The Revolutionary
New series High Speed
Flying Optic CO₂ Laser
Advanced Solution for Productivity and Environmental Requirements

The eX delivers maximum productivity and incorporates 2 Action Cutting which provides extremely simple operation. It also features an ECO mode that reduces power consumption during standby by up to 99%.*

excellent [high performance]
The faster processing speed and optimized control system of the eX Series reduces thin-plate processing time by approximately 20%. The cutting-edge piercing technology allows for about a 30% reduction* in processing time of mid-thick and thick mild steel plates. *In-house comparison

cology [energy-saving]
When not processing, the system switches to ECO mode and the resonator stops idling. Minimizes energy consumption, reducing running costs by up to 99%* during standby. Quickly resumes normal operation. Mitsubishi Electric's original resonator reduces CO₂ emissions by approximately 30% compared to standard high-speed, axial-flow resonators. *In-house comparison

easy to use [simple operation]
2 Action Cutting allows for the entire process, from job setup to parts cutting, to be completed in two simple actions. Delivers easy operation and stable performance. CAD/CAM computer, connected via network, is a great aid for operators on the shop floor.

MITSUBISHI
ML3015eX
**Faster Moving Axes**

Increased machine tool path-control technology and optimized rigidity, Helical Rack and Pinion on the X and Y axes and optimized path-control technology compared to previous model. The result is approximately 1.2 times faster movement and 2 times faster acceleration speeds.

### Thin-plate High-speed Cutting

- **Productivity has been dramatically enhanced owing to improved acceleration and the latest control technologies exclusive to Mitsubishi Electric:** An example is Direct Reduction (DR) Control, which contributes to high-speed order processing while maintaining high quality.

### Mild Steel Cutting

- Less time is required for planning and changing conditions, resulting in substantially reduced operating cost and enhanced productivity when cutting medium and thick mild steel plates.

### Technologies Supporting Thin-plate High-speed Cutting

- **Head retraction method**
  - The optimum retraction method may be set according to the material and plate thickness. Minimize processing time and achieve better stability by selecting the best retraction method.
  - Normal retraction (LZ/10/90°)
  - Diagonal retraction (119°/90°)
  - Arc retraction (90°)

- **Faster Z-axis**
  - In addition to the latest control technologies, travel in the Z-axis is 3 times faster and has twice the acceleration speed compared to previous models, enabling shorter processing times.

### High-speed Cutting Technology for Mid-thick Mild Steel Plates

- **Blow piercing**
  - Produces smaller piercing holes faster in mild steel plates up to 6 mm thickness by controlling the oxidation reaction and optimizing beam quality.

- **Beat piercing**
  - High-meter power control realizes the same level of quality as the previous stage piercing while reducing the piercing time of mild steel up to 12 mm by a maximum of 50% compared to the previous model.

### Outstanding Productivity for Thin & Thick Plates

- **Operating cost:**
  - Thin-plate thickness 1520 mm:
    - 9.6 minutes
    - 9.6 minutes
    - 1.574 mm
    - Operating cost: 1520 10 mm
    - 1.544 mm
    - 41% reduced
  - Thick mild steel:
    - 1055 mm
    - 19.77 mm
    - 3.141 cm
    - Operating cost: 1055 110 mm
    - 3.067 cm
    - 50% shorter

### Calculation conditions

- Electric kilowatt: Laser power: Assist gas (N2): Assist gas (He) content 20% availability: 3.39 m2/sec 5.13 m3/h 1.71 m3/h
Simple 2-action Processing

Automatic setup realizes simple operation in two effortless actions. This not only prevents operation and setup errors, but also contributes to enhanced productivity.

Step 2
3. Press the start button

Step 1
① Read barcode
② Automatically loads onto NC

Easy to Use, Even for Beginners

Simple Nesting
Allows for rectangular nesting at the user's NC control to meet urgent needs for additional parts.

