TECHNICAL SOLUTIONS

GF1530JH-1500W IPG

Above machine picture is for reference only, actual machine appearance will be subjected to latest upgrade and special requests.

Chapter 1 Company Profile

Wuhan Golden Laser Co.,LTD （Golden Laser for short） is a high-tech enterprise specializing in providing laser processing solutions for global users. The company was founded in 2005 and listed on the Shenzhen GEM in May 2011 with stock code 300220.

Golden Laser Group Building

Golden Laser listed in stock market at 2011

After years of continuous innovation, Golden Laser has grown into a leading manufacturer and a world-renowned laser equipment manufacturer with a marketing network covering more than 100 countries and regions around the world. The company has a provincial-level R&D center and a foreign technical cooperation institution, and has established a complete laser equipment manufacturing industry chain. Golden Laser products cover industrial applications such as fiber laser cutting and welding, flexible material laser processing, 3D printing, etc. The series products include more than 100 models, including metal processing, metal welding, three-dimensional cutting and welding, aerospace, precision processing, 3D printing, textile and apparel, industrial fabrics, advertising, technology, printing, packaging, electronics, furniture, decoration, medical equipment and many other industries, more than 200 products and technologies have obtained national patents and software copyrights.

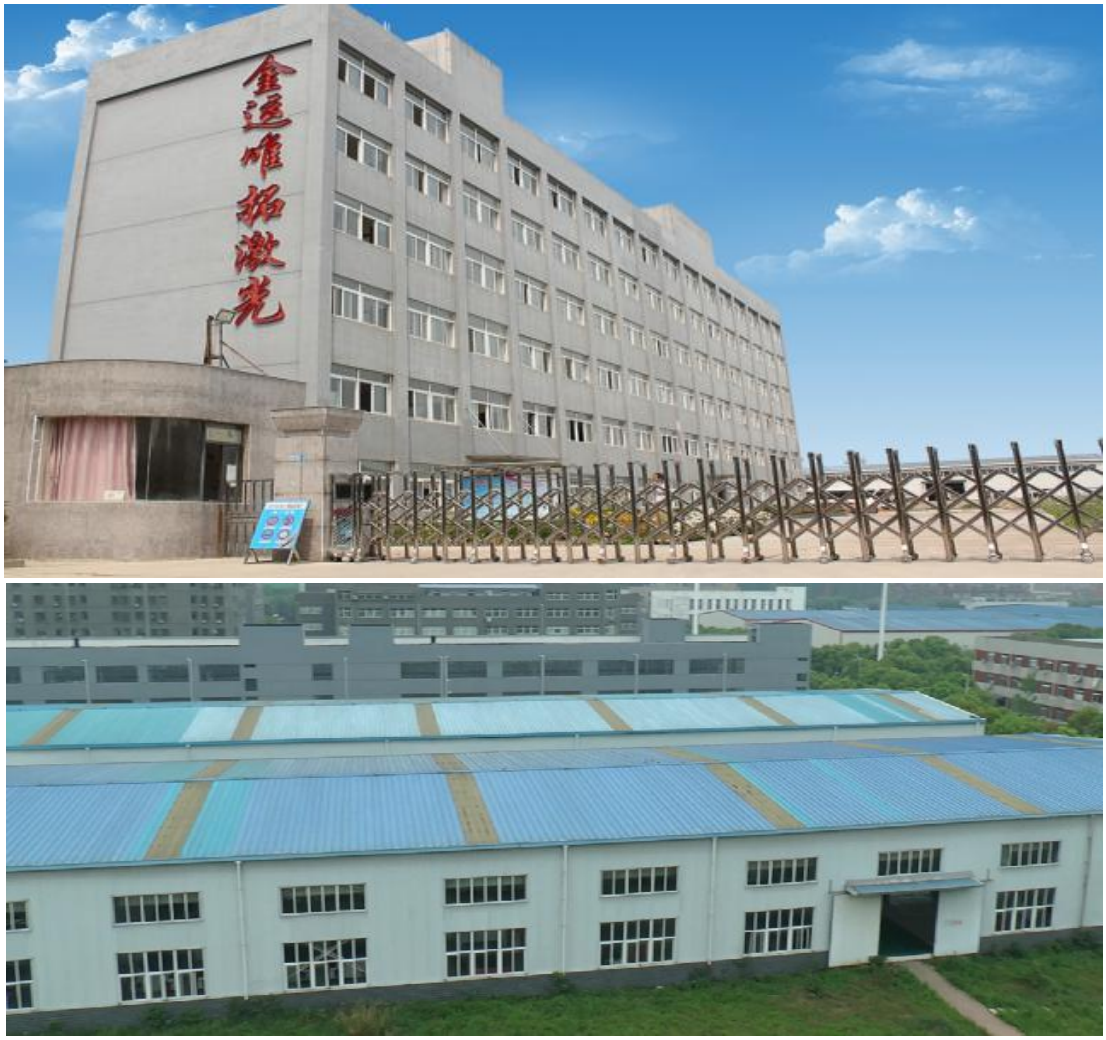
European CE Certification

American FDA Certification

ISO9001:2000 International Quality System Certification

Our honors and certificates

Wuhan Vtop Fiber Laser Engineering Co.,LTD （Vtop Laser for short） is a wholly-owned subsidiary of Wuhan Golden Laser Co., Ltd.,which operates independently on the basis of Golden Laser's fiber laser product line. Vtop Laser has integrated with R&D ,production,sales,service and with fiber laser cutting and welding as the only production line. The Vtop Laser R&D team consists of the core backbone members of the Golden Laser Wuhan R&D Center. The leading figures have been selected for the first batch of Yellow Crane Talent Programs in Wuhan. Most of the team members have more than 10 years of experience in the laser industry.



