

Technical Solution

For Upgrade of CO2 Laser CNC Laser Cutting Machine to Fiber Laser Cutting Machine



About TA Laser

Wuhan TA Laser Machinery Co.,Ltd is an integration of a laser cutting machine manufacturer and industrial machinery trading company based in south central China, Wuhan city.

Wuhan TA is dedicated and committed to represent the highest quality in equipment and customer service.

Who we are

- An ambitious laser cutting machine manufacturer that enjoys a leaping growth over the past 6 continuous years.
- Laser cutting machine and parts exporter in China.
- Metal sheet processing machinery & parts international trading and exporting.
- Tech service provider, including machine installation, debugging, upgrading, maintenance, trouble-shooting.
- Technical upgrade of YAG Laser cutting to Fiber laser cutting, and Upgrade of CO2 Laser cutting to Fiber laser cutting.

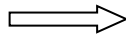
I General Introduction of Upgrade of CO2 Laser Cutting Machine to Fiber Cutting.

Company TA Laser develop this technology with an international partner. It replaces the CO2 laser source, CO2 cutting head and some components on the original machine, changing the original CO2 laser cutting to Fiber laser cutting, without modification on the CNC Controller and machine bed.

The advantage is that quickly completion the upgrade of the original equipment, while maintaining the original excellent dynamic performance, simple operation, convenient maintenance, so as to solve the problem of aging and maintenance of CO2 laser for users. With high maintenance cost, the old cutting machine is facing elimination and high investment cost of purchasing new equipment, and with new machine the clients will face problem of training for new CNC and operation interface.



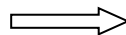
CO2 Laser Cutting head



Fiber Laser Cutting head



CO2 Laser Source



Fiber Laser Source+Chiller

II Problem of old CO2 Laser Cutting Machine.

1. CO2 Laser aging, high annual maintenance costs. Upgrade to Fiber laser cutting, can at least save maintenance costs of 5000USD per year. CO2 Laser has been almost end of life and spare parts are expensive. The turbine costs more than 30,000USD, the electron tubes costs around 2,000IUSD and thousands USD cost of lenses are needed. The glass tubes will be also aged.

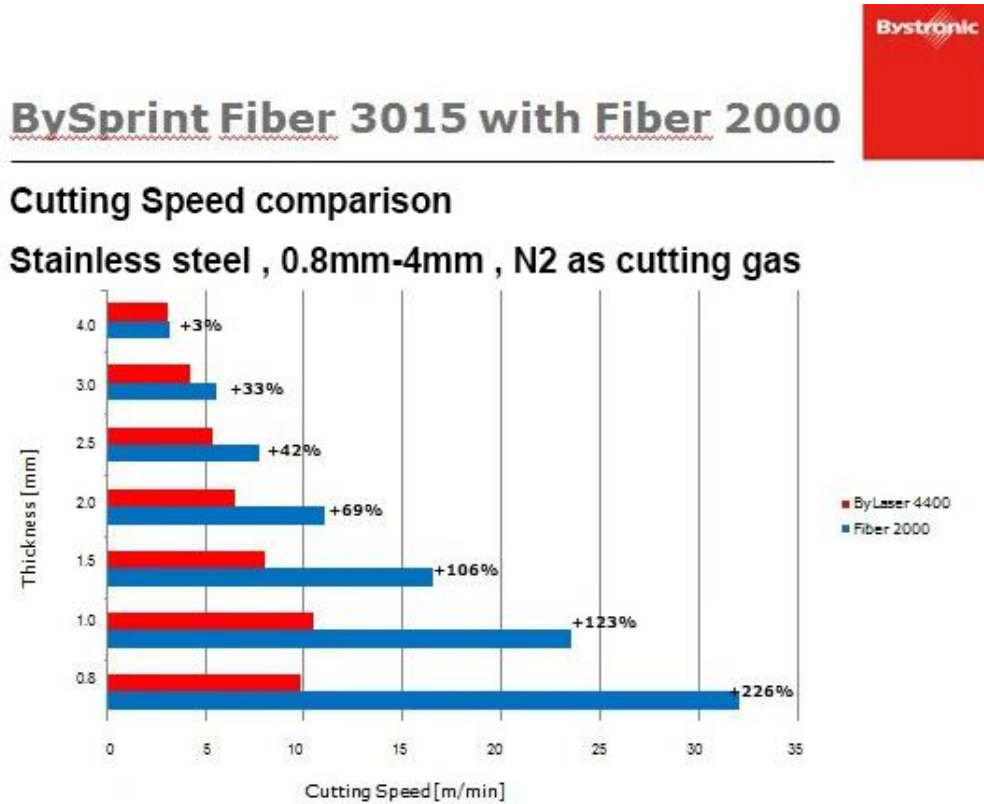
2. CO2 Laser cutting machine consumes high power, its efficiency is only 10-15%, and the optical fiber could reach 30%. It can save half of the electricity cost. The running cost of replacing 6000W CO2 is equivalent to 3000W. Fiber laser.

3. The running cost of CO2 laser cutting is higher. CO2 Laser belongs to gas laser. It needs to consume helium, nitrogen, carbon dioxide and other gases, more than 200USD of gas in a bottle, and two weeks consumes one bottle gas.

