

SENFENG

# SF3015H4

High-power Laser  
Cutting Machine

TECHNICAL  
SOLUTIONS

# The Fourth Generation Versatile & Efficient

## SF3015H4

### High Power Laser Cutting Machine

- Heavy-duty and thermally isolated hollow bed

- Intelligent surrounding spiral negative pressure dust removal

- Laser cutting process database

- Storm cutting system



※The picture is for reference only, the actual appearance and size shall prevail



# TECHNICAL PARAMETERS

## TECHNICAL PARAMETERS

Items	Parameters
	12kW
Work area (length x width)	3000*1500mm
X-axis travel	1530mm
Y-axis travel	3050mm
Z-axis travel	390mm
X/Y-axis positioning accuracy	±0.05mm
X/Y-axis repeated positioning accuracy	±0.02mm
Maximum speed	200m/min
Maximum acceleration	2.8G
Dimensions (length x width x height)	8440x2270x2340mm
Maximum load of workbench	3000KG
Total weight	6230
Phase	Three-phase
Rated voltage of power supply	380V
Frequency	50HZ
Power supply protection grade	IP54

Note: 1. The accuracy of the workpiece depends to some extent on factors such as workpiece type, preparation, sheet size and position.

2. The above technical parameters are subject to change without notice, and the final technical parameters are subject to the order agreement.



# CUTTING PARAMETERS

## CUTTING PARAMETERS ( SF3015H4 )

Materials	Thickness(MM)	12kW	15kW	20kW	30kW	Gas
		Cutting speed (m/min)				
Stainless steel	6	13-15	15-18	18-22	22-25	N2/air
	8	8-10	10-12	13-16	18-22	N2/air
	10	6.5-7.5	8-9	11-13	14-18	N2/air
	12	5-5.5	6-7	9-11	12-14	N2/air
	14	3-3.5	4-4.5	7-9	10-12	N2/air
	16	2-2.3	2.9-3.1	6-7	8-9	N2/air
	18	1.3-1.5	2.2-2.4	3.5-4.5	6-7	N2/air
	20	1.2-1.4	1.9-2.1	3.5-4.5	5-6	N2/air
	25	0.7-0.9	1.2-1.4	1.8-2.5	2.5-3	N2/air
	30	0.25-0.3	0.8-1	1.4-1.6	1.5-2	N2/air
	35	0.2-0.25	0.5-0.65	0.8- 1.2	1.2- 1.5	N2/air
	40	0.15-0.2	0.4-0.5	0.5-0.8	0.8-1.2	N2/air
	45	0.05-0.1	0.25-0.3	0.3-0.5	0.75-0.8	N2/air
	50	0.05-0.1	0.2-0.4	0.2-0.3	0.6-0.8	N2/air
	60			0.15-0.2	0.15-0.2	N2/air
	70			0.1-0.13	0.1-0.13	N2/air
	80				0.08-1.1	N2/air
	90				0.05-0.06	N2/air
Carbon steel	5	15-18	20-23	23-28	24-30	N2/Air
	6	10-13	17-19	18-20	25-28	N2/Air
	8	7-10	10-12	14-16	18-22	N2/Air
	10	6-6.5	7-8	9-12	14-17	N2/Air
	14	1.6-1.8(O2)	4.5-5.5	6-8	8-10	N2/Air
	16	1.5-1.6(O2)	3-3.5(O2)	5-6	7.5-8.5	N2/Air
	18	1.35-1.5(O2)	1.35-1.6(O2)	3.2-4	5.5-6.5	N2/Air
	20	1.3-1.4(O2)	1.3-1.5(O2)	2.7-3.2(O2)	5-5.5	N2/Air
	25	0.8-1(O2)	0.95-1.2(O2)	1.4- 2.6(O2)	3-3.5	N2/Air
	30	0.4-0.5	0.6-0.95	1.2- 2.2	1.3- 2.8	O2
	35	0.3-0.4	0.5-0.6	0.9- 1.8	1.0- 2.0	O2
	40	0.25-0.3	0.3-0.35	0.8-1.2	0.9- 1.8	O2
	50	0.18	0.2-0.25	0.3-0.7	0.8-1.2	O2
	60		0.18-0.2	0.17-0.22	0.5-0.6	O2
	70				0.2-0.3	O2
80				0.12-0.15	O2	

Note: 1. Due to the difference in carbon content of materials, the cutting parameters are for reference only, and the actual material shall prevail.