New Reset - Restart Function
If the system stops in the middle of processing, it will easily restart cutting once the cause of stoppage is identified. Allows the operator to check and adjust the restart position quickly and easily on the control.

Easy Processing mode
A user-friendly operating environment can be created by hiding the advanced settings screen.

Features Designed for Experienced Operators

Pro-Processing mode
The advanced settings screen can be displayed for advanced laser applications.

Double Cut Function
Allows high-precision cutting of low-grade material and protected sheet metal, which offers fewer cutting defects, in two passes.

Easy to Use

Extremely Versatile - From Simple 2-Action Processing to Advanced Applications
ECO mode available for increased energy savings

Costs during standby have been dramatically reduced by incorporating Mitsubishi's original just-on-time discharge method. ECO mode allows the processing machine to quickly resume operation.

Energy-saving/Low Operating Cost

Reduced assist gas usage (ECO conditions)

A technology that optimally controls assist gas conditions has realized a large reduction in the consumption of nitrogen gas.

Comparison when cutting 45 parts of the sample as left
- Processing time (SU5304 1.2mm)
  - LZ 1890 (1999)
  - UA4CF (2001)
  - EZ-4SCF-1 (2011)
  - SU5304 1.2mm
  - 138 minutes
  - 76 minutes
  - 38 minutes
  - 21% shorter

Operating cost (SU5304 1.2mm)
- LZ 1890 (1999)
- UA4CF (2001)
- EZ-4SCF-1 (2011)
- SU5304 1.2mm
- 16,773 yen
- 34,233 yen
- 22,648 yen
- 39% reduced

Work Environment

Partitioned dust-collection function

An automatic flap opens and closes according to the movement of the processing head, offering on-the-spot dust collection during processing.

Ease of Maintenance

Self-check

Monitors the main components as a regular basis and displays results on the screen. Supports continuous operation and preventive maintenance.

Laser-gas change

Gas change time is improved by 50% over previous model.

Lower Operating and Maintenance Costs
Cutting performance
Greater Flexibility Increases Cutting Capabilities

Thin plate

Mid-thick plate

Thick plate

* The above are processing capabilities based on special conditions. The acceptance criteria are as stated in the specifications.
* The actual performance may vary depending on the surface condition and deviation of the material composition.
* Processing performance and material quality may also vary depending on the part geometry.
* Regarding steel and stainless steel, processing is based on 2 material levels (data for basic cutting) of Chukoku Steel Products Co., Ltd.
* Optional features may have been used in the above cut samples.
**Machine**

**High-speed, High-stability Processing Machine**

Mitsubishi Electric's cutting-edge technologies provide ultimate stability to ensure non-stop operation, realizing higher productivity and ease of maintenance.

- **Auto Focus Preset Head**
  Automatically controls the focal point according to the given NC command. Lens movement is five times faster*, resulting reduced piercing and processing times.

  * Compared to previous model.

- **Magnetic Damage Reduction Mechanism**
  Incorporates a magnetic part to hold the processing head in position, which allows recovery in less than 1 minute after collision.

- **Constant Beam Length System**
  Maintains consistent beam quality by fixing the system's beam path length regardless the position of the processing head. Provides stable and superior cut quality.

- **Processing Lens Monitor**
  Monitors the condition of the processing lens at all times, contributing to stable performance.

  * Not available to 3G model.

**Resonator**

**SD Excitation 3-Axis Cross Flow Resonator**

- **Unique Technologies Supporting Highly Reliable Processing**
  Mitsubishi Electric's resonator series realizes further enhancements in performance and reliability, and incorporates original technologies that ensure high reliability.

- **High-speed power sensor**
  Mitsubishi's high-speed power sensor, which comes standard on the 3G, monitors the laser output in real-time. Maintains an output true to the desired setting with a power variation less than ±1%. Allows processing of highly reflective materials such as aluminum and copper.

