

YDFLP-20-M8

User Manual

V02

Security Information

Before using this product, please read this user manual carefully.

In this user manual, we provide you with important product safety operation specifications and other reference information. In order to ensure your personal safety when operating this product, and to achieve the best performance of this product, please follow the following precautions and warnings and other relevant operating specifications in this manual during operation.

- Before connecting the power supply, please check whether the adapter and the power supply voltage are connected correctly and make sure that it is correct before powering on. Incorrect connection of the power supply may cause damage to the laser.
- Please do not disassemble this equipment without permission. All maintenance and maintenance can only be carried out within JPT. The upgrading work can be carried out on site by technical support personnel. If the device is opened without permission, the damage caused will not be covered by the warranty.。
- The output wavelength of this equipment is 1064nm (invisible light), and the average output power is more than 20W (peak power is more than 10KW). It is a Class IV laser, which is not only harmful to the eyes, but also burns the skin, its reflection and
Scattered light may also cause harm to the human body, so please wear OD4+ and above laser protective glasses during use (see Figure 1 for details).

- **Attention: Even when working at 0% power setting, there will still be an average power of about 100mW at the output of the isolator laser output.**

Table 1 Laser safety label



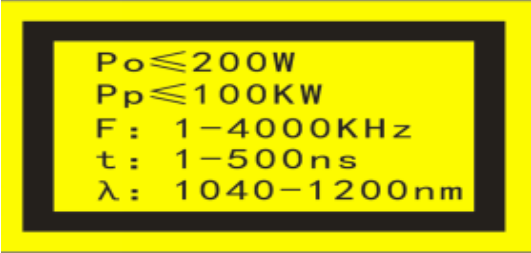
Label Image	Label Information
	<p>Laser label (located on the upper cover of the laser near the output end)</p>
	<p>Use warning (located on the laser cover)</p>
	<p>Parameter information (located on the laser cover)</p>



Figure 1 Laser protective glasses

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1. Product Description

1.1 Product Description

The JPT pulsed fiber laser adopts the MOPA (Master Oscillator Power Amplifier) structure. The main oscillation uses a semiconductor laser as the seed source, and the power amplification is achieved through a traveling wave fiber amplifier. This MOPA fiber laser has the characteristics of independent and adjustable frequency, and can still maintain a high and stable peak power output under the condition of changing the frequency, providing an ideal light source for industrial laser marking and other applications.

This type of fiber laser is pumped by fiber-coupled output semiconductor laser, which has higher energy conversion efficiency; and the laser adopts an air-cooled system, which has a more compact heat dissipation structure, smaller size and more portable; and an integrated all-fiber design, so that the system is free of maintenance and convenient for customers to use.

This type of fiber laser comes with a power adapter, please use 100-240V AC power supply, built-in universal golden orange marking control card, you can use the universal USB Type-C interface to connect to the golden orange software, with good compatibility. Compared with similar products, JPT pulsed fiber laser can adjust the pulse frequency within a certain range, and can maintain a stable high peak power output, which is particularly advantageous in high-speed marking applications.

The following picture is the physical picture of JPT pulse fiber laser (the specific appearance is subject to the actual shipment of JPT):



Figure 2 Physical image of YDFLP-20-M8 laser

1.2 Configuration list

Please refer to the included list according to Table 2 (different models have different configurations, subject to actual shipment)

Table 2 Fiber laser configuration list

Project	Quantity
fiber-optic laser	1 set
Power Adapter	1 piece
power cable	1
F163 field lens (M55)	1 piece
USB Type-C data cable	1 piece
Measured parameter table	1 piece
configuration list	1 piece
Note table	1 serving

