THE RX SERIES

4020 FLYING OPTIC CO₂ LASER

MITSUBISHI LASER

MACHINERY SYSTEMS, INC.

a subsidiary of Mitsubishi Corporation
BUILT FOR SPEED AND SIZE: RX4020

INTRODUCING THE SLEEK NEW RX SERIES FROM MITSUBISHI LASER

The new RX series from Mitsubishi features a 4m by 2m footprint with all of the features and options that are popular in our best selling eX series. We are proud to combine these two models into one new model...THE RX.
CONTINUOUS IMPROVEMENT

At its core all Mitsubishi companies are working towards continuous improvement. It’s our corporate mission and it is put to the test by our people, our services and especially our product. Mitsubishi design and manufactures every critical component that goes into every Mitsubishi Laser System. Every individual component is performance-matched to excel in the most demanding environments. Advanced CAE models were employed to development the stable and accurate high-speed RX system design. High strength machine frame ensures high rigidity and system stability while oversized precision linear guides on both X and Y axes result in longer life. The RX also features Helical Rack and Pinion on the X and Y axes resulting in faster movement and a more quiet operation.

UNIQUE FEATURES OF THE RX

• FAB control which expands processing stability across the the cutting area, decreases processing time and provides better edge quality.

• Gas change time is improved by 60% over previous model, approximately 10 minutes from start up time

• Helical Rack and Pinion reduces noise, and allows for an increase in acceleration in X and Y axes and provides increased accuracy and longer life time

• Optional Magnetic Head is available on the 45CF-R and 60XF models, allowing for quicker recovery after collision

• Built in Jet Pierce provides the ability to aggressively pierce mild steel

• New Mitsubishi Control with Faster graphical interface, USB compatibility and expanded programming options

• ECO MODE available for increased energy savings

• New PHXS Head has new lens cartridge design which allows for more constant centering and the focus lens will achieve better performance due to this design change. The PHXS Head allows for a 10” focal length option

• Improved Diamond Path Technology for constant beam control and exceptional cutting performance

• Nozzle Changer Option is now available

• New High Peak Piercing greatly reduces pierce time in thick plate mild steel. This standard feature (60XF) results in higher productivity.
MITSUBISHI 700 SERIES CONTROL

TAKE CONTROL OF YOUR CUTTING

Competing manufacturers’ PC-based controls can’t touch the sophistication of the new Mitsubishi 700 Series CNC controls. Mitsubishi has utilized its vast experience developing the most sophisticated and accurate controls for laser machines and implemented new nanotechnology for finer, faster interpolation with greater power. Our CNC controls include a 15-inch touch screen, 64-bit Windows XP, ethernet for input/output and a USB port for further flexibility.

700 SERIES CNC ALSO FEATURES:

• Dedicated nano-control for highest precision machining
• Newest RISC-CPU and high-performance ASIC
• Improved and accelerated graphics with superior NC design simplify operations
• Network function adaptable for diverse factory environments
• USB Compatible
• Sheet detection
• LAN-Ethernet connectivity
• Decreased graphic time
• Increased cutting condition database
• Improved help diagnostic functions
• Micro-joint function
• 20 GB Hard Drive
• 2 Action Cutting provides automatic setup and easy operator interface
  Step 1 - use barcode reader (optional) and automatically load onto NC from CAD/CAM computer
  Step 2 - once data loaded, head moves to start positions, automatically measures the tilt, the size and the edge of the workpiece, and starts cutting
• New Reset - Restart Function provides a simple interface for resuming suspended processing
• Simple Nesting - rectangular nesting of dissimilar parts at control
• Advanced help and maintenance screens are a great aid for operators
• ECO Cut is available and can reduce your nitrogen assist gas usage by 30%
• M-Cut shortens processing time in thin materials by turning the beam on/off while in motion.
**IMPROVED CUTTING CONDITION DATA**

Cutting condition library memory is increased. The controller will now hold 1000 libraries of 17 conditions.

The libraries have become more intelligent. Nozzle diameter and lens focal length parameters are now data fields in the condition pages. This allows for new functions like Automatic Height Sensor calibration.

Automatic Height Sensor calibration calibrates height sensor whenever the nozzle is changed. This function will give more consistent processing capability.

**MAINTENANCE GUIDE**

Our new maintenance screens provide step by step instructions for most resonator maintenance functions. All of these steps are built into the control for ease of use and convenience for your operator.

