. Scale Feedback for the X/Y/Z/C-Axis
- 11. Coolant Unit
- 12. Chip Flow
- 13. Linear Motor Cooler
- 14. Spindle Overload Protection
- 15. 9 Sorts of M-code Counters
- 16. Work Light
- 17. Standard Mechanical Tool and Tool Box
- 18. Machine Color Paint
- 19. MIMS
- 20. Intelligent Protection System
- 21. Spindle Run Hour Meter
- 22. Leveling Pads and Bolts
- 23. Automatic Operation Run Hour Meter
- 24. PC Tool for Memory Card Program Operation and Editing

### Outline (10-tool Magazine and NON-PC) Units: mm (in.)

#### Left Side View

![Left Side View](image)

#### Front View

![Front View](image)

### Floor Plan (10-tool Magazine and NON-PC) Units: mm (in.)

![Floor Plan](image)
**Spindle**
- 46,000 min⁻¹ (BT30 Oil-Air)
- 46,000 min⁻¹ (HSK-E40)

**ATC**
- 30 tools (#40, chain type)
- 50 tools (#40, chain type)
- 128 / 188 / 248 / 308 / 338 tools (base for 320 tools)

**High Accuracy Control**
- Scale Feedback System X/Y/Z-Axis

**Coolant**
- Cutting Oil Tank
- Vacuum Type Coolant-Thru-Spindle Type A
- Vacuum Type Coolant-Thru-Spindle Type B
- Vacuum Type Coolant-Thru-Spindle Type C 20BAR
- Vacuum Type Coolant-Thru-Spindle Type C 70BAR
- Coolant Flow Checker
- Mist Separator (without Fire Damper)
- Mist Separator (with Fire Damper)
- Cutting Oil Temperature Controller (with 100L Tank, separate type, small)

**Swarf Management**
- Total Enclosure Guard
- ATC Auto Door
- Chip Flush System
- Spiral Chip Conveyor
- Lift-up Conveyors (Scraper, Drum, Right and Left Spiral Conveyors)
- Air Blow For Chip / Swarf Removal
- Workpiece Cleaning Gun (Machine side)

**Operation / Maintenance**
- AD-TAP Function
- IPC Function
- MIMS
- Intelligent Protection System
- Auto Grease Supply to Feed Axis
- Work Light
- Spindle Run Hour Meter
- 8 Sets of Extra M Function
- Weekly Timer
- Rotary Wiper
- Optional Block Skip 2 - 9
- Reliability Meister Plus Type A
- Reliability Meister Plus Type B

**Safety Features**
- Matsuura Safety Specification

**Optional Package**
- High-Speed, High-Precision Package
- 5-Axis Package
- High-Speed, High-Precision 5-Axis Package
- Value Package

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**Floor Plan (50-tool Magazine with PC2)**

*Units: mm (in.)*

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**True Path**
• Product specifications and dimensions are subject to change without prior notice.
• The photos may show optional accessories.

Products are subject to all applicable export control laws and regulations.