



GX-F ADVANCED PLUS Series



LESS INPUT. MORE OUTPUT.

The GX-F Advanced Plus is Mitsubishi's most advanced fiber laser cutting solution, engineered for high performance productivity. It combines intelligent automation features like AI-assisted processing, advanced nesting with Augmented Reality Plus, next-generation height sensing and Automatic Collision Avoidance, Automatic Centering for fast, hands free setup, and Advanced Gas Reduction (AGR) Technology to significantly lower nitrogen consumption and operating costs.



**One source.
Endless expertise.**



With the manufacturing industry suffering from a shortage of experienced workers, Mitsubishi designed this new generation of fiber lasers to minimize the need for operator input while maximizing quality and productivity.

Designed by Mitsubishi engineers and built entirely with Mitsubishi components, the GX-F ADVANCED PLUS is the only laser system in the industry with a single source for service and support.

Features

- Automatic Centering
- Next generation Direct Sense height control and automatic crash avoidance
- Augmented Reality Plus advanced nesting with drop and cut, part rotation, and rectangular nesting
- Advanced artificial intelligence technology
- Mitsubishi-designed automated zoom head
- 21 Position Nozzle Changer
- AI-assisted cutting
- Visible Processing Status (VPS)
- Advanced Gas Reduction (AGR)
 - AGR-AIR
 - AGR-N2
 - AGR-MIX
 - AGR-O2
- Dynamic Drive Control (DDC)
- Dross Reduction Control (DRC)
- Plasma Guard Control (PGC)
- High Peak Piercing (HPP)
- Mel's Eye (Plasma, Burn and Burst Detection)
- Protective Process Window Monitoring

Benefits

- Automatic Centering reduces setup time and eliminates manual alignment
- Direct Sense improves height sensing response and provides automatic collision avoidance
- AI Process Monitoring adjusts cutting conditions in real time for optimal performance and cutting stability
- Advanced Gas Reduction (AGR) technology dramatically lowers nitrogen use and operating costs while boosting productivity
- Zoom Processing Head automatically adapts beam shape and focus for any material or thickness
- Augmented Reality Plus simplifies nesting on remnant sheets and reduces scrap
- Automatic Nozzle Changer enables continuous operation with minimal downtime
- Remote360™ diagnostics and predictive maintenance minimize unplanned interruptions
- Five-year oscillator parts warranty and two-year machine warranty with all-Mitsubishi components ensure long-term reliability
- Fully automation-ready for flexible integration into smart manufacturing systems
- Intuitive, touchscreen control makes operation easy for users of any skill level

MC Machinery Systems, a subsidiary of Mitsubishi, is the U.S.-based supplier and servicer of Mitsubishi Electric laser and automation systems, drawing from an extensive global source of support and innovation.

Our expertise spans virtually every aspect of metalworking—from simple fabrication to CNC-driven, automated manufacturing cells. Serving industries including aerospace, mold and die, job shops, medical, and energy, MC Machinery is headquartered in the

Chicago area, with technology centers in Concord, N.C.; Cypress, Calif.; Pine Brook, N.J.; Dallas, Tex.; Querétaro, Mexico; and Richmond Hill in Ontario, Canada.

AGR TECHNOLOGY

AGR or **Advanced Gas Reduction** is a family of cutting methods and advanced nozzle technologies aimed at reducing the consumption of nitrogen assist gas, improving productivity, process reliability, and ultimately reducing operating costs. Central to all AGR technologies is a low pressure air compressor system which provides the air necessary to enable AGR technology. AGR technologies provide a solution to meet any manufacturers needs in todays diverse manufacturing landscape.

1. AGR-N2

AGR-N2 is a Nitrogen cutting process which utilizes Mitsubishi nozzle technology to **reduce running costs by reducing nitrogen assist gas consumption by up to 75%** while producing oxide free parts. for Mild Steel and Stainless Steel applications.

2. AGR-MIX

AGR-MIX utilizes patented MC Machinery nozzle technology which combines low pressure air with nitrogen within the nozzle to mix and create a blended or mix gas of about 95% N2 and 5% O2 – without an external blender. Achieve **extreme nitrogen assist gas reduction of up to an additional 50% over AGR-N2, enhanced part quality, productivity, and stability** with AGR-MIX. For Mild Steel applications.

