MITSUBISHI LASER

THE RX-F SERIES

4020 FIBER LASER

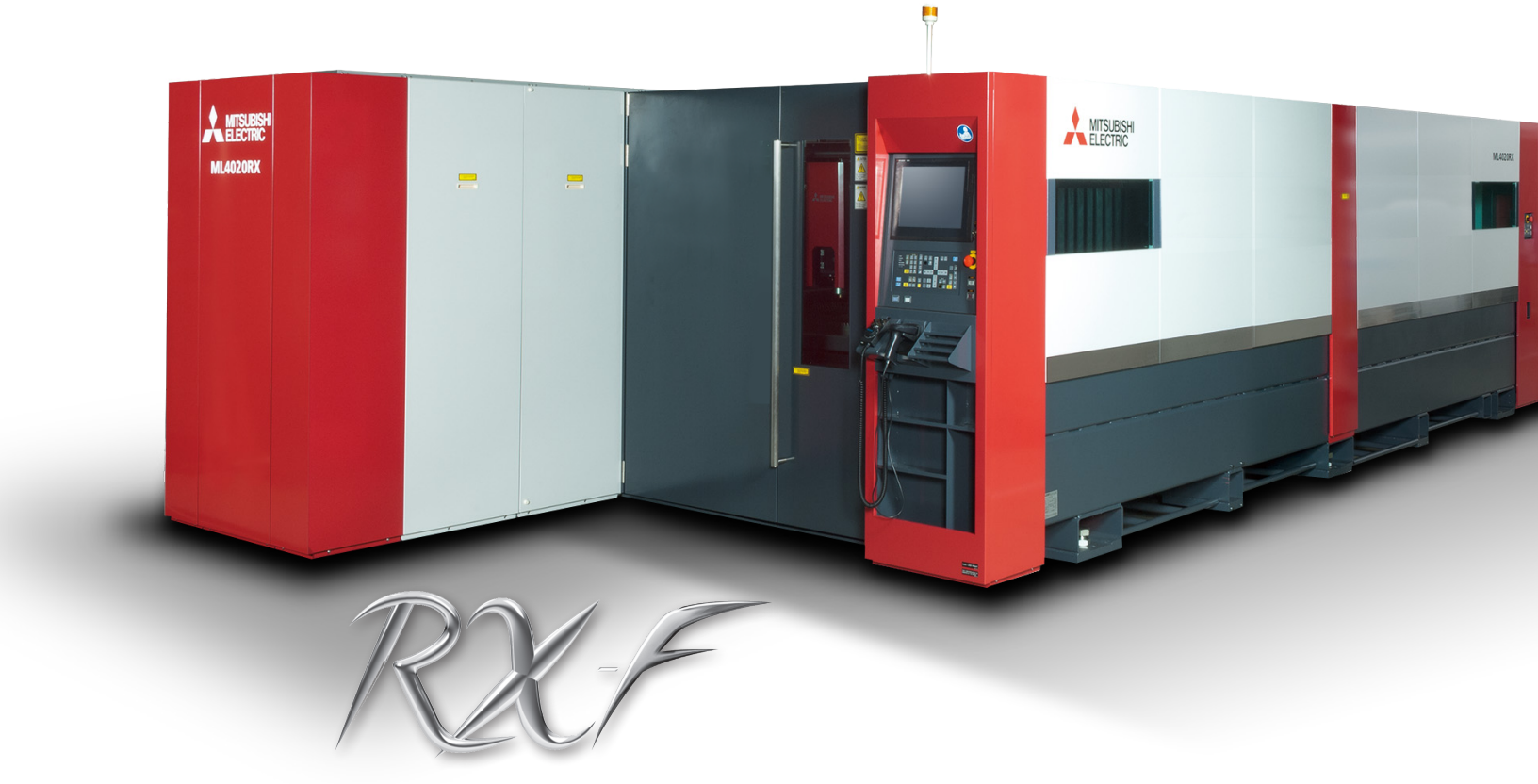
MC MACHINERY SYSTEMS, INC.

