Hymson

Laser Cutting Machine Technology Document

HF3015A-3kw with Enclosure

Your Reliable Partner We Grow Together

Metal plate cutting

- Medium- and high-power high-speed metal plate cutting
- Automation solution

Lithium battery automation

- High-speed tab cutting machine
- Automatic production line for cell assembly
- Automatic logistics line for battery baking

Precise cutting

- Glass/ sapphire/ ceramics cutting
- FPC/ chip cutting
- Medium- and high-power high-speed metal plate cutting

Precise welding

- Precise welding of VCM modules
- PCB soldering
- All kinds of metal welding and non-metal welding

Laser marking

- PCB marker
- Marking of mobile phones, fittings, etc.
- Marking of various metal and no-metal surfaces

Automatic assembly line specific to the industry

- Mobile phone charger and transformer assembly line
- Inverter assembly line
- Intelligent electric meter assembly line

Company Profile

Hymson Laser, founded in 2008, has been making contributions to the fields of laser and automation. Now it has become the world’ s leading laser and automation equipment integrated solution provider and a national high-tech enterprise.

Hymson has been paying close attention to the fiber laser sheet metal application market and has established a Sheet Metal Intelligent Equipment Division. After concentrating on researches for more than ten years, Hymson has accumulated fruitful laser cutting technology and has mature experience in automatic manufacturing.Aiming at sheet metal applications in different industries, Hymson provides users with professional and high quality product mixes and services, including comprehensive laser automation solutions, such as laser plate cutters, laser tube cutters, laser welding machines, laser automation software, etc.Widely used in engineering machinery, construction machinery, light industrial machinery, agricultural machinery, petroleum machinery, electrical manufacturing, automobile making and aerospace industries.

Hymson has always been adhering to the operation philosophy of “Intimate services let you feel at ease to create wealth” and provides customers with thoughtful, fast and professional services. At present, Hymson’ s service network covers all provinces and cities in China and has established sales and service outlets in nearly 40 countries and regions.

HYMSON LASER

METAL INTELLIGENT EQUIPMENT PRODUCT LINE SITES


HYMSON ITALY


HYMSON USA


HYMSON INDIA


HYMSON LASER (JIANGSU)


HYMSON LASER(JIANGMEN)


HYMSON LASER (SHENZHEN)

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DELTA


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LITEON

Product Introduction

Pictures are for reference only

HF·A Series is a Hymson single table fiber laser cutting machine.

- The single table type can be applied flexibly,
- The integrated main machine covers a small area, with a high availability,
- Integrating an electric cabinet a laser cabinet, with the gas path and oil circuit for main machine driving divided into modules and the whole machine of high quality matching,
- Mobile operating table, for easy operation.

Core Configuration

Unit	Name	Model / Specification
I. Control Programming	Control System	FSCUT2000C
II. Mechanical Drive	Machine Lathe	HF-A Honeycomb Heavy Duty Lathe
	Servo Motor and Drive	INOVANCE
	Precision Reducer	DESBOER
	Precision Toothed Rack	YYC
	Precision Guide Rail	HIWIN
	Table Type	Single table type
III. Pneumatic	Intelligent Pneumatic	SMC
IV. Optical System	Fiber Laser	3000W
	Auto Zoom Cutting Head	RAYTOOLS
V. Dedusting System	Intelligent Zoned Exhausting System	HYMSON
	Dedusting Fan	HYMSON

Performance Indexes

Equipment Model	HF3015A
Effective Cutting Range	3050mmX1525mm
X/Y-axis Positioning Accuracy	±0.03mm/m
Maximum Speed of X/Y-axis Linkage Positioning	120m/min
Maximum X/Y-axis Acceleration	1.2g
Maximum Z-axis Positioning Speed	30 m/min
Floor Space of Whole Machine	5500mmX2700mm m

Main Components

Fiber Laser Generator

A fiber laser refers to a laser with rare-earth element doped glass fiber as gain medium. As the diameter of the fiber core is small, high power density can be formed easily in the fiber core. Therefore, a fiber laser has high conversion efficiency, a low threshold value and a high gain and it can be connected to the current fiber communication system easily and efficiently. Fibers are very flexible, therefore, a fiber laser has the characteristics of being small and flexible, compact, cost-effective and easier system integration.