3. AGR-O2

AGR-O2 Boost Is an innovative oxygen cutting process that can perform at double the speed of standard O2, and can **rival the productivity of nitrogen cutting while reducing operational costs significantly**. Central to this technology is an MC Machinery patented nozzle cooled by compressed low-pressure air. Experience efficiency and cost-effectiveness like never before with AGR-O2 Boost. For Mild Steel applications.

AGR-O2 Shiny utilizes the same MC Machinery patented cooled nozzles but applies unique cutting techniques to achieve **ultra high cutting quality and ultra stable cutting performance across almost any material grade and surface quality**. For Mild Steel applications.

4. AGR-AIR

For extreme low cost - full production, low pressure AIR cutting of select materials and thicknesses by wattage. **Obtain the cheapest cost per part possible with AGR-AIR.**

ALL IN ONE CUTTING SOLUTION WITH AGR TECHNOLOGIES





ADVANCED ZOOM HEAD ADDS MORE VROOM

The Mitsubishi Zoom Head Delivers Speed and Flexibility.

Mitsubishi Electric's proprietary optical system offers optimal control of the beam according to the material and plate thickness. The zoom head delivers speed and flexibility by automatically changing the beam size, shape and focal point for each material. It also processes plates with a wide range of thicknesses.

Because it's not necessary to exchange the processing lens according to plate thickness and material, setup time is significantly reduced.

- Operators can switch between sheet material of different thicknesses quickly and without compromising cutting quality.
- Piercing time is reduced by as much as 60 percent, making it possible to pierce 25mm-thick mild steel within 0.8 seconds.
- The window diagnostics feature fires the laser after piercing to assess the protective window condition to prevent processing with a defective window.



Mel's Eye (Plasma, Burn and Burst Detection)



High Peak Piercing (HPP)



Plasma Guard Control (PGC)



Anti-Spatter Spray System

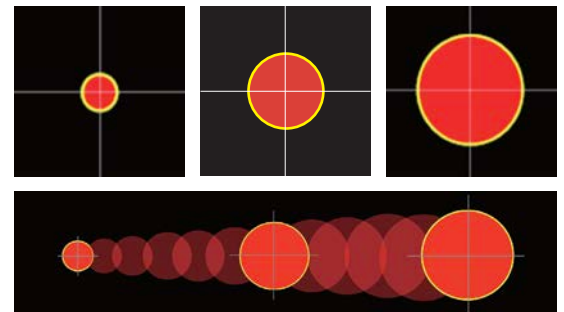


Zero-Point Targeting



Window Diagnostics

Conventional head requires three-step switching



Stepless switching of zoom head mechanism reduces setup time

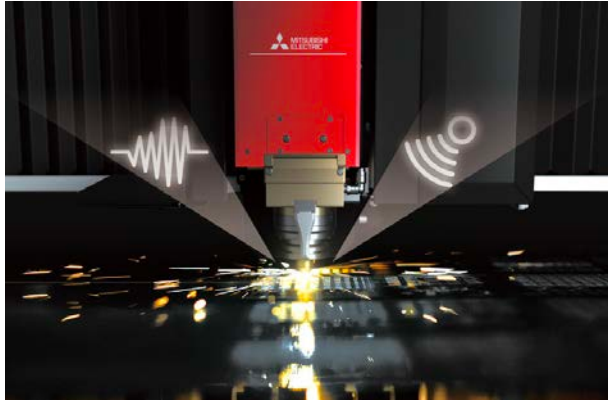
Magnetic Damage Reduction



AI-ASSIST MAKES IT SMART

The “brains” behind the GX-F ADVANCED PLUS Series is the proprietary Mitsubishi Electric artificial neural network technology Maisart®, which imitates neurons in the human brain. It uses audio and light sensors to monitor the cutting process in real time, automatically adjusting parameters to optimize cutting performance and increase process reliability.

Also used in automobiles to help prevent accidents, Maisart is the foundation of the GX-F ADVANCED PLUS Series, creating a nonstop processing system for maximum productivity.



