Deyou Technology Inc

Laser Obstacle Remover

Lion-Series
User Manual

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Thank you for choosing the DEYOU laser equipment.

Please read the manual carefully before using the product.

- Although this user manual has been carefully reviewed, omissions are inevitable. If there is any ambiguity, please contact the Customer Service Center or sales staff of DEYOU TECHNOLOGY INC.
- The company holds the final explanation right of this user manual.

Declaration:

DEYOU TECHNOLOGY INC. guarantees that this product has been thoroughly tested and inspected, and all testing items can meet the written quality specifications before transportation. If there is any damage to the outer packaging or interior of the product upon receipt, please contact us as soon as possible.

The copyright of the user manual is owned by DEYOU TECHNOLOGY INC., and without permission, it is not allowed to reproduce, copy or modify the content of this manual.

National 400 Free Customer Service Hotline of DEYOU：400-005-3391

DEYOU Website: http://www.laser1.ca

Safety Information

Before using this product, please read and understand this user manual. This user manual

provides important product operation, safety, and other information for you and all future users as a reference. To ensure safe operation and optimal product performance, please follow the below precautions and warnings, as well as other information in this manual.

● The series of laser obstacle clearing equipment refers to the Class IV laser products. The series of lasers emit no more than 10W of laser radiation within the 1080nm wavelength range. The exposure of eyes or skin to direct radiation or scattered rays must be avoided.

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

● Invisible light is emitted by this laser. When using it, do not face the laser output head towards someone. Please wear laser protective glasses when the laser is working.

● Please do not open the laser host, because there are no product parts or accessories available for users. All maintenance or repair matters must be returned to DEYOU TECHNOLOGY INC. for processing.

Laser Class:

The series of lasers belongs to the Class IV laser: direct laser irradiation can inevitably cause irreparable damage to the eyes, as well as skin burns and burned items. In some cases, the reflected and scattered light of the laser can also cause eye damage and skin burns.

Safe Label and Location:

The above two labels, which signify laser radiation, have been attached to the laser output head of the product.

Content

1. Product Description

The series of laser obstacle removers are designed specifically for the rapid removal of foreign objects in exposed power grids. To maintain the safety of power grids and high-speed railways, the company provides an ideal, efficient, and remote obstacle remover.

The series of laser obstacle removers use fiber laser as the light source, and adopt air-cooled and compact structural design, with an electro-optical conversion efficiency of over 35% and maintenance-free operation. They are cost-effective and far superior to other types of lasers with the same power. By the international standard fiber QBH output head, the laser is controlled by a wireless controller.

The series of laser obstacle removers adopt a focusing machine vision amplification system, with a maximum removal distance of up to 300-400m.

2. Product Parameters

The configurations of the laser obstacle removers are described in the following table: (Please correspond to your respective instrument)