1.3 Use environment requirements and precautions

- 1) If the fiber laser is not used in the method specified in this manual, the reliability and service life of this product may be reduced. Therefore, please read the following requirements and precautions carefully, and refer to the relevant specifications when using it.
- 2) This laser comes with a power adapter, please use **100-240V AC** power supply, **connecting the power supply incorrectly may cause the laser to malfunction and fail to work!**
- 3) A ventilation distance of about 10cm should be left at the air inlet and outlet positions of the laser, and the direction of the air duct of the laser should be consistent with the direction of the air duct of the system. **Insufficient ventilation distance and wrong direction of the air duct may cause the laser to malfunction and fail to work!**
- 4) The operating environment temperature range of the fiber laser is 0~40°C, if it exceeds this range, it may cause the internal alarm of the system. The recommended operating temperature range of the laser is 10~30°C, and good heat dissipation helps to extend the working life of the laser;

***Special Note:** The ambient temperature of pulse width with * in Table 5 is 10°C-35°C. In order to ensure that the laser can still operate stably under the optimal parameters, the system sets the ambient temperature for the normal operation of the laser with pulse width of 250ns and above as 10°C -35°C, the program defaults that the laser will stop emitting light and give an alarm if it is not within this temperature range, indicating that the red light will flash.

- 5) The laser requires high environmental cleanliness. Please handle the collimated output isolator carefully when using or moving the laser to prevent dust or other pollution. When the laser is not working, please cover the output port of the isolator with a protective cover. **Dust on the output end face of the isolator may cause the lens to heat up and be damaged, thereby causing the laser output power to attenuate;**
- 6) Check before installing/disassembling the laser to ensure that the laser is in a power-off state;
- 7) Do not look directly at the laser output head. **It is recommended to wear laser protective glasses during the operation!**
- 8) YDFLP-20-M8 model laser pulse width is 1-350n. If you need other pulse width modes, please contact the manufacturer for customization.

1.4 YDFLP series naming rules

Table 3 Naming rules for pulsed lasers
YDFLP – X – XX – XX – X – X

- | | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
- 1、 Basic product attributes: Ytterbium pulsed fiber laser (YDFLP)
 - 2、 product type
 - 3、 Output Power
 - 4、 Pulse characteristics: M series, adjustable pulse width
LP series, fixed pulse width
 - 5、 Fiber properties: S: single-mode fiber, $M^2 < 1.4$
L: Few-mode fiber, $M^2 < 1.8$ H: Multi-mode fiber, $M^2 > 2.5$
 - 6、 Additional features: R: built-in red light

For example: YDFLP-E-20-M7-S-R: Average power is 20W, E version M7 adjustable pulse width series, single-mode fiber, built-in red laser.

YDFLP-200-M7-H-R: The average power is 200W, M7 adjustable pulse width series, multi-mode fiber, built-in red laser.

1.5 Technical parameter

Table 4 YDFLP-20-M8 Laser parameter index

JPT M8 20W	
M ² (typical value)	1.4
Average output power	>20 W
Maximum pulse energy	1.1 mJ
Frequency adjustable range	1-4000 kHz
Full power frequency range	18-4000 kHz
Pulse Width	1-350 ns
Output power instability	<5 %
Cooling method	Air-cooling
Supply voltage	100-240 V
Maximum power consumption	<120 W
Center wavelength	1064 nm
Spectral width@3dB	<15 nm
Polarization direction	Random
Whether anti-high reflection	Yes
Beam diameter	7.5±0.5 mm
Power adjustment range	0 ~ 100 %
Range of working temperature	0 ~ 40 °C
Storage temperature range	-10 ~ 60 °C
Laser size	272*105*76.2 mm
Package dimensions	460*260*140 mm
Weight	NW: 2.7KG GW: 5.5KG

Table 5 YDFLP-20-M8 Laser decreasing power frequency value

YDFLP-20-M8		
Set pulse width (ns)	Decreasing power frequency (kHz)	Maximum frequency (kHz)
	YDFLP-20-M8	
500 (CW)	-	-
1	500	4000
2	240	4000
4	160	4000
6	120	4000
9	85	4000
13	65	3000
20	50	3000
30	46	3000
45	42	2000
60	38	2000
80	36	2000
100	34	1000
150	24	1000
200	20	1000
250*	18*	900
350*	18*	600