2. The dark part means that the whole metal plate cannot be processed, but the sample can be cut, please be informed.



# CUTTING PARAMETERS

## CUTTING PARAMETERS ( SF3015H4 )

Materials	Thickness(MM)	12kW	15kW	20kW	30kW	Gas
		Cutting speed (m/min)				
Brass	5	13- 16	13- 17	18-20	18-20	N2/air
	8	6.0-8.0	6-8.5	9.0-11	10-15	N2/air
	10	4.5-5.5	5-6.5	6.0- 8.5	7.0- 10	N2/air
	12	1.8-2	2-2.2	4.0-6.0	4.0-7.0	N2/air
	14	1.2-1.4	1.4-1.6	2.5-3.5	3.0-4.5	N2/air
	16	0.8-1.0	1.2-1.3	2.0-3.0	1.5-2.5	N2/air
	20	0.3-0.5	0.6-0.75	0.8-1.0	0.7-1.0	N2/air
	30			0.5- 0.6	0.4- 0.6	N2/air
Aluminum	5	15- 17	15-20	21-24	20-24	N2/air
	8	6.5- 9.0	9.0- 11	16-20	15-20	N2/air
	10	5.0-6.0	6.0-8.0	14- 16	8.0-13	N2/air
	16	1.3- 1.8	1.8-2.5	2.0-3.0	5.0-7.0	N2/air
	20	0.8- 1.2	0.8- 1.5	1.5-2.2	2.0-3.5	N2/air
	30	0.3-0.5	0.4-0.6	0.5-0.8	0.8-1.0	N2/air
	35	0.25-0.3	0.3-0.4	0.4- 0.6	0.6- 0.7	N2/air
	40	0.2-0.25	0.2-0.3	0.3- 0.5	0.4-0.6	N2/air
	50	0.1-0.15	0.2-0.25	0.15-0.2	0.3-0.4	N2/air
	60			0.1-0.15	0.2-0.3	N2/air

Note: 1. Due to the difference in carbon content of materials, the cutting parameters are for reference only, and the actual material shall prevail.

2. The dark part means that the whole metal plate cannot be processed, but the sample can be cut, please be informed.



# COST BENEFIT ANALYSIS

## COST BENEFIT ANALYSIS ( SF3015H4 )

Items		12kW			15kW			20kW			30kW		
		Air	O2	N2	Air	O2	N2	Air	O2	N2	Air	O2	N2
Power consumption (peak power consumption)	Laser source(kW)	32			45.5			57			90		
	Water chiller power(kW)	18			27			28			35		
	Air compressor power(kW)	22	/	/	22	/	/	37	/	/	37	/	/
	Machine tool host (kW)	22	22	22	22	22	22	22	22	22	22	22	22
	Dust removal equipment(kW)	3	3	3	3	3	3	3	3	3	3	3	3
Consumables and gas consumption(RMB/H)		0.5	4.5	60.5	0.5	4.5	60.5	0.5	4.5	60.5	0.5	4.5	60.5
Total power(kW)		97	75	75	119.5	97.5	97.5	147	110	110	187	150	150
Total power consumption(kW/H)		58.2	45	45	71.7	58.5	58.5	88.2	66	66	112.2	90	90
Total operating cost (1RMB/kWh)		58.7	49.5	105.5	72.2	63	119	88.7	70.5	126.5	112.7	94.5	150.5

If the cutting auxiliary gas is compressed air that has been dried, the cost is the air compressor electricity consumption + machine tool electricity consumption + consumables (protective lenses and nozzles).

Note: 1. The electricity and gas prices listed above are for reference only and may vary from region to region.

2. The auxiliary gas consumption will be different when cutting plates of other thicknesses. The oxygen column takes 25mm carbon steel as an example, and the nitrogen column takes 1mm stainless steel as an example. The values are for reference only and are subject to actual use.