a subsidiary of Mitsubishi Corporation

BUILT FOR SPEED AND SIZE: 4020RX-F40 / F60

INTRODUCING THE SLEEK NEW RX SERIES FROM MITSUBISHI LASER

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



FIBER OSCILLATATOR

Fiber lasers deliver their energy through an integrated flexible optical fiber. Fiber lasers have a monolithic, entirely solid state, fiber-to-fiber design that does not require mirrors or optics to align or adjust. These features make fiber lasers easier to integrate and operate in production, medical and other laser-based systems. Fiber lasers are typically smaller and lighter in weight than traditional lasers, saving valuable floor space. While conventional lasers can be delicate due to the precise alignment of mirrors, fiber lasers are more rugged and able to perform in variable working environments. These qualities permit fiber laser systems to be transported easily.

MAIN FEATURES

- Excellent Beam Parameter Product (BPP)
- Constant BPP Over Entire Power Range
- Small Focus over Large Working Distance
- Over 30% Wall-Plug Efficiency
- Maintenance Free Operation
- Compact, Rugged & Easy to Install
- Estimated Diode Lifetime > 100,000 hours

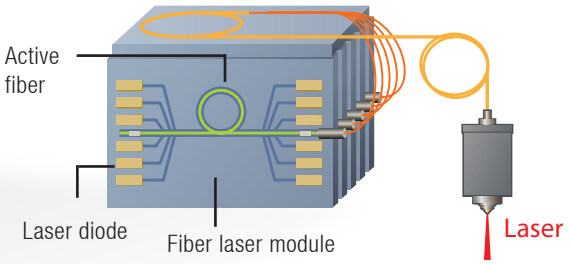
CONTINUOUS IMPROVEMENT

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. Every individual component is performance-matched to excel in the most demanding environments. Advanced CAE models were employed to develop the stable and accurate high-speed RX-F 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-F also features Helical Rack and Pinion on the X and Y axes resulting in faster movement and a more quiet operation.

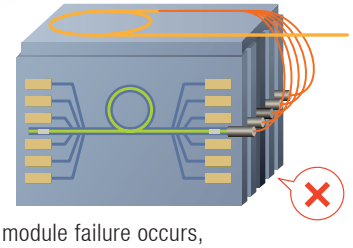
Fiber-laser Oscillator Construction

Oscillator built onto machine frame for stable processing.

All Fiber Structure



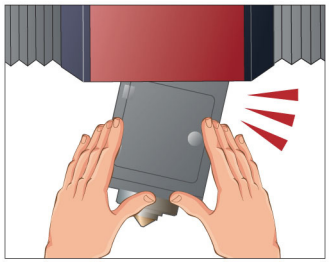
Hot reserve function



Even if a module failure occurs, continuous operation is possible with the remaining modules

UNIQUE FEATURES OF THE RX-F

- FAB control which expands processing stability across the the cutting area, decreases processing time and provides better edge quality.
- 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
- 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 (standard on 4kW) has new lens cartridge design which allows for more constant centering and the focus lens will achieve better performance due to this design change.
- Nozzle Changer Option is now available



MAGNETIC DAMAGE REDUCTION FUNCTION

Protects the head and eliminates the need for nozzle centering in the event of a crash. Allows quick recovery.

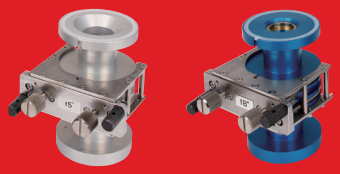
4kW Standard Processing Head

Precise Cutting

- The standard in processing head technology manufactured by and for MITSUBISHI LASER
- Accommodates 5.0” and 8.0” focal lengths
- Cartridge recognition
- Zero focus position is memorized. No need to focus between cartridge changes
- Quick change lens cartridge
- The focus adjustment uses a motorized lens system. When the cutting condition is searched, the lens adjusts to the focus position automatically
- Anti-plasma technology fully takes advantage of the fiber laser speed
- HPP (High Peak Piercing) is incorporated for fast piercing of mild steel
- Protective window lengthens lifetime of processing lens
- Process lens monitoring provides notification of any failure
- Zoom head optional