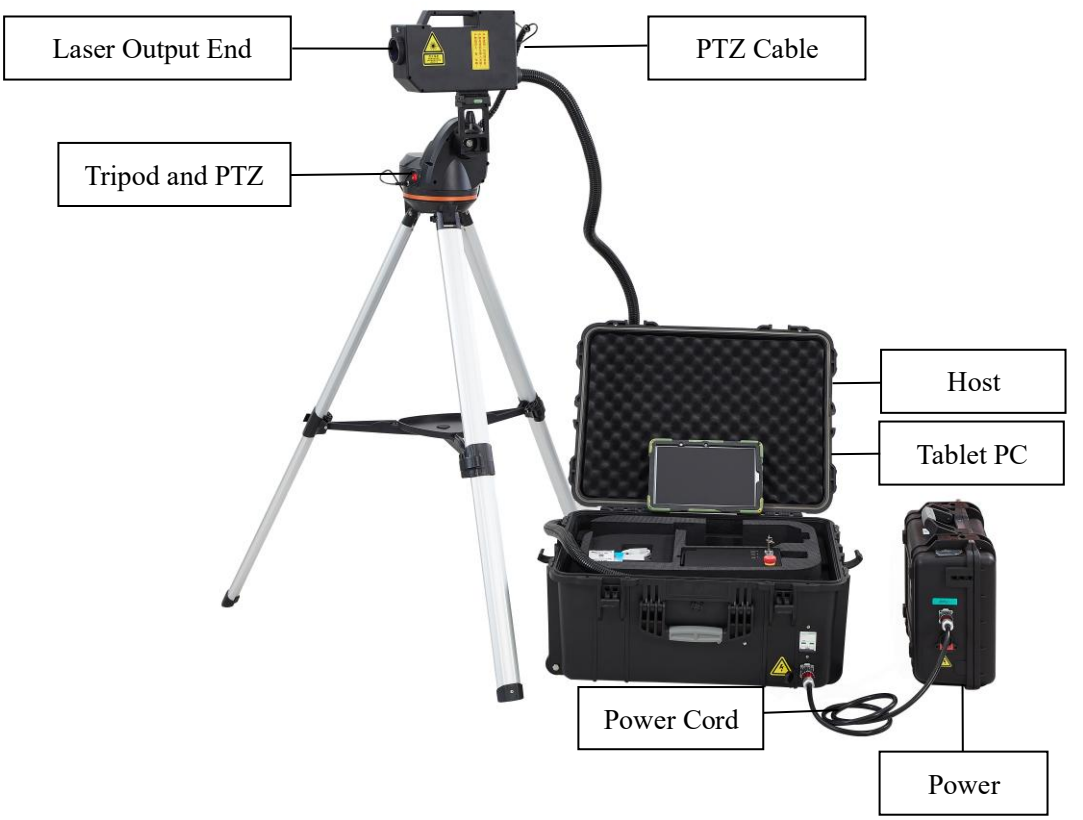
NO.	Equipment Name	Unit	Power
1	Lion-50 Laser Obstacle Remover	W	50
2	Lion-100 Laser Obstacle Remover	W	100
3	Lion-200 Laser Obstacle Remover	W	200
4	Lion-270 Laser Obstacle Remover	W	270
5	Lion-300 Laser Obstacle Remover	W	300
6	Lion-350 Laser Obstacle Remover	W	350
7	Lion-500 Laser Obstacle Remover	W	500
8	Lion-600 Laser Obstacle Remover	W	600
9	Lion-1000 Laser Obstacle Remover	W	1000

The above are standard equipment powers. If customers have requirements, our company can customize them.

The user manual for this product is a shared version. When customers refer to the manual, the parameters are based on the actual delivered equipment.

3. Product Appearance and Structure Diagram

Overall Product Appearance



4. Precautions for Product Transportation

4.1 The laser output fiber is a very sensitive and critical component. During installation, transportation, packaging, and working conditions, it is necessary to ensure that the bending radius of the output fiber is not less than 30cm, otherwise it is easy to damage the laser. Meanwhile, you should be careful not to bend the tail and root of the laser output fiber, otherwise it may damage the laser. If the laser needs to be returned to the factory, it is recommended to use the original packaging materials. If there are no original packaging materials, the laser body and output optical isolator need to be packaged with suitable soft materials to avoid damage to the laser due to transportation vibration.

4.2 Precautions for Battery Transportation

4.2.1 Measures, such as filling and collision prevention, should be taken during battery transportation to avoid severe collisions or vibrations.

4.2.2 The battery cannot be charged immediately after being discharged from outdoor high temperatures or retrieved at high temperatures. It can only be charged after the battery temperature has cooled to room temperature.

4.2.3 When storing the battery, it should be stored in a dry and safe room (low temperature storage will not damage the battery, but the battery temperature should be raised during use). When used outdoors, it should be placed in a shadow as much as possible to avoid direct sunlight causing the battery temperature to be too high.

