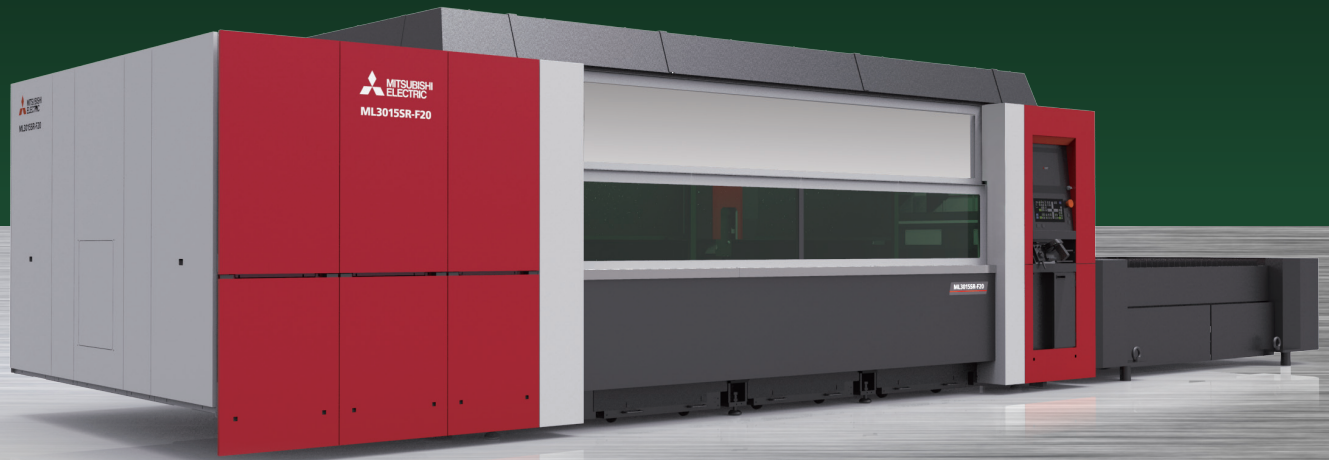


# SR-F

FROM MITSUBISHI LASER



# SR-F

## MITSUBISHI SR-F FIBER LASER

### INTRODUCING THE SR-F SERIES FROM MITSUBISHI LASER

Features a 3m by 1.5m footprint with many of the features and options that are popular in our best selling eX-F laser.

### WHAT IS FIBER LASER?

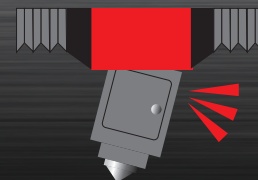
Fiber laser technology uses rare-earth elements, in this case, ytterbium, to dope the optical fiber of the active gain medium. The fiber couples the light, and acts as a flexible path for delivering the beam to the processing head. The technology eliminates bend mirrors, so it effectively eliminates the need for beam adjustment and alignment, improving consistency. The process can support high kilowatt inputs, and features accelerated cutting speeds.

### SMALLER FOOTPRINT

Because fiber laser technology relies on fiber optics to deliver light to the head, as opposed to mirror-directed beams, significant space savings can be realized with fiber laser technology. We know that square footage is at a premium in your facility. The SR Fiber is built on the same platform as our highly successful SR CO<sup>2</sup> platform. A true proven work horse. All of the benefits of this model have been moved over to Fiber technology.

