

Security information

Before using this product, please read and understand this user manual and familiarize yourself with the information we provide to you. This user manual provides important product operation, safety and other information for you and all future users to refer to. To ensure operational safety and optimal product performance, please follow the following precautions and warnings, as well as other information in this manual.

This series of fiber lasers is a Class IV laser product. This series of lasers emits no less than 10W of laser radiation in the 1940 ± 2nm wavelength range. Avoid eye and skin exposure to radiation directly emitted or scattered by the light output.

Do not directly look at the output head, and ensure that you wear laser protective glasses for a long time when operating the machine.

The light emitted by this laser is invisible light, do not put the laser output head towards someone when using, please wear laser protective glasses when the laser is working.

Please do not open the machine, as there are no product parts or accessories available to the user. All maintenance or repairs must be returned to the company.

This series of lasers is a Class IV laser: direct laser irradiation will certainly cause irreparable damage to the eyes, but also cause skin burns and burned items, in some cases the laser's reflected light and scattered light can also cause eye damage and skin burns.

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1.

I. Laser parameter

NO. 1	Project	Text condition	TMFL-10W	TMFL-30W	Unit
1	(P_{nom}) Maximum Average Power Output (Pnom)		> 10	> 30	W
2	Output center wavelength	$P_{out}=P_{nom}$	1940 ± 2		nm
3	Output linewidth	FWHM $P_{out}=P_{nom}$	<1		nm
4	Polarization		Random		
5	Resistance to high reflection (light isolator)		no		
6	Power regulation range		0-100%		
7	Power instability	$P_{out}=P_{nom}$	<5%		
8	Output mode		Collimator output		
9	Output beam diameter	$P_{out}=P_{nom}$ $1/e^2$	5 ± 0.5		mm
10	Output fiber length		5		m
11	(DC)		24±1		V

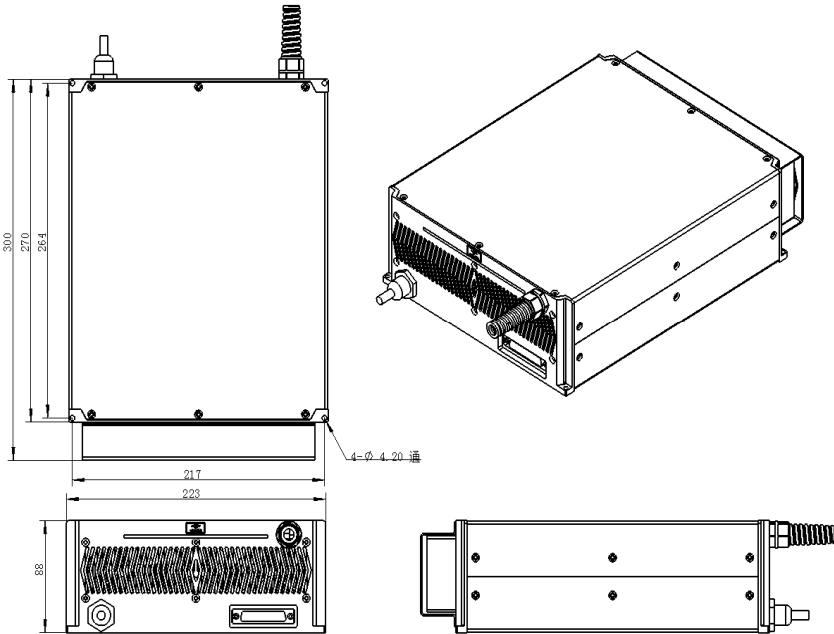
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1940 Fiber laser product user manual

	Operating voltage (DC)			
12	Output beam offset		1	mrad
13	Power consumption (W)	$P_{out}=P_{nom}$ $T=20^{\circ}\text{C}$	<120	<300 W
14	Operating ambient temperature		10-30	$^{\circ}\text{C}$
15	Module dimensions W x D x H		300 x 223 x 88	mm
16	Output collimator outside diameter		14 ± 0.1	mm
17	Outer diameter of armored cable		6.2 ± 0.5	mm
18	Cooling mode		Air cooling	

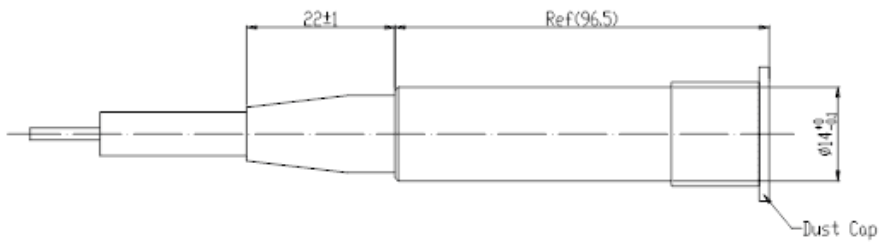
2.