5. Product Installation and Debugging

5.1 Introduction to the Tripod, as shown in Figure 1.

Widened and Retractable Aluminum Tripod Diagram

Retractable Detail of the Fixed Tripod

Figure 1. Tripod

Precautions:

5.1.1 The tripod is a high-precision instrument. During its use, you should be careful to handle it with care. When opening the fixed clip of the tripod, as the clip is made of plastic, you should gently pull and lightly clamp it. It is strictly prohibited to forcefully pull to prevent the clip from breaking.

5.1.2 When extending and retracting the tripod legs, due to the aluminum alloy bayonet type, please pay attention to the size of the extension and retraction, and do not use brute force to detach the aluminum alloy legs, resulting in damage to the clamp.

5.2 Introduction to the PTZ, as shown in Figure 2.

Figure 2. PTZ Fixed Base

5.3 The Installation Steps for Tripod and PTZ, as shown in Figure 3.

Take out the tripod and stretch it out.

Put the tripod leg out, adjust the height according to your own needs, and then fix the lock.

Take the tray out and install it, then rotate and secure it tightly.

The tray installation diagram.

Install the laser module and tighten the screws to secure it.

Figure 3. Installation of Tripod and PTZ

5.4 Introduction to the Aiming System

The tablet PC can enter the aiming system through wireless connection to set the following parameters:

Set (1) the PTZ speed, (2) the laser power, (3) the automatic cutting start and end points, and (4) the electronic fence.

By setting the speed of the PTZ, you can accurately move the PTZ to lock targets. The on-site situation can be recorded through the functions of “Photos” and “Videos”.