AI Diagnosis

When suboptimal processing is detected, the machine can automatically adjust cutting parameters to restore or enhance cutting performance. Under optimal conditions, AI diagnostics further increase processing speed to boost overall productivity.

Dynamic Focus Control

Automatically adjusts focus position via artificial intelligence to maintain stable processing.



Direct Sense

Direct Sense is Mitsubishi’s next generation height sensing technology, delivering faster response and greater height control accuracy. It provides automatic crash avoidance by detecting and reacting to material changes instantly, while improved height sensing and trace speed enhance cut quality on warped or uneven plates. The result is greater processing stability, fewer interruptions, and extended consumable lifetime.



AI Nozzle Monitor

AI nozzle monitor uses a camera system to monitor nozzle lifetime and condition. When nozzles are replaced with the nozzle changer, the nozzle condition is automatically determined from images using AI. If the nozzle processing duration is too long, or the nozzle condition is determined to be poor by the AI assistance, the nozzle is automatically replaced with the nozzle changer if necessary.



Automatic Centering w/ 21 Position Nozzle Changer

Automatic centering utilizes the AI Nozzle Monitor camera and two manipulator tools located next to the nozzle changer to automatically determine the nozzle centering condition and correct it, all without any operator intervention needed.

M800 Series CNC Control

Monitor your daily operations
and projects effortlessly with
one smart, easy-to-use system



SMART AND SIMPLE CONTROL EXPERIENCE

The intelligent M800 control offers a generous 19-inch user interface. The status of the machine and work can be displayed simply on one screen or as a detailed analysis, whichever the operator desires.

Key features include:

- Intuitive, user-friendly operation similar to a smartphone
- Customizable home screen
- Real-time condition adjustment and correction
- Intelligent cutting assist
- Advanced multi-part nesting
- Online job scheduling and runtime estimator
- Automatic sheet detection
- Scrap cutting
- Real-time tracking of electrical and assist gas consumption
- Micro-tabbing on the fly
- Advanced help and maintenance screens
- The operator can monitor the cutting process from the machine or remotely
- Operator Lockout can restrict parameters on the machine to prevent any unwanted changes