II. Dimensions and mounting holes of the laser

Laser shell dimensions and mounting holes

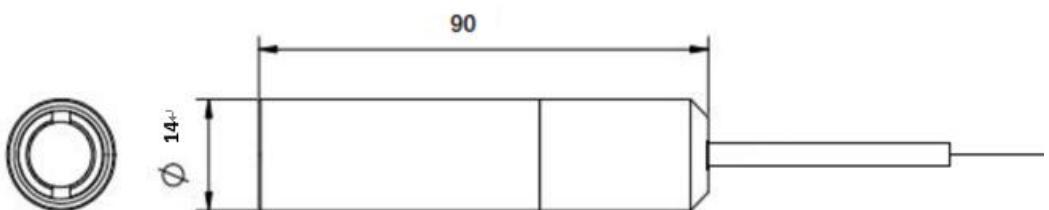


10W



Unit in mm

30W



3.

III. Product installation

Product transportation and installation:

I). The output fiber of the laser is a very sensitive and critical component, the laser must ensure that the bending radius of the output fiber is not less than 15cm during installation, transportation, packaging and working state, otherwise it is easy to damage the laser. At the same time, the tail and root of the laser output fiber should also be careful not to bend, otherwise it will damage the laser. If the laser needs to be returned to the factory, it is recommended to use the original packaging material. If the original packaging material is not available, both the laser and the output light isolator need to be packed with a suitable flexible material to avoid damage to the laser by transportation vibration.

II). Fix the laser module reliably on the support, and ensure that there is enough space in the laser ventilation direction to ensure air circulation.

III). Connect the power cable to the 24V DC power supply and ensure that the DC power supply provides sufficient output power. Note the polarity of the power cord. The brown cable is positive, the blue cable is negative, and the yellow and green cables are connected to the protection ground.

IV). Ensure that the control interface of the external controller matches the laser, connect the control cable to the laser control interface, and secure it reliably.

I). The main power supply (24VDC) must be able to provide continuous operating current (refer to the maximum current loss in the laser parameters). The power supply shall maintain a stable voltage and ensure that it is within the specifications. If the fluctuation of the power supply voltage exceeds the specification range, it will cause the laser to work unstable, and the instantaneous load change rate of the power supply should be noted that an appropriate power supply type should be selected.

II). Connect the main power supply of the laser, and the length and cross section of the power cord with the laser can ignore the voltage drop (especially the peak current loss).

III). The 24VDC main power supply must have a suspension output, and its return line can only be connected to the laser's power line (blue). A faulty connection may result in an inability to form a current loop.

IV). The laser ground (DB25 Pin10-15, 24) and 24VDC return cables (blue) are connected to the inside of the laser. The external interfaces of the laser cannot be connected.

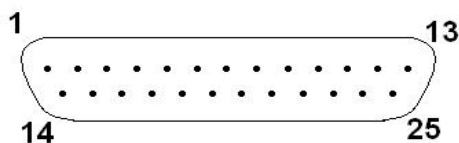
V).
The common ground inside the laser is connected to the laser housing by a 470 ohm resistor and 47nf capacitor in parallel. This network is used to balance the pressure difference between the ground and the laser housing.

VI).
The grounding of the control card may be connected to the ground according to the design; If no, the ground of the control circuit is suspended, indicating that the blue and yellow green wires of the 24VDC power cable of the laser are not connected.

IV. Control interface

IV.I The DB-25 behind the laser is the interface between the control system (such as the marking machine) and the laser system. Make sure the connection is reliable before working. Each pin is defined as follows:

DB-25 port
EKOU25



In order to meet the needs of more customers, the company has designed two control methods for this series of lasers, one is the power control through analog signal control, the other is the power control through digital signal control, the two control methods are not compatible, the customer needs to choose one of the two, the specific control pin definition is as follows:

(I) Digital signal control:

PIN #	Content
1-8	Laser power Settings: LSB(D0) corresponds to Pin1, MSB(D7) corresponds to Pin8 - 00H: indicates the minimum output power - 01H - FFH: indicates the maximum output power - Not connected or not used, comparable to OOH
10-15	(GND)

