

eX Plus Series

The eX-Plus Series CO² Laser



It's not where you are, it's where you're going.

The Revolutionary eX-Plus

OUR 6TH GENERATION HIGH SPEED FLYING OPTIC CO₂ LASER

The eX-Plus Series is designed to meet the needs of the most demanding users in today's 24/7 competitive manufacturing environment. Built on a heavy duty, single platform, the eX-Plus incorporates important advancements over the previous eX model. Faster movement, more powerful piercing and an ECO mode that provides even more running cost savings to the most cost friendly machine in the market today.



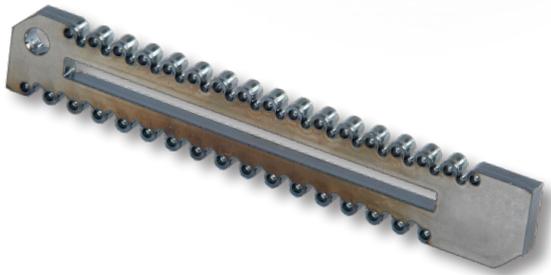
eX PLUS

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 designs 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 develop the stable and accurate high-speed eX-Plus system design. Solid dianite machine casting ensures high rigidity, strength, and system stability while oversized precision linear guides on both X and Y axes result in longer life. The eX-Plus 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 eX-PLUS

- 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
- Magnetic Head is standard on 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
- PH-XS 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
- New Options are Available to increase and expand your productivity:
 - Nozzle Changer
 - High Peak Pierce
 - Rotary Axis
 - High Accuracy Positioning Function



remote360[®]

At MC Machinery Systems our number one goal is customer satisfaction. We have invested greatly in our infrastructure to better serve our customer base with a state of the art call center, regional service and support, and millions of dollars of parts inventory. MC Remote 360, our robust production monitoring and support solution, is geared to provide transparency to your laser cutting process. Remote360 provides real-time data to help increase productivity, improve efficiency, and reduce down time for your Remote360 enabled machine.

Remote360 provides

- End-user machine monitoring through a web enabled device
- MMS Remote Diagnostics & Fault Monitoring
- MMS Remote Support



Analyze



Monitor



Produce

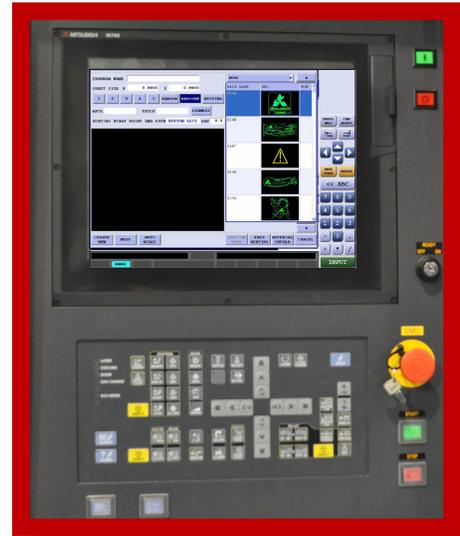
Mitsubishi 700 Series Control

TAKE CONTROL OF YOUR CUTTING

Competing manufacturers' PC-based controls can't touch the sophistication of the 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
- 30 GB Hard Drive
- Optional: 2 Action Cutting provides automatic setup and easy operator interface
 - Step 1 - use optional barcode reader and automatically load onto NC from CAD/CAM computer
 - Step 2 - once data is loaded, head moves to start position, automatically measures the tilt, the size and the edge of the workpiece, and starts cutting
- New Reset - Restart Function
- Simple Nesting - rectangular nesting of dissimilar parts at control
- Advanced help and maintenance screens are a great aid for operators
- ECO Mode is available and can reduce your running cost by 99% while in standby
- 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

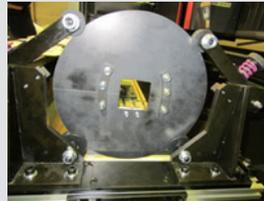


Handle Box and Optional Bar Code Reader combine for a more user-friendly experience.

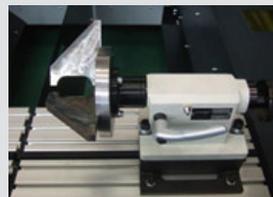
New eX-Plus Options

Rotary Axis Option for Square and Round Pipe Applications

Our new Rotary Axis Option is great for small tube and pipe projects. If your shop isn't processing strictly tube and pipe but does have an occasional need, this option can help bridge that gap in your capabilities.