* Above the reduced power frequency is the full power output range of the laser, and below the reduced power frequency is the reduced power output range of the laser, that is, when the frequency is lower than the reduced power frequency, the laser will synchronously reduce the output power to protect the laser. The laser marking frequency corresponds to the output power change as follows as shown in the figure:

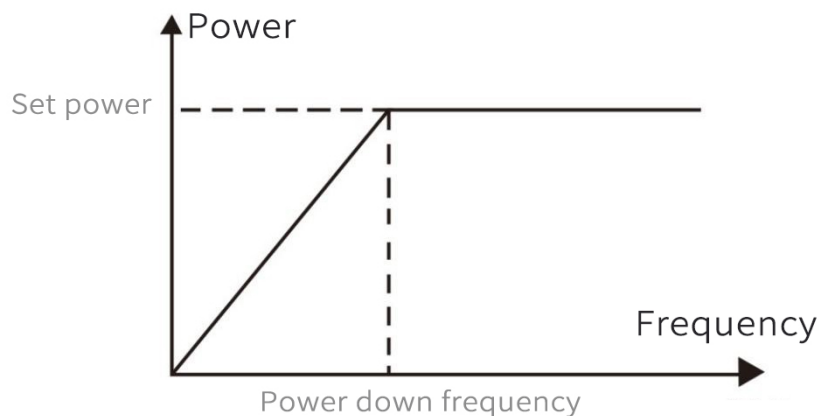


Figure 3 The output power change corresponding to the power reduction frequency

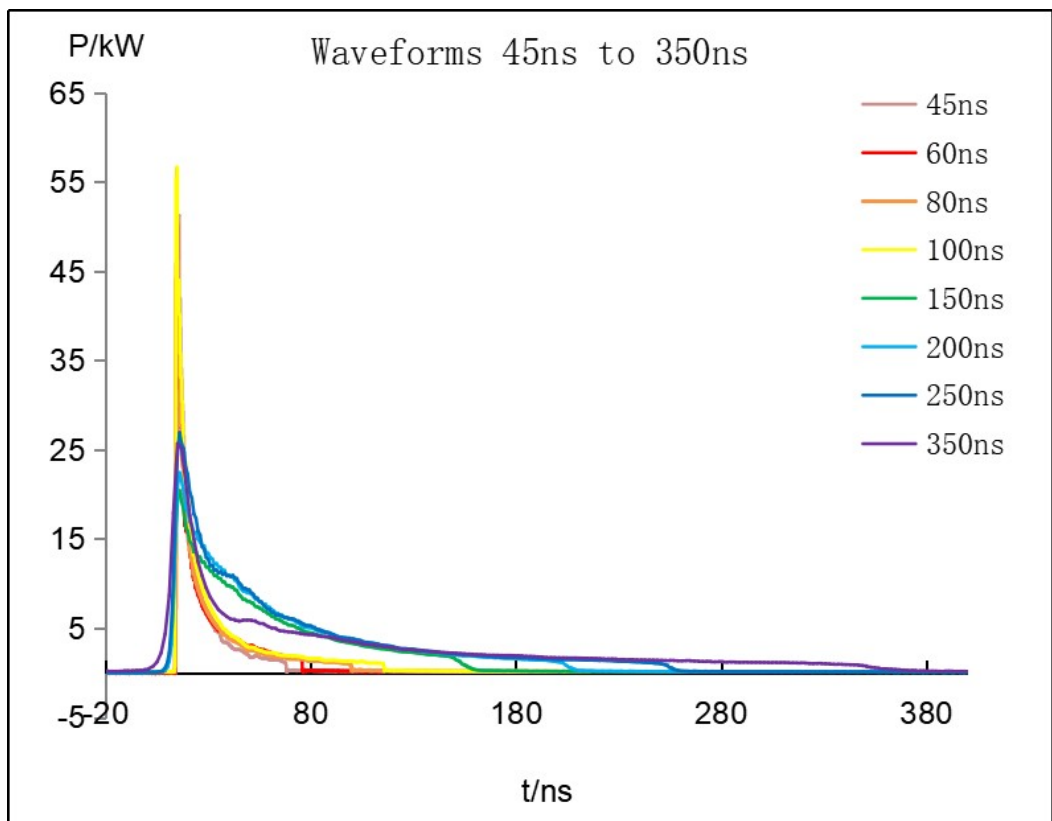
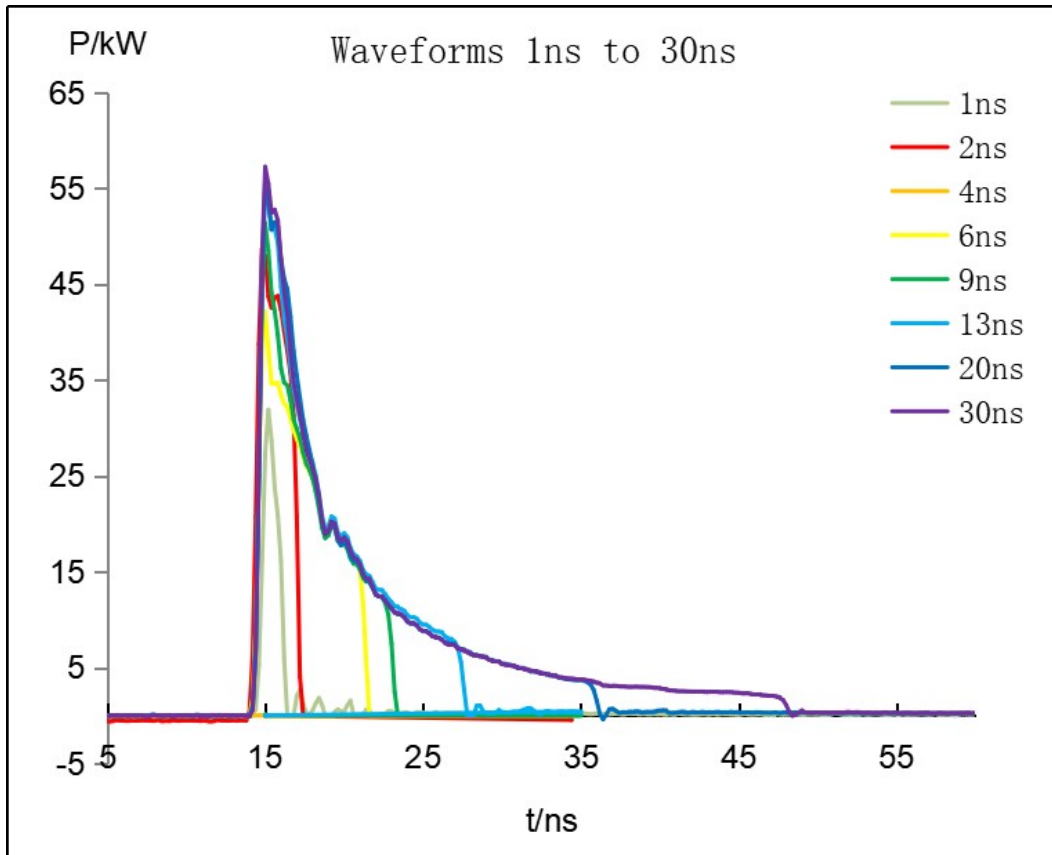


Figure 4 YDFLP-20-M8 output waveform curve

1.6 Installation dimension drawing

1) YDFLP-20-M8 dimension drawing (Unit: mm)

