

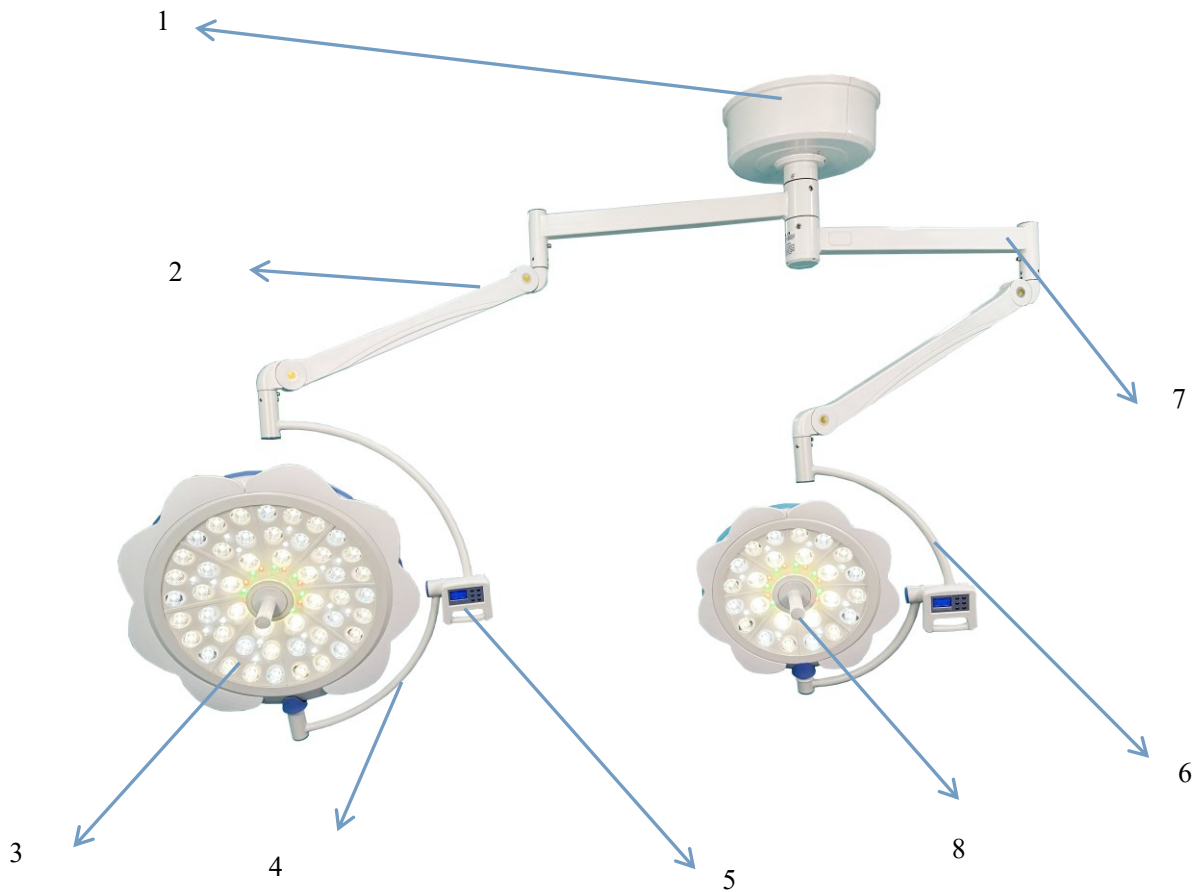
Surgery without shadow lamp

**Instructions for product use and maintenance
(instructions)**

**Thank you and you for your support to our
company!**

[Product name] Operation without shadow lamp

[After-sales Service agency] After-sales service Department



Shadowless structure for LED surgery

1、 Base 2, balance arm 3, lamp head 4, lower bend tube 5, control panel

6、 Upper bend tube 7, transverse arm 8, disinfection handle

[contraindications] No

[Notes, warnings and prompt instructions]