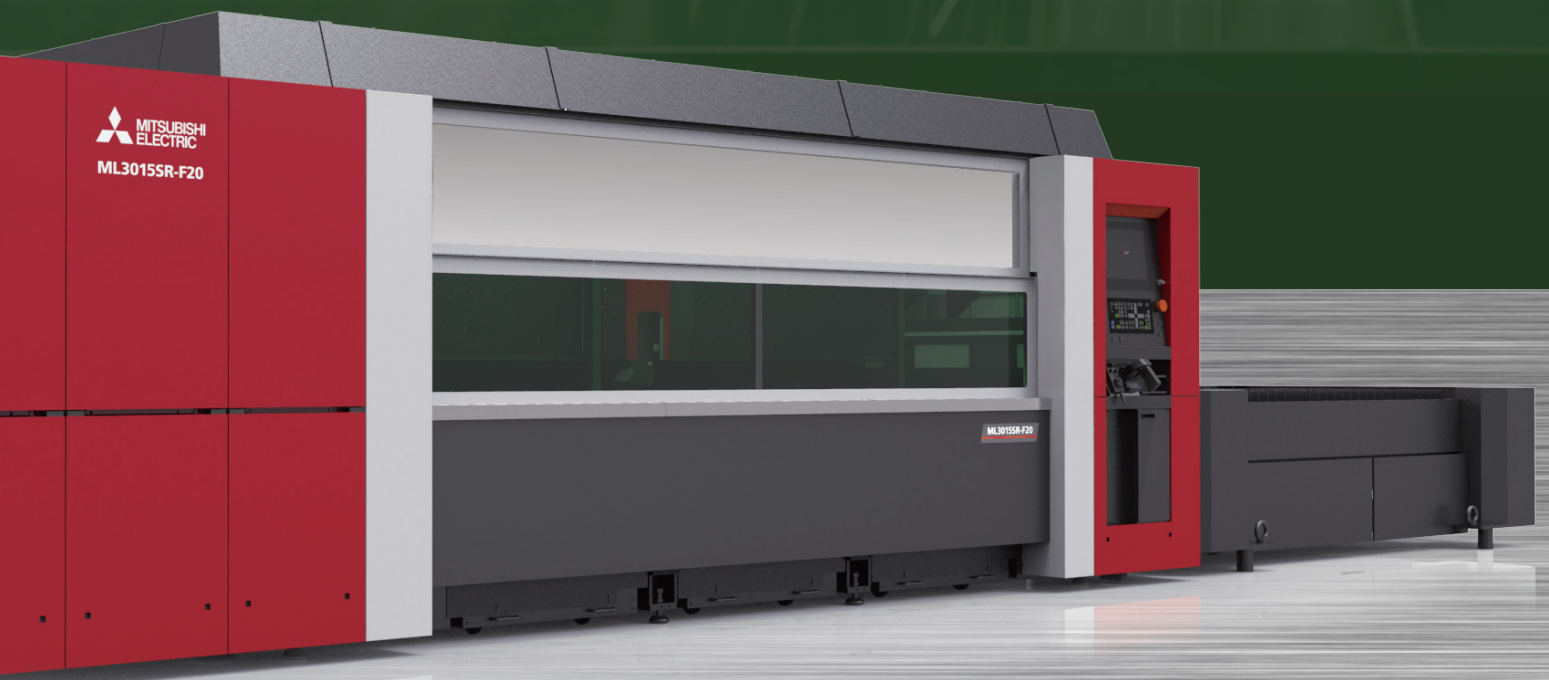
### THE MITSUBISHI ADVANTAGE

Fusing our world-leading laser processing machines, rich in history and technical prowess, with an advanced fiber laser beam, we've evolved laser processing to an entirely new level of performance. The SR-F 3015 two-dimensional fiber laser processing system comes standard with a fiber laser resonator, a processing head and a safety cover. The Mitsubishi 700 series control with 64 bit NC and a 15 inch touch screen NC panel is the latest most sophisticated control from Mitsubishi. The machine also features a Multi-chamber dust-collection mechanism.



### MAGNETIC DAMAGE REDUCTION FUNCTION

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



## STANDARD FEATURES OF THE SR-F

- Mitsubishi's High-Speed Control for Lasers (MHC-L), an original control method which maximizes fiber lasers high speed cutting capability. Controls beam on/off timing in 1 micro-second increments. The system includes a timing calculator that allows the machine to deliver fast rise time when the laser needs power.
- Motion Cut - features the beam on/off time and axial movement simultaneously to eliminate the need for the axes to stop.
- Eco Mode reduces cost during standby by up to 70 percent.
- Power Control System provides power stability of  $\pm 1\%$ .
- Automatic Focusing allows for easy and consistent focusing.
- Reduction of cutting time by fast command execution.
- Long term stable processing by all fiber composition.
- Remote 360

