Factory Smart

PENTA LASER

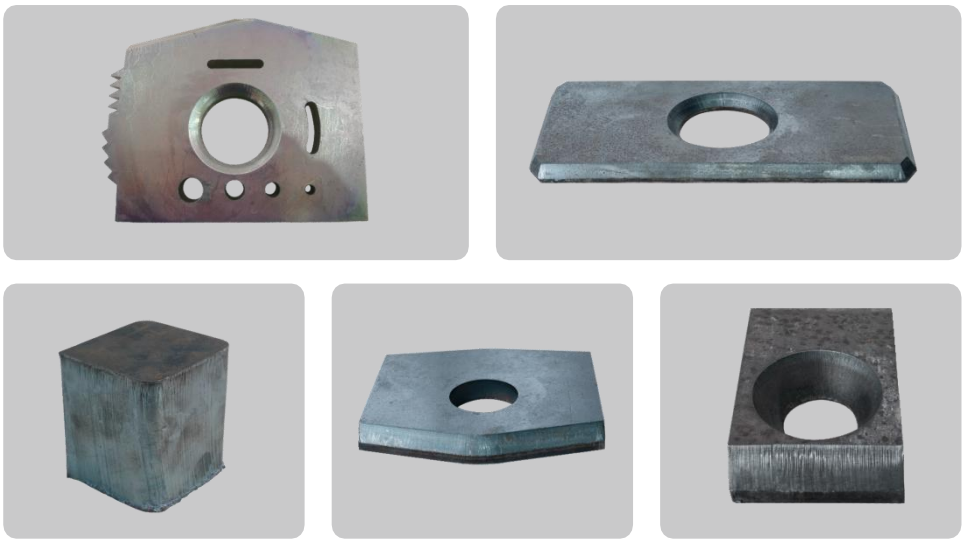
FIBER LASER CUTTING MACHINE
BULL V

USE

With the strong market demand for large equipment and large plate manufacturing, the traditional laser cutting machine is limited by the format, and the traditional flame and plasma cutting machine is limited by equipment stability, cutting efficiency, cutting accuracy, dust removal effect, etc., which has been unable to meet the higher production and manufacturing requirements. To solve these problems, and meet the needs of the market, reduce the use of costs, and the requirements of customer sites, we thereby launched the BULL V large format laser cutting machine.

BULLV-12035 specialized laser cutting machine is mainly used for sheet metal with a length not exceeding 12m and a width not exceeding3.5m (straight cut), and can handle various thicknesses of carbon steel, stainless steel, aluminum alloy, brass, copper etc. The ground rail of the machine adopts split extension technology, ensuring the accuracy of the entire section and the accuracy of the left and right structures, thereby ensuring the long travel distance cutting accuracy. The ground rail is completely separated from the worktable. The heat generated by cutting the plate will not cause deformation of the base, thus ensuring the cutting accuracy during high power long-term cutting. This machine has been largely applied in rail transit, shipbuilding, automotive, engineering machinery, agricultural and forestry machinery, electrical manufacturing, elevator manufacturing, household appliances, grain machinery, textile machinery, tool processing, petroleum machinery, food machinery, kitchenware and bathroom, decorative advertising, and advertising, various mechanical manufacturing and processing industries etc.

CUTTING SAMPLES



+27 (11) 397-6356 info@factorysmart.co.za factorysmart.co.za
Unit B1B Isando Business Park, C/O Hulley and Gewel Str, Kempton Park, 1619

TECHNICAL PARAMETERS AND CONFIGURATION DESCRIPTION

MAIN TECHNICAL PARAMETERS

Technical parameter		
Model	BULL V	
Power	6000W-60000W	
X-axis travel	12000mm to 60000mm	
Y axis travel	3500mm to 6000mm	
Accuracy of positioning of axis X (GB/T 17421.2-2023)	± 0.075mm	
Accuracy of positioning of axis Y (GB/T 17421.2-2023)	± 0.025mm	
Repeatability of positioning of axis X (GB/T 17421.2-2023)	± 0.035mm	
Repeatability of positioning of axis Y (GB/T 17421.2-2023)	± 0.015mm	
Rapid speed	110m/min	
Maximum Acceleration	8m/s²	
Bevel cutting (optional)	Type	Positive V bevel, reverse V bevel, positive Y bevel(root bevel), reverse Y bevel, X bevel, etc
	Angle	+45 degree to -45 degree continous variation or fixed angle cutting
	Method	Corner cutting using segmented or continuous single pierce bevel cutting method.

