



ZOOM FIBER™



# Mitsubishi XL-F Fiber Laser

## Experience the difference of ZOOM Technology

Mitsubishi is proud to unveil its new ZOOM XL Fiber Laser line, which ushers in a new era of laser processing performance. There are plenty of fiber laser systems available, but you've never seen one like this before. Our Zoom XL Fiber will change the way you laser cut forever.

## 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 – think more than 2,000 inches per minute.

## 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 XL Zoom Fiber is built on the same platform as our highly successful XL platform. A true proven work horse. All of the benefits of this model have been moved over to this new Zoom 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 XL-F Zoom 6030 two-dimensional fiber laser processing system comes standard with a fiber laser resonator, a processing head (preset auto focus for the 4kW and Zoom for the 6kW) and a full enclosure. 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. For maximum viewing of the work area, a large screen with four camera angles is provided. The machine also features a Multi-chamber dust-collection mechanism.





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### Standard Features of the XL-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.
- Hot reserve function allows continuous operation.
- Long term stable processing by all fiber composition.
- Power / Gas Consumption Tracking
- Remote 360 (Remote Monitoring)

# 4kw Standard Processing Head (ZOOM Option)



## CARTRIDGES

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

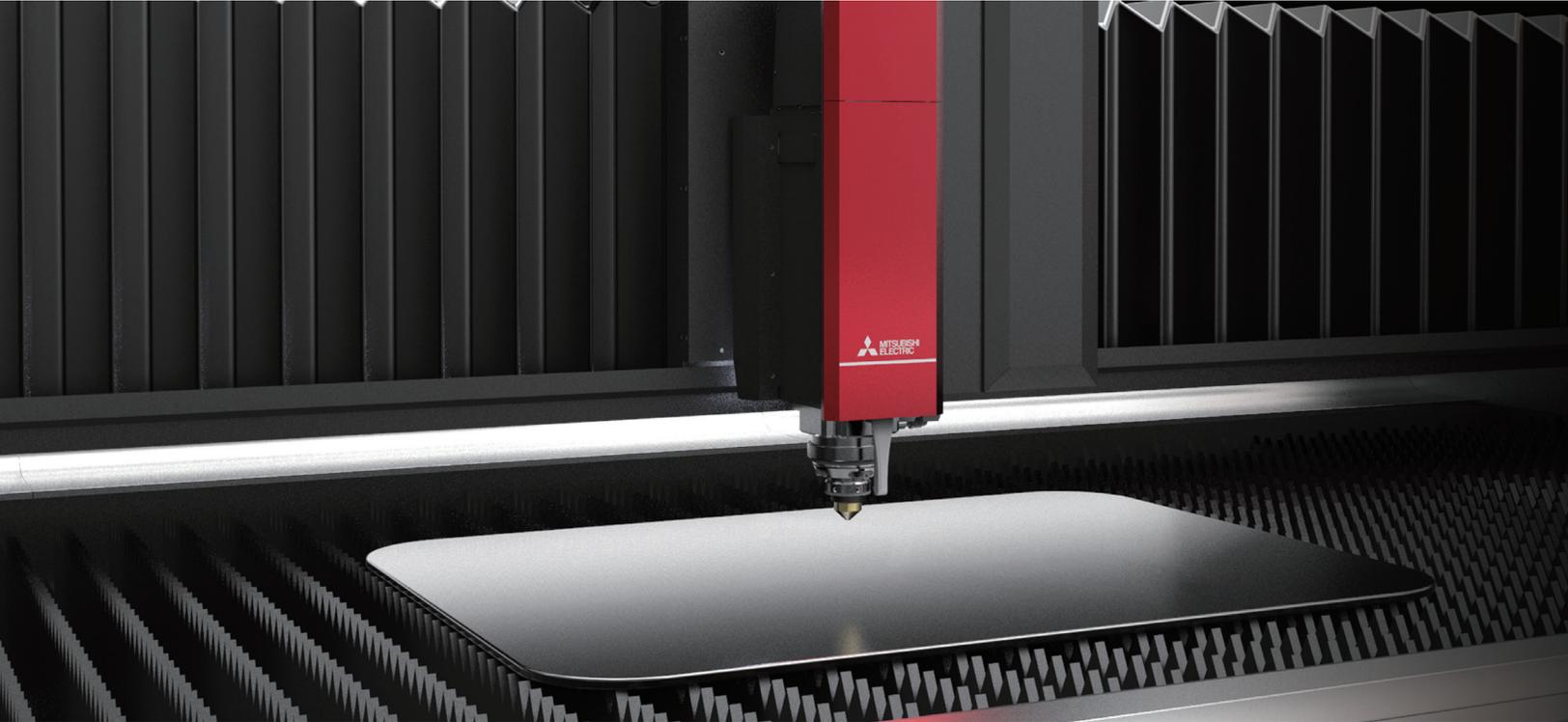


f5" lens cartridge (for XL-F 40)  
f8" lens cartridge (for XL-F 40)