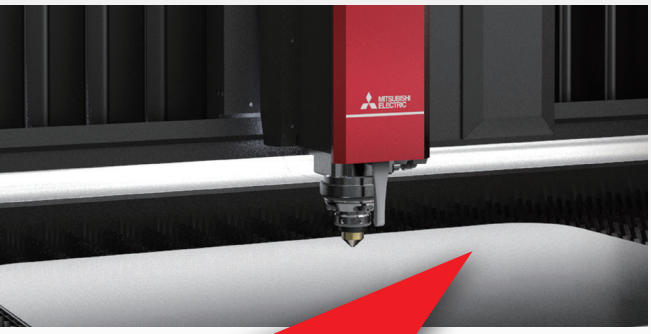
CARTRIDGES

Equipped with two processing lens configurations provides the widest cutting range. Thin to thick material is processed with ease.



f5" lens cartridge (for RX-F 40)
f8" lens cartridge (for RX-F 40)

6kW / 8kW Standard Zoom Processing Head:



ZOOM FIBER

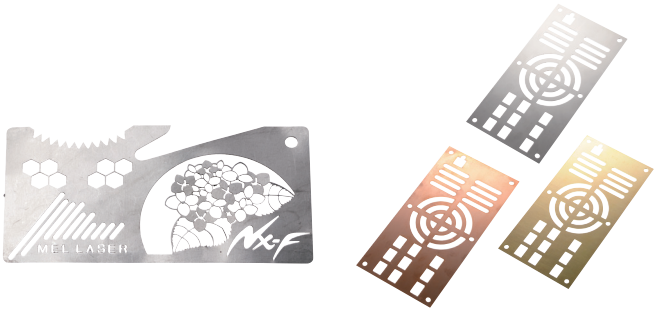
The All In One Head Design

The Zoom Cutting Head features an "All In One" design with an Auto Focus range from 3.75 ~ 10 inches. This allows multiple sheet thickness cutting up to 1 inch mild steel with no setup. The design includes:

- Auto Focus - Focal Range From 3.75 ~ 10"
- Automatic Beam Mode Manipulation from Thick to Thin Based on the Material
- No Lens Cleaning Required
- No Cartridge Changing Required
- Reduced Nozzle Centering Time
- Collision Protection: The Industry's Best Magnetic Breakaway Fiber Head
- HPP Pierce Technology

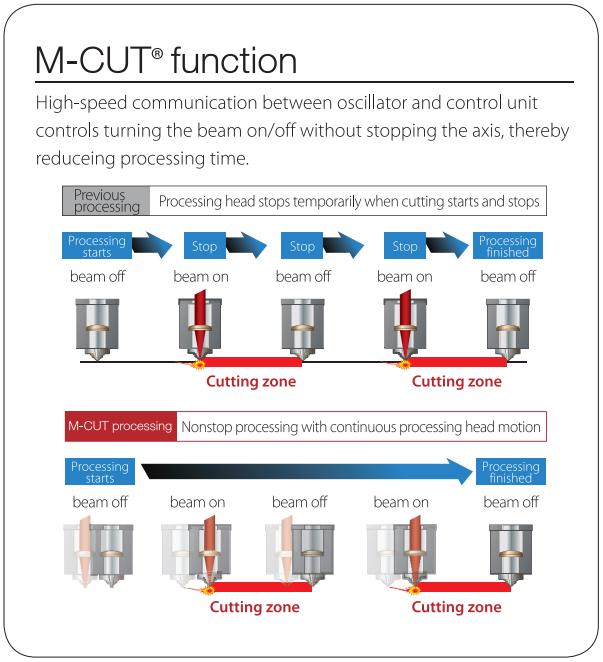
Motion Cut Advantage

For maximum production on a fiber laser, especially when running components with complex geometries or in smooth curves, Mitsubishi has upped the traditional ante to introduce the Motion Cut (M-Cut) technology.



Strong Control Lineage

Mitsubishi's industry leading laser control expertise has once again been brought into play in designing controls for the 4020 RX-F laser. The Mitsubishi High Speed Control for Lasers (MHC-L) is an original control method that is now being applied to fiber optic laser technology to maximize the fiber laser's number one attribute – speed.