- 1.The safety factor of the suspension system is 20 (4 M12 screws, single screw load greater than 1500kg, product weight 120kg)
- 2.Construction, installation, commissioning and use shall be carried out in strict accordance with the steps described in the installation instructions.
- 3.Please regularly check whether the fasteners of the invisible lamp are loose to prevent accidents.
- 4.Remove the shadowless lamp and control circuit
- 5.The safe use period of this shadowless lamp is six years, and the free warranty period is one year (except vulnerable bulbs). The damage caused by improper use of users does not belong to the scope of free warranty. This product provides lifetime maintenance service.
- 6.When cleaning the shadowless lamp, please use soft cloth or sponge, wet cloth or dishwashing liquid, do not use hard hair brush, steel wire brush, also do not use decontamination powder, paint, banana water, acid and so on to any surface.
- 7.After using the detergent, please wipe the dark light with a wet cloth, and then dry with a dry cloth.
- 8.The front cover glass surface is often removed with medical gauze to improve the illumination.
- 9.It is strictly prohibited to hang other articles other than the equipment.
- 10.In order to ensure the normal use of the shadowless lamp, it is forbidden for non-professionals to remove it and open the shell of the lamp head.
- 11.When a single lamp head reaches the surgical lighting brightness, try to avoid the two lamp heads overlapping!
- 12.The weight of the ceiling, fixed bolts and fixed plate is not only the weight of the LED shadowless lamp itself, but also the additional weight of traction, shaking and distortion. Therefore, in the installation of the fixed lifting bolts and fixed plate, please pay full attention to strengthen its firmness. The hoisting LED lamp foundation must be able to withstand a load of more than 650kg.
- 13.Equipment used near shadowless lamps: functions such as high-frequency surgical (pad penetration) equipment, defibrillator, or short-wave therapy equipment will be affected. Pay attention to avoid!
- 14.This product is power equipment. This description is introduced according to the power supply voltage in China and exported to the power supply voltage and power plug configuration according to the order.






15. Read the instructions carefully before using this product.


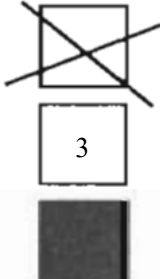
Failure analysis and troubleshooting

fault phenomenon	analysis of causes	The exclusion method	remarks
The no-shadow lamp is not bright	1.Whether the lamp bead life is to 2.The fuse fuse is burnt out	Check whether the handle box controller indicator is on normally, and check whether the base switch power indicator is on. If the indicator light is OK, check that the wire connector is secure.	Light bead: OSRAM LED1W / 3V Fuse: RT18-32 / 380V / 2A / Φ 1038
The shadowless light is spinning constantly	1.Installation is not horizontal 2.The brake parts are too loose	1.Adjust the horizontal to reinstall 2.Adjust brake screws	
The shadowless light is not bright enough	1.External electricity is low 2.Poor potentiometer contact	1.Check the voltage with a multimeter 2.Replace the potential	External voltage is often unstable and low, it is best to use ac stable voltage
shadowless lamp head up and down a certain position can not stop	Balancing spring force is loose or tight	Open the upper cap of the balance arm, tighten it clockwise and loosen it counterclockwise.	

Note: The occurrence and processing results of the above faults should be recorded

[Labeling and packaging identification sample drawing]

symbol	meaning	symbol	meaning
~	alternating current (AC)		protective ground
	Afraid of rain		Prevent burns
	fragile		upward

	Disable hand hook		The limit of the number of stacking layers
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3 Main structure, performance characteristics and working principle

Structural composition: The surgical shadowless lamp consists of a base, transverse arm, balance arm, upper elbow, lower elbow and lamp head.

Performance features: this series of surgical shadowless lamp installation mode is fixed. The lamp head is composed of multiple warm lamp beads and cold lamp beads, which are fixed on the balance arm suspension system. The positioning is stable and can do vertical or cyclic movement, which can meet the needs of different heights and angles in the operation.

essential parameter:

Input power: 600VA

4 Scope of application

Suitable for operating room surgical lighting.

5 Technical parameters

5.1 Use environment

- a) Ambient temperature range: 15~35℃ ;
- b) Relative humidity range: 45~75%;
- c) Atmospheric pressure range: 860 ~ 1060 hPa;
- d) Power supply: AC220V, 50Hz.

5.2 Safety classification: Class I operation mode: continuous operation

5.3 Performance parameters

5.3.1 The color temperature of the shadowless light shall be 3000K Tc 6700K.

5.3.2 Color rendering index 85 Ra 100.

5.3.3 Light column depth: 900mm-1400mm

6. Installation and use

Domestic customers can be sent by the manufacturer of

engineers to guide the installation, foreign customers in the domestic training.

Note: 1, the installation process should connect the electrical line (power line to AC220V) and tighten the fasteners of each connection part (important);

2, the installation process of the crane must be strictly calibrated with the level of the crane level (very important).

3. Before the installation of the shadowless lamp, the customer shall provide a 250V / 10 A low-voltage circuit breaker to complete the breaking of the line (important). Requirements for this low-voltage circuit breaker: 1) When breaking the circuit breaker, the zero line must be double disconnected and completely separated from the network power supply.