Pipe Holder



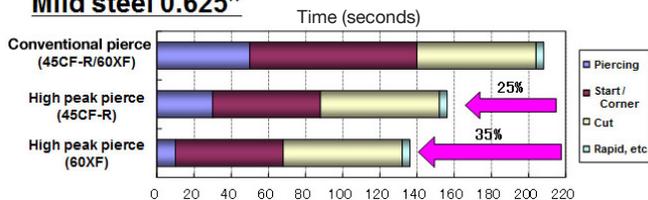
Tail Stock

	Round Pipe	Square Pipe
Loadable Pipe Diameter	1.18-7.5" (30-190.7mm)	1.18-5.9" (30-150mm)
Maximum Loading Weight	110lb (50kg)	
Weight	30lb (13kg)	

	Round Pipe
Loadable Pipe Diameter	1.18-7.5" (30-190.7mm)
Maximum Loading Weight	110lb (50kg)
Weight	18lb (8kg)

Loadable Pipe Diameter	1.18-7.5" (30-190.7mm)	
Maximum Loading Weight	110lb (50kg)	
Weight	Tail Stock	18lb (8kg)
	Platform	24lb (7kg)
	Small Center	7lb (3kg)
	Large Center	12lb (5.5kg)

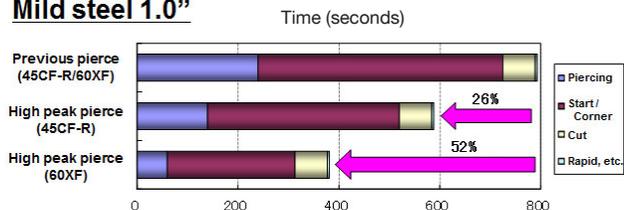
Mild steel 0.625"



Cut geometry

High Peak Pierce Technology will produce smaller pierce holes faster in mild steel up to 1.0" (25mm) in thickness by controlling the oxidation reaction and optimizing beam quality. You can realize up to 52% reduction in processing time.

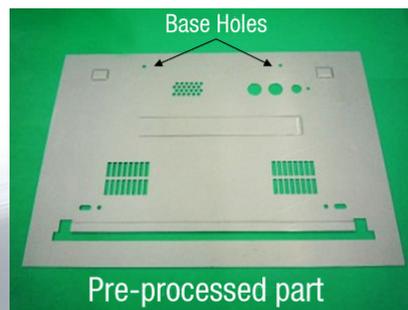
Mild steel 1.0"



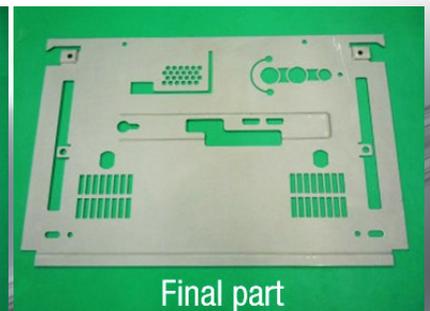
Cut geometry

Optional High Accuracy Positioning Function

This function allows you to position based on a round or square hole from a pre-processed part from a turret punch press. Additional laser cutting of embossed areas is also possible along with sheet edge detection.