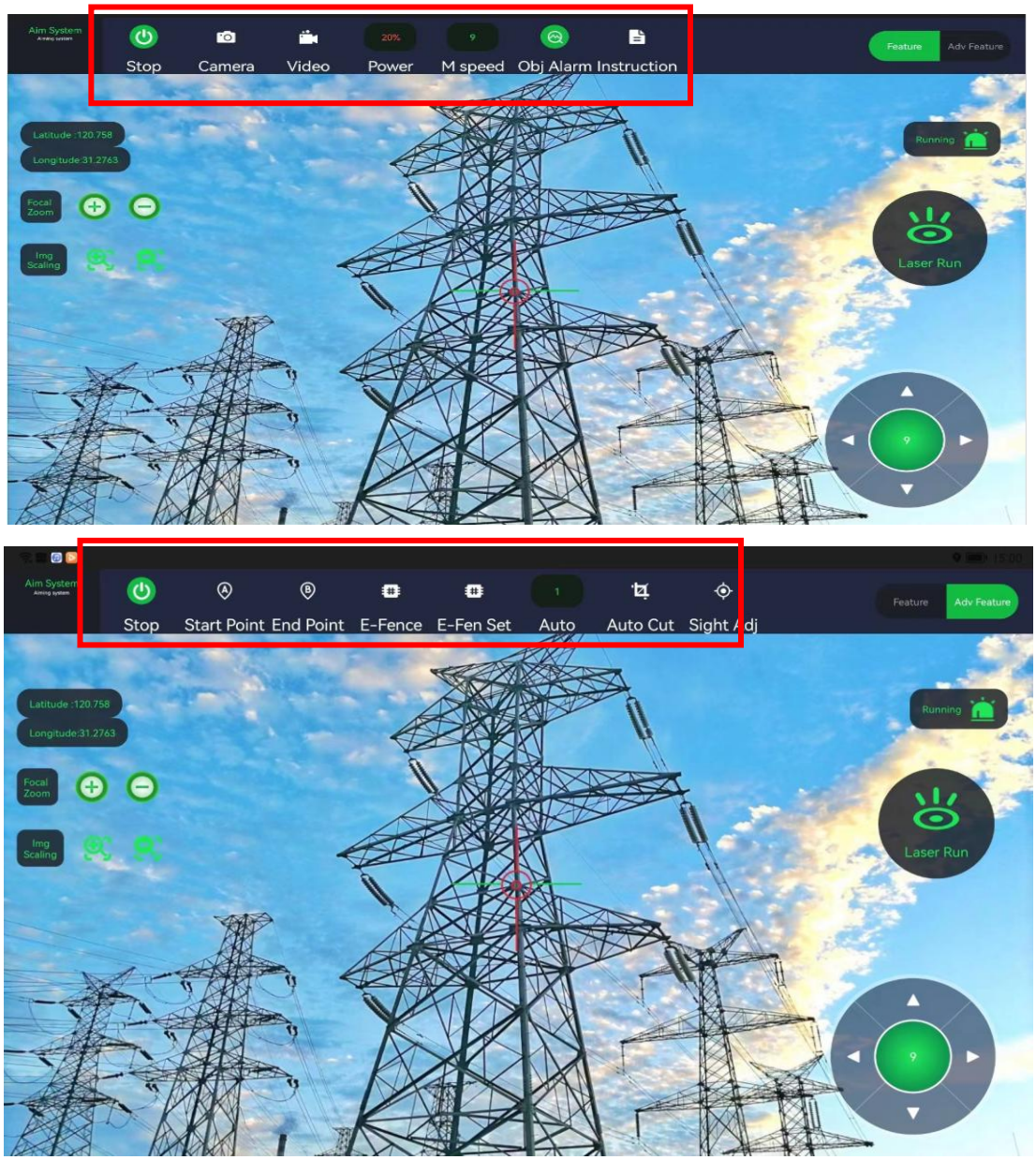


Figure 4. Aiming System Function Interface

5.5 Installation of Laser Head, as shown in Figure 5

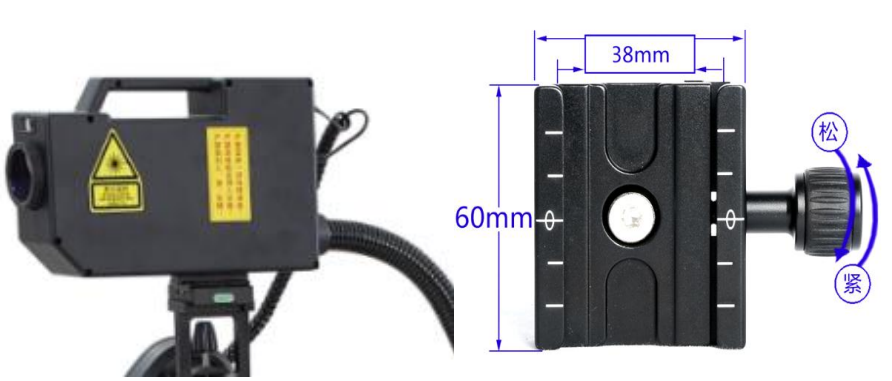


Figure 5. Installation of Laser Head

5.6 Electrical Connection Components

Electrical Components mainly include battery, generator, 220V AC converter module wire, and laser power cable, as shown in Figure 6.

The battery or generator mainly supplies power to the laser (the battery must be manned when it is charged or in use).

The laser power cord is connected to the 48V power output terminal.

48V Power(standard) Laser Power Cord(standard) 220V AC Converter Module (Optional) Patch Cord (Optional)

Figure 6. Electrical Connection Components

Figure 7. Laser Equipment Host

5.7 Introduction to the Functions and Usage of the Laser Control Box

After the laser is powered on, you should turn the emergency switch to confirm if it is normal. The key switch mainly controls the laser on and off. When the key is turned to the ON position, the POWER light will light up. When the laser is emitted, the EMISSION light will light up. When the laser is turned off, the EMISSION light will go out. If there is an emergency situation that needs to stop the laser, the red emergency switch can be used. As shown in Figure 8:

Figure 8.

