

Fiber-2000W laser cutting machine

| Scope of Supply | FOB Shanghai Price |
|--|--------------------|
| <ul style="list-style-type: none">1. Mechanical motion systems2. Working Table3. Control Systems4. Laser Source5. Chiller6. Laser Cutting Head, Height Following Sensor and Beam Delivery System7. CAD/CAM Software Package8. Auxiliary Gas Control9. Safety Facilities10. Auxiliary System11. Spare Parts List12. Installation, commissioning and Acceptance13. Training14. Documentation15. Warranty | 340700 USD |

Working area: 2000*4000 mm (78.8” x 157.5”)

Laser power Fiber 2000w IPG (made in Germany)

Cooling system : industrial water chiller (made in China)

Air compressor

Drying machine

Red point , auto focus, follow-up system

X axis , Y axis THK made (in japan)

2kw YASKAWA Servo motors and drivers from Japan

- # Imported Lenses and mirrors
- # Welded steel, heavy lathe frame closed shell
- # With German Precitec laser cutting head
- # Control system: FANUC Controller
- # WMH Herion linear square rail from German





Technical parameters:

| | | |
|-------------------------------|------------------------|--|
| Machine Model | | 2040-fiber-2000W |
| Cutting Area (Length X Width) | | 2 mx4 m, (78.8" x 157.5") |
| Laser Model | | Fiber laser IPG 2000W (Germany) |
| Laser Wavelength | | 1,070-1,080nm |
| Interface | | USB, RJ45 |
| X-Axis | Moving Speed | 150m/min |
| | Stroke | 3000mm |
| | Position Accuracy | 0.03mm, 0.0012" |
| | Repeatability Accuracy | 0.02mm , 0.0008" |
| | Resolution | 0.001mm , 0.0004" |

| | | |
|-------------------------|------------------------|----------|
| Y-Axis | Moving Speed | 150m/min |
| | Stroke | 1500mm |
| | Position Accuracy | 0.03mm |
| | Repeatability Accuracy | 0.02mm |
| | Resolution | 0.001mm |
| Z-Axis | Stroke | 150mm |
| | Resolution | 0.001mm |
| Continuous Working Time | | 24Hours |
| Maximum Load-Bearing | | 720Kg |

Exchangeable working table:

The processing area of working table is 2m x 4m with maximum capacity of up to 500kg each. fiber-2000W is designed with exchangeable working table mechanism that one table works on loading/unloading while the other one is on cutting; the tables swap automatically within 8 seconds as programmed without further manual adjustment after swapping. By adopting this method productivity could be leveraged by 30% - 50%.

Numerical control system:

2040-fiber-2000W is equipped with international standard **FANUC** control system and adopts industrial level bus Profibus to communicated with laser source, hand control unit and other related components

A.With hardware specification as below:

| | Item | Unit | Quantities | Specification |
|---|------------|------|------------|---------------|
| 1 | CNC system | Set | 1 | BECKHOFF C6XX |

| | | | | | |
|----|--|-------------------|-------|---|---------------------------------------|
| 2 | Numbers of linkage axis | Axis | 3 | X/Y/Z | |
| 3 | Operating system | Set | 1 | WINDOWS XP | |
| 4 | Centralized control system | Set | 1 | Centralized control of laser source and chiller | |
| 5 | CPU | Piece | 1 | 32bit | |
| 6 | Memory | | | 2G | |
| 7 | Standard mouse and keyboard | Set | 1 | Standard | |
| 8 | Network Interface Card Remote diagnostic service) | Piece | 1 | Built-in | |
| 9 | RJ45 Network interface | | 1 | Standard | |
| 10 | USB interface | Piece | 2 | USB2.0 | |
| 11 | CF card | Piece | 1 | 16G CF Card | |
| 12 | English interface | Set | 1 | | |
| 13 | Operating station | Display | Piece | 1 | 24" LED |
| | | Hand control unit | Piece | 1 | Resolution 0.1/0.01/0.001(switchable) |