MAIN CONFIGURATION

Serial number	Main components	Brand
1	Laser source	MACPHOTONICS
2	Cutting head	Precitec
3	Z32 CNC system (inlcuding control software)	ELEN Group, Italy
4	X/Y/W axis rack	Gudel, Switzerland
5	Guide rail	THK
6	Reducer	Alpha, Germany
7	AC servo motor	Inovance,
8	Proportional control valve	Lanny, Germany
9	Laser cutting process database	ELEN Group, Italy
10	Nesting software	Lantek, Spain
11	Chiller	DVT, China
12	Dust collector	Donaldson/Topsinn
Optional		
1	Air compressor	Domestic match

2	Stabilizer	Domestic match

Note:
If the customer purchases the above devices themselves,they must purchase the specified brand and model.If the brand is changed arbitrarily,the customer is responsible for any impact on the overall performance of the machine.
The warranty period for Standard Auxiliary Systems provided by us is 1 year.
The connection of the air compressor should be installed by the customer themselves.

MAIN CONFIGURATION DESCRIPTION

LASER CUTTING HEAD

Adopting a fiber laser cutting head specifically designed for high power cutting, equipped with a non-contact capacitive height automatic tracking system, The cutting head can automatically adjust its heigh with the deformation of the workpiece, without affecting the cutting of the workpiece. Greatly improves the response speed and processing efficiency in the Z-axis direction.

CHARACTERISTIC

- High-performance Z-axis float function
- Including linear drive,cutting system,adjuster,and collimating unit
- Integrated non-contact capacitive sensor

- Compact appearance for easy space cutting
- Water cooled optical components and fiber optic sockets
- All water guiding components are made of stainless steel
- Integrated collimation unit

Project name	Technical parameters	Project name	Technical parameters
Cutting materials	MS,SS,AL,Brass, Copper etc	Auxiliary gas input	O2, AIR, N2
Cutting head	Capacitive height adjuster	Auxiliary gas output	CNC select gas type

INTRODUCTION TO EQUIPMENT CONFIGURATION

The base consists of ground rail, working table, gantry, ram, cooling system, pneumatic system, suction system.

MACHINE BASE

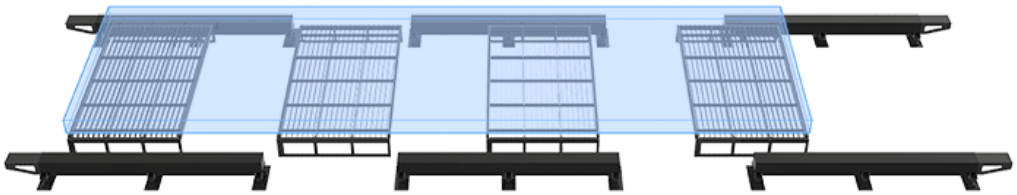
Based on the left and right separated ground rail structure, a rationalized ultra long extension technology is adopted, driven by high-precision linear guide rails and rack and pinion gears. The use of structural dynamic design principles and variable analysis techniques of finite element method in the design of ground rails has excellent dynamic and static characteristics. It adopts a frame structure welded with high-quality steel pipes, which has undergone welding and secondary aging treatment by professional large-scale OEM partners. These design and manufacturing methods ensure excellent seismic resistance, high rigidity, and stability.

BEAM

Original high stiffness lightweight beam structure. The ultimate scientific design reduces the weight of the moving part of the beam, so that the high-speed operation deformation is minimal, and high dynamic operation can be achieved.

WORKING TABLE

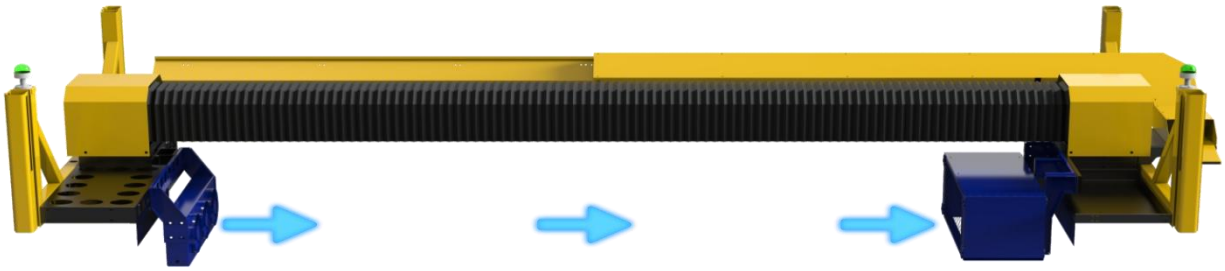
The worktable adopts an unique integrated frame structure with toothed plates, which can ensure the stability of the structure. The worktable adopts advanced design concepts, supporting the toothed plates to be directly subjected to force on the worktable frame until the pressure on the worktable is converted to the foundation. There will be no direct force acting on the board inside the worktable frame, resulting in long-term deformation of the internal structure of the worktable frame, laying the foundation for thick plate cutting. At the same time, the bottom of the worktable is equipped with adjustable shims to adjust the height and levelness of the worktable, thereby ensuring cutting accuracy. It can better block the burning of high-power lasers and is also easy to replace and maintain in the later stage. Adopting a modular toothed plate structure, the toothed plate module can be quickly removed for manual and regular dross cleaning.