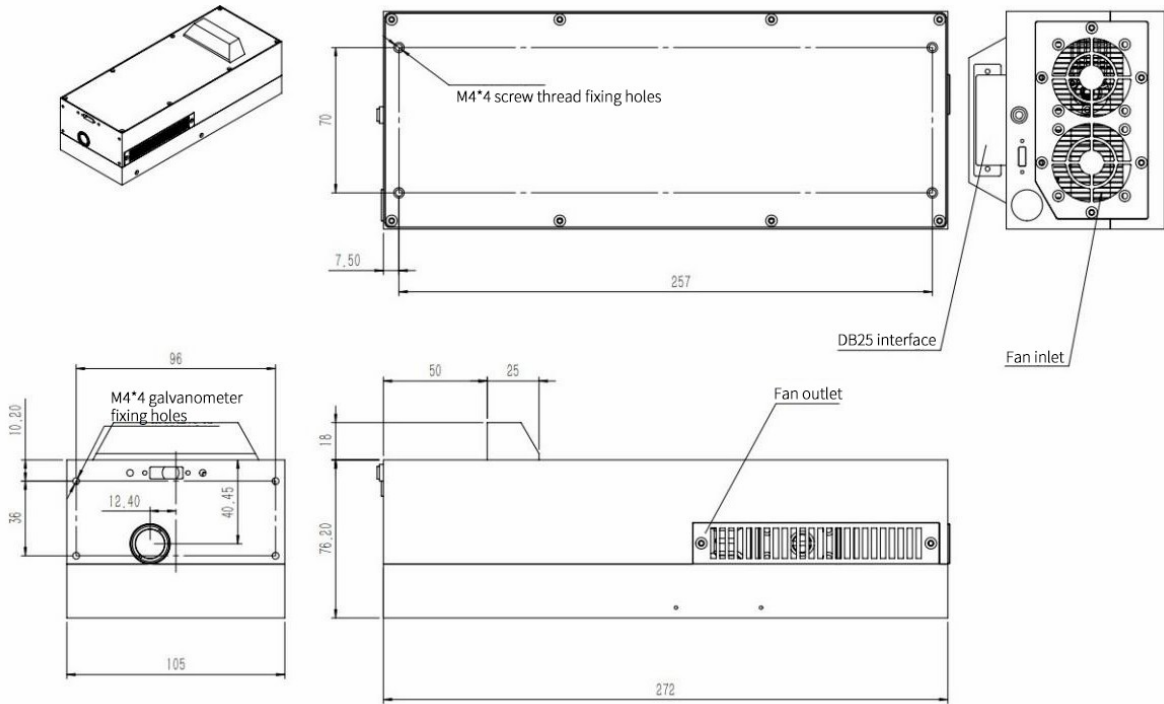


Figure 5 YDFLP-20-M8-S-R laser size diagram (separate laser source)