User-Friendly
Controls



Scheduling



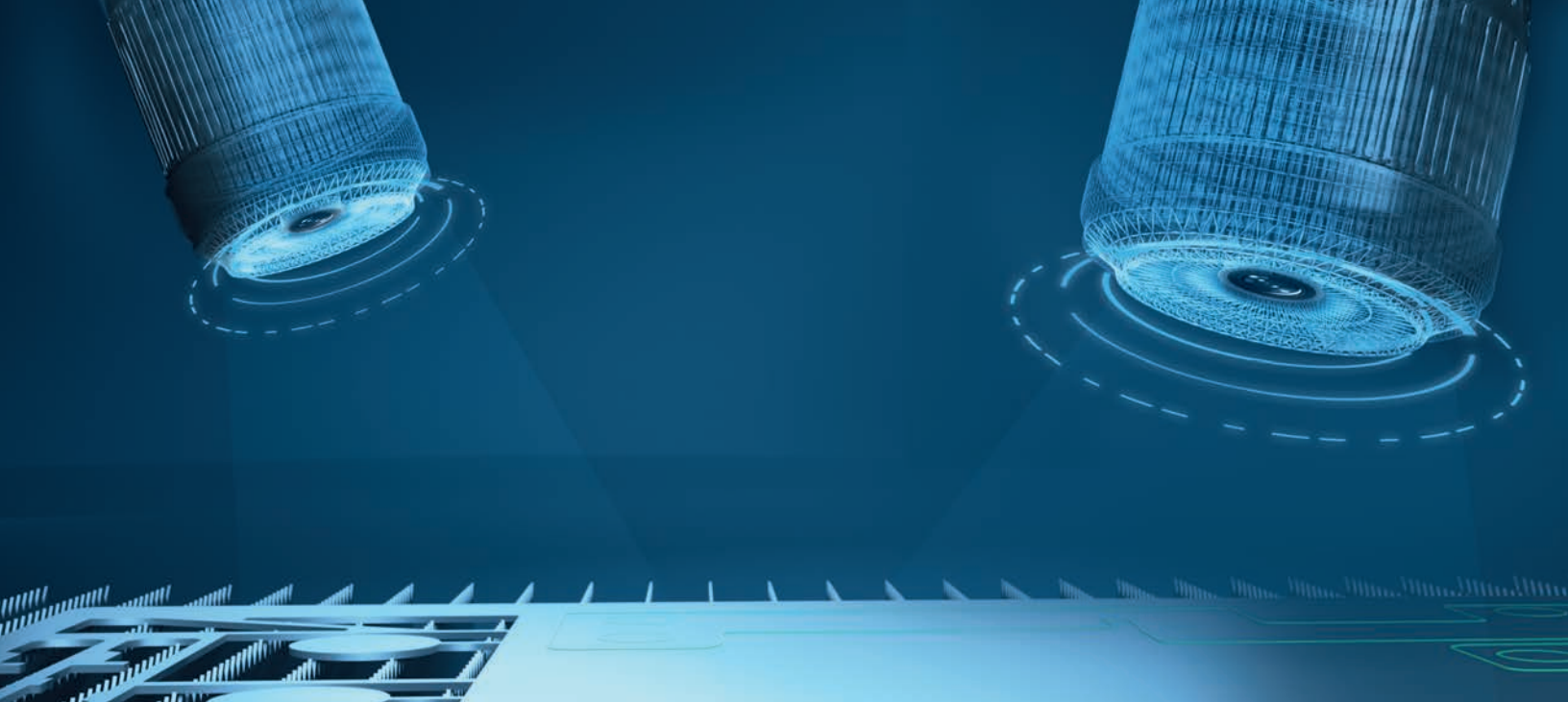
Time
Estimation



AI-Assist



Automatic Sheet Detection
and Remnant Off-Cuts



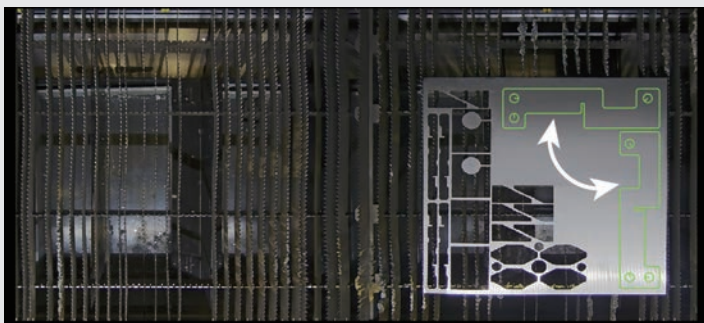
ELIMINATE THE GUESSWORK

Augmented Reality Plus builds on the intuitive part placement capabilities of the original AR feature with powerful new tools to maximize material usage and reduce setup time. Using overhead cameras and intelligent software integrated into the M800 control, AR Plus enables automatic part nesting on irregularly shaped sheets, and part-in-part nesting.

Virtual top-view picture

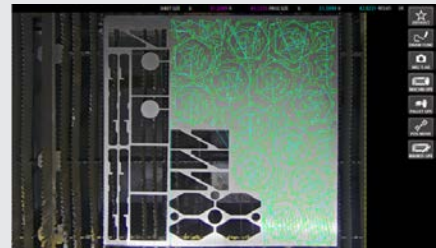


Pre-conversion photo from one camera in the processing system



Virtual top-view picture generated from two camera photos

Advanced nesting



Parts can be incrementally moved to and rotated in the desired location while parts from existing programs can be recut and renested. AR also allows the operator to cut remnant shapes from finished stock.



Augmented Reality



Renesting



Drop Cut



Move and Rotate



Advanced Multi-Part Nesting



Part-in-Part Nesting

ADVANCED FIBER LASER OSCILLATOR

Advanced Fiber Laser Oscillator

Fiber laser oscillators are solid-state, use no optical components, and are sealed from outside air. Because of the reliable design, there is little need for regular maintenance.