	Ground connection
16	Alarm feedback signal- L level (normal operation)
19	Laser on/off input pin H level: Laser starts running (can only be turned on at 18 pin H level) L level or No connection: The laser stops running
21	Alarm feedback signal- H level (normal operation)
22	Red light input H level: ON(red light on)- L level or no connection: OFF (red light off)
23	-H level (normal operation) -L level or no connection: STOP (laser prohibited)
Other pins	Not in use

Set the signal of pins 1 to 8, through the combination of signals to set the current of the pumped laser diode, that is, the output power of the laser, you can set the code in the range of 0 to 255 through pins 1 to 8, corresponding to 0 to 100% of the power output (the actual optical power output may not be completely linear with these Settings). For example:

	Setting 1	Setting 2	Setting 3	Setting 4	Setting 5
Pin 1	0	0	0	0	1
Pin 2	0	0	0	0	1
Pin 3	0	0	0	0	1
Pin 4	0	0	0	0	1
Pin 5	0	0	0	1	1
Pin 6	0	0	1	1	1
Pin 7	0	1	1	1	1
Pin 8	1	1	1	1	1
Electrical current	50%	75%	87.5%	93.75%	100%

(II) Analog signal control:

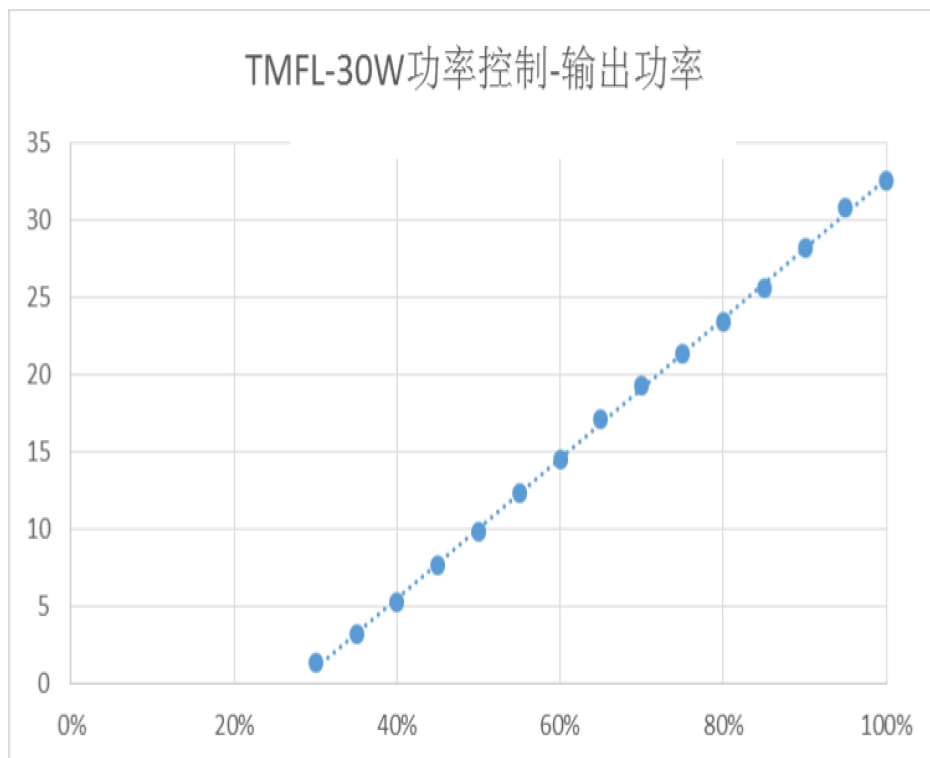
Pin	Introduction
1	Power signal (0-5V for 0%-100%)
15	GND
19	Laser switching signal (H level on)
22	Indicating red light signal (H level on)

Note: >3.3V indicates the high level. You are advised to set it to about 5V

Note : Due to the current threshold of the pump source in the laser, the set power of the laser is not synchronized with the actual output power, as shown in the figure below, about 25% of the light begins to be emitted, and then it increases approximately linearly to the

full power.

TEMF-30W Power control-output



Other models are similar, but the initial light point is not in the same location

V. Use safety and precautions

I. When using the laser, the ground wire should be reliably grounded and the power supply with a nominal voltage ($24V \pm 1V$ DC) should be used.

II. When installing the laser, ensure that the laser is turned off. When testing and using, do not point the laser output head at a human.

III. The output head of the laser is connected to the optical cable, please handle the output head carefully when using, do not touch the output lens, to prevent dust or other pollution, please use a special lens paper when cleaning the output lens. When the laser is not installed on the system device and does not produce light, cover the optical isolator protective cover to avoid dust pollution.