Blazing Speed

New software calculates the timing to control the resonator according to the position of the axis. A high-speed communication unit between the CNC and the control board allows for ultra-fast serial communication thanks to signal delay reduction. The laser power control, exclusive to fiber lasers, provides fast rise times, and the resonator itself is customized to control the beam ON/OFF timing, even at high speeds.

Tough Geometries

Traditional technologies worked fine for square or rectangular cutting in fiber lasers, as they relied on the axes perpendicular travel coincides with the 90 degree right angles of these types of shapes. But when faced with complex geometries or smooth curves, traditional controls slowed down the process due to axial stoppage at start point. These MHC-L M-Cut controls the ON/OFF timing to eliminate the need for axes to stop. This increased speed in difficult geometries increases process speed, and ultimately, the bottom line.

It All Adds Up

Power isn't the sole determinant of process time. The M-Cut time-saving controls allow an operator to cut multiple shapes without the axes having to stop, providing industry-leading speed with less power input, and greater cost efficiency per part.

MITSUBISHI 700 SERIES CONTROL

TAKE CONTROL OF YOUR CUTTING

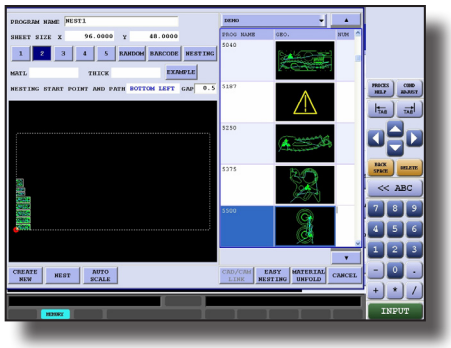
Competing manufacturers' PC-based controls can't touch the sophistication of the new Mitsubishi 700 Series CNC controls. Mitsubishi has utilized its vast experience developing the most sophisticated and accurate controls for laser machines and implemented new nanotechnology for finer, faster interpolation 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 Compatable
- Sheet detection
- LAN-Ethernet conncectivity
- 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 is loaded, head moves to start postion, 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 dissimiliar parts at control
- Advanced help and maintenance screens are a great aid for operators
- M-Cut shortens processing time in thin materials by turning the beam on/off while in motion.



Handle Box and Optional Bar Code Reader combine for a more user friendly experience.

IMPROVED CUTTING CONDITION DATA

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

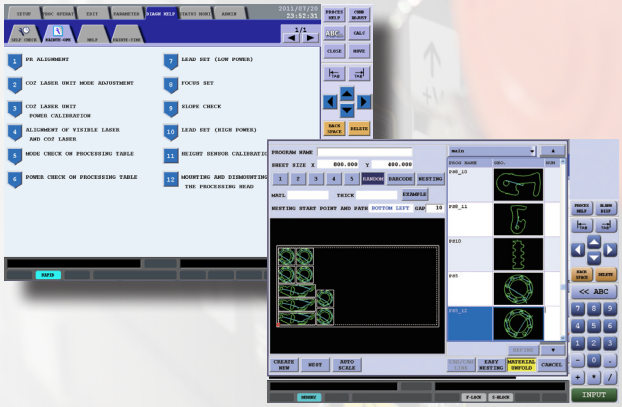
The libraries have become more intelligent. Nozzle diameter and lens focal length parameters are now data fields in the condition pages. This allows for new functions like Automatic Height Sensor calibration.

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 routine 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.



SIMPLE NESTING

Allows the rectangular nesting at the CNC control to meet urgent needs for additional parts.

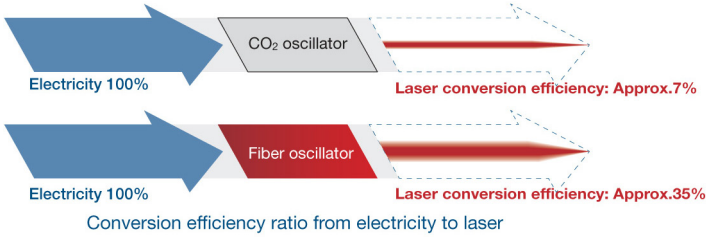
SIMPLE PROGRAM EDITOR

Allows the change of program and processing condition numbers easily while checking the shape on the graphic screen.