Vtop Laser building

At present, Vtop Laser develops and sells fiber laser products in a total of 9 series of 35 types, including metal sheet fiber laser cutting machine, metal tube fiber laser cutting machine, dual function tube & sheet fiber laser cutting machine, 3D fiber laser cutting machine and 3D fiber Laser welding machines and other products.

Vtop Laser full rang of products

Vtop Laser factory（one corner）

Chapter 2 GF1530JH Introduction

2.1 Machine Appearance

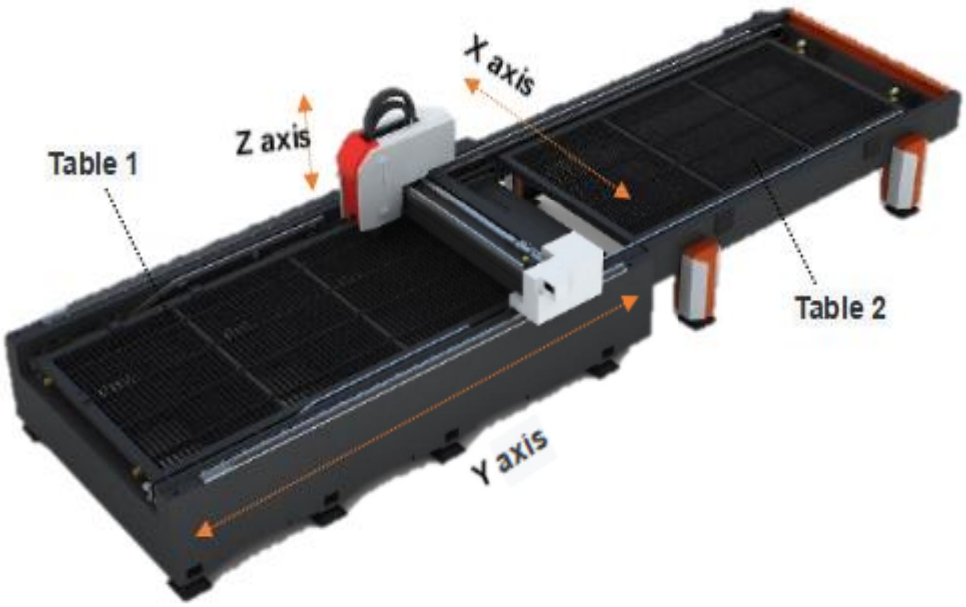
The professional industrial design appearance is presented, and each region's modeling level has distinct characteristics, which is stable and without losing the atmosphere, and enhances product quality.

The orange, gray and white colors are ingeniously matched to give the operator a refreshing feeling and relieve the dull mood of the machine operation.

2.2 Machine Structure Introduction

External Structure:

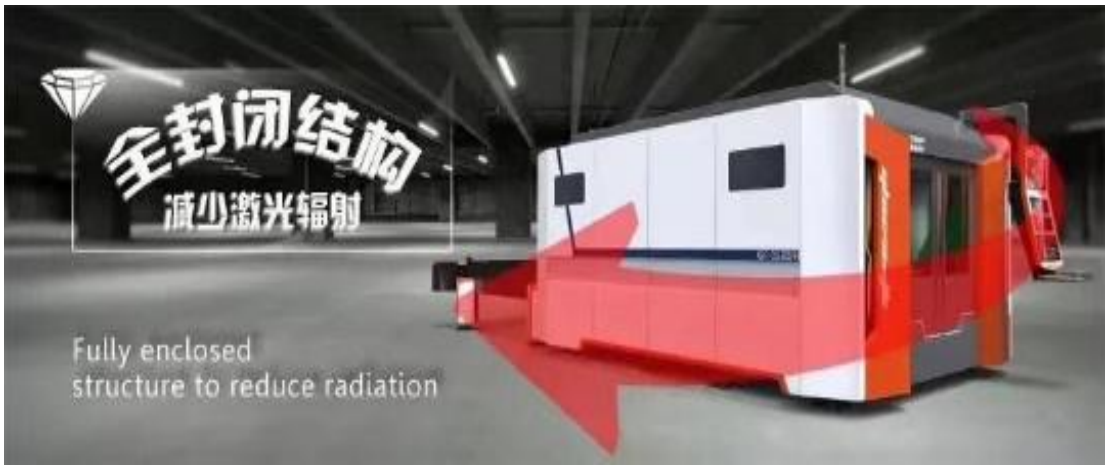
Internal Structure:



Chapter 3 Machine Features

3.1 Structure Design Characters

3.1.1 Full enclosed design to reduce radiation.



Laser cutting is hazardous, radiation is the main hazard, and the main target of radiation is the human eye and skin. If it is in direct contact, it will cause irreversible damage. The fully enclosed design, including the top of the unit, effectively shields all visible lasers from the laser cutting process. Provide laser radiation protection to all personnel who have access to the equipment.

3.1.2 Multi-distributed top dusting method combined with closed design to isolate cutting dust.

The main environmental pollution caused by laser cutting is cutting dust pollution. Cutting different materials with different kinds of auxiliary gas, the degree of contamination of the cutting dust smoke is different. The fully enclosed design completely isolates the dust fumes generated during the laser cutting process inside the enclosed cutting area, thereby creating a shield with the outside to prevent contamination from spreading. Then according to the law of dust smoke flow during

the cutting process, the top multi-distributed vacuum design is adopted, combined with the large suction fan, multi-directional multi-window synchronously evacuates the dust smoke and excludes the designated sewage outlet, so as to prevent the workshop from dust and smog, and also your green Environmental protection.