# ADVANTAGES OF LASER CUTTING

## ADVANTAGES OF LASER CUTTING

( SF3015H4 )

Items	Plasma cutting	Laser cutting	Laser cutting advantages
Positioning accuracy	0.4mm (especially 10m bed)	0.14mm (especially 10m bed)	High precision
Section taper	5mm (especially 40mm thick)	0.4mm (especially 40mm thick, 20kW and above)	No need for fine processing
Kerf	4-6.0mm	0.2-1.6mm	Save 6-9% of materials
Bleed and co-edge	10mm	3-4mm	Save 6-9% of materials
Heat affected zone	0.5-2.0mm	0.1-0.4mm	Less heat absorption, less deformation
Cutting effect	Average	Excellent, less slags	No need for sanding
Cutting speed	Average	Very fast	High production efficiency
Piercing	Can't cut small holes	Diameter-depth ratio of 10-20%	Save drilling and handling
Working environment	Smoky	Clean	Healthy and environmentally friendly



# CONFIGURATION LIST

## CONFIGURATION LIST ( SF3015H4 )

No.	Items	Quantity	Brands
	Laser source		
1	Laser source	1	Max photonics
	Laser cutting head		
1	Laser cutting head	1	BOCI
	Machine tool · host		
1	Transmission system	4	Taiwan LAPPING/SENFENG
2	Machine tool and accessories	1	SENFENG
3	Machine bed burn-proof parts	1	Graphite (optional refractory bricks)
4	Reducer	3	Japan SHIMPO
5	Electrical and pneumatic systems	1	France SCHNEIDER Japan SMC & Taiwan AirTAC
6	AC servo motor and driver	4	Japan Fuji Electric
7	Water chiller	1	HANLI
	CNC system		
1	CNC system	1	FSCUT P8000

Note: 1. This is the optimal configuration verified by our company. If you change the brand or configuration, it may cause irreversible effects. Please be aware of this.

2. The warranty period for the entire machine (excluding consumables, force majeure natural disasters, wars and violations, human damage, and other reasons) is 1 year.





# CUTTING SAMPLES

## CUTTING SAMPLES ( SF3015H4 )

# CUTTING SAMPLES





## LASER DEVICE SF3015H-LASER SOURCE

# LASER DEVICE

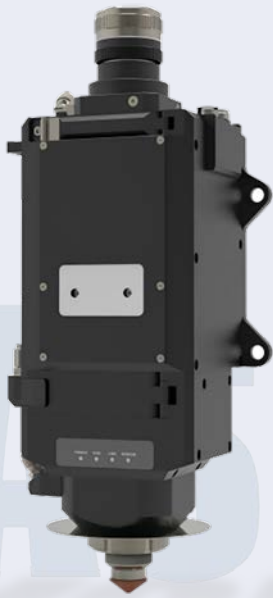
12kW~30kW optional

1. Small core diameter (50-300 $\mu$ m optional) and excellent beam quality
2. Efficient cutting
3. Power-saving, electro-optical conversion efficiency > 40%
4. Precise and controllable
5. Lightweight
6. Highly customizable
7. Smooth operation, safe and durable