IV. There are no built-in parts available for use, all maintenance should be carried out by qualified joint product technicians, in order to prevent electric shock, please do not damage the label and remove the lid, otherwise any damage to the product will not be guaranteed.

V. Do not expose the laser to high humidity.

VI. There are three cooling fans at the tail end of the laser, and at least 10cm ventilation space is left in the ventilation direction of the front and back of the laser; The cabinet where the laser is installed must be well ventilated. If the cabinet where the laser is installed is equipped with a cooling fan, ensure that the air flow direction of the fan in the cabinet is different from that of the laser.

VII. Do not look directly at the output head; When operating the machine, ensure that the laser safety eye is worn for a long time.

VIII. Power interruption in operation is very harmful to the laser, please provide continuous power supply.

VI. Laser use and operation

VI. I Preliminary inspection

I) Check whether the appearance of the laser is abnormal, and whether the output fiber is bent or fallen off.

II)

Check whether the signal line between the marking machine and the laser is connected

properly.

III) 3) Check whether the 24V power cable is correctly connected (the positive terminal is connected to the brown wire, the negative terminal is connected to the blue wire, and the ground cable is connected to the yellow and green wire).

Ensure that the terminal is fully in contact with the switching power supply.

VI. II Laser operation flow

I. Remove the protective cover from the laser output head.

II. 2. Connect the laser module to the control system through DB-25 ports. For details about pin connections, see Pin definitions. At this time, it is not up to standard, and the pin is initialized to Pin19 at L level (digital signal control mode).III.

The laser can start working 10 seconds after receiving 24DC power supply (warm-up time).IV. Set the laser power and PWM signal by software.V.

The switch of the laser is controlled by the H/L level of Pin19, and the power of the amplifier is controlled by Pin1-8.

VI. After one operation is complete, turn off the laser(set Pin19 to low level).

VII. Usage and storage environment

Operating environment: +10°C~+30°C, 10% ~ 80% relative humidity.

- Storage environment: -10°C to 60 °C, 10% to 95% relative humidity.

VIII. Quality assurance

For products that fail due to materials and production processes during the warranty period, our company has the right to reasonably choose products for repair or replacement. The repair or replacement of all products within the warranty period is still subject to the remaining warranty period of the original product.

VIII.II Warranty limitation

Products, parts or equipment are not covered under warranty if:

Damage to the product and its components (including optical fiber) caused by tampering, opening, disassembling, misloading and improvement caused by Non-company personnel;

Damage caused by misuse, negligence or accident ;

Due to use outside the scope of product specifications and technical requirement

Damage caused by incorrect installation and maintenance, abuse or failure to follow the information and warnings in the user manual: The customer is responsible for understanding and following the instructions in the user manual and operating specifications, and the damage caused by wrong operation is not covered by the warranty.

The warranty, which the buyer must request in writing within 31 days from the date of discovery of the product problem, does not cover third parties, including the Buyer, end user or customer as specified, nor does it cover parts, equipment or other products not manufactured in conjunction with the product.

VIII. III Service and maintenance



Note: There are no built-in parts for user maintenance, all maintenance should be carried out by the joint personnel. All requests for repair or replacement under warranty must be notified to our company personnel as soon as a problem is discovered. Approved returned items must be stored in appropriate containers. If any damage is found upon receipt of the goods, it shall promptly notify the carrier in writing.

No third party (including the purchasing user or customer) has been granted the right to repair parts, equipment and other products of Super Laser.

IX. Common troubleshooting methods

I. The main inspection and solution of laser no light

- a. Check whether the emergency stop switch of the whole device is normal;
- b. Check whether the 24V power supply cable of the laser is correctly connected.
- c. Check whether the DB-25 serial port of the laser is connected correctly according to the connection definition, and whether the control card has a high level signal that triggers the laser to emit light;
- d. Check whether the software Settings are correct.

II. The main causes and treatment measures of laser power reduction

- a. Check whether the power supply is stable and whether the current reaches the rated working current;
- b. Check whether the mirror of the timely output head of the laser is polluted. If there is pollution, the cotton swab can be dipped in anhydrous ethanol to wipe gently, and do not scratch the mask layer of the mirror;
- c. Check whether other optical lenses of the whole equipment are polluted; Such as red light and beam mirror, galvanometer lens, field mirror;b .
The power attenuation of the laser after 20,000 hours is a normal power loss.