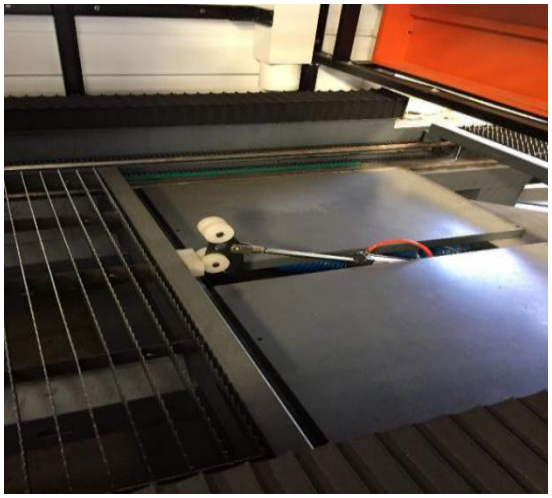
3.1.3 Unique rotatable separate control panel

Abandoning the integrated console mode on the traditional equipment casing, using the external rotary console, retaining the integrity of the overall appearance of the equipment, more in line with the industrial design standards of high-end CNC equipment; console 270 degree large-angle three-dimensional space rotation, support multi-dimensional operators Position;monitoring window, operation interface, high-end CNC panel, wireless mouse and keyboard integrated in the console, equipment switching machine and standby maintenance state start operation can be completed in the same interface; equipment built-in high-definition surveillance camera, laser cutting full-process picture real-time dynamic display, Equipment operation.And the machine running state monitoring can be taken into consideration at the same time; additional configuration of high-end CNC panel conforming to European and American operating standards, while supporting convenient and simple mouse button operation mode, providing a variety of operating modes.

3.1.4 The machine bed is made of a more reliable plate welding method

We adopt a more costly full-welded structure for the bed. The thickness of the steel plate is up to 18 mm. The machine tool has better rigidity and is less prone to deformation. The stability of the machine tool is higher, the weight of the equipment is heavier, and the overall service life of the equipment is increased. Guarantee the machine stabilization and cutting accuracy for long-term use.

3.1.5 Exchange workbench can be fixed automatically



Exchange workbench equipment can support dual workbench simultaneous operation, exchange to the workbench inside the cutting area for laser cutting processing operation, and exchange to the external workbench to finish loading and unloading work, this can reducing equipment standby time and improving equipment utilization, improve processing efficiency.Because the two worktables are synchronously exchanged through the same chain, if the workbench is not fixed, the work piece is taken on the external workbench and the raw material is

being loaded, especially the whole plate with thicker material thickness, Because the large external force of the loading and unloading will cause the displacement and sway of the rear table, which will cause the table to shake and shift inside the cutting area, it can also will cause misalignment or error in processing.This is a problem that many exchange station equipment easily overlooks.In the design of the equipment structure, we added the pneumatic fixing method of the worktable. After the worktable is automatically exchanged in place by the PLC program control, the pneumatic topping device is automatically started, and the top material wheel will be tightly exchanged to the workbench inside the cutting area for fixing. In place, it can effectively avoid the problem of sloshing displacement of the working table inside the cutting area during the loading and unloading process on the external workbench, ensuring the stability and precision during the whole processing.

3.2 Machine Configuration Characters

3.2.1 **Adopt excellent performance laser resonator IPG imported from Germany**

a、IPG laser is an internationally renowned brand of fiber lasers, with the highest visibility and largest market share in fiber laser cutting applications worldwide.

b、IPG fiber lasers currently cover all power segment lasers in fiber laser cutting applications, from 500W to 15000W power segment, and are the earliest applications in the market. Currently, the fiber laser cutting technology in the ultra-high power segment is relatively mature and super High power segment of the fiber laser cutting market dominates the market

3.2.2 Professional laser cutting head imported from Switzerland

a、The Raytools BM111 is our cost-effective, Automatic-focusing fiber laser cutting head for 1500W lasers. It is based on Swiss technology's imported cutting heads, which greatly enhances fiber laser cutting performance for faster cutting speeds and better cutting quality.

b、Advanced dustproof, dustproof grade IP65, fully enclosed optical path, reducing the probability of natural condition damage of the internal focusing and collimating lens of the cutting head to zero.

c、The lens and the copper nozzle have built-in cooling function, and all the heat radiated by the fiber laser to the laser cutting head is cooled, and the laser cutting head is maintained from the top to the bottom and from the inside to the outside, so the cutting is more stable.

d、The lower protective lens replacement window newly closes the protective door. The replacement of the protective lens can effectively prevent dust from entering the laser cutting head from the replacement window.

The protective lens is added on the collimating lens, and the optical fiber is inserted from the laser head QBH. Or during the extraction process, avoid unpredictable dust entering the laser head and falling onto the collimating lens to cause damage, resulting in greater loss for the customer; inserting the fiber head into the QBH position of the laser

head to increase the protective cap to prevent the processing environment from entering the QBH Internally, the end face of the fiber is damaged. The protection is meticulous.

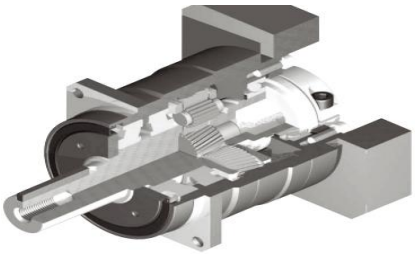
3.2.3 Japan YASKAWA Servo drive and servo motor.