- High power/ small light spot
- High stability
- High electro-optical conversion efficiency
- Modular design and installation, for easy machine maintenance and reducing downtime
- Compact and stable design
- A low cost solution, taking semiconductor fiber as laser generation medium, without generation gas, which is environment-friendly.

Laser Cutting Head

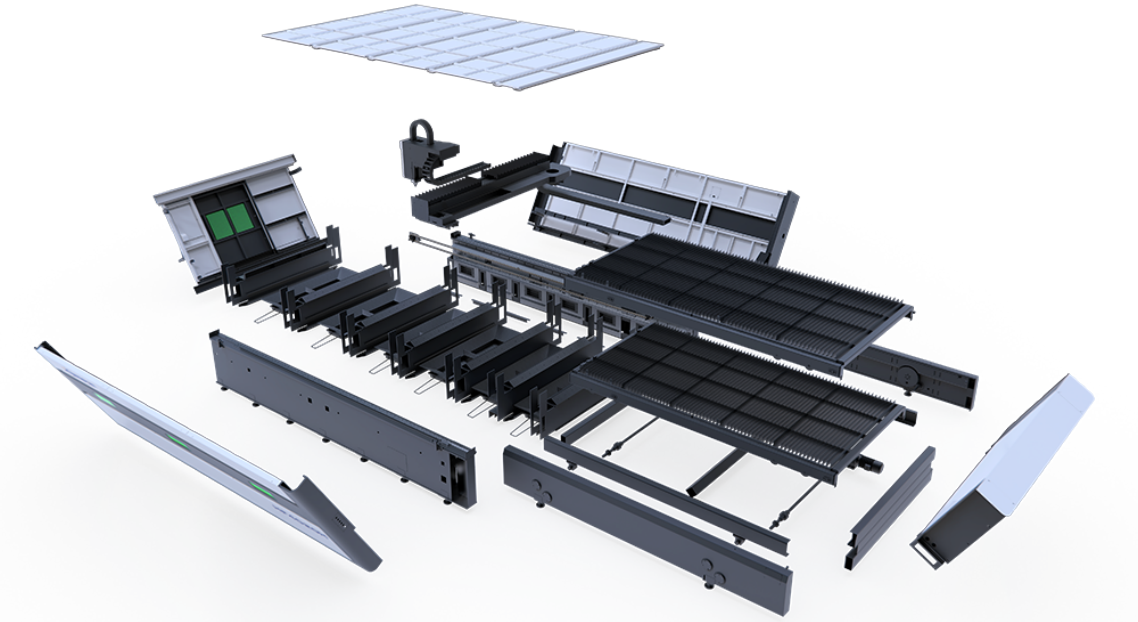
- Auto focus system
- Lightweight design, with fast acceleration
- Drift-free range sensor
- Continuous protective lens monitoring
- Closed optical path protection
- Automatic piercing
- The cooling technique cools the surface temperature of the sheet metal rapidly
- LED operational tell-tale shows the status of the cutting head

- With pressure sensors in the cutting head and at the nozzle

Machine Structure

I. Modular design

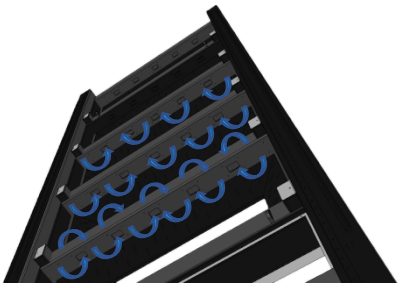
- Several components with independent functions are integrated scientifically and systematically for high quality matching of the whole machine;
- With high strength and high reliability of the machine guaranteed, the product development speed is improved to respond to market demand rapidly.



II. Tube Welded Construction of the Machine Body

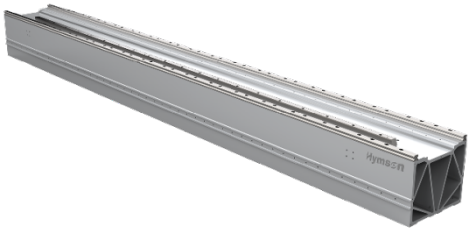
- The machine body is welded with high strength standard tubes and, after welded, undergoes high temperature annealing treatment to eliminate the internal stress caused by the material itself and welding to the utmost extent, which ensures high strength, high precision and high tolerance;
- The machine complies with the standard for precision numerical control machine design and has undergone data simulation analysis and inspection of durability to guarantee stable machine structure and long-time and stable operation of the equipment.