- **Gas-sealed resonator**
  The seal-off operation reduces gas consumption to only about four gas cylinders per year (operating 250 days per year). Allows 24-hour operation at rated power between gas changes. Significantly reduces operating cost and eliminates the need to change gas cylinders on a frequent basis.

- **Just-On-Time discharge method**
  The Just-on-time discharge method significantly reduces power consumption when the beam is turned off.
**Options**

**Optional Equipment**

**F254mm (10") lens**
Improves the processing capability when cutting stainless steel with nitrogen.

**CamMagic LA**
A CAD/CAM system designed for 2D CO2 laser processing machines.

**Simple "One-click" Operation**
After loading the DXF file data, register parts and diagrams, and create NC programs with a single click.

**Magnetic damage reduction mechanism**
Protects the head and eliminates the need for nozzle centering in the event of a crash. Allows quick recovery.

**Automation pack**
This combined package includes the magnetic damage reduction and a nozzle changer, realizing shorter setup times and higher productivity.

**Magnetic Damage Reduction Mechanism**
These features reduce setup time and allow automated high-speed, low-volume production, while maintaining productivity.

**Nozzle Changer**
These features reduce setup time and allow automated high-speed, low-volume production, while maintaining productivity.

**Optimum Conditions Setting**
Load cutting conditions from the unit series laser processing machine using LNN or a USB storage device and easily create NC programs with optimal conditions.
* More flexible detection and processing conditions are set automatically.

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**CAD/CAM Link Functions**
CAD/CAM Link allows remote access to CAD/CAM software, compatible with the link functions, from the processing machine. Operators can create and download nesting programs at the shop floor according to need, leading to improved work efficiency.

**Linked Barcode Reader**
Read the barcode on the instruction sheet to automatically load NC programs onto CNC from a linked CAD/CAM computer and perform program search.

**Linked Nesting**
Set necessary parts and the required quantity of each part to create nesting programs on the CAD/CAM computer connected via LAN load onto NC and perform program search.

**Example System Configuration**

**Linked DFX conversion**
Load DFX files onto NC, create NC programs on the CAD/CAM computer connected via LAN, and perform program search.

**Functions/Options Chart**

<table>
<thead>
<tr>
<th>Options</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linked nesting</td>
<td>Linked nesting</td>
</tr>
<tr>
<td>Linked DFX conversion</td>
<td>Linked DFX + Linked Barcode reader</td>
</tr>
<tr>
<td>Linked real-time notification</td>
<td>Linked DFX + Linked Barcode reader</td>
</tr>
<tr>
<td>Additional e-mail notification</td>
<td></td>
</tr>
</tbody>
</table>

**Linked e-mail notification additional features**
Setups a e-mail notification to notify the recipient of the status of the laser processing machine. (Time of day to notify necessary, Alarms to notify, Nesting program, Component checklist, E-mail notification setting).
**Specification**

### Cutting Capability

<table>
<thead>
<tr>
<th>Resinator</th>
<th>Material</th>
<th>Angle (°)</th>
<th>Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML-30CF-R</td>
<td>Mild steel 304 (SS304)</td>
<td>4</td>
<td>0.8 / 0.9</td>
</tr>
<tr>
<td></td>
<td>Stainless steel 316L (SS316)</td>
<td>4</td>
<td>0.8 / 0.9</td>
</tr>
<tr>
<td></td>
<td>Aluminum alloy H6061</td>
<td>4</td>
<td>0.8 / 0.9</td>
</tr>
<tr>
<td>ML-40CF-R</td>
<td>Mild steel 304 (SS304)</td>
<td>4</td>
<td>1.0 / 1.2</td>
</tr>
<tr>
<td></td>
<td>Stainless steel 316L (SS316)</td>
<td>4</td>
<td>1.0 / 1.2</td>
</tr>
<tr>
<td></td>
<td>Aluminum alloy H6061</td>
<td>4</td>
<td>1.0 / 1.2</td>
</tr>
<tr>
<td>ML-50CF</td>
<td>Mild steel 304 (SS304)</td>
<td>4</td>
<td>1.2 / 1.4</td>
</tr>
<tr>
<td></td>
<td>Stainless steel 316L (SS316)</td>
<td>4</td>
<td>1.2 / 1.4</td>
</tr>
<tr>
<td></td>
<td>Aluminum alloy H6061</td>
<td>4</td>
<td>1.2 / 1.4</td>
</tr>
</tbody>
</table>