B. With software features as below:

| | Function | Features |
|----|------------------------|--|
| 1 | Interpolation | Overall interpolation function on each axis; Cutting path compensation function; Linear/circular interpolation; Spline interpolation; Cutting positioning display; Coordinate positioning display; |
| 2 | Work piece graphics | Graphics scaling, mirroring and rotation |
| 3 | Advanced programming | Synchronous programming and processing, cycle PLC endpoint error checking, variable parameter programming, etc. |
| 4 | Sub-program | Sub-program nesting, sub-program adjustment, combination of PLC |
| 5 | Prediction correction | Operator can do prediction correction on cutting path and process profiled parts according to the actual graphic requirements. |
| 6 | Graphics library | A variety of standard graphics are stored |
| 7 | Processing database | Laser processing related database are available |
| 8 | Failure auto-diagnosis | Machine failures can be automatically indicated and displayed with detailed information. |
| 9 | Remote diagnosis | remote diagnose and configure machine |
| 10 | Operation monitoring | A full scale monitoring system is equipped |

| | | |
|----|-------------------------------------|---|
| 11 | Powerful graphical display function | All operating information including working status, parameters, alarming and error information are displayed on the screen, easy to operate, repair and |
| 12 | Access Control | A powerful password Biometrics has built for access control |

C. With dedicated CNC laser cutting functions as below:

| | Function | Description |
|---|--------------------------------|---|
| 1 | "Set Zero" | Pressing "SET ZERO" button, the machine will returns to origin set. |
| 2 | Speed control | Automatic control The NC program can automatically set the cutting speed according to the cutting material and material thickness. |
| | | Manual control with X-axis ranges from 0 -150,000 mm/min; Y-axis ranges from 0-150,000 mm/min. Real-time cutting speed will be displayed on the screen |
| 3 | Height control | Cutting head can be automatically set at the initial height position by pressing "Retract" button By pressing "Following on" button, height will be automatically controlled by the sensor |
| 4 | Red-light pointer | With the help of a built-in red-light pointer, the plate can be placed |
| 5 | 150mm automatic lifting stroke | Height of the cutting head can be adjusted automatically in dealing with different thickness of plates |

| | | |
|----|------------------------------|--|
| 6 | Zoom | Dimension of the workpiece can be zoomed in directions of both X-axis and Y-axis, which is easier for operator to modify the dimensions before programming |
| 7 | Security Mechanism | Manually "E-Stop" button at control panel and rear end of machine tool and machine beam |
| 8 | Auto edge detection | Automatic adjustment of plates to the right location |
| 9 | Micro-Connection | Guaranty a high finished products rate |
| 10 | Nozzle Self-cleaning | A self-cleaning mechanism for nozzles |
| 11 | Frog jump cutting | Frog jump cutting function improves cutting efficiency. |
| 13 | Auto location-recording | Improves working efficiency |
| 14 | Laser Power Slope-adjustment | Fast-response laser power slope-adjustment function to ensure corner-cutting quality. |
| 15 | Laser Piercing | Laser power slope-adjustment function to improve piercing quality. |
| 16 | Scanning laser piercing | High speed laser piercing without sacrificing cutting speed |
| 17 | Laser Cutting Database | Built-in and history cutting data is recorded for future reference |

Laser Source

Equipped with world leading IPG 2000W laser source, 2040-fiber-2000W has an edge on following items:

- No lens built inside laser generator to avoid maintenance
- Beam delivery system consists of fibers
- Compact-design, easy for integration
- Start-up time not needed
- Excellent cutting capability
- Good beam quality and high power density

| | |
|--------------------------------|-------------------------|
| Rated power | 2 0 0 0 |
| Minimum power adjustment | 1 % |
| Maximum modulation frequency | 1 0 K H z |
| Power fluctuations in long run | ± 2 % |
| Running mode | Continuous or modulated |
| Beam quality M2 | |
| Polarization state | |
| Stability of laser spot (urad) | |
| Voltage required | 380 60 V |
| Power consumption (W) | 8 |

| | |
|------|------------------------|
| Mode | Q Mode or D Mode |
|------|------------------------|

Chiller

To ensure sufficient cooling mechanism for key components such as laser resonator and cutting head is essential against proper running of the machine.