III. Zoned Ventilation System



- Adopting zoned and segmental ventilation and using follow-up control to control the acts of cylinders in various zones to realize lower energy consumption and higher efficiency;
- Only the suction opening for the cutting operating range is opened for shorter path, more centralized and stronger wind power, and better dust removal effect.

IV. High Strength Cross Beam



- Adopting Hymson' s patented structural design of drawn aluminum cross beam for light overall mass, high tensile strength and superior dynamic performance;
- Through simulated data analysis and testing of different models and lengths, ensuring quality, rigidity and dynamic nature of the cross beam in long-time running.

V. Servo Motor

- Branded servo motor and drive, with high encoder resolution;
- Integrating high dynamics, compact structure and energy efficiency;

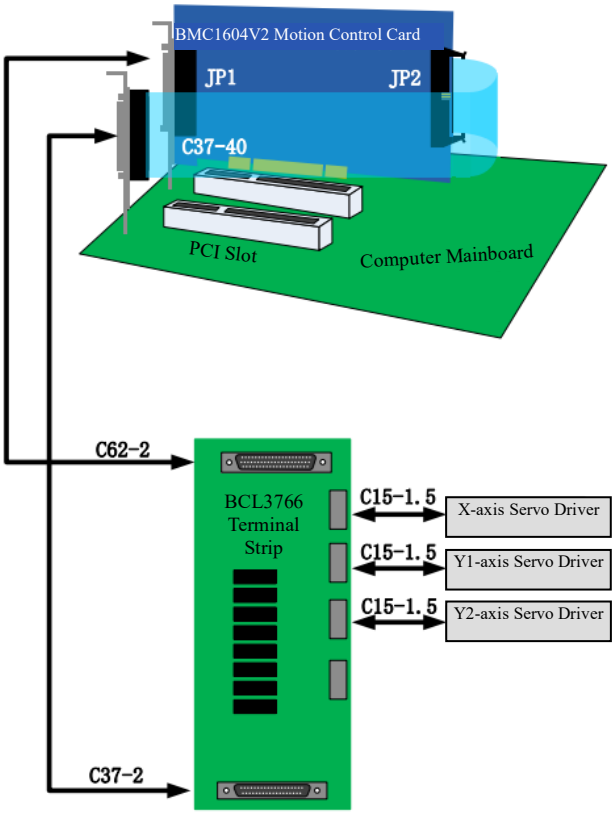
VI. Precision Gear Drive

- Precision machined high precision pinions and racks having been finished and ground;
- Super high matching rate and precision, high bite rate, smoother and quiet rotation;
- Compact load driven structure for effectively reducing driving torque and eliminating vibration;
- Adopting double drive gantry motion system for higher acceleration and faster movement speed.