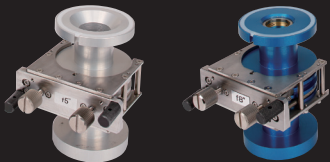




## STANDARD PROCESSING HEAD

### CARTRIDGES

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

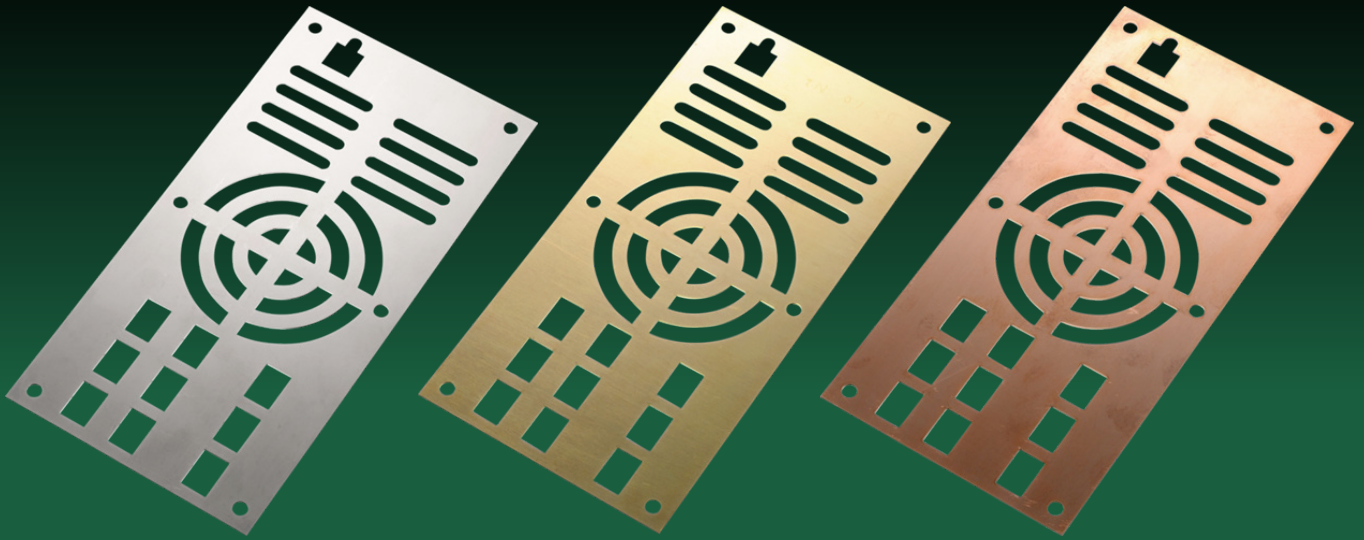


f4" lens cartridge (for SR-F 20)  
 f5" lens cartridge (for SR-F 30/40)  
 f8" lens cartridge (for SR-F 20/30/40)

### 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
- Magnetic Breakaway Head





## THE BENEFIT OF FIBER

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. 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.

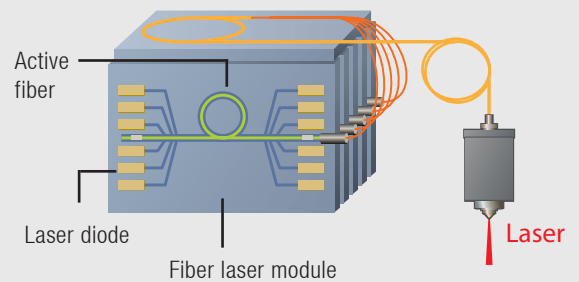
### MAIN FEATURES

- Excellent Beam Parameter Product (BPP)
- Constant BPP Over Entire Power Range
- Small Focus over Large Working Distance
- Over 35% Wall-Plug Efficiency
- Maintenance Free Operation
- Compact, Rugged & Easy to Install

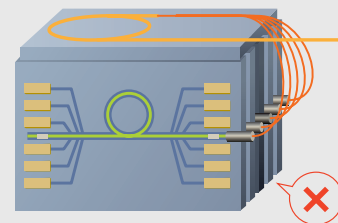
### Fiber-laser Oscillator Construction

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

# 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 includes a windows based 15-inch touch screen, prepared with 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 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 – Operator selects start point based on graphic
- Simple Nesting - rectangular nesting of dissimilar parts at control
- Advanced help and maintenance screens are a great aid for operators
- Sheet cut offs
- Email notification
- Multiple cutting with sheet size detection



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.