POWER/GAS CONSUMPTION MONITOR

Power and gas consumption can be easily checked on the operating screen. Visulization supports energy savings.

FIBER LASER OSCILLATOR



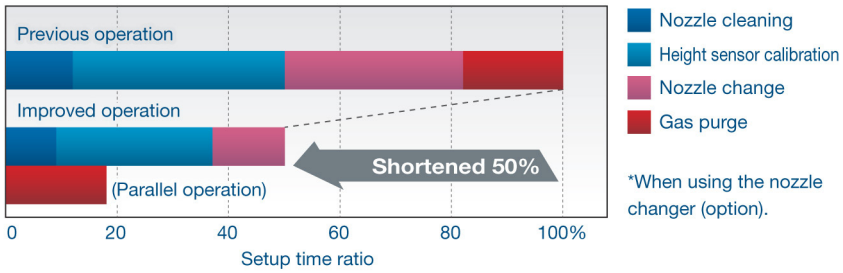
HIGH LASER CONVERSION EFFICIENCY ACHIEVES ELECTRIC POWER SAVINGS

Compared to CO_2 lasers, fiber lasers with high laser conversion efficiency consume less electricity

HIGHER PRODUCTIVITY

REDUCTION IN NON-ACTUAL PROCESSING TIME

Total productivity has been improved with the high-speed and parallel operation of each movement before processing.

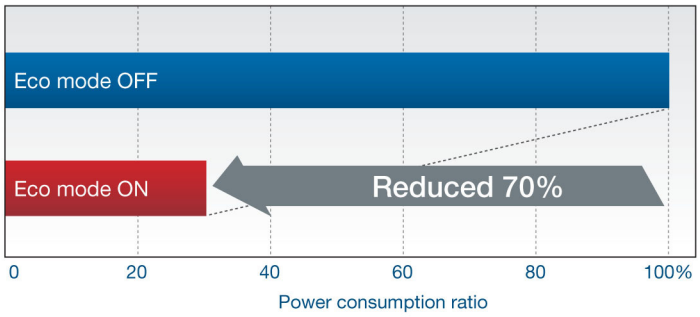


*When using the nozzle changer (option).

POWER SAVING CNC AND DRIVE UNIT

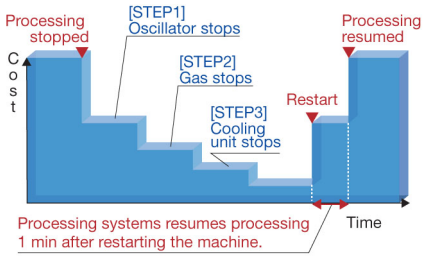
OPERATING COST REDUCED OWING TO ENERGY-SAVING CNC AND DRIVE UNIT

Power-saving realized using Mitsubishi Electronic CNC and drive unit best matched for the fiber laser oscillator.



ECO MODE

Cost during standby has been reduced by up to 70% by incorporating Eco mode which automatically shuts down each operation in stages after processing stops.



*Time required to resume operation varies depending on the equipment and usage conditions.

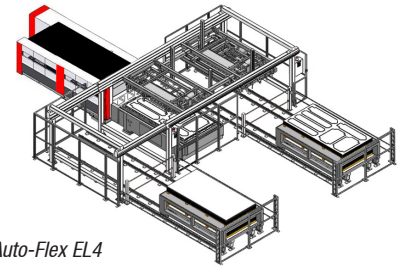
AUTOMATION

VERSATILE AND EXPANDABLE AUTOMATION

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

TANDEM LOAD/UNLOAD SYSTEM

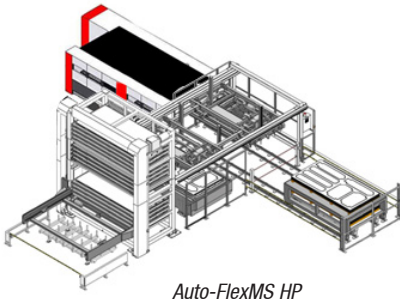
- Full load/unload cycle in approximately 65 seconds
- Heavy duty with up to 1 inch full sheet load/unload capacity
- Second material pickup loading station allows simultaneous preparation
- 4 motorized carts 2 load, 2 unload working simultaneously to increase throughput
- 11,000 lb per cart capacity
- 6x12 machines can accept raw material in 4x4, 4x8, 4x10, 5x10 and 6x12 sizes