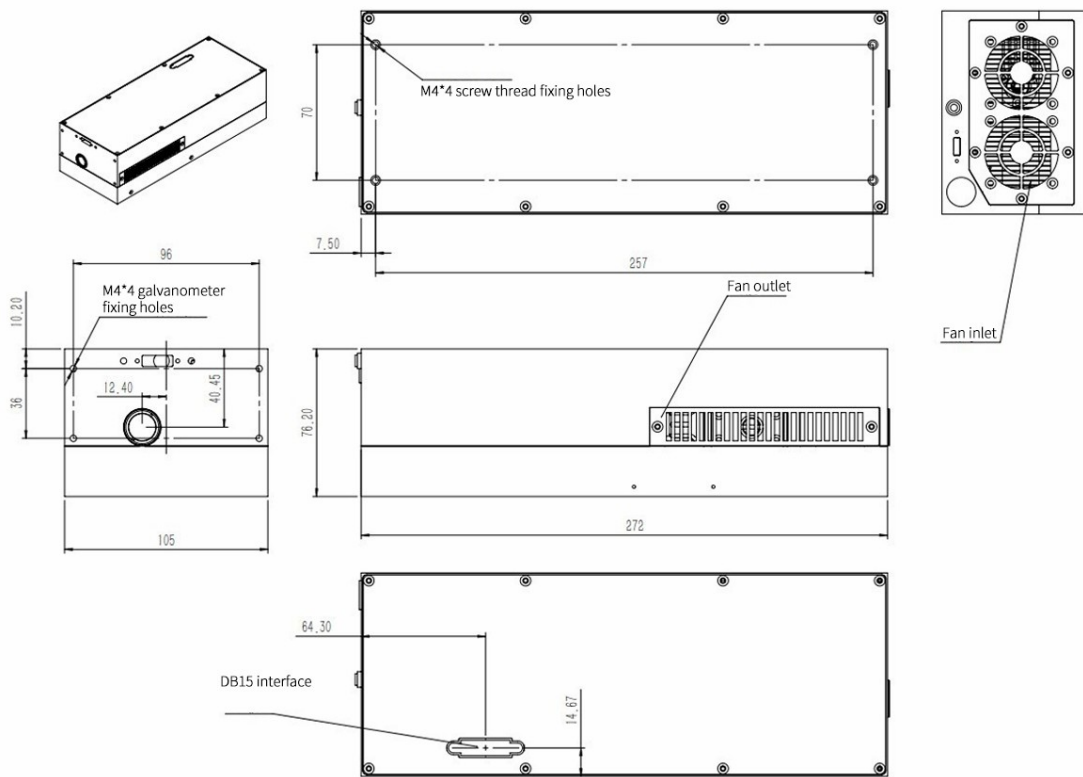


Figure 6 YDFLP-20-M8-S-R-N laser size diagram (light source + JCZ control card)

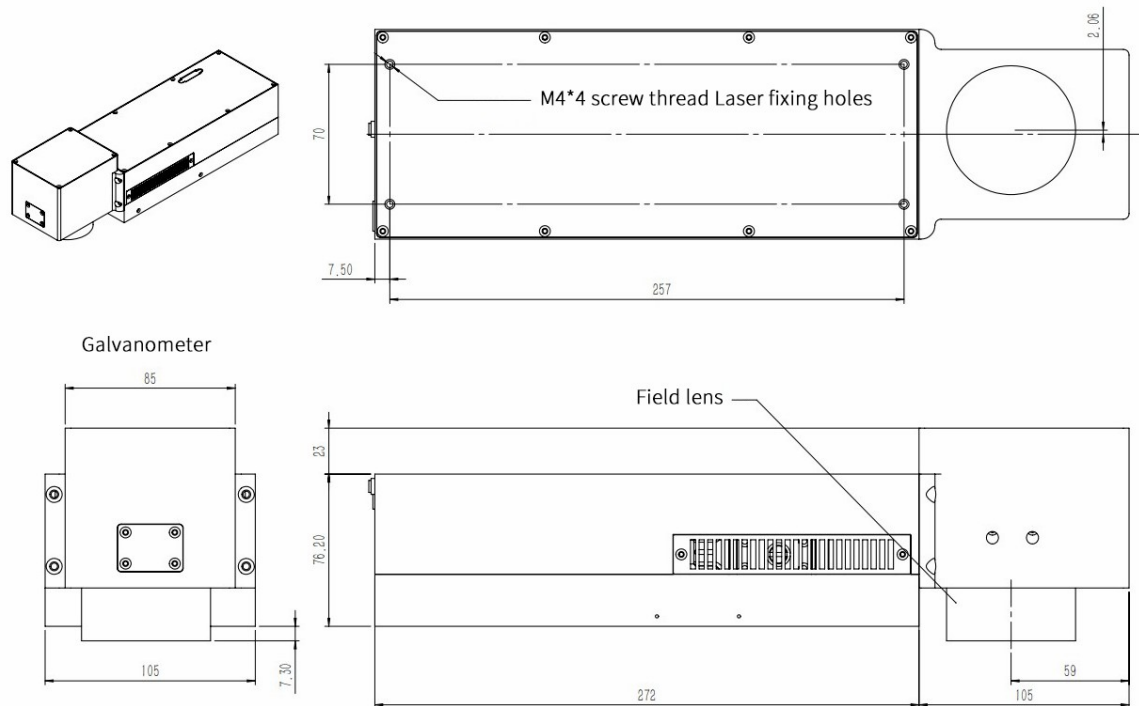


Figure 7 YDFLP-20-M8-S-R-C laser outline size diagram (light source +JCZ control card + galvanometer field lens integrated machine)