# LASER HEAD

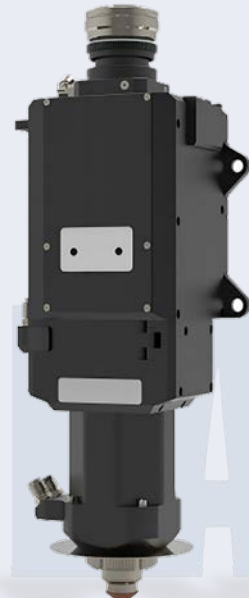
## SF3015H4-LASER HEAD



12kW-15kW



20kW



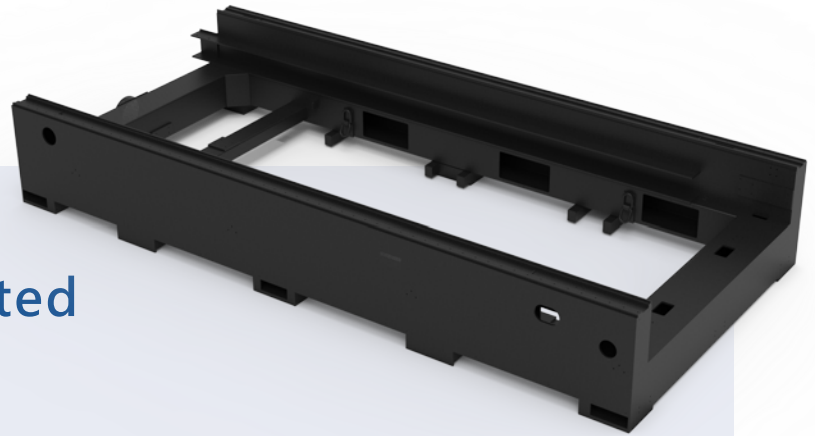
30kW

1. Cutting head anti-collision design. Customers can replace the anti-collision components themselves without replacing the cutting head, reducing the probability of returning to the factory.
2. Protective lens temperature monitoring. If the lens is contaminated, the system will immediately alarm and shut down to avoid damage to the cutting head, lenses, etc.
3. Real-time monitoring of the air pressure. If there is insufficient air/too small or unstable air pressure, the system will immediately alarm
4. Real-time detection of stray light value of lower protective lens against explosion. If the threshold is exceeded, it will alarm in time
5. Pan-seal failure detection. Real-time detection of gas pressure in the lower 1 and lower 2 protective lens cavities to ensure stable production
6. Process monitoring. If cutting is not complete, it will automatically cut back.
7. Intelligent perforation. Cut immediately after the hole is penetrated to improve efficiency and protect the machine tool
8. Intelligent knife retraction. The sensor automatically determines the knife retraction process to avoid cutting lumps and damage to the workpiece.
9. Co-edge perforation monitoring. When thermal deformation or misalignment of the plate is detected, the perforation procedure is automatically performed to increase the service life of the lens.



# MACHINE BED SYSTEM

## SF3015H4-MACHINE BED SYSTEM



### Heavy-duty heat-isolated hollow bed

Higher processing efficiency

#### Technology

Welding is followed by stress relief annealing, secondary aging treatment, and precision machining using a super large gantry milling machine to ensure sufficient structural stability and shock resistance of the bed body, allowing it to withstand high acceleration.

#### Feature

The bed body has no internal connections to prevent heat transfer and accuracy decrease during cutting and ensure long-term use without deformation, thus improving its service life.

### Aviation-grade high-strength aluminum beam

Strong structural stability  
Strong impact resistance



#### Technology

The beam is made of high-strength aviation-grade aluminum alloy and undergoes extrusion, quenching, heat aging treatment, and precision machining. It has excellent rigidity and surface quality and is corrosion-resistant, lightweight, high in rigidity, and has good toughness due to the properties of aluminum alloy.

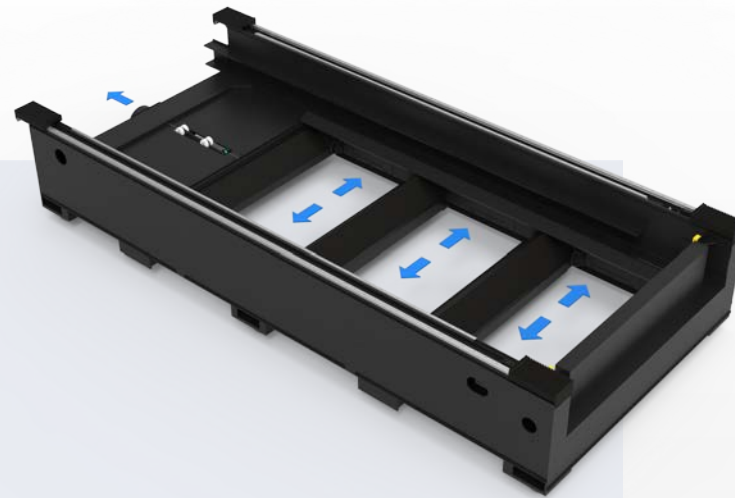
#### Feature

The internal structure is optimized through finite element analysis to ensure perfect dynamic performance during high-speed laser cutting. This allows for high-speed cutting of various shapes while maintaining accuracy.