2040-fiber-2000W adopts constant temperature chillers to chill the system both accurately and stably.

The chillers boost comprehensive protection mechanism consists of over-temperature, phase-loss, over-pressure, water-shortage, low-voltage, overload, etc. The chiller has an advantage of

easy-maintenance and high-stability while accord with chilling indicators of laser machine.

Laser Cutting Head, Height Following Sensor and Beam Delivery System

2040-fiber-2000W adopts a laser-cutting head with 200mm focal length and non-contact automatic height sensing system.

International standard Precitec non-contact capacitive sensor is equipped to withstand a gas pressure over

25Mpa, which guarantees its accuracy and stability.

The beam delivery system is designed with non-mirror mechanism by using fiber transmission system thus leads to a maintenance free advantage.

CAD/CAM Software Package

- Convert the geometric information from CAD system (such as AutoCAD) into NC code. The off-line programming CAD/CAM can transfer NC code

generated to CNC system; DXF graph file can be automatically converted into NC program without manual programming. The generated NC code can be processed in the machine directly.

- The software simplifies the programming for complex components, it is also easy to modify while the component is displayed in the form of graph
 - Powerful nesting function
 - Edge-shared Cutting function
 - Micro-connection function
 - Software upgrade available
 - Data report
 - Auto nesting

Auxiliary Gas Control

N₂, O₂ and Air are auxiliary gases controlled by CNC system. Different cutting scenario requires different combination of gases, the system adjusts gas pressure and gas flow accordingly based on a pre-programmed Cutting Parameter Library. Farley designed a set of high-pressure pipeline that can withstand a pressure up to 25Kg/CM² to guarantee safety operating.

Safety Facilities

- Digital interlock and security facilities are installed to ensure safety operation of laser source.
- Dedicated security device for machine tool.
- Security systems for motion system.
- Areas around cutting table are protected by light curtain.

- Machine beam is equipped with a separate light curtain and a soft reflector.

Auxiliary System

- Extraction and dust removal device: An extraction and dust removal device is equipped right under the processing area in order to exhaust cutting emissions and metallic vapor
- Slag discharging device: A waste collection drawer at the bottom of working table for slag discharging.

Spare Parts List - (including consumable list) and Tool List

| S.N. | Item | Quantity | Specificatio n |
|------|-------------------------------------|----------|-------------------|
| 1 | Nozzles (single/double layer) | 3 ea. | 1.5/1.5mm |
| 2 | Nozzles (single/double layer) | 5 ea. | 2.0/1.8mm |
| 3 | Nozzles (single/double layer) | 5 ea. | 2.5/2.0mm |
| 4 | Nozzles (single/double layer) | 3 ea. | 3.0/2.5mm |
| 5 | Protection lens | 2 pcs. | 7.5 inch |
| 6 | Ceramic Ring | 1 pc. | Precitec |
| 7 | Laser protecting glass | 2 | |

Installation, Commissioning and Acceptance

Delivery and insurance is to customer's site. Supervision, working on machine

installation and commissioning comprise of:

Supply of one qualified technician for 7.5 hours per day for 10 man-days. Supervision and working with 1 of customers personnel for:

- Rail installation and assembly.
- Positioning of machine on the rail and adjusting the cam followers and drive pinions.
- Running the cables and connections from the services entry point to the laser system. Note: The customer is to supply these cables; Technician will supply cables from the laser source to the machine.
- Connecting the electrical cables and gas hoses to the services entry "panel" and the machine.

At the completion of the installation, the commissioning will commence. The machine will be considered accepted once the machine completes acceptance tests to following standard. At the completion of commissioning training will commence.

| No | Item | Contents | Notes |
|----|----------|--|---------------------------------|
| 1 | Time | After installation and commissioning | |
| 2 | Location | Customer's site | |
| 3 | Contents | Machine appearance; Function Demonstration In accordance with the product specifications and technical proposal | Including spare parts and tools |

| | | | | |
|--|--|----------------|---------------------------------------|--|
| | | Sample Cutting | In accordance with technical proposal | |
|--|--|----------------|---------------------------------------|--|

Training

At the completion of commissioning technician will commence training on the machine. Training duration of up to a maximum of 3 days is provided. This will be needed depending on the prior knowledge of the trainees. The customer will provide sufficient material and consumables to be able to complete this task.