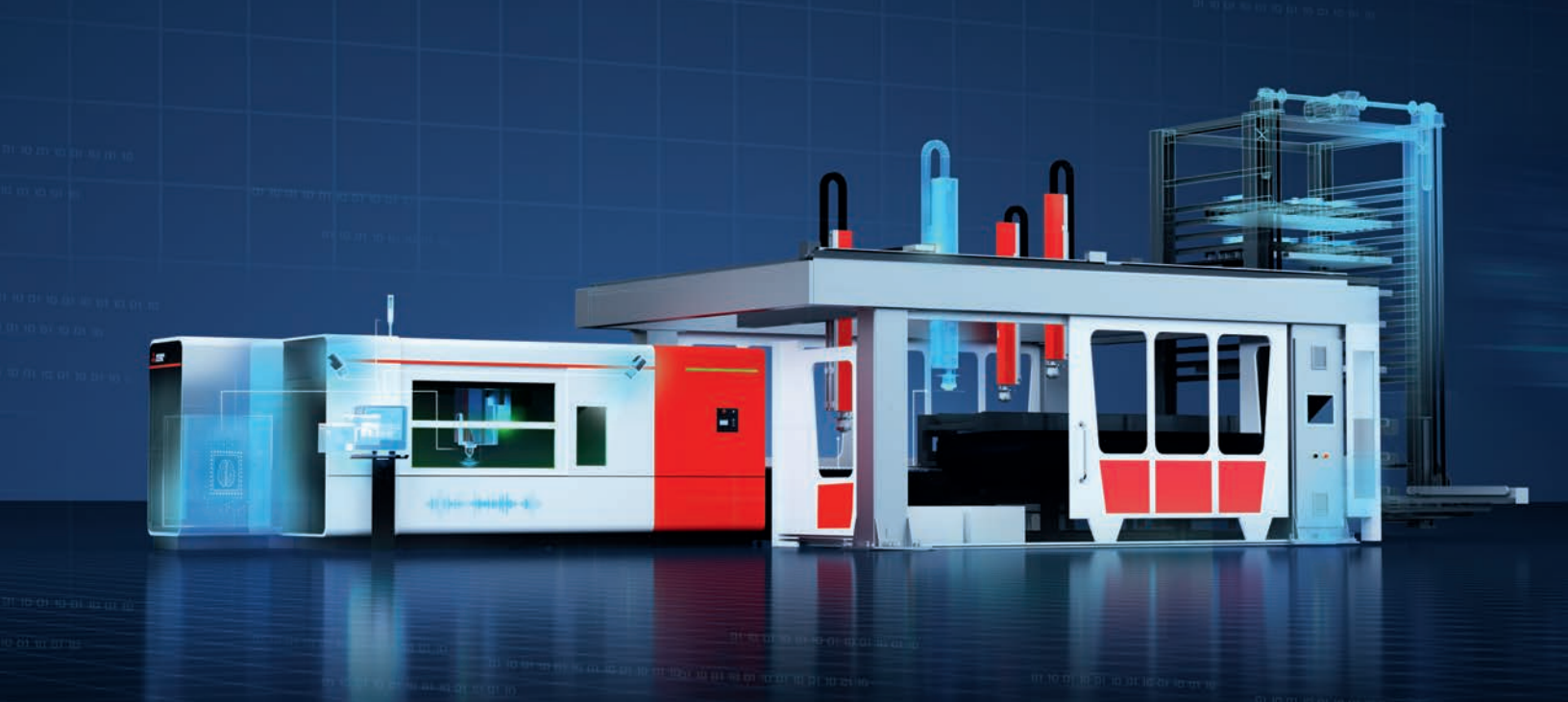
The Mitsubishi oscillator delivers the latest advances in clean beam and anti-reflection technologies.

These advances not only improve reliability but also enhance performance and processing capabilities.

Oscillator features:

- Dynamic power reserve: Ensures rated power output over the life of the oscillator
- Extended lifetime structure: Increases module lifetime and prevents immediate power loss in the event of a diode failure
- Maximum processing capabilities
- Compatible with Mitsubishi CNC for high-speed response control
- Automated beam selection for improved processing stability
- Enables N₂ cutting of pure copper
- Integrated with remote diagnostics for preventive maintenance
- Total service and support by MC Machinery
- Five-year parts warranty





BUILT FOR AUTOMATION

The GX-F ADVANCED PLUS Series was built to seamlessly integrate with automation systems that increase productivity and reliability by automating production processes, including material loading, laser processing, parts sorting and material unloading.