We recommend the industry's first-line brand Yaskawa.Yaskawa's latest series of Σ-7 series servo drives and servo motors. The excellent quality and four main advantages help the GF1530JH equipment improve overall performance and ensure stability.

YASKAWA

3.2.4 Japan Shimpo Reducer

- ✧ High precision: Higher precision which can fully meet high precision requirement of laser cutting
- ✧ High rigidity: Higher rigidity which can meet the high speed running
- ✧ Big load capacity: It can adapts different load requirement of different sheets
- ✧ High compatibility: It can be matched different servo motors, which have space for future update for motion control
- ✧ High sealing performance: Fully sealing features, high tolerance of environment and prolong lifetime
- ✧ Free of maintenance: No need lubrication oil during lifetime3.2.5 High precision gear and rack



3.2.5 Taiwan High precision KH gear and rack

High precision KH gear and rack, the surface which is treated by special technical process, features high rigidity and anti-corrosion, also can prevent broken of the gear.

3.2.6 Taiwan Hiwin Guider

HIWIN linear guide is a four-row single-arc-tooth contact linear guide, which integrates the heavy load precision linear guide, designed with optimized structure, and improves the load and rigidity compared with other linear guides.With four directions and other characteristics of the load, and automatic centering function, can absorb the mounting surface assembly error, get the demand of high precision.

3.2.7 Japan SMC Electrical proportional valve.

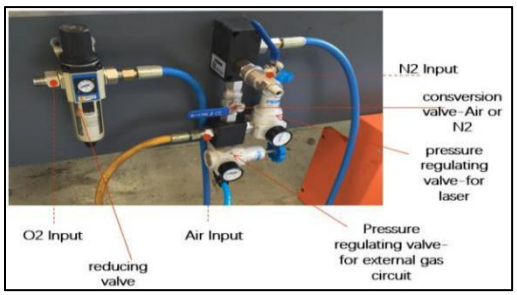
SMC electric proportional valve has high sensitivity and precise control ability. Under oxygen cutting state, it can stably and effectively control the

oxygen pressure and flow rate to ensure stable cutting effect. Waterproof grade IP65 can effectively inhibit the impact of machine vibration on itself, with high tolerance to different flat quality oxygen, and can adapt to harsh production environment.

3.2.8 Professional chiller brand :Tongfei chiller。

IPG laser supporting chiller first-class supplier - Tongfei refrigeration, it is also the only choice for our chiller brand. The largest brand of domestic chillers in the laser application industry, with reliable quality, fast service response and strong professionalism. The almost zero failure rate guarantees stable operation of expensive lasers.

3.2.9 Air circuit assembly



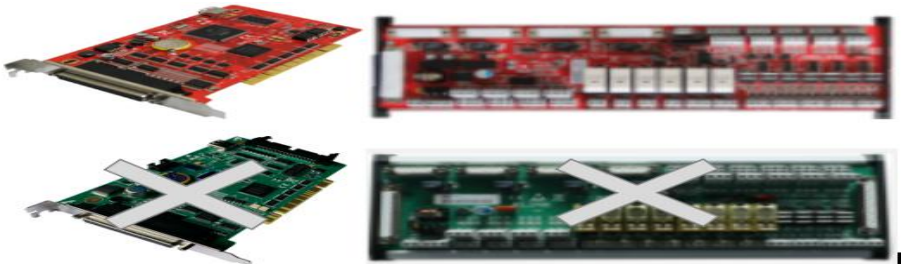
The gas path assembly insists that the three gases of oxygen, nitrogen and air are simultaneously introduced into the equipment mode, and the multi-node control maintains the reliable input of the gas and the gas pressure is stable and controllable.

After the oxygen is input, it must be passed through the pressure reducing valve for decompression control to ensure that the oxygen pressure input to the pipeline is controlled within 1.0 MPa, thus ensuring that the oxygen proportional control device of the rear oxygen pressure control

device can be protected and the pressure control is accurate. After the air is input, it can simultaneously take into account other airway use requirements outside the equipment, laser air input requirements and cutting requirements. At the same time, the external external air pressure and laser protection gas pressure can be adjusted through the pressure regulating valve configured in the air circuit assembly, one input and three controllable outputs. Nitrogen and air cutting requirements can be easily converted to nitrogen and air input through a switching valve, without the need to replace pipes, cylinders and other cumbersome ways.

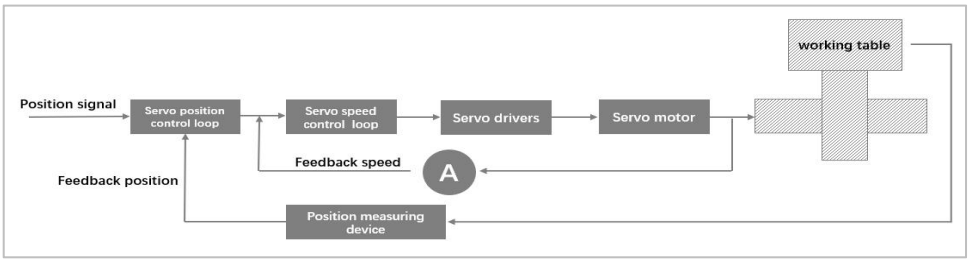
3.2.10 A closed-loop control system with higher precision and faster control.

The control system is obviously the most critical function of the machine,we adopt Bochu higher-level closed-loop control system FSCUT4000 series rather than open-loop control system.