Laser Control Box

5.8 Connection Diagram of the Entire Equipment, as shown in Figure 9.

Figure 9. Connection Diagram of the Entire Equipment

5.9 After opening the cover of the host box, you should take out the laser gun head and install it on the PTZ bracket. Then, take out the DC cable and spiral cable, and connect them to

the gun head and the PTZ interface. Then, remove the protective cover of the laser gun head. Finally, place the cover of the host box in a half-closed state to prevent sunlight from damaging the host controller.

5.10 After completing step 5.9, you can open the tablet, connect the WIFI emitted by the camera, turn on the aiming system, and adjust the camera to the maximum magnification.

5.11 You can control the PTZ rotation through the tablet's directional touch key to aim at the target. As shown in Figure 10.

Figure 10. Crosshair Aiming Target

5.12 After aiming at the foreign object and confirming that there are no personnel obstructing the surrounding area, you can click the Light button on the tablet as shown in Figure 11 to confirm the light, and then the laser can be emitted.

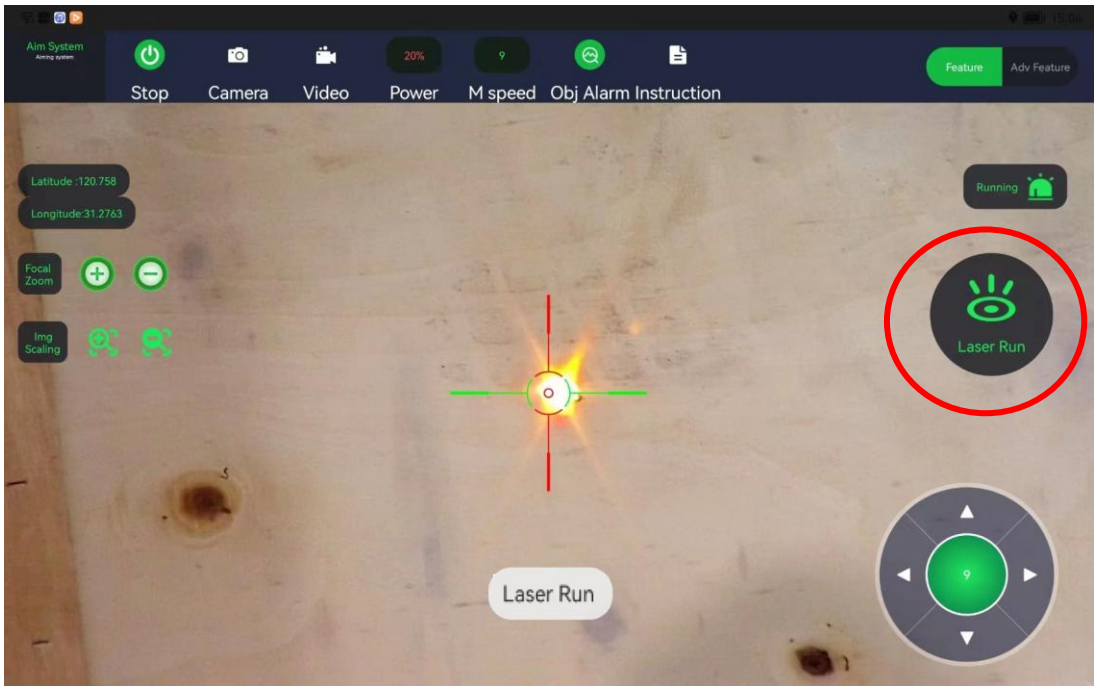


Figure 11. Laser Control Panel

5.13 The foreign object can be removed by controlling the tablet's directional touch key to move back and forth horizontally on the joint surface between the foreign object and the wire, with the laser position shown in Figure 12 (cross center on the display screen) .