Safety is our main concern at Mitsubishi, our machine is built to allow our users to perform their own maintenance on certain components of the machine. This is why we have incorporated special JIGS to make it easier and safer for our customers to keep their machines up and running at peak efficiency.
Mitsubishi resonators are so reliable and efficient that they’ve never needed to be replaced – eliminating a potentially expensive repair. The innovative Cross-Flow design consumes up to 90% less gas than traditional fast-flow systems, giving our resonators the lowest cost of ownership on the market.

**XF Series Features**
- 22% smaller
- Less Blowers
- 3 liters of laser gas
- 10 min gas change

**Mitsubishi’s Exclusive**

**X-Flow R and XF Series Resonators**

- Revolutionary “Dual” Cross-Flow design maximizes beam quality and stability
- DiamondClean™ Technology provides ultra-clean resonator materials that yield higher performance and greater stability
- Lower gas costs – consumes up to 90% less gas than traditional fast-flow systems
- Extended maintenance intervals by new optic technology
- Improved power supply provides high efficiency, stability, reliability and lower maintenance
- Fast startup
- Designed and manufactured exclusively by Mitsubishi
- 4.5 and 6.0kW resonators available
- Enhanced rectangular wave pulse
- No chemical additives for chiller

**Mitsubishi’s Superior**

**“Cutting Power”**

Output power alone does not define cutting performance or cut edge quality. It takes superior “cutting power” to achieve high-performance results. Cutting power is optimized by creating the perfect blend of output power, beam quality, beam stability and power control. The results are visible through superior edge quality, lower thermal effects, precision cutting ability and greater overall processing control.
BRILLIANT NEW TECHNOLOGY

Mitsubishi’s new state-of-the-art BrilliantCUT technology can produce a cutting surface near-machined finish – eliminating secondary operations and decreasing production times. The eX Series reaps the benefits of this innovative, optimal machine tool beam path design. The new CF-R resonator has increased beam characteristics and a new control method for the high-peak rectangular-pulse platform, providing optimal processing conditions for the resonator. It also features new nozzle technology for improved cutting surface quality.

BrilliantCUT is ideal for stainless steel applications 3/8” (9.5 mm) and up. With an increased focus margin, processing stability is increased for a more consistent cut. BrilliantCUT also provides better part straightness by controlling the Kerf on the bottom of the part. And, the ability to control the heat affected zone of the material (bottom of part) eliminates the need for secondary processes. Simply brilliant.

*Data to the right is for reference. Surface discoloration may differ depending on material, thickness, processing condition or state of the processing machine.

PLASMA GUARD CONTROL

Conventional lasers exhibit a crude transition as speed increases from starting point to corner. Plasma Guard Control restricts the generation of plasma in mid-thick stainless steel, allowing for a much smoother acceleration. Increased corner speeds maintain superior cutting quality and stability for maximum precision production.

- Plasma Guard (PG) Control smoothly steps up acceleration on the pierce line and corner sections.

- PG control restricts the generation of plasma in Stainless Steel Plate which improves cutting quality, cutting stability and ease of use.
HEAD & MOTION SYSTEM

MITSUBISHI’S PATENTED DIAMOND PATH TECHNOLOGY

- Maintains a constant beam quality by fixing the system’s beam path length regardless of processing head location
- Achieves superior cut edge quality and processing consistency over the entire work area
- Provides a stable cutting beam at high speeds across all processing areas at speeds of up to 1,970 in/min (50 m/min)
- Ensures consistent corner-to-corner cutting on any application
- Integrated Beam Optimizer automatically adjusts the beam characteristics for maximum processing speed and efficiency
- Lens failure detection feature (good for automation) comes standard

NEW MITSUBISHI PHXS HEAD

The XS-Series Head

- The new standard in processing head technology manufactured by and for MITSUBISHI LASER
- Accommodates 5.0”, 7.5” and 10” focal lengths
- Cartridge recognition. The zero focus position is memorized. No need to focus between cartridge changes
- Faster lens movement speed
- Long focus stroke
- Centering is supplied on the cartridge instead of the head, allowing for easier nozzle centering
- Optional nozzle changer automates the nozzle change process for up to five nozzles simultaneously
- ME functions are available
- Auto focus preset head (standard)
- The focus adjustment uses a motorized lens system. When the cutting condition is searched, the lens is moved to focus position automatically
- Quick-change lens cartridge
- Built in Jet Pierce provides the ability to aggressively pierce mild steel
- Antiplasma Height Control ignores plasma generated while processing thin materials at high-speed. A constant gap is maintained
- High Peak Pierce available
VERSATILE AND EXPANDABLE AUTOMATION