## 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
- HPP (High Peak Piercing) is incorporated for fast piercing of mild steel

# 6kW / 8kW Standard Zoom Processing Head:



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## 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 as much as 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 Need for Nozzle Centering
- Collision Protection: The Industry's Best Magnetic Breakaway Fiber Head
- HPP Pierce Technology

# The Benefit of Fiber

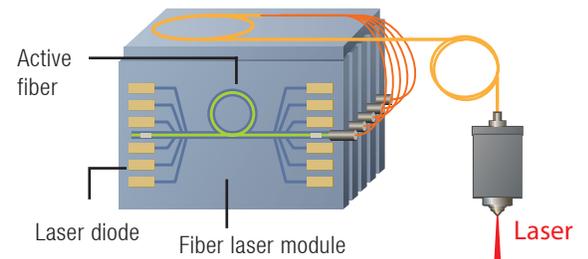
Fiber lasers deliver their energy through an integrated flexible optical fiber. Fiber lasers have a monolithic, entirely solid state, fiber-to-fiber design that does not require mirrors or optics to align or adjust. These features make fiber lasers easier to integrate and operate in production, medical and other laser-based systems. Fiber lasers are typically smaller 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.



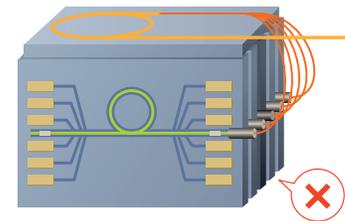
## Fiber-laser Oscillator Construction

Oscillator built onto machine frame for stable processing.

### All Fiber Structure



### Hot reserve function



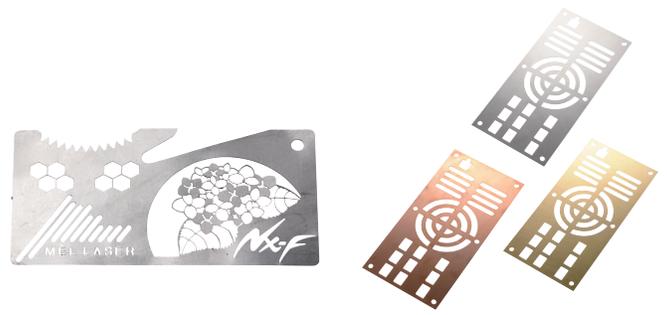
Even if a module failure occurs, continuous operation is possible with the remaining modules

## 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

# 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 XL-F 6030 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

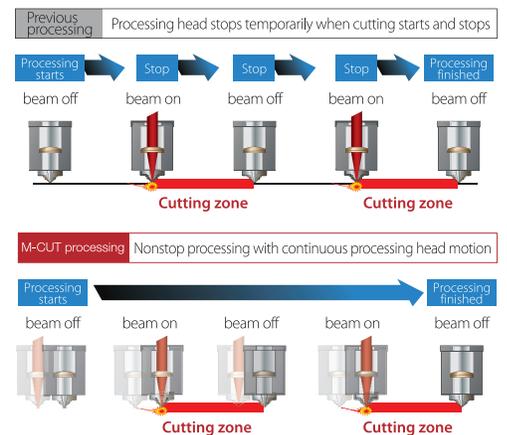
Traditional technologies worked fine for square or rectangular cutting in fiber lasers, as they relied on the axes perpendicular travel coincides with the 90 degree right angles of these types of shapes. But when faced with complex geometries or smooth curves, traditional controls slowed down the process 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.

### 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.



# Automation That Keeps Up



## Abandon One-Step-At-A-Time Processes with Automated Solutions from Mitsubishi

Automation changes everything. Mitsubishi Laser has more automated installations than any other manufacturer. From modular cells to fully automated storage and inventory systems, our automation systems allow you to run back-to-back jobs with virtually no supervision. The right automated system can drive incredible profits, and no one knows laser automation like Mitsubishi.

Even our XL Series lasers can benefit from the fastest automation in the industry. With systems that move the largest plates quickly and easily, Mitsubishi can help keep your lasers running!