Pre-processed part



Final part

Resonators

Lowest cost of ownership

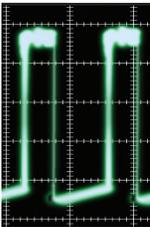
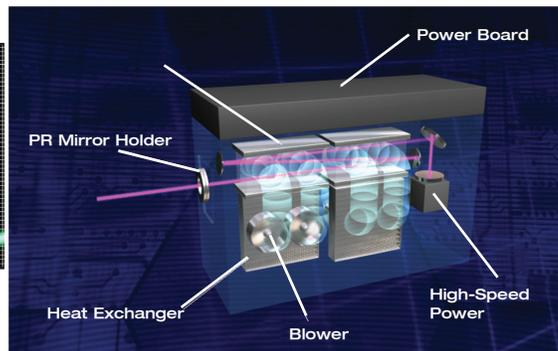
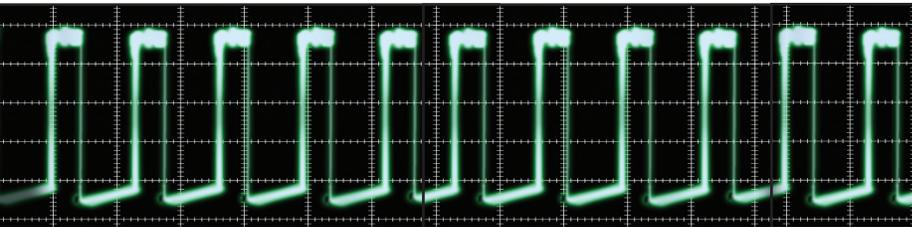
Mitsubishi resonators are so reliable and efficient that they've never needed to be replaced – eliminating a potentially expensive repair. The innovative Cross-Flow design consumes up to 90% less gas than traditional fast-flow systems, giving our resonators the lowest cost of ownership on the market.

XF Series Features

- 22% smaller
- Less Blowers
- 3 liters of laser gas instead of 4.5
- 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 equal less maintenance
- Improved power supply provides high efficiency, stability, reliability, and lower maintenance
- Fast startup
- Designed and manufactured exclusively by Mitsubishi
- 3.5, 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-Plus Series recaps 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.

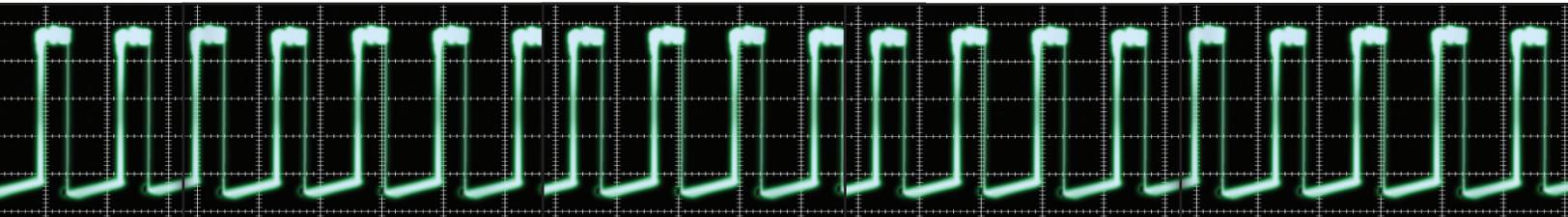
BrilliantCUT is ideal for stainless steel applications 1/2" (12.7 mm) and up. With an increased focus margin, processing stability is increased for a more consistent cut. BrilliantCUT also provides better part straightness by controlling the Kerf on the bottom of the part. The ability to control the 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.

Conventional Cut Surface

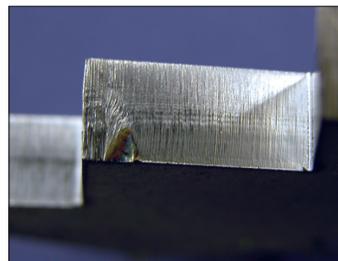


Brilliant Cut Surface

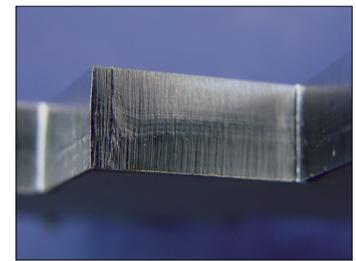


PLASMA GUARD CONTROL

Conventional lasers exhibit a crude transition as speed increases from starting point to corner. Plasma Guard (PG) 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.

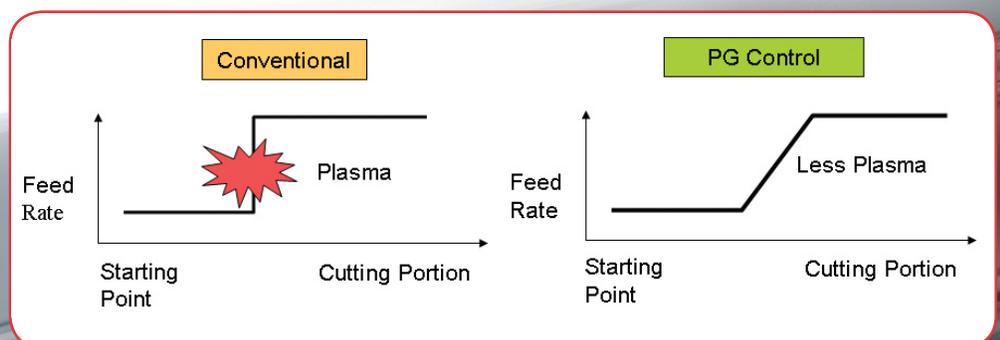


Plasma Guard Control off



Plasma Guard Control on

- 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.