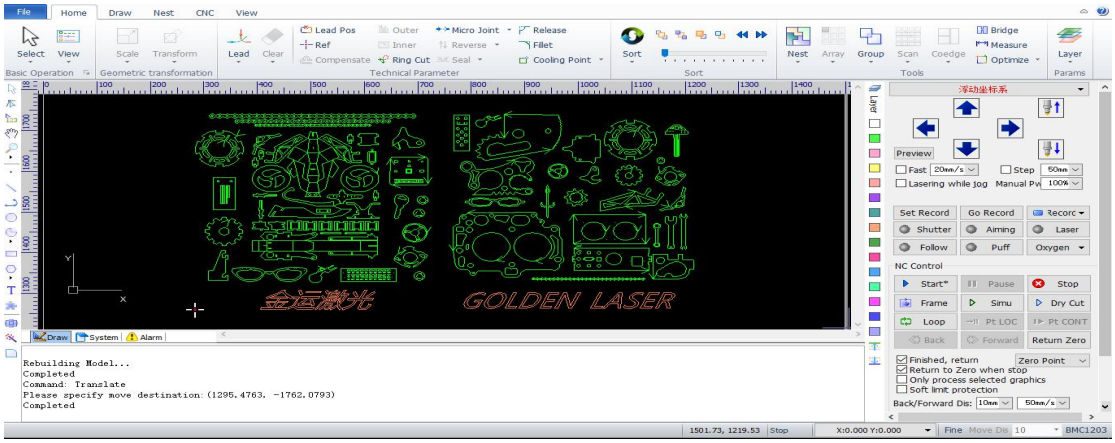


a、 Compared with open-loop control system,closed loop control has a number of advantages. In the feedback control system, for whatever reason (external disturbance or internal variation of the system), as long as the controlled amount deviates from the specified value, a corresponding control action is generated to eliminate the deviation. Therefore, the closed-loop control system can not only detect the

equipment error, Calibration errors can also be synchronized to ensure accuracy and stability for long-term use. At the same time, it has the ability to suppress interference, is insensitive to changes in component characteristics, and can improve the response characteristics of the system, thus greatly improving the motion performance of the device.



b、With the closed-loop control system, the device adopts CypCut laser cutting software with complete functions and simple operation.



✧ **Easy operation**：Whether you have or not have experience in laser equipment operation, you can master the use of cutting software quickly through 1-2 days of training;

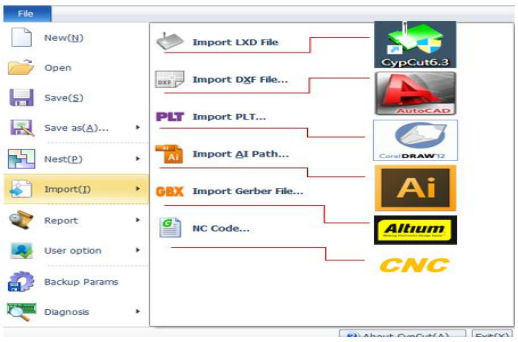
✧ **Graphic form rendering processing view**: whether it is importing graphics or NC processing code, it is finally formed in graphics in

software, graphics processing, process editing modification, machining process simulation operation, etc., all of which are visualized and intuitive;

✧ **Powerful, professional and practical functions:** The software have drawing function, to meet the needs of conventional graphics drawing and direct processing; complete process settings, frog jump, flight cutting, cutting gap compensation, automatic edge finding, film cutting, marking, etc. It can fully meet the basic requirements and special process requirements of laser cutting process in different processing industries with different powers and different configurations;

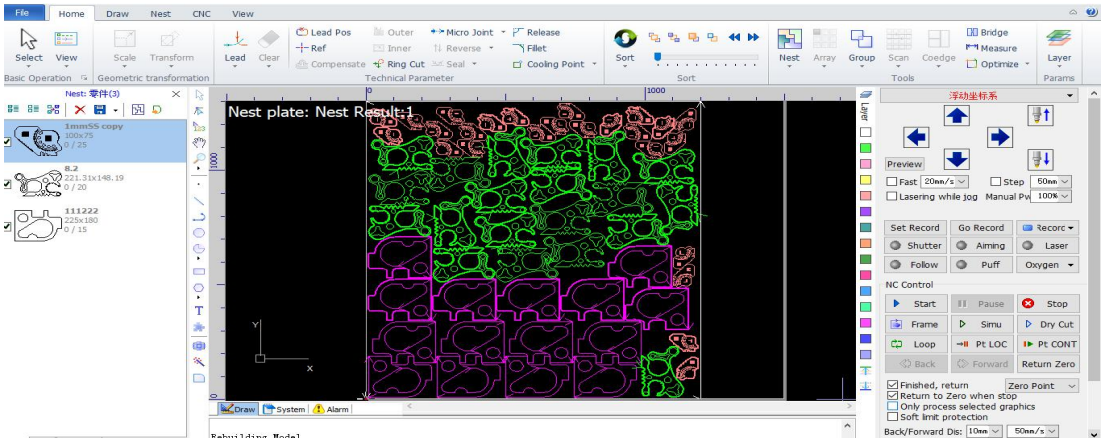
✧ **Continuous updates and free software upgrades**;

c、Support multi-format graphics or file input mode, seamlessly interface with the customer's conventional design software, from the design drawing to the processing program conversion one-click import can be completed. The format of the graphics or files input by the software support is LXD, DXF, PLT, AI, GBX, NC processing code. At the same time of inputting graphics, you can automatically process the errors of the graphics automatically, such as automatic deletion of repeated line segments and extra small line segments, automatic merging of unclosed lines, and smoothing of lines to ensure the integrity and accuracy of the processed graphics.