## Big Plates. Big Benefit.

From load/ unload systems to full pallet towers, Mitsubishi Automation dramatically improves production efficiency and enables extended periods of unattended operation. With options like conveyors and tower storage of finished sheets, our systems can be adapted to your needs, environment, and floor space.

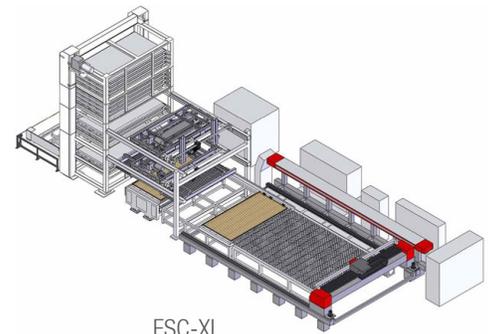
- Improves flow of production and information in the factory
- Reduces materials/products, search/transfer time
- Space saving and easier inventory control
- Efficient production process
- Reduces damaged material
- Stores partial remnant sheets

## XL Automation System Variations

While many manufacturers offer automation for only their standard size machines, we at Mitsubishi understand that the world is not a “one size fits all” kind of place. Our customers who require the size and capability of a large format machine can still benefit from significant increases in productivity, safer material handling, and even lights out operation. If bigger is better, we’ve got you covered at MC Machinery.

### FSC-XL

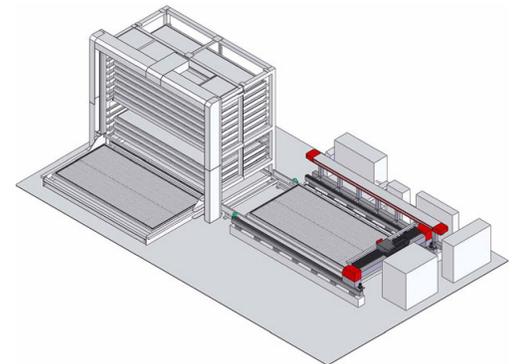
- Add lights-out capacity to an XL economically
- Full load/unload cycle time approximately 100 seconds
- Finished parts storage in tower
- 6,000 lb per shelf capacity 5’x10’ sheet size
- Vacuum load system with thickness detection and sheet separator features
- Heavy duty clamshell fork unload system with built in sheet raking
- Heavy-duty up to 1” full size sheet load/unload capacity



FSC-XL

### Pallet Tower-XL

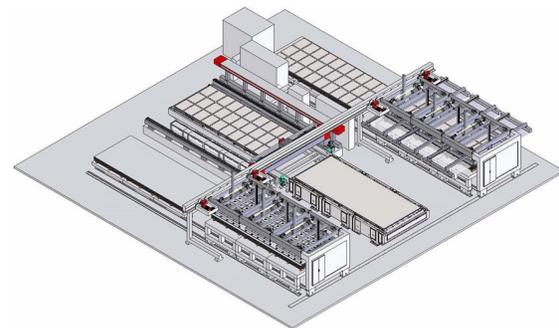
- Exchanges the entire laser pallet, not just material
- No special programming considerations to achieve lights-out operation
- Full 10’x20’ pallet change in only 240 seconds
- Finished parts storage in tower
- 8000 lb material capacity per shelf (10’x20’x1.0”)
- Models from 6 to 16 shelves for a weight capacity of over 49 Tons



Pallet Tower-XL

### LF-4

- Add efficient load/unload to a large format machine
- Full material exchange cycle in only 120 seconds
- Extreme-duty 6,600 lb capacity (8’x20’x1.0”) plate handling system (XL 6025)
- Vacuum load and extreme-duty clamshell fork unload system
- Open top frame style allows material staging with crane
- Compatible with XL-6725 and XL-6030 models



LF-4

# 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
- 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

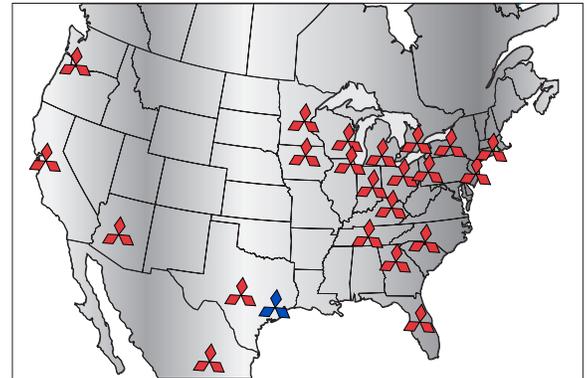


Handle Box and Bar Code Reader combine for a more user friendly experience.