*The galvanometer can be equipped with low configuration and high configuration version

2. Laser interface definition

2.1 Interface diagram

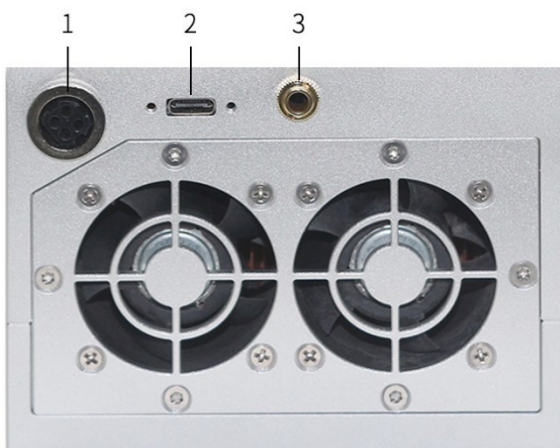


Figure 8 Schematic diagram of laser interface

Table 6 Laser interface description

NO.	Description
1	R7B power connector
2	USB Type-C control interface (single light source version, this interface is reserved but not connectable)
3	3.5mm AUX audio interface

2.2 Power cord installation

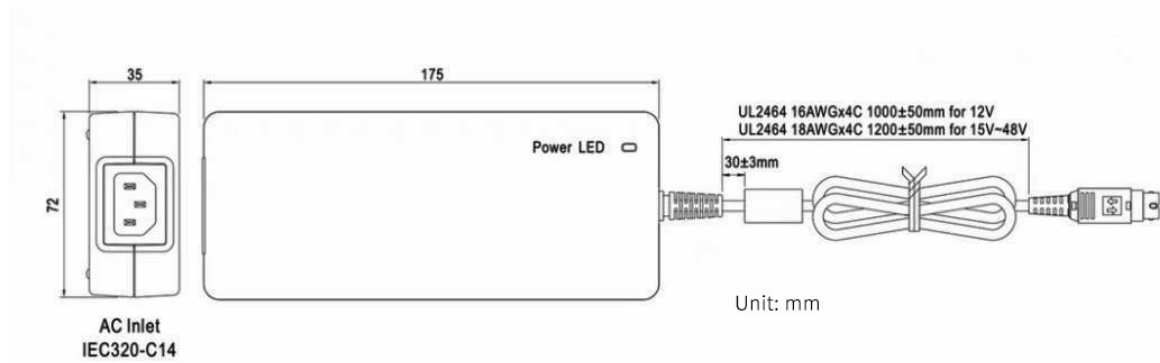
The standard power adapter of the laser is GST160A24-R7B AC power adapter, which can be connected with a three-core input line. Please install it to the laser power interface according to the definition shown in Figure 7. Please pay attention to the polarity of the power line when installing.

Adapter specifications:

INPUT: 100-240VAC, 50/60Hz, 2.0A

OUTPUT: 24V = 6.67A, 160W MAX

■ Structure size



■ DC output interface

© Standard plug: R7B

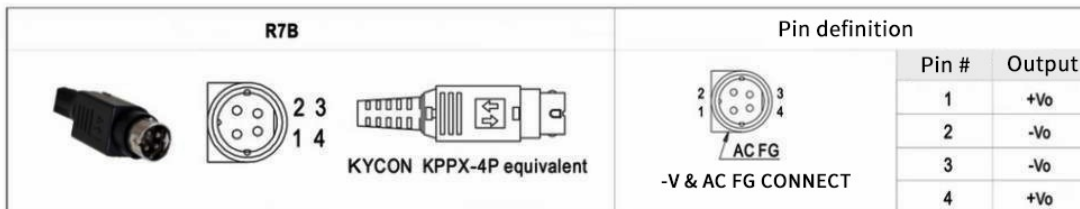


Figure 9 Schematic diagram of power supply adapter and interface

2.3 3.5mm AUX audio interface

The 3.5mm AUX audio interface of the laser can be used to connect to a computer or a red card. After the interface is connected, the user can use TypeE software, serial commands or a red card to monitor and control the laser. The pins of the control interface are defined as follows:



Figure 10 3.5mm AUX audio interface

Table 7 3.5mm AUX audio interface definition

PIN	Description
1	GND
2	RxD Laser reception
3	TxD Laser sending

Note: If the user needs to use serial commands to control the laser, please refer to the TypeE Serial Command Manual.