CNC Numerical Control System

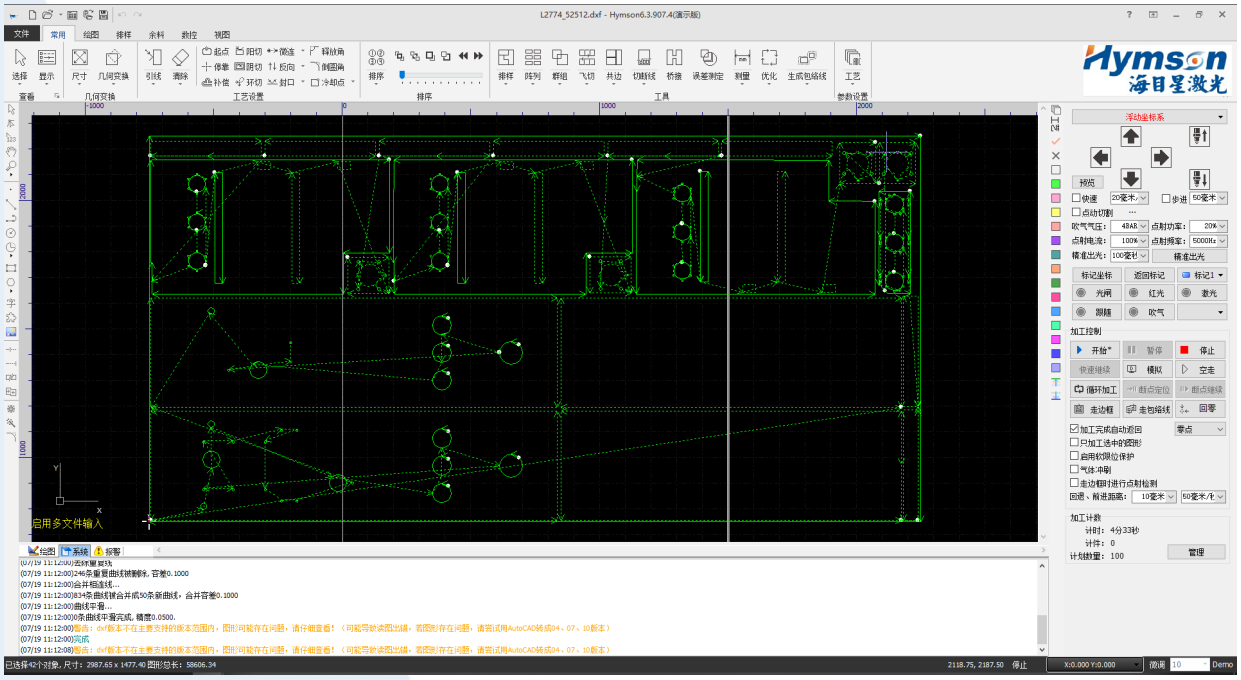
FSCUT laser control system

- The system is taken as the control platform of a flat laser cutting machine and is developed on the basis of Window 10 architecture. The data calculations are conducted with an industrial grade CPU, which is secure, reliable and self-diagnostics.



- FSCUT, applied to the flat laser cutting system, mainly contains the laser cutting technology processing, common nesting functions and laser processing control. The main functions include the graphic processing, parameter setting, custom cutting process editing, nesting, path planning, simulation, and cutting process control.

- The system can be combined with automatic loading and unloading production lines and flexible production lines of FMS laser cutting to support the automated production.



- The built-in CAM nesting with common editing, layout and graphic editing functions can distinguish the internal and external moulds automatically, determine the direction of cutting gap compensation based on the internal and external moulds, and inspect the leads. The automatic nesting is time- and effort-saving, and supports the automatic co-edging and generation of residuals.
- The automatic optimization will be carried out when opening/importing external files such as DXF, including: the removal of duplicate lines and minimal graphics, the merging of connected lines, and the automatic distinction of internal and external moulds and sorting. The above functions can be customized and manually set.
- The segmental piercing, progressive piercing, pre-piercing and group pre-piercing, as well as the setting of the separate laser power, frequency, laser type, gas type, air pressure, peak current, delay time, following height, etc. in the piercing and cutting process are available.
- The memory of machining breakpoints, forward and backward tracing of breakpoints, machining of part of graphics, positioning to any point in the stop and pause state, and starting machining from any position are available.

Compatible with multiple files

The system can be compatible with AI, DXF, PLT, Gerber, LXD and other graphic data formats, as well as G-generation international standards from ACTcut, Lantek, Master Cam, Type3, etc. It is convenient for users to import external graphics quickly for the proofing and debugging.

Power/frequency curve

The frequency/power curve can be edited in real time, and the parameters related to the slow start can be set.