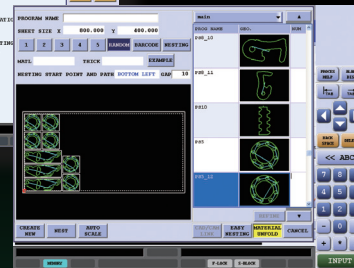


Automatic Height Sensor calibration calibrates height sensor whenever the nozzle is changed. This function will give more consistent processing capability.

## MAINTENANCE GUIDE

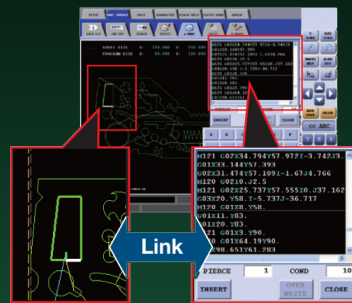
Our new maintenance screens provide step by step instructions for most resonator maintenance functions. All of these steps are built into the control for ease of use and convenience for your operator.

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.



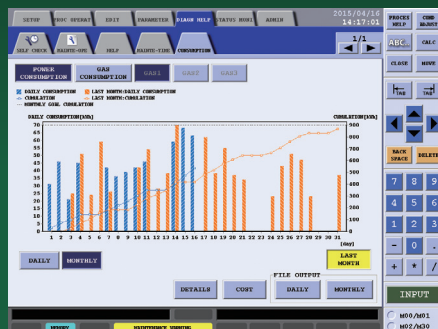
## SIMPLE NESTING

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



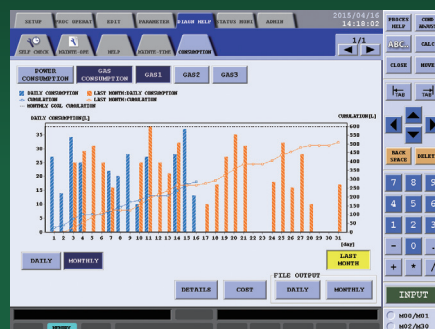
## SIMPLE PROGRAM EDITOR

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. Visualization supports energy savings.



# SMARTFLEX

## AUTOMATION THAT KEEPS UP

### ABANDON ONE-STEP-AT-A-TIME PROCESSES WITH AUTOMATED SOLUTIONS FROM MITSUBISHI

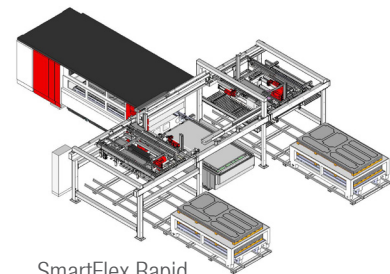
As the industrial laser industry evolves, shops of all sizes are requiring more speed and agility to get the job done. Mitsubishi's SmartFlex Automation Line is designed and engineered to increase productivity and reliability—because to stay on top, your automation needs to keep up. And with Mitsubishi, it will.

### VERSATILE AND EXPANDABLE AUTOMATION

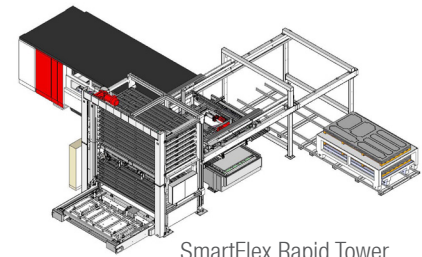
Virtually all SmartFlex Automation Systems are versatile and expandable. Mitsubishi offers several high-production options that can transform and adapt the SR-F System for maximum versatility and throughput. Current Mitsubishi users can add an SR-F to an existing automated system. That's the expandability of Mitsubishi.