Comparison between CO2 Laser and Fiber Laser

CO2 (6000Watt)	Fiber (6000Watt)
Electrical consumption: more than 75 KW	30 KW
Laser gas consumption: Yes	No need
Consumables: complete lens and mirrors, nozzles and ceramic rings	Only protection lens, nozzles, and ceramic rings.
Assist Gas	Assist Gas
If Co2 laser cutting costs 101usd	Fiber laser cutting only costs 43 USD
Fiber Saves more than 100% costs to CO ₂ !	

4. After replacing the fiber laser, getting the higher power and cutting speed is faster.



III Our Advantages (Why use our Optical Fiber upgrade solution for Machines instead of Buying New Machines)

1. Bystronic is the second largest cutting machine company in the worldwide. The machine tool performance is excellent. Optical-mechanical-electrical is only too weak in the optical field. We are just filling the short-coming.

2. International cooperation and development of core technology, only laser replacement, maintaining the excellent performance of original machinery, electricity and software. Bystronic machine tool has good dynamic response, large output per unit time, convenient operation and good human-computer interaction.

3. Avoid spending a lot of money on new machines. Now the economic downturn is under great pressure. Enterprises invest cautiously to save costs and generally avoid large investments in new equipment.

4. Save the much work and time of machine installation, debugging and training, save time and reduce costs.

5. Combining with Wuhan Raycus laser source Company, we have mastered the core technology of the fiber laser source. The service of maintenance and upgrade is guaranteed for lifetime, and there is no worries about further cooperation.

6. Bystronic Laser Cutting CNC System and hardware platform are fixed, and the system after software rebooting and updating is more smooth and efficient.

7. A new Bystronic fiber machine costs about almost 600 thousand--1 million USD. Upgrading the existing CO2 machine costs less than 300 thousand USD, which is a much economic than new machine purchaser.

There are many Chinese laser cutting machines manufacturers, but many of them can not offer high power laser cutting, and if chooses wrong supplier, their machine tools can not use in long time and unstable. The cost is higher than upgrading. Instead of spending more money, it is better to improve the power of laser, cutting efficiency and quality is higher!

IV Our Service and Supplying

Configurations

Series	Components	Solution with IPG	Solution with Raycus	Note
	Laser Source	IPG 2000W-6000W	Raycus 2000W-6000W	
	Laser Cutting head	Raytool	Raytool	BM111/114S/115
	CNC Controller	TA6000	TA6000	
	Chiller	TongFei	TongFei	2000W-6000W
	Drag chain	Igus	Igus	Germany
	Spare parts for upgrade	Corresponding	Corresponding	
	1-year consumable parts	Lens, Nozzles, Ceramic ring.....	Lens, Nozzles, Ceramic ring.....	

Solution details

Main features of the upgraded fiber laser cutting machine

Innovative fiber lasers can achieve unprecedented efficiency and precision in cutting thin metal sheets

High-tech fiber technology combined with sophisticated mechanical systems

Fiber laser energy is high in energy efficiency, high in output, easy to operate, more economical and environmentally friendly.

2.1 Machine structure after upgrade (without change)

High-speed stable gantry structure, open operating space

The most convenient access to the machine working area

No need for clamping, automatic edge finding, automatic positioning, fast order processing

High quality, long-term stability and reliability, minimum maintenance

2.2 After the upgrade the drive system (without change)

AC servo disc motor is directly driven, no intermediate gearbox, high momentum, low inertia

High dynamic performance (acceleration), high precision, long-term stability and reliability

Closed drive system, centralized lubrication for long-term protection

2.3 Upgraded laser cutting head (Upgrade to fiber laser cutting head)

Best focal length suitable for cutting the work piece range

Non-contact automatic height tracking

Focal length automatic adjustment



Raytool BM111 For 2KW/3KW



Raytool BM114S For 4KW



Raytool BM115 For 6KW

2.4 Post-upgrade operation (**without change**)

Automatic operation

Manual operation: manual setting, cutting adjustment, restart, tracking cutting, material separation

You can choose a variety of restart methods after cutting interrupts, no need to waste time.

2.5 Upgraded CNC system ByVision (**Add TA6000 CNC Controller**)



We add this main CNC controller TA6000 to transfer the Bystronic main controller Signal to control the fiber laser source and fiber laser cutting, and the Bystronic operate software we still use the old, we do not change any, just use this CNC controller TA6000 to make the Bystronic operate software match the fiber laser source and fiber laser cutting head.

2.6 Add a set of water cooling system for fiber lasers source



2.7 Upgrade Laser fiber laser generator IPG/Raycus (2000W-6000W)

Raycus 2000W/3000W/4000W/6000W



IPG 2000W/3000W/4000W/6000W



High energy efficiency, low power consumption High-tech fiber laser technology, low operating cost (no laser gas required, low maintenance cost) Cuttable non-ferrous metals.

Warranty and Compromise.

---If upgrade with Raycus Laser source, then we offer 2 years warranty.

---Guarantee the excellent mechanical and electrical performance of the Bystronic cutting machine, and it can be used for another 10 years.

---The machine stays in the same place and does not require large-scale construction.

---The operator does not need to do the training after upgrading the equipment. The operation is exactly the same as before.

---Preparation in advance, and complete the whole installation and commissioning work within 2--3 days, even can work and finish in the weekend. No delay in production.