*The above are processing capabilities based on special conditions. The actual performance varies according to the material and cutting conditions.*

### Processing Machine Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table pass</td>
<td>X: 3,000 mm, Y: 1,250 mm, Z: 1,200 mm</td>
<td>2,000 mm, 1,000 mm, 1,000 mm</td>
<td>2,000 mm, 1,000 mm, 1,000 mm</td>
<td>2,000 mm, 1,000 mm, 1,000 mm</td>
</tr>
<tr>
<td>Speed</td>
<td>Y-axis (mm/min)</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Accuracy</td>
<td>X-axis (mm)</td>
<td>0.003 mm</td>
<td>0.003 mm</td>
<td>0.003 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Y-axis (mm)</td>
<td>0.010 mm</td>
<td>0.010 mm</td>
<td>0.010 mm</td>
</tr>
<tr>
<td>Power requirements (kW)</td>
<td>7.2 kW (arc welding), 7.2 kW (MIG welding)</td>
<td>10.8 kW (arc welding), 10.8 kW (MIG welding)</td>
<td>10.8 kW (arc welding), 10.8 kW (MIG welding)</td>
<td>21.6 kW (arc welding), 21.6 kW (MIG welding)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>66</td>
<td>66</td>
<td>66</td>
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</tbody>
</table>

### Cooling System Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>LC-300BEK</th>
<th>LC-300BEK</th>
<th>LC-300BEK</th>
<th>LC-300BEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling method</td>
<td>Water</td>
<td>Water</td>
<td>Water</td>
<td>Water</td>
</tr>
<tr>
<td>Power (kW)</td>
<td>3</td>
<td>3</td>
<td>3</td>
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</tr>
<tr>
<td>Cooling capacity (l/min)</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>External dimensions (mm)</td>
<td>2,350 x 1,720</td>
<td>2,000 x 1,620</td>
<td>2,000 x 1,620</td>
<td>2,000 x 1,620</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>1,000</td>
<td>1,100</td>
<td>1,100</td>
<td>1,100</td>
</tr>
</tbody>
</table>

### Resinator Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>ML-30CF-R</th>
<th>ML-40CF-R</th>
<th>ML-50CF</th>
<th>ML-60CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser output characteristics</td>
<td>3,500 mW</td>
<td>6,000 mW</td>
<td>6,000 mW</td>
<td>6,000 mW</td>
</tr>
<tr>
<td>Laser power (W)</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Laser output power (W)</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Laser beam divergence</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Laser beam quality</td>
<td>Better</td>
<td>Better</td>
<td>Better</td>
<td>Better</td>
</tr>
<tr>
<td>Power supply (V)</td>
<td>220</td>
<td>220</td>
<td>220</td>
<td>220</td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>External dimensions (mm)</td>
<td>2,000 x 1,010</td>
<td>2,000 x 1,010</td>
<td>2,000 x 1,010</td>
<td>2,000 x 1,010</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>220</td>
<td>220</td>
<td>220</td>
<td>220</td>
</tr>
</tbody>
</table>

### Control System Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>LC-300BEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display screen</td>
<td>17&quot; color LCD</td>
</tr>
<tr>
<td>Network</td>
<td>Gigabit LAN</td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>40</td>
</tr>
<tr>
<td>Operation method</td>
<td>Laser output power adjustment, High-speed output sensor</td>
</tr>
</tbody>
</table>

### Space Saving

The oil displacement is smaller than our previous LX and LX series.