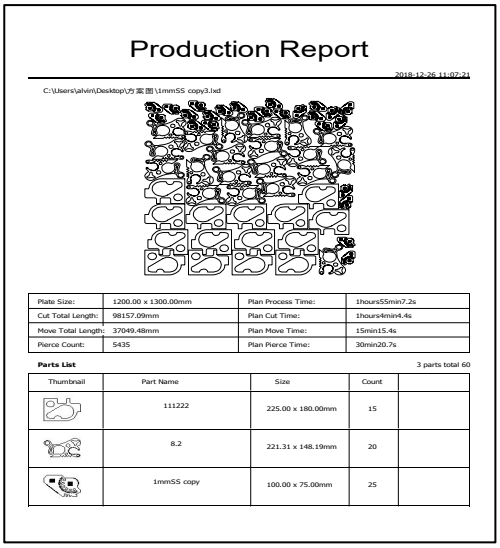


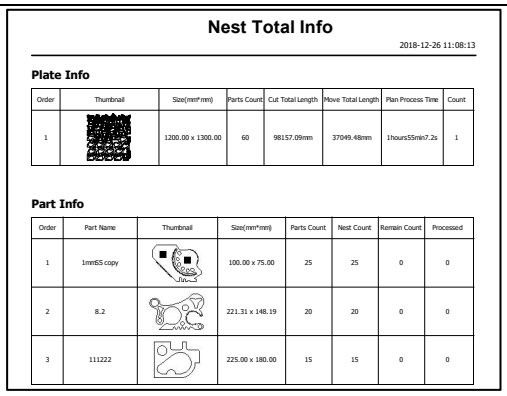
d、The cutting application and the nesting are combined into one.

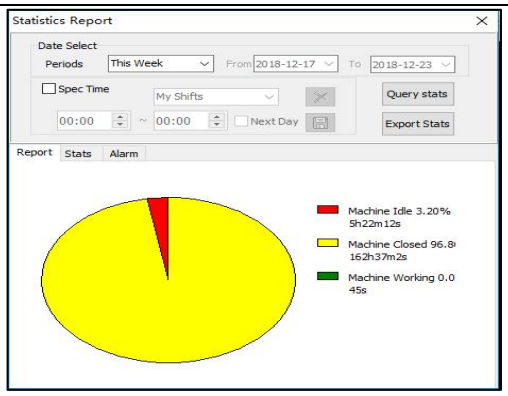
The software has nesting function, which can directly input and process the work piece pattern for nesting typesetting, and directly cut the processing result of the typesetting, avoiding the cumbersome process of introducing the additional nesting material into the cutting software, improving the efficiency of pre-processing preparation, and also Customers save on the cost of additional purchases of nesting software.



e、After the processing graphics are input into the nesting layout, the corresponding process parameters are set, and the corresponding typesetting report, production report sheet and equipment expected usage information statistical table can be immediately generated to inform the user of the layout information,production processing information and equipment usage information, etc. Guide the user to make production schedules.







f、A complete library of fiber laser cutting processes is available.

Thanks to the years of technology accumulation in fiber laser cutting application industry, we have developed a complete and professional fiber laser cutting process library, including low-power 500W to high-power 12000W fiber laser cutting process library. These are free to all of our users. For laser cutting processing under different changing conditions, such as different materials and different gas requirements, our users can get started with the process library quickly easily .

Chapter 4 Machine Configuration and Technical Parameters

4.1 Machine Configuration

GF1530JH-1500W main configuration

No.	Item	Items model	Brand
1	Control system	Cypcut	China
2	Nesting	Cypcut	China
3	Fiber laser resonator	1500W	IPG
4	Cutting head	BM111	Raytools(Switzerland)
5	Chiller	Tongfei	Tongfei(China)
6	Servo motor	Yaskawa	Yaskawa(Japan)
7	Reducer	Shimpo	Japan
8	Gear and Rack	KH	Taiwan
9	Liner	HIWIN	Taiwan
10	Gas proportional valve	SMC	Japan
11	Electric components	Schneider	Schneider(France)
12	Machine bed	GF1530JH	Vtop laser
13	stabilizer	Junwen	Junwen(China)
14	Automatic oil circuit lubrication	Vtop	Vtop laser
15	Exhaust fan	3KW	China
16	Air circuit assembly	A set	Vtop laser

4.2 Technical Parameters

GF1530JH-1500W technical parameters

No.	Model	GF1530JH	Note
1	Working ares	1500mm*3000mm	
2	X Y Axis position speed	120m/min	
3	X Y Axis acceleration	1.2G	
4	Position accuracy	±0.05mm/m	
5	Repeat position accuracy	±0.03mm	
6	X-axis travel	1550mm	
7	Y-axis travel	3050mm	
8	Z-axis travel	200mm	
9	Lubrication system	√	
10	Exhaust fan	√	
11	Air filtration system		For option
12	Visual window	√	
13	Workbench exchange speed	19s	
14	Table loading	800kg	
15	Total weight	8T	
16	Machine dimensions	8600mm*3100mm*2200mm	
17	Total power consumption	19.7KW	
18	Electric supply	AC380V 50/60Hz	