A fully automated system means less downtime for unloading, parts removal, sorting and machine adjustments. It also means you'll need fewer skilled operators—a significant advantage as the manufacturing industry faces a continued shortage of an experienced workforce.

And because our automation is modular and flexible, it can grow with you. With our wide range of options—including configurations that require 30 percent less floor space than typical laser automation setups—we have a solution for virtually any application.

To maximize your shop's productivity, our laser automation experts can work with you to determine the right combination of laser, material storage, material delivery/removal and part sorting.



Watch a video
of the ASTES4
in action

PREMIER TRAINING, SERVICE AND SUPPORT

Regionalized Service Network

With our industry-leading regionalized service network, we have the most experienced, knowledgeable and responsive employees in the industry. We're here for you with phone support, operation training, on-site service, parts inventory, and a robust, interactive website.

- With regionalized locations throughout North America, we can respond promptly to your service needs.
- We have the largest fleet of service vehicles 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.
- You'll have access to 24/7 support, a detailed interactive parts catalog, printable machine manuals, and software.

Application Support

The value of our support stretches well beyond service, parts and training. Our experienced and creative team members put their knowledge and problem-solving skills to work for you—offering application and engineering support that includes creating specialized shop-floor setups that work harder and get better results. Whether developing integrated manufacturing cells from the ground up or adding specific solutions to complement existing operations, our pre-sales, sales, installation, and application support staff can help you eliminate bottlenecks, improve accuracy, and drive throughput.

remote360™ Machine Monitoring

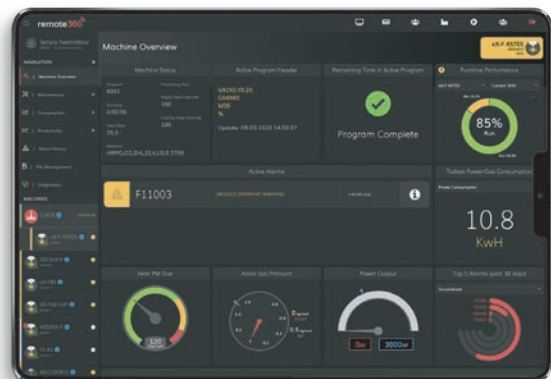
The GX-F ADVANCED PLUS Series has a two-year machine tool warranty for parts and labor and a five-year oscillator parts warranty. Also included is two years of the remote360™ machine monitoring software system.

remote360™ is a robust production monitoring and support solution offering real-time data to help increase productivity, improve efficiency, and reduce downtime. It provides:

- Email and 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



remote360™



 Remote
Diagnostics

 Predictive
Maintenance

 Two years of
remote360 support

 Consumption
Monitoring



SPECIFICATIONS



MACHINE SPECS		
Available Platform	ML 3015 GX-F ADVANCED PLUS	ML 4020 GX-F ADVANCED PLUS
X – Axis Stroke	122" (3100 mm)	161.41" (4100 mm)
Y – Axis Stroke	61.61" (1565 mm)	82.67" (2100 mm)
Z – Axis Stroke	4.72" (120 mm)	4.72" (120 mm)
Maximum Processing Feed Rate	3937 in/min (100 m/min)	3937 in/min (100 m/min)
Maximum Work Piece Weight	2094 lbs. (950 kg)	3637 lbs. (1650 kg)
Table Pass Height	35" (890 mm)	35" (890 mm)
Rapid Travel Speed	6700" in/min (170 m/min) simultaneous	6700" in/min (170 m/min) simultaneous
Repeatability	±0.00039" (0.0099 mm)	±0.00039" (0.0099 mm)
Machine Weight	20,723 lbs. (9400 kg)	29,843 lbs. (13,537 kg)
OSCILLATOR SPECS		
Manufacturer	Mitsubishi Electric	Mitsubishi Electric
Excitation Method	Ytterbium Doped Fiber	Ytterbium Doped Fiber
Wavelength	1.07µm	1.07µm
Available Output Power (CW)	12 kW, 16 kW, 20 kW	10 kW, 12 kW, 16 kW, 20 kW
Processing Head	Zoom	Zoom



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