Auto-Flex MSCII (Multiple Shelf Changer) Series is versatile and expandable. Mitsubishi offers several high-production options that can transform and expand the eX System for maximum versatility and throughput. Current Mitsubishi users can add an eX to an existing automated system. That’s the expandability of Mitsubishi.

TANDEM LOAD/UNLOAD SYSTEM

- Full load/unload cycle in approximately 65 seconds
- Heavy duty with up to 1 inch full sheet load/unload capacity
- Second material pickup loading station allows simultaneous preparation
- 4 motorized carts 2 load, 2 unload working simultaneously to increase throughput
- 11,000 lb per cart capacity
- 5x10 machines can accept raw material in 4x4, 4x8, 4x10 and 5x10 sizes

MULTIPLE SHELF TOWER

- Integrates a low-profile storage tower with 6,000 lb shelf capacity
- Up to 20 shelves can be added to one tower for a total of 120,000 lbs. of material capacity
- Heavy duty with up to 1 inch full sheet load and unload capacity
- Full load/unload cycle time in approximately 65 seconds
- 11,000 lb per cart capacity

TWO LASER SYSTEM

- Add a second laser to maximize productivity. A two laser FMS system allows up to six product carts for total capacity of 66,000 lbs. Compatible with NX and LVP models.
- Heavy duty with up to 1 inch full sheet load and unload capacity
- Full load/unload cycle time in approximately 65 seconds
- 11,000 lb per cart capacity

NEW FSC COMPACT SYSTEM

- Completely modular and expandable
- Lighting-fast system cycle time – full load/unload cycle in approximately 75 seconds
- Vacuum load system with thickness detection and sheet separator features
- Heavy-duty clamshell fork unload system with built in sheet raking system
- Heavy-duty up to 1” full size sheet load/unload capacity
THE INDUSTRY’S MOST RESPONSIVE SERVICE AND SUPPORT

When you choose a Mitsubishi Laser from MC Machinery Systems, Inc., you get industry-leading technology for peak bending performance - but that’s just the beginning.

Long before your purchase, you’ll know the difference the Mitsubishi Experience can make. Our field service managers and applications engineers have technical expertise and industry-specific knowledge, combined with MC Machinery’s wide array of machine tools and modular automation options. This potent combination gives the flexibility to deliver a custom system designed to make your business its most efficient and competitive.

From installation and on-site training to support and service to keep you running at peak performance throughout the life of your system, our national service network is just a phone call away. No other company has greater depth of experience and resources than Mitsubishi and MC Machinery Systems Inc.
FABRICATION PRODUCT LINE

- Diamond Smart Series
- Diamond Elite Series
- Diamond BB Series
- Diamond BH Series
- eX Series
- VZ Series
- NX Series
- HV Series
- Automation: MSCIII
- Tanaka LMRV
- Tanaka LMZV
- Tanaka LMXVII
- MWX-3
- MWX-4
## Laser Specifications

### Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>45CF-R</th>
<th>60XF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excitation method</td>
<td>3-axis Cross-Flow, Silent Discharge</td>
<td></td>
</tr>
<tr>
<td>Rated output power (W)</td>
<td>4500</td>
<td>6000</td>
</tr>
<tr>
<td>Control method</td>
<td>Power feedback</td>
<td>Power feedback</td>
</tr>
<tr>
<td>Power stability</td>
<td>Less than ±1% of rated power</td>
<td>Less than ±1% of rated power</td>
</tr>
<tr>
<td>Beam mode</td>
<td>Low-order (main component TEM01*)</td>
<td>Low-order (main component TEM01*)</td>
</tr>
<tr>
<td>Beam outer diameter (in)</td>
<td>1.02 (26 mm)</td>
<td></td>
</tr>
<tr>
<td>Beam divergence (mrad)</td>
<td>Approx. 3.5 or less (total angle)</td>
<td></td>
</tr>
<tr>
<td>Laser gas consumption rate (l/Hr)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Gas sealing time (during rated continuous oscillation) (Hrs)</td>
<td>24 (during rated continuous oscillation)</td>
<td></td>
</tr>
<tr>
<td>Wave length (µm)</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Duty Range (%)</td>
<td>0–100 adjustable</td>
<td>0–100 adjustable</td>
</tr>
<tr>
<td>Output Power Adjustable Range (%)</td>
<td>0–100 of rating</td>
<td>0–100 of rating</td>
</tr>
<tr>
<td>Resonator unit dimensions (W x H x D) (in)</td>
<td>100 x 71.3 x 31.5</td>
<td>102.4 x 77.2 x 31.5</td>
</tr>
<tr>
<td>Resonator unit weight (lbs)</td>
<td>4,850 (2,200 kg)</td>
<td>4,960 (2,250 kg)</td>
</tr>
<tr>
<td>Chiller power requirements</td>
<td>46 KVA 3Ø 208 VAC ±10% 60Hz 129 Full Load AMPS</td>
<td>54 KVA 3Ø 208 VAC ±10% 60Hz 155 Full Load AMPS</td>
</tr>
</tbody>
</table>

## System Specifications

### System Specifications

- **Model Name**: Model Name 4020RX
- **Machine structure**: Precision Helical Rack & Pinion (X, Y) – Z Precision Ball Screw
- **Travel drive method**: X-Y-Z Simultaneous 3 axes
- **Max. workpiece size (in)**: 159.44" x 81.10 (4050 x 2070mm)
- **Processing access**: Manual Door
- **Pallet changer**: Provided
- **Table pass height (in)**: 34.6 (880 mm)
- **X-axis stroke (in)**: 161.41 (4,100 mm)
- **Y-axis stroke (in)**: 82.67 (2,100 mm)
- **Z-axis stroke (in)**: 5.9 (150 mm)
- **Rated output power (W)**: 4500, 6000
- **Control method**: Power feedback
- **Power stability**: Less than ±1% of rated power
- **Beam mode**: Low-order (main component TEM01*)
- **Beam outer diameter (in)**: 1.02 (26 mm)
- **Beam divergence (mrad)**: Approx. 3.5 or less (total angle)
- **Laser gas composition**: CO2:CO:N2 He 8:4:60:28
- **Laser gas consumption rate (l/Hr)**: 3
- **Gas sealing time (during rated continuous oscillation) (Hrs)**: 24 (during rated continuous oscillation)
- **Wave length (µm)**: 10.6
- **Frequency Setting Range (Hz)**: 10–3000
- **Duty Range (%)**: 0–100 adjustable
- **Output Power Adjustable Range (%)**: 0–100 of rating
- **Resonator unit dimensions (W x H x D) (in)**: 100 x 71.3 x 31.5, 102.4 x 77.2 x 31.5
- **Resonator unit weight (lbs)**: 4,850 (2,200 kg), 4,960 (2,250 kg)
- **Chiller power requirements**: 46 KVA 3Ø 208 VAC ±10% 60Hz 129 Full Load AMPS, 54 KVA 3Ø 208 VAC ±10% 60Hz 155 Full Load AMPS

## Control System Specifications

### Control System Specifications

<table>
<thead>
<tr>
<th>Control Type</th>
<th>Mitsubishi M700 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU / OS</td>
<td>64-bit RISC / Windows XP</td>
</tr>
<tr>
<td>Display</td>
<td>15&quot; Color TFT LCD with Touch Screen</td>
</tr>
<tr>
<td>Hard drive</td>
<td>20.0GB</td>
</tr>
<tr>
<td>Generator output control</td>
<td>Output Power, Frequency, Duty</td>
</tr>
<tr>
<td>Generator operation control</td>
<td>Beam ON/OFF, Laser Gas Change, etc.</td>
</tr>
<tr>
<td>Drive method</td>
<td>X, Y, Z (Simultaneous Control)</td>
</tr>
<tr>
<td>Position detection system</td>
<td>Optical Rotary Encoder</td>
</tr>
<tr>
<td>Min. command input</td>
<td>0.001 mm / 0.0001 in</td>
</tr>
<tr>
<td>Program input system</td>
<td>USB, Computer Link, Ethernet LAN</td>
</tr>
</tbody>
</table>

This product complies with CFR 1040. 10. Data provided in this brochure is for reference only.