### SMARTFLEX RAPID

- 52-second load and unload cycle time
- Aerial positioning
- 22 gauge to 1.0" load/ unload capacity
- Pair with High Capacity (11,000 lbs.) Carts or Tower (6,600 lbs. per shelf)
- Intelligent, High Speed, Independently Operating Load and Unload Units



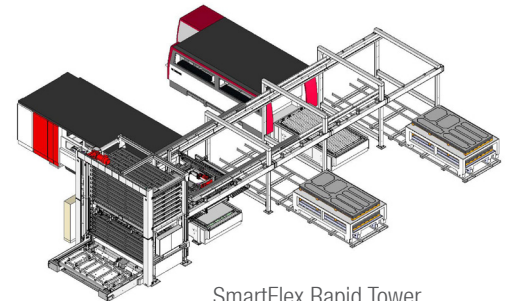
SmartFlex Rapid



SmartFlex Rapid Tower

### SMARTFLEX RAPID TOWER

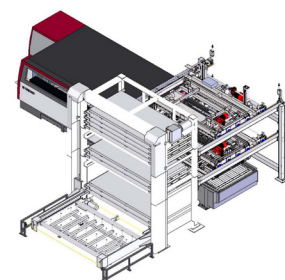
- Up to 22 shelves (more than 145,000 lbs. weight capacity for raw material)
- Increase storage capability with the addition of a second or third tower
- Configure an auxiliary load station for quick change-over of material types on multiple laser systems with no additional time
- Standard shelf spacing is 3.5" for use without skids or available at 7.5" for skid compatibility
- Offload to carts, SmartFlow conveyor, or a dedicated finished-goods tower



SmartFlex Rapid Tower  
w/ 2 Lasers

### SMARTFLEX COMPACT WAREHOUSE

- 75-second load and unload cycle time
- Flexible, expandable automation in a compact footprint
- Space-saving options
- Equipped for any shop, ideal for short-run jobs
- Modular and expandable system that grows with your shop
- Vacuum load systems with thickness detection and sheet-separator features



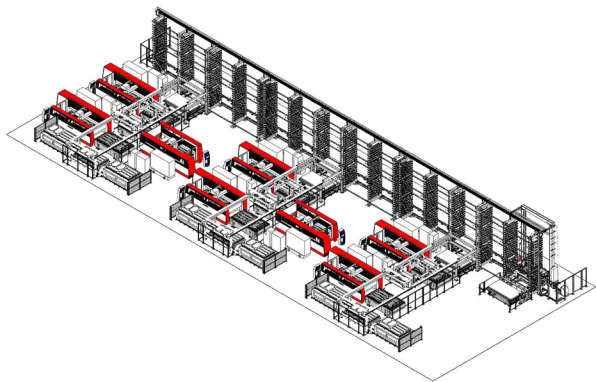
SmartFlex Compact Warehouse



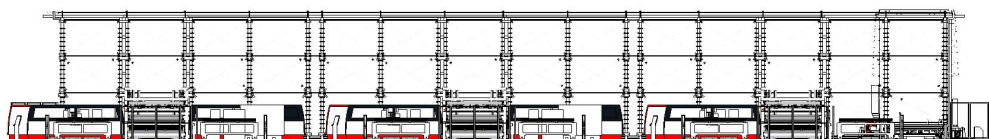


## MITSUBISHI RIVER SYSTEMS

All of Mitsubishi's SmartFlex Automation configurations shown here deliver standard key features and options, including:



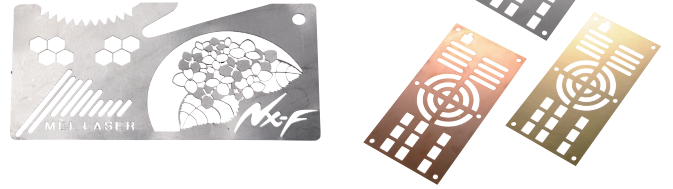
- Modular and expandable to grow with changing needs
- Aerial positioning provides accurate and correct sheet location
- Automatic sheet separation and thickness detection to help ensure you never cut the wrong material
- Heavy-duty load and unload cycle with up to 1" thickness capacity
- Tower shelves with 6600 lbs. capacity
- Automated Carts with a full capacity of 11,000 lbs.