Training comprises of :

1. Introduction to the machine
2. Control features and operation
3. Machine maintenance and adjustment
4. Supervised running of the machine

Documentation

1. One set of mechanical assembly drawings complete with bills of material including the OEM's name & part number.
2. Electrical schematic diagram of laser cutting machine
3. Operation and Maintenance Manual
4. Operating Manual of CNC control system
5. Auxiliary Equipment Brochure
6. Outgoing Certificate

Terms, Delivery and Payment

Prices shown in this quotation supersede all previous offers, either written or verbal.

The quoted prices exclude any value added or goods and services tax. Such tax, if due, is payable by the customer on arrival of the machine at the port.

If, while on site, the Technicians' schedule is delayed due to circumstances beyond their control, such as site not ready, craneage not available, services not ready, power failure, machine breakdown, etc. the customer will pay the time lost due to the delay at A\$950/day/man plus costs.

This quotation is valid for 30 days from receipt of quotation. Prices will be held firm from date of order.

Delivery is approximately 9 weeks, based upon current work loading. Firm date will be organized upon receipt of order and deposit.

Delivery includes packing, insurance and freight from our store to customer's premises. The customer must provide insurance, on the full value of the machine prior to unloading.

Delivery does not include unloading at customer site. The customer is to supply suitable craneage at installation site.

Payment terms lies as Following:

- 50% Deposit with order
- 40% Upon shipping after completion of testing in our factory
- 10% on completion of commissioning but not later than 45 days from delivery to customers plant

Where the customer delays the delivery or commissioning, the payments will still be due on the dates these if actions would have taken place had there been no delay. Any expenses incurred as a result will be chargeable to the customer.

Warranty

Machine hardware is guaranteed from time of commissioning for a period of 24 months whichever comes first. This guarantee covers all parts and labor under normal and proper use. The delivery of new parts is at Customer's expense.

Customers are expected to perform simple replacements to ensure minimum possible downtime.

This warranty does not cover compensation for loss of profit, loss of production or for any damage incurred by misuse.

Due to continual improvements in performance and/or manufacturing techniques, reserved the right to make any design changes in the machine, or machine control equipment, program systems hardware or software.

Customer Responsibility

- a. Gases, Air and Electrical supplies to be available or connection to the machine at nominated points. We will supply a detailed layout drawing and service supply specifications within 28 days from receipt of order.
- b. Customer to ensure that all the services, as described in the customer supply services requirements, are available at the services entry point prior to the commencement of the installation. Allowable power and gas variation at the services entry point is +/- 5%.
- c. Supply of labor, crantage and insurance to unload machine.
- d. Customer is to ensure that the site is clear prior to commencement of the installation and to provide crantage when required by the supervisor.
- e. Supply one electrical fitter for the extent of the installation. It is preferred to have these personnel from the maintenance department.
- f. Customer is to ensure that the nominated personnel are available at all times during the installation. Supply of plate for commissioning tests and machine alignment.
- h. Weatherproof building, as warranty will become void if machine is subject to the elements.
- i. Suitable concrete floor with sufficient support to ensure that the machine alignment can be maintained over a long period and the track and worktable can be leveled within 1mm per meter over the total length of the rail assembly. standard rails can only compensate for a floor level within 25mm over total rail length. Extra work incurred by us from floors exceeding 25mm

of variation may be charged to the customer.

- j. Overhead caterpillar support structure is customer's responsibility.
- k. Bolting of steel installation plates to factory floor prior to machine arriving.

Appendix

Equipment Working Environment

| S. N | Sub item | Item | Requirement | Marks |
|------|----------|------------------------------|-------------|---|
| 1 | Power | Laser | 5KVA | Total installed capacity no less than 40KVA |
| | | Chiller | 5KVA | |
| | | Machine tool | 20KVA | |
| | | Other accessories | 10KVA | |
| | | Stability of 3-phase | 380V±5% | |
| | | Instability of 3-phase power | <2.5% | |