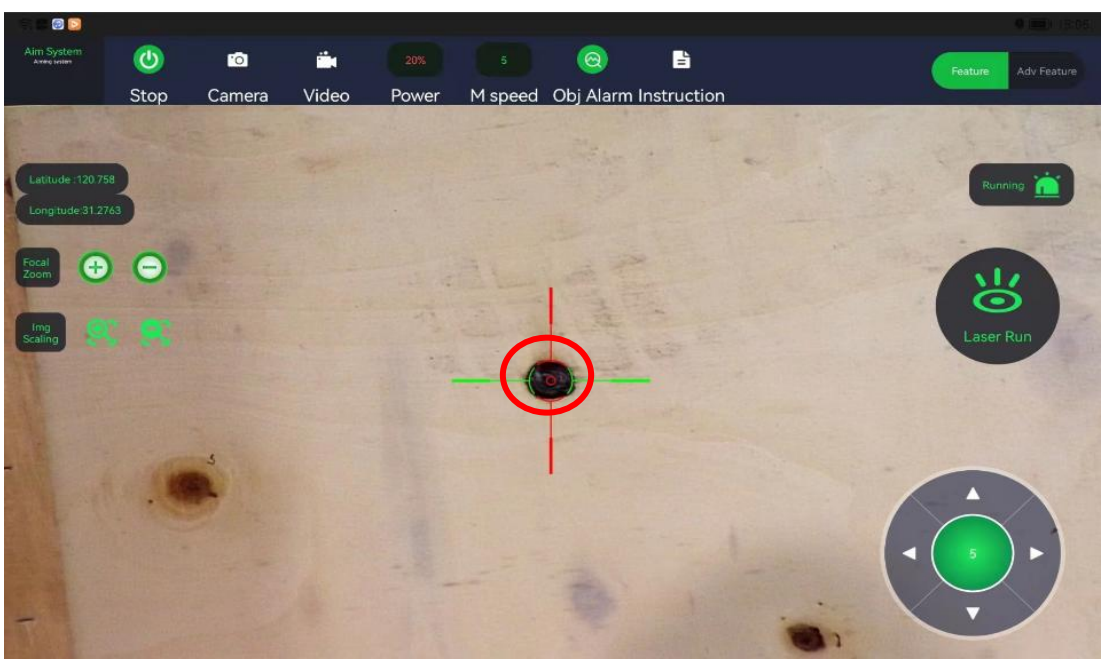


Figure 12. The Laser Position

5.14 Turn off the laser output button on the tablet control panel, then turn the key switch of the laser control box to the OFF position (as shown in Figure 13), and finally turn the air switch in the bottom right of the protective box to the downward position (as shown in Figure 14) to complete the shutdown of the laser equipment.

Figure 13. Key switch

Figure 14. Air Switch

5.15 Place the laser output head, tablet PC, various chargers, and connecting cables in the designated packaging box.

5.16 Compete the removal of foreign objects from the laser power grid.

6. Usage and Storage Environment

- Equipment Usage Environment: -20 ℃~+50 ℃, 10%~90% relative humidity.
- Equipment Storage Environment: -25 ℃~+70 ℃, 10%~95% relative humidity.

7. Product Qualification and Quality Assurance

7.1 Warranty Terms

DEYOU TECHNOLOGY INC. shall guarantee all products manufactured according to orders or specifications within the warranty period stipulated in the contract for any defects caused by materials and obstacle clearing process, and promise that the products meet their written quality specifications under normal use.

The company shall have the right to reasonably choose products for repair or replacement due to any failure caused by material and obstacle clearing process during the warranty period. The repair or replacement of all products within the warranty period shall be still subject to the remaining warranty period of the original product.

7.2 Limitations of Warranty

Products, components, or equipment shall be not covered by warranty under the following circumstances:

- Damage to the product and its components caused by tampering, opening, dismantling, improper installation, and improvement by non-DEYOU personnel.
- Damage caused by misuse, negligence, or accidents.

- Due to the usage beyond the product specifications and technical requirements.
- Damage caused by incorrect installation and maintenance, misuse or failure to follow the information and warnings in the user manual. The customers shall be responsible for understanding and following the operating instructions in the user manual and operating specifications. Any damage caused by incorrect operations, as well as accessories and fiber optic components, shall be not covered by the warranty.