# 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 SR-F 3015 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

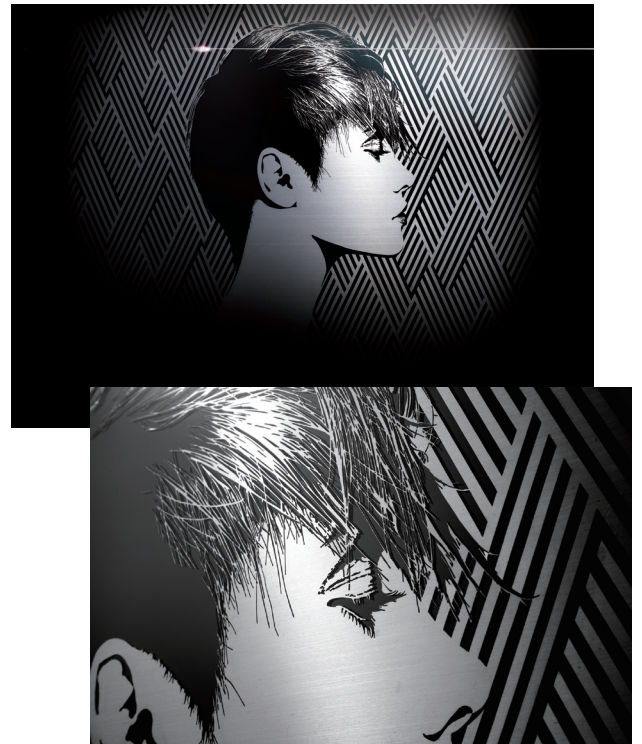
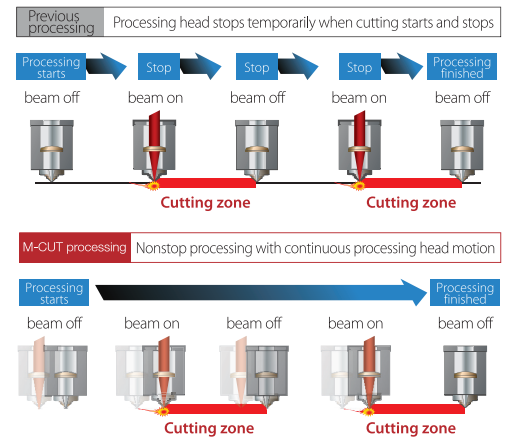
Traditional technologies worked fine for square or rectangular cutting in fiber lasers, as they relied on the axes perpendicular travel to coincide with the 90 degree right angles. When faced with complex geometries or smooth curves, traditional controls slowed down the process due to axial stoppage 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.

## M-CUT® function

High-speed communication between oscillator and control unit controls turning the beam on/off without stopping the axis, thereby reducing processing time.





## 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**

# remote360<sup>®</sup>

Remote Monitoring And Support Solution

## WHERE ARE YOU WHEN YOUR PARTS ARE FINISHED?

A robust production monitoring and support solution geared to provide transparency to your laser cutting process. MC Remote 360 provides real-time data to help increase productivity, improve efficiency, and reduce down time for your MC Remote 360 enabled machine.