# MACHINE BED SYSTEM

## SF3015H4-MACHINE BED SYSTEM



### Intelligent surrounding spiral negative pressure dust removal

Green and smart

#### Core

The dust removal system is designed to divide the cutting area into sections and exhaust in a time-sharing, zonal, and segmented manner according to the current cutting position.

#### Feature

It is also equipped with a sealed bottom structure to achieve smoke-free cutting.

### Pneumatic system

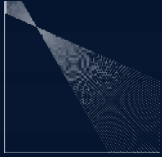
Precise control

#### Core

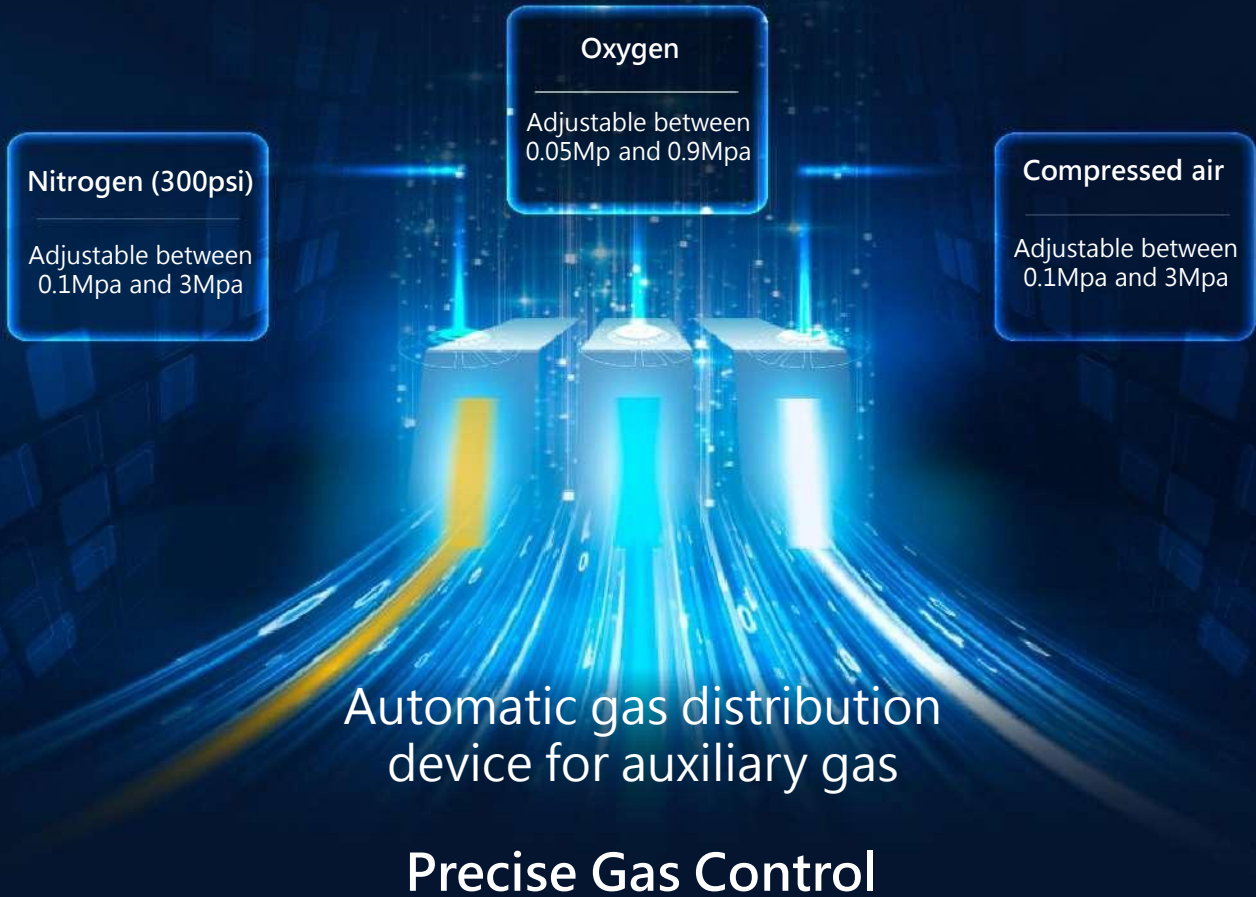
The gas system is equipped with well-known brands of SMC and AirTAC control valves and proportional regulating valves, which controls the pressure and flow of each gas through electricity.