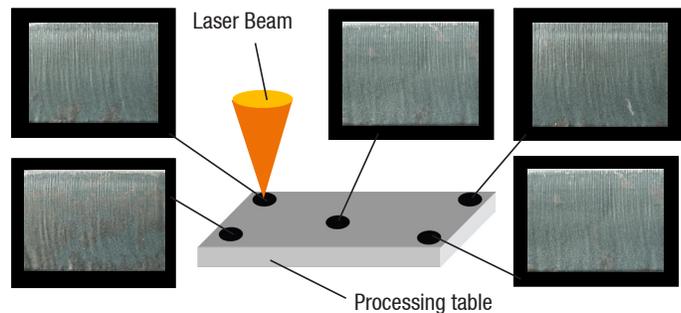
Head & Motion System

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 on 45CF-R and 60XF

Diamond Path Advanced Beam Delivery System

Highly stable processing at every point in the processing area



THE MITSUBISHI PH-XS HEAD



The PH-XS Series Head

- The 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

SMARTFLEX

AUTOMATION THAT KEEPS UP

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

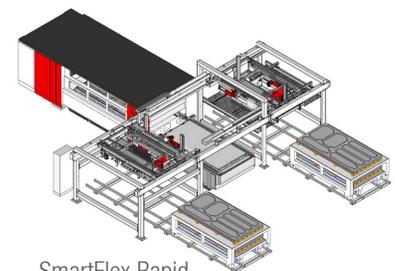
As the industrial laser industry evolves, shops of all sizes are requiring more speed and agility to get the job done. Mitsubishi's SmartFlex Automation Line is designed and engineered to increase productivity and reliability—because to stay on top, your automation needs to keep up. And with Mitsubishi,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

VERSATILE AND EXPANDABLE AUTOMATION

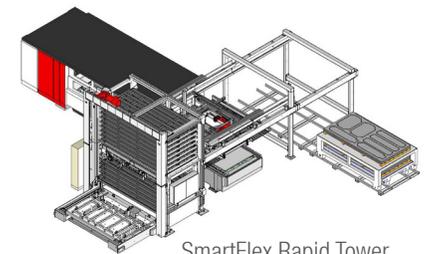
Virtually all SmartFlex Automation Systems are versatile and expandable. Mitsubishi offers several high-production options that can transform and adapt the SR-F System for maximum versatility and throughput. Current Mitsubishi users can add an SR-F to an existing automated system. That's the expandability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



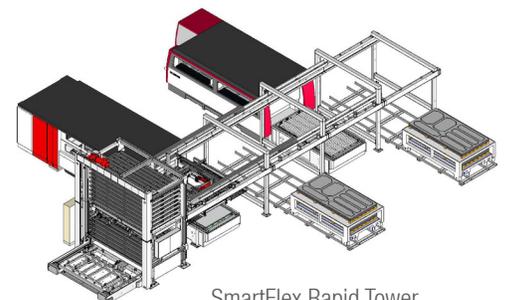
SmartFlex Rapid



SmartFlex Rapid Tower

SMARTFLEX RAPID TOWER

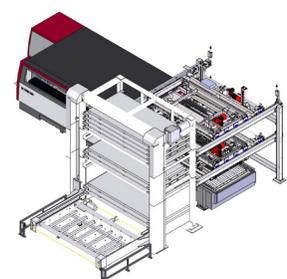
- Up to 22 shelves (more than 145,000 lbs. weight capacity for raw material)
- Increase storage capability with the addition of a second or third tower
- Configure an auxiliary load station for quick change-over of material types on multiple laser systems with no additional time
- Standard shelf spacing 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



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



 **OVER 60 SERVICE LOCATIONS IN NORTH AMERICA**

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.