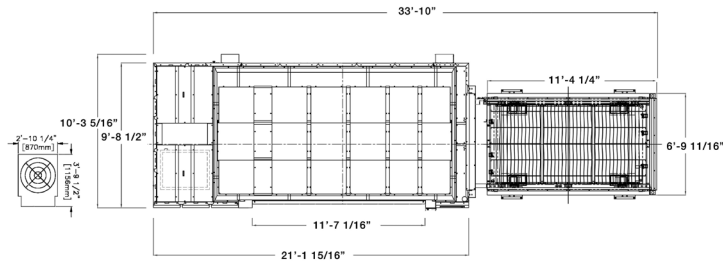
### MC Remote 360 provides

- Email & mobile notifications of stoppages, completions and maintenance warnings
- Dashboard display of runtime performance by shift, day, week and month
- Proactive Support with real-time monitoring and remotely connected service technicians

[www.mcmachinery.com/remote360](http://www.mcmachinery.com/remote360)



## SRF Layout



\*All machines in this brochure may be pictured with optional equipment.

Laser Machine	ML 3015 SR-F
Machine Structure	Welded Frame with Precision Helical Rack & Pinion, Direct Drives
Travel Drive Method	X,Y,Z simultaneous 3-axes
Control Method	X,Y, and Z simultaneous 3 axis control
X – Axis Stroke	122.05"
Y – Axis Stroke	61.02"
Z – Axis Stroke	5.9"
Maximum Work Piece Size	120.080" x 60.040"
Maximum Processing Feed Rate	2000 (in/min)
Maximum Work Piece Weight	1550 lbs.
Table Pass Height	33.5"
Rapid Travel Speed	3940 single axis, 5550 simultaneous
Minimum Command Input	0.001mm/0.0001"
Drive Motor Type	Intelligent AC Servo
Positioning Accuracy	0.0019"/20"
Repeatability	+/-0.00039"
Machine Unit Dimensions	406.0" (W) x 112.0" (H) x 123.2" (D)
Total System Weight	19621 lbs.
Pallet Change Time	Approximately 40 seconds
Pallet Changer Weight	4500 lbs.
Pallet Changer Drive Mechanism	Chain
For Installation and Facility Requirements:	See Pre-Installation Manual

CNC Controller	Mitsubishi • M700 Series	
Type	Self-Contained Simple Dust Proof (Mounted on Processing Machine)	
CPU	64 Bit	
Display Unit	15" TFT Color LCD Touch Screen	
Hard Disc Drive Capacity	20.0 GB	
Program Memory Capacity	Standard: 5,000m / Approximately 2MB Number of register able programs: 400	
Laser Control	Power Control Operation Control	
Processing Machine Control	Output Power, Frequency, Duty Beam On/Off, etc.	
	Drive Method	X, Y, Z, (Simultaneous Control)
	Position Detection	Encoder
	Min. Command	0.001mm/0.0001"
	Program Input	USB / Ethernet LAN
	Operation Method	Memory Operation HD Direct Operation

### Laser Oscillator Specifications

Oscillator/Resonator	YLS 2000 ML	YLS 3000 ML	YLS 4000 ML
Excitation Method	Ytterbium Doped Fiber	Ytterbium Doped Fiber	Ytterbium Doped Fiber
Control Method	Power Feedback	Power Feedback	Power Feedback
Wave Length	1.07 Micron	1.07 Micron	1.07 Micron
Frequency Range	100-3000 Hz	100-3000 Hz	100-3000 Hz
Duty Range	5-100%	5-100%	5-100%
Output Power Range	5-100%	5-100%	5-100%
Rated Output Power (CW)	2000 watts	3000 watts	4000 watts
Electrical Requirements: Motion System, Control, Oscillator	208 VAC +/-10%- 5%, 3 Phase, 60Hz 21 KVA (Total Machine Usage) 60 (Full Load Amps)	208 VAC +/-10%- 5%, 3 Phase, 60Hz 22 KVA (Total Machine Usage) 63 (Full Load Amps)	208 VAC +/-10%- 5%, 3 Phase, 60Hz 22 KVA (Total Machine Usage) 63 (Full Load Amps)
Electrical Requirements: Chiller Unit	208 VAC +/-10%- 5%, 3 Phase, 60Hz 12KVA 35 (Full Load Amps)	208 VAC +/-10%- 5%, 3 Phase, 60Hz 12KVA 35 (Full Load Amps)	208 VAC +/-10%- 5%, 3 Phase, 60Hz 12KVA 35 (Full Load Amps)