2.4 USB Type-C control interface

The laser's Type-C control interface can be used to connect to a PC. Once the interface is connected the user can control the laser using the Golden Orange software (version: Ezcad 2.14.11 (20191219)).

2.5 Galvanometer control interface

The galvanometer control interface of the laser is a 12-pin header, which is used to connect the galvanometer and the laser. The pins of the control interface are defined as follows:

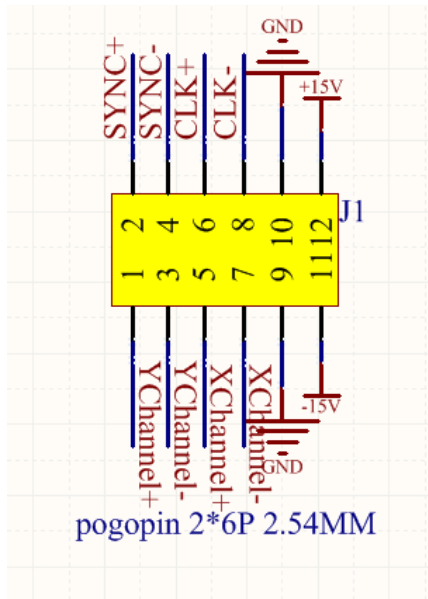


Figure 11 Definition of galvanometer control interface

2.6 DB25 Control interface

The DB25 control interface of the laser is generally used to connect the marking control board. The pins of the control interface are defined as follows:

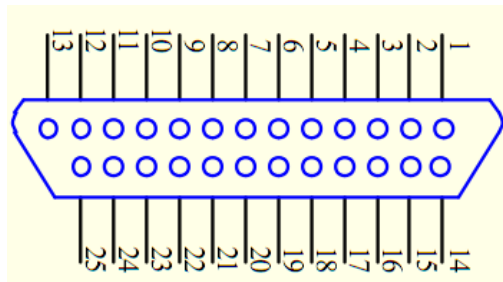


Figure 12 Control interface DB25

Table 8 Laser DB25 control interface definition

DB25	PIN#	Definition
1-8		IP0-IP7 Power Control
9		Power latch signal , the rising edge is valid (this function can be enabled in the GUI)
10-15		GND Note: The 10-15 pins have been connected to each other inside the laser, and the GND of the marking card should be connected to at least one of the pins
16, 21		Laser feedback signal Note: 16 is low level, 21 is high level: normal

	16 is low level, 21 is low level: laser temperature alarm
19	Laser PA switch on signal Note: high level is on, low level is off
20	Frequency modulation signal, square wave
23	Emergency stop signal Note: The high level is normal, and the low level emergency stop is valid (this function can be enabled in the GUI). The emergency stop signal is low first and then high. It is necessary to detect the rising edge of MO before the light can be re-emitted
22	Red light enable (laser and red light are mutually exclusive, red light has priority *Note 2) Pulse width adjustment enable (please refer to the pulse width control section below for specific control methods) High level is on, low level is off
18	MO switch signal Note: High level is on, low level is off.
17, 24, 25	Reserve, not connected

Note1: The voltage amplitude requirements of the DB25 control interface: high level range > 4.6V, <5.4V; low level range ≥ 0V, <0.5V.

Note12: The priority level of the red light PIN22 signal is higher than the MO and PA signals. When the PIN22 signal is high, the MO and PA signals will be automatically closed internally. After the PIN22 signal is low, the MO and PA can be restarted to emit the laser; when the laser (built-in Red light version) When an alarm occurs, the red light will flash 2 short and 1 long as an alarm prompt until the alarm is eliminated, and the cycle time is about 1.5s.