Within the scope of warranty, the buyers shall make a written request within 31 days from the date of discovering product issues. This warranty shall not involve any third parties, including specified buyers, end users, or customers, nor does it include components, equipment, or other products not produced by the company.

7.3 Service & Repair

Note: This equipment does not have built-in components for user maintenance, and all repairs shall be carried out by personnel from DEYOU. All repair or exchange requirements within the warranty scope shall be notified to our customer service personnel as soon as possible within 30 days of discovering the problem. Approved returned items shall be placed in suitable boxes. If any damage is found upon receipt of the goods, it shall be promptly reported in writing to the carrier.

DEYOU TECHNOLOGY INC. has not authorized any third parties (including purchased users or customers) to repair components, equipment, or other products of the company.

8. The Do's and Don'ts

8.1 Power-on Sequence: Close the air switch in the bottom right of the protective box, and then turn on the key switch.

8.2 The mobile power supply is a dedicated power supply for the laser obstacle remover, and it cannot be used to power other high-power electrical appliances.

8.3 During the operation of the laser obstacle remover, it should be cut back and forth along the joint surface of the foreign object and the wire. If it is unavoidable to act on the wire, it should be prohibited to continue to act on a certain point on the wire for a long time.

8.4 When handling foreign objects, it is strictly prohibited to directly apply the laser to power equipment with insulation layers, such as insulators.

8.5 When the surface of the steel strand (such as the ground wire) is corroded or damaged, it will greatly increase the absorption rate of the laser beam. If the laser is inevitably sprayed on the steel strand (such as the ground wire) during the process of handling foreign objects, the laser should be turned off immediately.

8.6 The mobile power supply should be charged after each use, and it is important to ensure that someone is on duty for safe charging.

8.7 After installing the laser obstacle remover before use, please make sure to half close the upper cover of the host box to prevent the laser control box from being exposed to sunlight, especially in hot summer weather.

9. Common Troubleshooting Methods

9.1 The Main Checks and Solutions for Laser Failure:

a. Check if the emergency stop switch of the laser is turned off;

b. Check if the laser key switch is normal;

c. Check if the air switch of the laser is normal.

9.2 The Main Reasons and Treatment Measures for the Reduction of Laser Power:

a. Check if the power supply is stable, and if the current reaches the rated working current.

b. Check if the protective mirror surface of the laser head is polluted. If it is polluted, please gently wipe it with lens wiping paper or with glasses cleaning cloth dipped in anhydrous ethanol. Do not scratch the mirror coating.

c. Check if other optical lenses of the entire equipment, such as laser focusing lens, are contaminated.

d. Confirm if the laser has been used for more than 20,000 hours, and after being used for more than 20,000 hours, the power attenuation belongs to normal power loss.

9.3 Common Alarm Diagnosis

No.	Fault Name	Fault Cause	Note and Solution
1	Forward light alarm	Forward PD cannot detect laser	The reasons for this fault include low peak power, low average power, and other causes of low power. It can be maintained by calibrating parameters or returning to the factory.
2	Temperature alarm	The temperature of the pump source or air-cooled plate is too high	Please check if the ambient temperature is too high. Prolonged operation of the laser can also lead to heat accumulation, causing excessive temperature. You can pause the equipment to cool before use.

3	Overcurrent alarm	The power supply current of the pump is too high	The internal overcurrent of the laser is faulty. Please check whether the current value is between 0-10A.
4	Overvoltage alarm	Laser overvoltage fault	The internal overvoltage of the laser is faulty. Please check if the mobile power supply is between 40V DC-53V DC.
5	QBH alarm	The QBH optical fiber connector is not properly inserted	Please check if the QBH is plugged in properly.
6	Emergency stop alarm	The emergency stop switch is pressed	The emergency stop switch is pressed and then released. The laser needs to be restarted for functioning properly.

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