Auto-Flex EL4

MULTIPLE SHELF TOWER

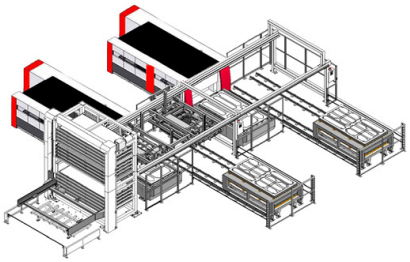
- Integrates a low-profile storage tower with 6,000 lb shelf capacity
- Up to 20 shelves can be added to one tower for a total of 120,000 lbs. of material capacity
- Heavy duty with up to 1 inch full sheet load and unload capacity
- Full load/unload cycle time in approximately 65 seconds
- 11,000 lb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



Auto-FlexMS HP

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.
- 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



Auto-FlexMS HP 2Laser

WHERE ARE YOU WHEN YOUR PARTS ARE FINISHED?

Receive live notifications straight to your phone when jobs are completed or interrupted.

A new level of support for your Mitsubishi machine.

IMPROVE EFFICIENCY

View a realtime dashboard display of your machine's runtime vs. idle & stop time. Compare your machine's performance by shift, day, week, and month.

ALERTS & NOTIFICATIONS

Set up e-mail or mobile notifications to see critical alarms, machine stoppages, job completion and maintenance warnings.

PROACTIVE SUPPORT

MC Machinery will receive automatic notifications of critical and trending alarms allowing us to provide a proactive response to your service needs.

You can allow our technicians to remote into your machine control to fix and diagnose problems as they happen.

Available for existing Mitsubishi Laser and EDM machines

remote360®

mcmachinery.com/remote360

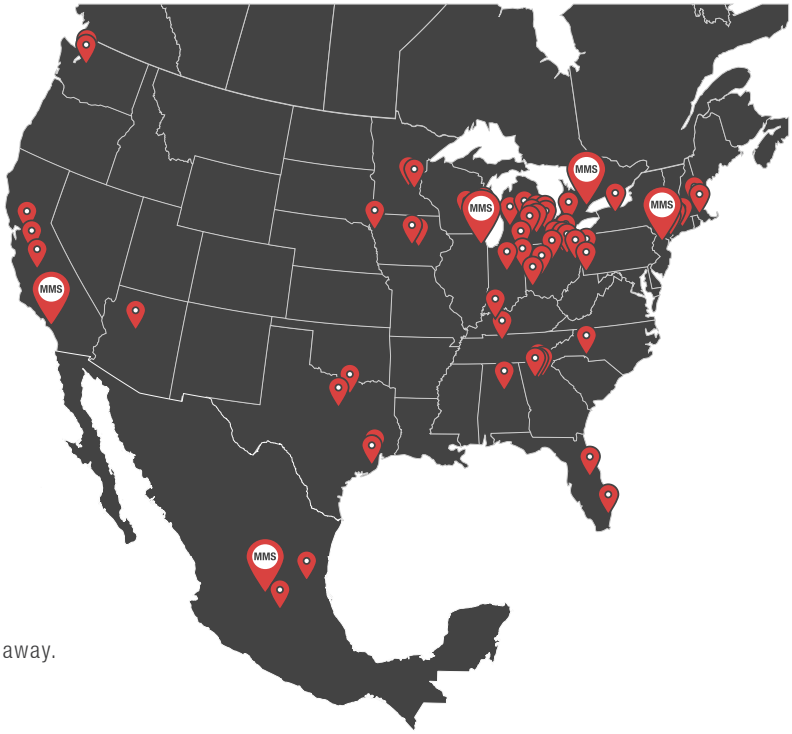
GET CONNECTED!
630-616-5673
remote360@mcmachinery.com

MITSUBISHI EDM/LASER

THE INDUSTRY'S MOST RESPONSIVE SERVICE AND SUPPORT

With more than 200 employees, our regionalized Service Network is the most advanced and responsive team in the industry. We're here for you with phone support, operation training, on-site service, parts inventory and a robust, interactive website. With 20 locations throughout North America, and more scheduled to open, we can respond promptly to your service needs. For the best on-site customer service capabilities, we have more than 25 vans in the field – three times more than any other company in the industry.