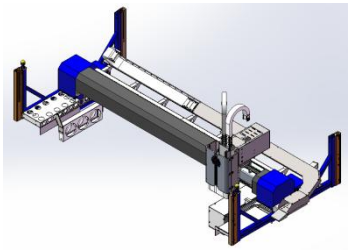


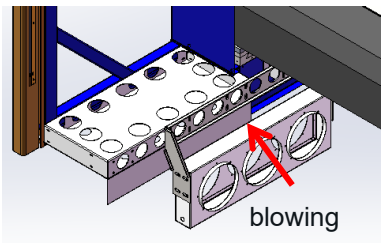
+27 (11) 397-6356 info@factorysmart.co.za factorysmart.co.za
Unit B1B Isando Business Park, C/O Hulley and Gewel Str, Kempton Park, 1619

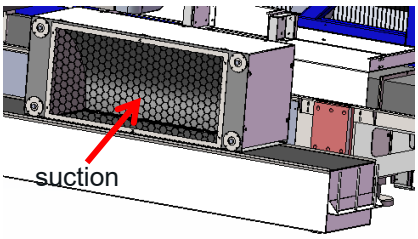
DUST REMOVAL SYSTEM

The application of adjust removal fan blowing while suction and a belt suction dust removal structure.



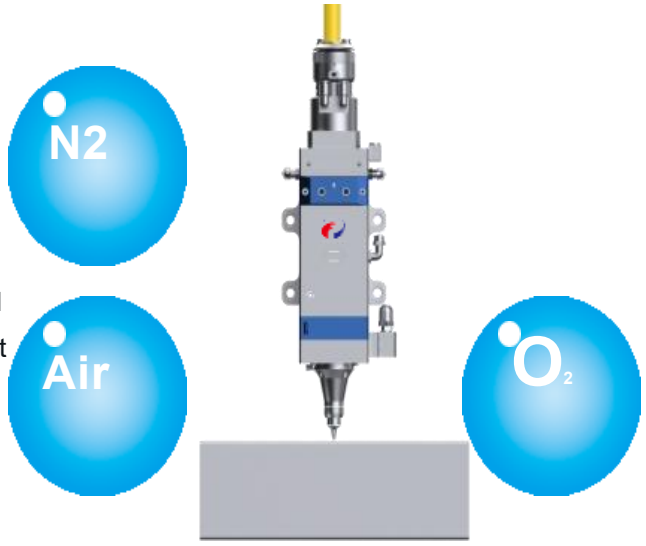






PNEUMATIC SYSTEM

Pneumatic system is divided into auxiliary cutting system and auxiliary control system. The auxiliary cutting system consists of three paths of gas, namely N2, O2 and Air, and can automatically select the gas and automatically adjust the air pressure according to the cutting material; and meanwhile, each gas path is provided with a pressure adjustment detection switch to prevent the cutting head and the optical fiber from being damaged due to continuous light emission when the gas is insufficient, so that the auxiliary cutting system is safe and reliable. The auxiliary control system mainly controls the action of the dust removal air door. The main components of the gas circuit are imported



+27 (11) 397-6356
info@factorysmart.co.za
factorysmart.co.za
Unit B1B Isando Business Park, C/O Hulley and Gewel Str, Kempton Park, 1619

or specially customized to ensure that the machine tool has the highest cutting performance and stable use qualitative.

LASER

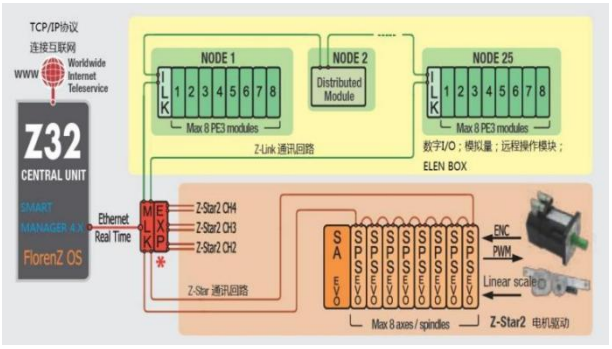
Laser With professional fibre laser, it has the following characteristics:

- The electro-optical conversion efficiency is up to 35% -40%, which greatly reduces the use cost.
- High stability greatly reduces the requirements for laser quality monitoring in operation.
- Long life, high precision, maintenance-free.
- In industrial applications, it is much superior to traditional lasers, which shows that it has
- the best wavelength and the best beam quality for metal processing.
- The semiconductor optical fiber is used as a laser generation medium, so that the laser generation gas is not needed, the method is environment-friendly, and the cost is low

CNC SYSTEM

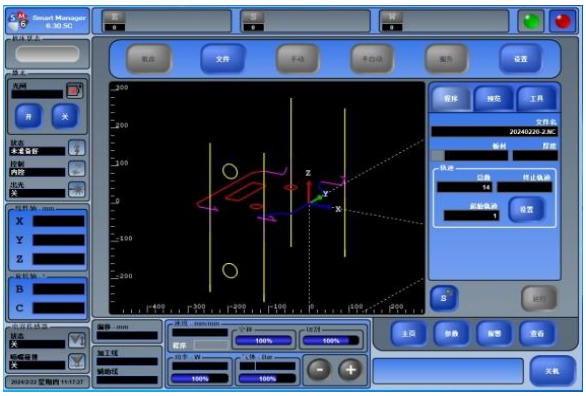
THE CONTROL SYSTEM IS ITALIAN Z32 BUS TYPE NUMERICAL CONTROL SYSTEM.

- New Z32 real time CNC system, with dynamic and geometric JERK control.
- The date exchange between CNC system and machine drive system is adopted with bus.
- 27〃 TFT with LCD.
- USB port, ethernet interface, can achieve remote assistance.
- Power modulation for the ultimate cutting quality in the corners.
- Z axis following to eliminate the influence of uneven plate.
- Automatically choosing gas type and pressure (N2, O2 and Air).
- Auto restart procedure.



OPERATING SYSTEM SMART MANAGER

Smart Manager is originally imported from Europe. This software is based on the Windows 10 system and can fully interface with Italy CNC system which original imported also. Therefore the real control of the machine, the laser source and software update is more convenient and faster



- Friendly interface, easy to learn and operation; easy to edit the numerical control program and high readability.
- Cutting parameters database is available, at the same time the real time adjustment to the cutting quality.
- Optimize various fast moving modes, have the function of frog jump and turn off the assisting

+27 (11) 397-6356
info@factorysmart.co.za
factorysmart.co.za
Unit B1B Isando Business Park, C/O Hulley and Gewel Str, Kempton Park, 1619

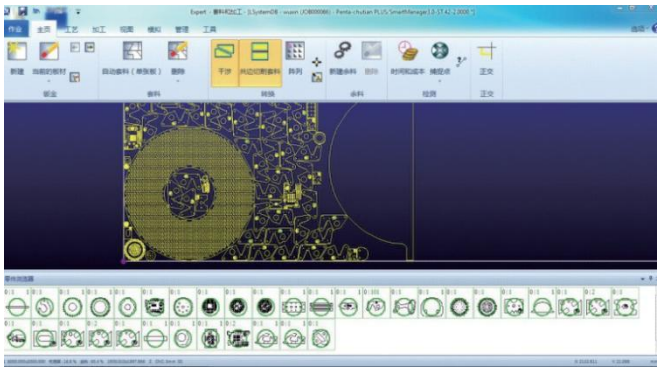
gas automatically when fast moving.

- Easier and faster in automatic edge-finding function.

PROFESSIONAL NESTING SOFTWARE

BULL V NC laser cutting machine is configured with the Spanish Lantek automatic nesting software for professional laser cutting, which has powerful functions such as automatic programming, nesting, layout, word processing, and process setting, and maximizes the management and utilization rate of sheet metal. Lantek nesting software has the following functions and features:

- Based on AUTO CAD/CAM automatic program nesting software and easy to use.
- Multilayer nesting functions to intensively increase the sheet usage rate
- Use divisional cutting path to avoid over heat.
- Parameter setting: automatically apply different cutting parameters to different materials and thickness based on customer's requirement.
- Edge-sharing cutting function optimizes the cutting efficiency and increase the sheet usage rate.
- Pre-perforation: Accomplish the pre-perforation as settled.
- Make use of the rest materials



AC SERVO MOTOR, DRIVER AND REDUCER

The machine tool adopts Inovance bus-type servo motor and drive, which has good precision, good dynamic performance and fast response, and ensures the machine tool to run stably with high precision.

+27 (11) 397-6356 info@factorysmart.co.za factorysmart.co.za
Unit B1B Isando Business Park, C/O Hulley and Gewel Str, Kempton Park, 1619