## The Industry's Most Responsive Service And Support

With more than 100 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.

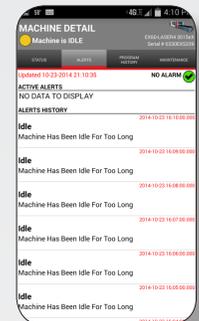
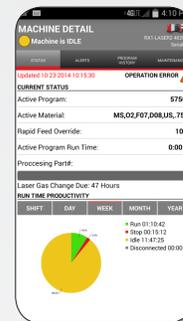
From installation and on-site training to support and service throughout the life of your system, our national service network is just a phone call away. No other company has a greater depth of experience and resources than Mitsubishi and MC Machinery Systems. Access 24/7 support with our interactive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



At MC Machinery Systems our number 1 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. Now we are excited to introduce the next generation of service tools from MC Machinery systems. Inc. MC Remote 360. This is 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

- End User machine monitoring through web enabled device
- MMS Remote Diagnostics & Fault Monitoring Service
- MMS Remote Support Service

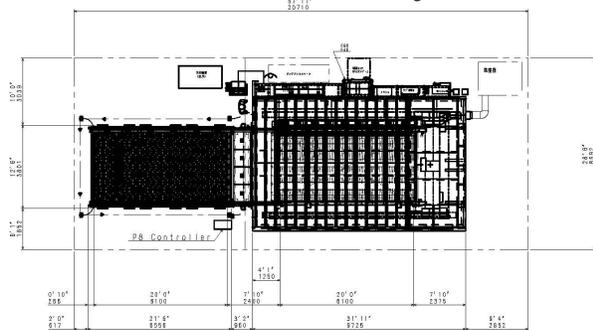


### Your MC Remote 360 machine can be monitored from many different devices

- Java based PC dashboard
- Mobile Android devices (V2.3+)
- Mobile Apple devices (iOS V4+)
- Apple Tablets (iOS V4+)
- Android tablets (V2.3+)

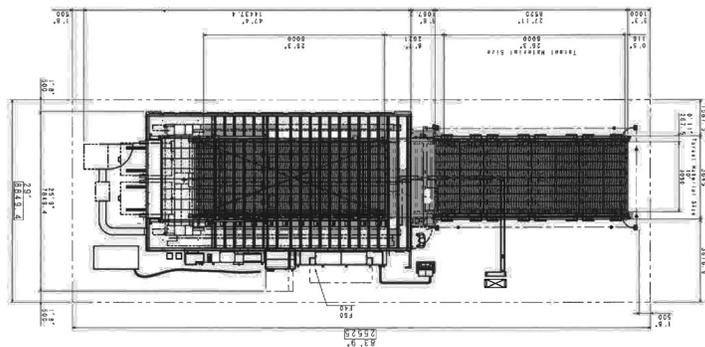
As long as a live internet connection is accessible, the machines can be monitored from virtually anywhere.

## ML 6030 XL-F Layout



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

## ML 8030 XL-F Layout



## Processing Machine Specifications

LASER MACHINE	ML 6030 XL-F	ML 8030 XL-F
Machine Structure Direct Drives	Welded Frame with Precision Helical Rack & Pinion,	
Travel Drive Method	X,Y, Z simultaneous 3-axes	
Control Method	X,Y, and Z simultaneous 3 axis control	
X – Axis Stroke	255.9"	318.9"
Y – Axis Stroke	126"	126"
Z – Axis Stroke	5.9"	5.9"
Maximum Work Piece Size	120" x 240"	120" x 315"
Maximum Processing Feed Rate	2000 (in/min)	
Maximum Work Piece Weight	8050 lbs.	9780
Table Pass Height	34.6"	
Rapid Travel Speed	3940 single axis, 5512 simultaneous (in/min)	
Minimum Command Input	0.001mm / 0.0001"	
Drive Motor Type	Intelligent AC Servo	
Positioning Accuracy	0.0019"/20"	
Repeatability	±0.00039"	
Machine Unit Dimensions	67.78' x 28.5' x 112.6"	80.25' X 28.50' x 113"
Total System Weight	42000 lbs.	45000 lbs.
Pallet Change Time	Approximately 60 seconds	
Pallet Changer Weight	15000 lbs.	16000 lbs.
Pallet Changer Drive Mechanism	Chain	
For Installation and Facility Requirements:	See Pre-Installation Manual	

## 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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