From installation and on-site training to support and service throughout the life of your system, our national service network is just a phone call away. No other company has a greater depth of experience and resources than Mitsubishi and MC Machinery Systems. Access 24/7 support with our interactive website, a detailed interactive parts catalog, printable machine manuals and software.



OVER 60 SERVICE LOCATIONS IN NORTH AMERICA

Financing Solutions

MAC FUNDING CORPORATION

a subsidiary of Mitsubishi Corporation

Simple, Fast & Easy

Being a fellow Mitsubishi Corporation company, MAC Funding is an integral part of MC Machinery Systems. We work closely with MC Machinery to ensure every transaction is fast and simple, saving you time, effort, and most importantly money.

Fast Track

For loans up to $350,000, a signed loan application is all we need! The easy, one page application allows you to be approved within 24 hours. We also offer pre-approvals, allowing you to have your financing in place before you even decide on a machine!

630-860-4218 • info@macfunding.com

System Specifications

Model Name				4020RX-F	
Machine structure				Precision Helical Rack & Pinion (X, Y) – Z Precision Ball Screw	
Travel drive method				X-Y-Z Simultaneous 3 axes	
Performance	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)	
	Stroke	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)	
	Speed	Rapid travel (X, Y)	(in/min)	3940 single axis (100m/min), 5550 (141 m/min) simultaneous	
		Max. processing feedrate	(in/min)	1970 (50 m/min)	
	Precision	Positioning precision	(in)	0.0019/20 (0.05/ 500 mm) (X-, Y-axis), 0.0039/4 (0.01/ 100 mm) (Z-axis)	
		Repeatability	(in)	(+/-)0.00039/ (+/-) -0.01 mm (X-, Y- axis)	
	Drive motor type			Intelligent AC Servo	
Maximum Workpiece weight			(lb)	3660 (1660kg)	
Machine unit dimensions (W x H x D)			(in)	530.3(W) x 96.8(H) x 217.4(D) 12575mm (W) x 2458mm(H) x 12575mm(D)	
Machine system weight			(lb)	24,250 (11,000 kg)	
Installation dimensions (W x D)			(in)	573.3 x 367.4 (14,560 x 9,330mm)	
Floor space requirement			(sq ft)	1,462 (136 m^2)	
Electrical requirements				208 VAC ± 5%, 3 Phase, 60HZ 28 KVA (45CFR) 82 Full Load AMPS	208 VAC ± 5%, 3 Phase, 60HZ 35 KVA (60XF) 90 Full Load AMPS

Control System Specifications

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

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

Resonator Specifications

Item				YLS-4000	YLS-6000	YLS-8000
Excitation method				Yb doped on Fiber		
Performance	Laser Power	Rated Output Power	(Watts)	4000	6000	8000
		Power stability		(+/-) 1%		
		Beam Characteristics	Beam mode	Multi-Mode		
			Beam outer diameter (μm)	140-400 micron (Zoom)		
Wave length			(μm)	1.07		
Frequency setting range			(Hz)	100-3000 (100-3000 with power control)		
Duty range			(%)	0-100		
Output power adjustable range			(%)	0-100		
Machine power requirements				28 KVA 3Ø 208 VAC +5% 60Hz 82 Full Load Amps	30 KVA 3Ø 208 VAC +5% 60Hz 88 Full Load Amps	36 KVA 3Ø 208 VAC +5% 60Hz 104 Full Load Amps
Chiller power requirements				22 KVA 3Ø 208 VAC +10% 60Hz 66 Full Load Amps	22 KVA 3Ø 208 VAC +10% 60Hz 66 Full Load Amps	24 KVA 3Ø 208 VAC +10% 60Hz 71 Full Load Amps

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