#### Feature

Auxiliary cutting gases (O<sub>2</sub>, N<sub>2</sub>, compressed air etc.).



# AUTOMATIC GAS DISTRIBUTION DEVICE AUTOMATIC GAS DISTRIBUTION DEVICE



Equipped with two different gases, namely nitrogen (air) and oxygen. Each gas circuit can be individually controlled for flow and pressure.



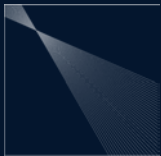
·The equipment software terminal is equipped with the function of automatically selecting auxiliary gas.



· The type and air pressure of the auxiliary gas can be automatically set and selected through the numerical control program without manual operation.



· The actual air pressure at the outlet of the cutting head can also be easily read and instantly displayed on the panel.



# NUMERICAL CONTROL SYSTEM SF3015H-NUMERICAL CONTROL SYSTEM



# FSCUT8000

## Storm Cutting System - FSCUT8000

### Convenient operation and efficient cutting

The FSCUT8000 high-end intelligent bus system is designed specifically for ultra-high-power laser cutting requirements of 8kW and above. It is stable, reliable, easy to deploy, simple to debug, safe to operate, well-featured, and superior in performance. This system supports modular, personalized, automated, and digital solutions. It is currently the most high-end bus laser cutting system on the market. It has a memory cache, a powerful cutting technology database, and cutting parameters for various thicknesses and plate materials, resulting in fast and efficient cutting.



- Support for native DXF, G-code, and other drawing formats for direct processing; high-speed read/write operations and processing of LXDS and NRP files generated by CypNest.



- Equipped with a cutting process parameter database, allowing real-time adjustment of parameters during cutting to achieve optimal cutting quality.



- Features like contactless perforation for thin sheets, lightning-fast perforation for thick plates, multi-stage perforation, slag removal, vibration suppression, closed-loop air pressure control, and fine process control through layer segmentation greatly enhance the efficiency and stability of high-power cutting.



- Optimize various rapid movement modes, with the "Leap Frog" function and automatic closure of auxiliary gas during non-cutting movements.



# NUMERICAL CONTROL SYSTEM SF3015H-NUMERICAL CONTROL SYSTEM



CypNest

Nesting Software - CypNest

## Automatic programming to improve utilization rate

The SF3015H CNC laser cutting machine is equipped with CypNest, a professional nesting software. It offers automatic programming, nesting, layout, text processing, and process configuration features, maximizing sheet metal management and utilization. The software has the following features:



- Lead-in, perforation, micro-joint, cutting sequence, optimized cutting path and optimized speed, etc.



- Fast, high-utility nesting algorithm reduces material waste. There is no upper limit to the number of nesting plates. Support automatic, manual and manual + automatic mixed nesting methods. Support automatic and manual nesting of special-shaped plates.



- Enable inter-part gap nesting, embedded nesting, symmetric flipping nesting, rotational nesting, and avoidance of shape overlapping and collisions, resulting in improved material utilization.



- Minimize tool travel and offer fast manual sorting options. It also provides multiple shared-edge toolpath generation modes for different scenarios.



- Co-edge segment cutting is implemented in CypNest software to optimize cutting efficiency and improve sheet metal utilization.



- CypNest software automatically applies different cutting processes based on user-defined material and thickness settings. This includes parameters like compensation radius, perforation time, cutting power, lead-in method, micro-joints, and bridging.



- It can generate various types of processing orders, quotation documents, and other statistical reports. It is fully compatible with the cutting processes of HypCut/CypCut.