4.3 Cutting Parameters

GF1530JH-1500W cutting parameters（for reference）

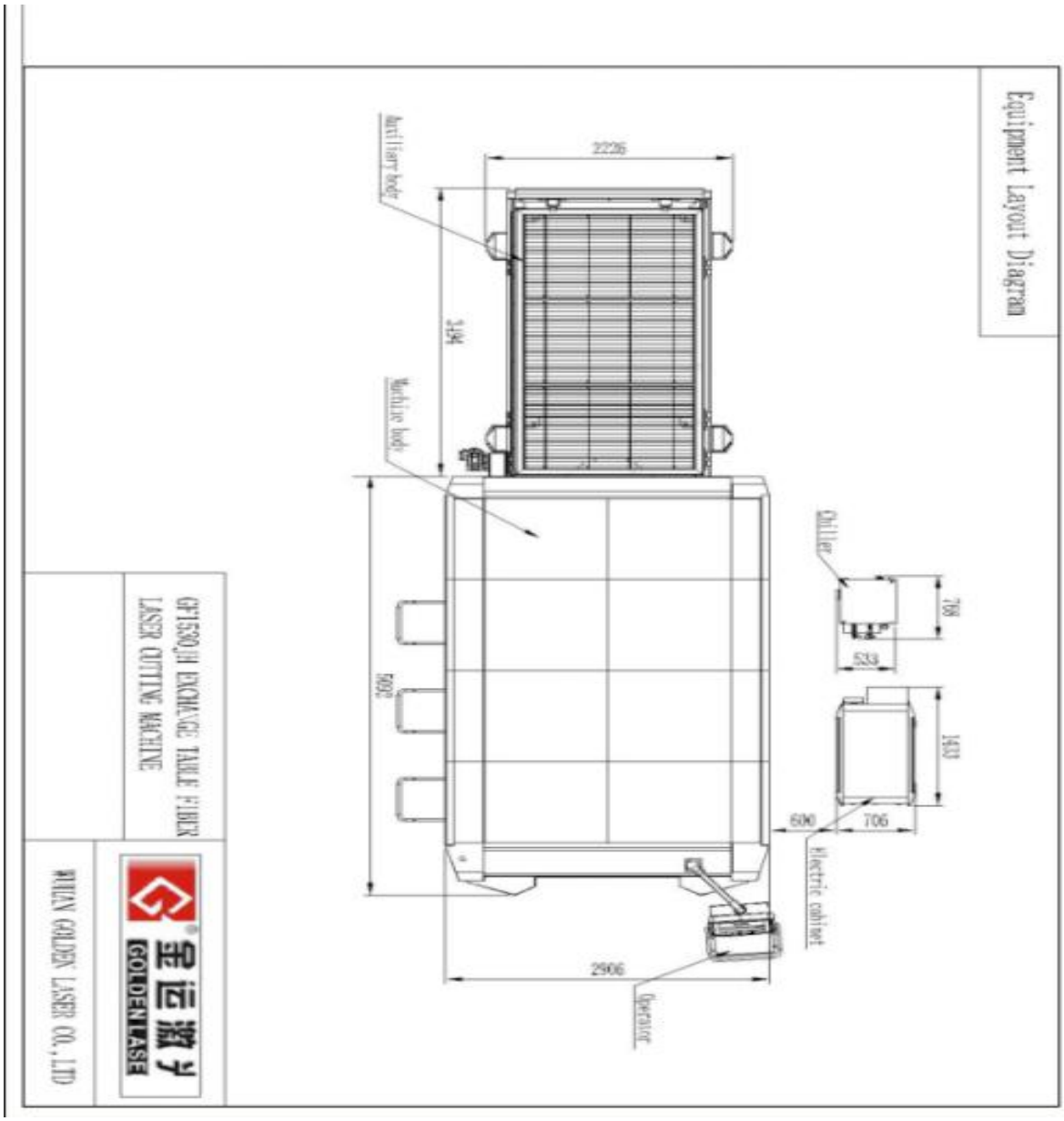
Material	Gas	Thickness	Speed(m/min)
Carbon steel	Air	1mm	22-27
	O2	1mm	9-11
		2mm	5-6.2
		3mm	4-5
		4mm	2.8-3.5
		5mm	2.5-3
		6mm	2-2.5
		8mm	1.2-1.5
		10mm	1.1-1.3
		12mm	0.75-0.9
		14mm	0.6-1.72
Stainless steel	N2	1mm	24-29
		2mm	9-11
		3mm	5.4-6.5
		4mm	3.3-4
		5mm	1.5-1.8
		6mm	0.9-1.1
Aluminum	Air	1mm	15-18
		2mm	9-11
		3mm	3.6-4.5
		4mm	2.1-2.7
		5mm	0.72-0.9
Brass	N2	1mm	9-11
		2mm	4.2-5.4
		3mm	2.7-3.6
		4mm	1.5-2.4

GF1530JH-1500W cutting capacity（for reference）

Material	CS	SS	AL	BRA	Copper	Galvanized
Gas	O2	N2	Air	N2	O2	N2
Thickness	14mm	6mm	5mm	5mm	4mm	5mm

4.6 Machine layout drawing

GF1530JH-1500W layout drawing



4.7 Cutting samples

Chapter 5 Installation and Service

5.1 Machine installation and commission

5.1.1 After the laser equipment arrives at the customer's site, the customer should strictly carry out the equipment foundation according to the equipment basic drawing requirements provided by our company in advance, ensure that the installation site is equipped and the power supply is installed in accordance with the equipment installation requirements, and the equipment is placed. Then the customer can inform our company to arrange technical engineers to go to the site form machine installation, commissioning and training, all work will be completed in not less than 7 working days;

5.1.2 Before the installation and commissioning of the equipment, the customer and our company personnel jointly unpack the box, and according to the contents of the contract and the packing list, check the random attachments and technical documents, and sign in time;

5.1.3 Our technician provide the special tools and inspection tools required for installation and commissioning. Other general tools and measuring tools shall be provided by the customer for free.