Processing Machine Specifications

Model Name		3015 eX-Plus		
Machine structure		X/Y - Precision Rack & Pinion - Z=Precision Ball Screw		
Travel drive method		X-Y-Z simultaneous 3 axes (Z axis height control is also possible)		
Specifications and Performance	Max. workpiece size (inch)	120.1 x 60.0 (3050mm x 1525mm)		
	Table pass height	34.6 (879mm)		
	Processing access	Automatic Up/Down Door		
	Pallet changer	Provided		
	Stroke	X-axis stroke (inch)	122 (3,100 mm)	
		Y-axis stroke (inch)	61 (1,550 mm)	
		Z-axis stroke (inch)	5.9 (150 mm)	
	Speed	Rapid travel speed (X, Y) (inch / min)	3940 (100m/min) 5550 (141m/min) simultaneous	
		Max. processing feedrate (inch / min)	1970 (50m/min)	
	Precision	Positioning precision (inch)	0.0019/20 (0.05/ 500mm) (X, Y axis), 0.0039/4 (0.01/ 100mm) (Z axis)	
Drive motor type		Intelligent AC Servo		
Max. workpiece weight (lb)	2050 (930 kg)			
Machine unit dimensions (W x H x D) (inch)	428.6 x 93.7 x 127.8 (CFR) (10,886 x 2,380 x 3,246 mm)	428.6 x 94.9 x 127.8 (60XF) (10,886 x 2,410 x 3,246 mm)		
Machine system weight (lb)	28090 (12740 kg)			
Machine power requirements	71 KVA (35CF-R) 3Ø 208 VAC ±5% 60Hz 202 Full Load Amps	77 KVA (45CF-R) 3Ø 208 VAC ±5% 60Hz 220 Full Load Amps	98 KVA (60XF) 3Ø 208 VAC ±5% 60Hz 280 Full Load Amps	

Control System Specifications

Type	Self-contained
CPU	64-bit
Display screen	15" TFT color LCD Touch screen
Hard disk	20.0GB
Generator output control	Output Power, Frequency, Duty
Generator operation control	Beam ON/OFF, laser gas change, etc.
Drive system	X, Y, Z simultaneous control
Position detection system	Encoder
Min. command input	.001 mm / .0001"
Program input system	USB, Computer Link, Ethernet LAN

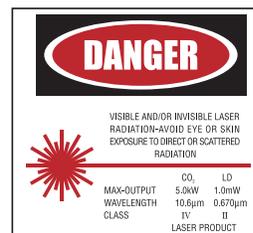
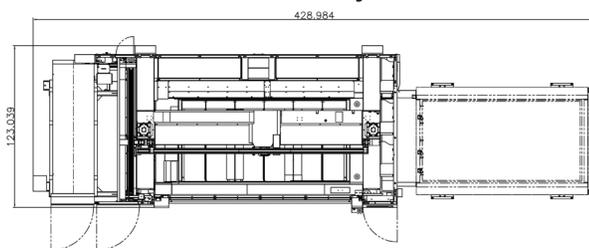
Pallet Changer Specifications

Type	P7
Drive mechanism	Chain
Pallet change time (sec)	Approx. 30
Work clamps	2 sets on Y axis
Pallet capacity (lb)	2050/pallet (930 kg)
Pallet changer weight (lb)	4500 (2,040 kg)
Applicable machine size	3015 (5' x 10') (1,525 x 3,050 mm)

CO₂ Laser Specifications

Model		35CF-R	45CF-R	60XF	
Excitation method		3-axis cross flow, silent discharge			
Performance Laser power	Maximum output power (W)	3500	4500	6000	
	Rated output power (W)	3500	4500	6000	
	Control method	Power feedback			
	Power stability	Less than ±1% of rated power			
	Beam characteristics	Beam mode	Low-order (main component TEM ₀₁ *)		
		Beam outer diameter (inch)	1.02 (26 mm)		
Beam divergence (mrad)		Approx. 3.5 or less (total angle)			
Laser gas composition	CO ₂ , CO, N ₂ , He		8:4:60:28		
Laser gas consumption rate (liter/Hr)	3				
Gas sealing time (during rated continuous oscillation) (Hr)	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)	98.4 x 71.3 x 31.5 (2,500 x 1,800 x 800 mm)		102.4 x 77.2 x 31.5 (2,600 x 1,960 x 800 mm)		
Resonator unit weight (lb)	4850 (2,200 kg)		4960 (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		

3015eX-Plus Layout



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

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