Cutting Parameters

3000W				
Material Thickness(mm)	Reference Effective Cutting Speed (m/min)			
	Stainless Steel N_2	Aluminum N_2	Brass N_2	Carbon Steel O_2/N_2
1.0	40.0-50.0	35.0-40.0	25.0-35.0	8.0-10.0/35.0-50.0
2.0	20.0-25.0	15.0-18.0	10.0-15.0	5.0-7.0/15.0-20.0
3.0	8.0-12.0	8.0-10.0	5.0-9.0	3.8-4.0/6.0-10.0
4.0	6.0-7.0	4.0-6.0	3.0-4.0	3.2-3.6
5.0	3.5-4.0	2.5-3.5	1.5-2.5	2.5-3.4
6.0	2.8-3.0	1.5-2.0	0.8-1.2	2.4-2.8
8.0	1.0-1.2	0.7-0.8	0.4-0.5②	1.8-2.3
10.0	0.7-0.8①	0.3-0.5①		1.2-1.5
12.0	0.3-0.4②			0.9-1.2
16.0				0.6-0.8
20.0				0.5-0.6

①Indicates that the graphic is simple, low requirements can be small batch; ②Indicates that proofing can be done, the limit of cutting. The cutting effect and speed may be affected by the difference of material or personnel operation.

6000W				
Material Thickness(mm)	Reference Effective Cutting Speed (m/min)			
	Stainless Steel N_2	Aluminum N_2	Brass N_2	Carbon Steel O_2/N_2
1.0	45.0-60.0	35.0-45.0	35.0-42.0	8.0-12.0/40.0-55.0
2.0	25.0-30.0	20.0-25.0	18.0-22.0	5.0-6.5/25.0-35.0
3.0	16.0-20.0	10.0-15.0	8.0-13.0	3.5-5.0/15.0-20.0
4.0	10.0-13.0	9.0-11.0	7.0-9.0	3.2-4.0/10.0-15.0
5.0	8.0-10.0	5.0-6.5	4.5-5.5	3.0-3.5/7.0-9.0
6.0	5.0-7.0	4.0-5.0	3.0-4.0	2.6-3.0/5.0-6.0
8.0	3.5-4.0	2.5-2.8	1.8-2.2	2.3-2.5
10.0	1.6-2.2	1.5-1.8	0.8-1.2	2.0-2.2
12.0	1.0-1.3	0.8-1.2	0.7-0.9②	1.8-2.0
16.0	0.8-0.9①	0.5-0.6①		1.0-1.3
20.0	0.5-0.6②	0.3-0.5②		0.6-0.7
25.0	0.2-0.3②			0.4-0.5①

Installation and Commissioning

User’ s Machine Installation Site Condition Preparation

S/N	Content
1	Power Supply Capacity: ≥60KVA
2	Power Supply Requirements: (1) Three-phase voltage stability < ±5%; (2) Unbalancedness of three-phase power supply < 2.5% (Note: Abrupt changes in supply voltage and sudden power failure are not allowed, otherwise, the laser may be damaged easily. Good grounding is required (ground resistance < 3 Ohm).
3	Compressed Air Supply Requirements: (1) Air supply capacity: ≥ 0.8m3/min (2) Air supply pressure: ≥ 7bar (3) Dewpoint ≤ 5℃ (4) Oil content ≤ 0.01ppm Solid particle ≤ 0.01μm
4	Auxiliary gas for cutting: Oxygen (O2)/ Nitrogen (N2): Purity ≥ 99.99%
5	Sheet (Tube) Cutting: Black skin, smooth, level, rustless, evenly rolled, reaching the ISO standard.
6	Installation Site Requirements: 1. The foundation for equipment installation does not settle and should be constructed according to the foundation drawing provided by Party B; 2. Temperature Requirement: [5-30]℃; 3. Humidity Requirement: < 70%; 4. After the equipment is installed and commissioned, separate the laser and install an air conditioner.
7	The equipment operator should have been graduated from a secondary specialized school or above and have the experience in operation of computers and general numerically-controlled lathes. The equipment should be equipped with a programming computer.

Installation and Commissioning

- All the equipment provided under the contract should be installed and commissioned by Hymson. After the contract is signed, we will determine the specific installation location of the equipment in the shortest time and provide the equipment foundation drawing within 5 working days after the contract goes into effect. Prior to the installation and commissioning, you should prepare the equipment foundation strictly according to the requirements specified in the equipment foundation drawing provided by Hymson. After the installation site is ensured, the engineers will install and commission the equipment with the tools they carry and, within 10 days, complete the installation, commissioning, technical index tests, training, acceptance and delivery for use;
- The expenses related to the installation and commissioning and the staff assigned should be borne by Hymson.