5.2 Training

5.2.1 Our professional technician will conduct comprehensive technical training for the equipment operators designated by the customer at the equipment installation site.The equipment installation, commissioning and training time shall not be less than 7 working days. The training includes the following aspects:

✧ Laser and laser equipment use safety protection knowledge;;

- ✧ Equipment structure and its role;
- ✧ Equipment operation and precautions;
- ✧ Software operation, equipment maintenance, troubleshooting of common faults;
- ✧ Laser processing technology training;

5.3 Equipment acceptance

5.3.1 Wuhan Golden Laser Co., Ltd. has passed the ISO9001 international quality management system certification, all products design, production and service are in line with the requirements of the quality assurance system.

5.3.2There are no special standards for non-standard equipment and production lines, but the outgoing products must meet (or partially meet) the requirements of the following national standards:

- ✧ GB10320 Electrical safety of laser equipment and facilities
- ✧ GB7247.1 Laser Product Safety Equipment Classification, Requirements and User Guide
- ✧ GB/T15301 gas laser general specification
- ✧ GB/T15490 Solid State Laser General Specification
- ✧ GB/T13863 laser power test party
- ✧ GB/T13864 laser power stability test method

✧ GB/T17421.2 General rules for machine tool inspection CNC axis positioning accuracy and repeat positioning accuracy

Verification of compliance with the above standards and verification of other technical parameters is required by equipment and instruments and must be carried out within the company. The customer can pre-accept the equipment according to various technical indicators at the location of Wuhan Vtop Fiber Laser Engineering Co., Ltd. within the time agreed by both parties;

5.3.3 After the equipment is installed and commissioned at the buyer's location, the two parties shall finalize the feasibility, stability and reliability of the equipment according to the standards or pre-acceptance standards stipulated in the contract. After the final acceptance index is reached, the buyer and seller will complete the inspection and acceptance report. Equipment acceptance procedure;

5.3.4 If the customer makes special requirements on the equipment, it shall be clearly specified in the form of contract terms or technical agreement documents, and these requirements may be accepted as provisions for pre-acceptance or final acceptance;

5.4 Warranty

5.4.1 The equipment host shall be free of charge for 12 months from the date of acceptance of the equipment;

5.4.2 During the warranty period, if the equipment is not working properly, Vtop Laser Company will send a technical service engineer to the customer's site for processing within the specified time of the after-sales service after receiving the customer's notice. In the event of damage to the equipment parts caused by improper use of the customer, the replacement cost of the parts in the repair service will be charged;

5.4.3 After the warranty period, the company still provides equipment maintenance services, but the corresponding replacement parts cost and maintenance service fees should be charged according to the company's after-sales service system standards.

5.5 After service

5.5.1 After the final acceptance of the equipment, the quality assurance period of the whole machine is 12 months;

5.5.2 If there are quality problems with equipment parts during the warranty period, our well-trained technicians will provide telephone or on-site service at any time. Our company is responsible for free replacement parts and services due to any damage or damage caused by the quality of the equipment itself, except for conventional consumables (such as externally operated optical fibers, optical lenses, cutting nozzles) and accidents involving user violations;

5.5.3 Within 300 km of domestic maintenance service site, we promise to provide door-to-door repair and service within 24 hours; on-site service and maintenance within 72 hours away from 300 km. For our foreign customers ,we will reply within 10 hours and provide repair service solutions within 72 hours for any equipment problems;

5.5.4 Beyond the warranty period, our company still provides technical support services, regular maintenance and spare parts supply of the whole machine and auxiliary machine for our customers. We still provide full

maintenance service for the products provided and equipment-related daily routines. According to our after-sales service system standard, we will charge the corresponding technical service fees to the customer out-of the warranty period.

5.5.5 We have sufficient spare parts to provide technical and spare parts services to our customer timely.

5.5.6 We will arrange technical service engineers to go to the site for free technical return visits irregularly.

5.5.7 From the date of machine purchase, the customer can come to our company for free technical training at any time; from the date of machine acceptance, customers can enjoy free software upgrade service for ever;

5.5.8 After the equipment leaves the factory, our company will establish the “User Profile Card” to track and record the relevant information of the user. After the equipment maintenance service is finished, our company will report the cause of the fault, remedial measures, complete the repair and restore time to our customers ,the report is in duplicate for review;

Chapter 6 Customer Site

Some of our customers

GF1530JH in Korea

GF-1540JH in America

GF-1530JH in Russia

GF-1530JH in Ukraine

GF-1530JH in Italy

GF-1530JH and P2060 in Thailand

GF-1530JH and P2060 in Romania

P2060A in Mexico

P3080A in US

4sets P2060A in Korea

GF1530JH

GF1530

GF1530JH-1500W technical parameters

No.	Model	GF1530JH	Note
1	Working ares	1500mm*3000mm	
2	X Y Axis position speed	120m/min	
3	X Y Axis acceleration	1.2G	
4	Position accuracy	±0.05mm/m	
5	Repeat position accuracy	±0.03mm	
6	X-axis travel	1550mm	
7	Y-axis travel	3050mm	
8	Z-axis travel	200mm	
9	Lubrication system	√	
10	Exhaust fan	√	
11	Air filtration system		For option
12	Visual window	√	
13	Workbench exchange speed	19s	
14	Table loading	800kg	
15	Total weight	8T	
16	Machine dimensions	8600mm*3100mm*2200mm	
17	Total power consumption	19.7KW	
18	Electric supply	AC380V 50/60Hz	