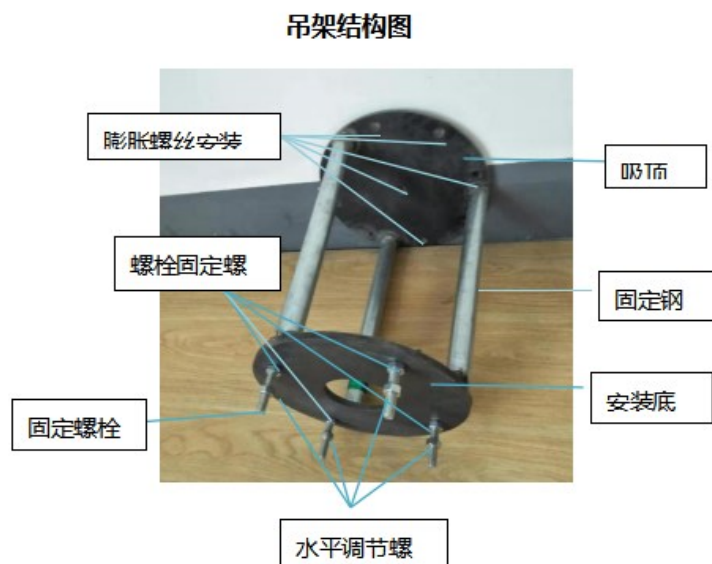
2) This circuit breaker is special for shadowless lamp, cannot be used for other purposes and should be marked for shadowless lamp.

3) The circuit breaker should be installed in an obvious place to facilitate the operation of the staff.

6.1 Installation of the crane hanger

The minimum installation height of this product is 2.5m. Please refer to the schematic diagram of the installation structure. Since this product is suspended load-bearing equipment, there are certain requirements for ceiling or hanger bearing.

When the central roof of the operating room ceiling is a flat concrete structure, the structural frame shall be welded according to the height of the ceiling to the roof (as shown in Figure 1). Install them with (M12 * 100) expansion screws according to the drawings, and install the next base with the screws attached with the product.



graph 1

When there is a structural beam in the center of the operating room ceiling, a

hanging hanger can be held on the structural beam,
The height of the hanger depends on the ceiling height of the operating room.



(As shown in the installation diagram of drawing 1)

When there is no structural beam in the center of the operating room, a hanger can be installed on the roof. The height of the hanger depends on the ceiling height of the operating room. When not penetrating the floor, six expansion bolts can be used to fix the hanger.(Note: The expansion bolt shall be fixed)



(As shown in the installation diagram of attached. 2)

6.2 Installation of shadowless lamp

6.2.1 The hanger mounting chassis has 4 screw holes, which can pass through with M1250 bolts (first).

6.2.2 Installation of the lamp holder and bracket

After the hanger is properly installed and confirmed as firm, refer to the installation structure diagram of the attached drawings, first install the lamp transverse arm to the bottom seat, tighten 6 M816 inner hexagonal screws with S=6 wrench and connect firmly. Referring to the attached drawings for details.



(As shown in the schematic diagram of base

installation in Figure 3)

After the lamp holder is installed, the flange on the bracket is aligned with the flange of the lamp holder. The 4 holes are firmly connected with 4 M1250 bolts (with 412 flat washers, 412 spring washers and 4 M12 nuts). The terminal on the lamp seat, wiring must recognize the color of each wire, and the corresponding color connection. Power input AC220V Power box L terminal N terminal (regardless of positive and negative), output yellow wire of power box shall be connected to V +, and blue wire shall be connected to V-. The power input of LED lamp shall be connected to the AC220V power supply with grounding wire or the air switch prepared by the medical institution, separating from the conductive line, reducing the insulation degree and causing the risk of electric shock.

6.2. 3 Install the balance arm and lamp head

Install the base and bracket, and then install the balance arm, lamp head and disinfection handle in order (see the second diagram of the installation of disinfection handle). Finally, install the base cover (seat cover flange should be embedded in the narrow slot between the lamp seat flange and the bracket flange, press the two seat cover together and fixed with screws.)。

Before installing the lamp head, remove the screws protecting the lower balance boom sleeve with a small "ten" screwdriver. Please install the brake hole corresponding to the balance arm brake.



Supplementary Figure 5 attached to Figure 6

Referring to FIG. 5, the balance arm is connected to the upper elbow.(As shown, the three screw holes in the upper balance arm sleeve are connected to the three screw holes in the lower upper bend)

Referring to Figure 6, connect the balance arm to the upper bend with M58 stainless steel screws.(tighten the screws)

The balance arm of the shadowless lamp has been strictly adjusted during the factory inspection, and there is no need to be adjusted when the newly purchased products are installed. After installation, if there is any imbalance, please follow the imbalance treatment method in Table 3.

6.2.4 Installation of lamp head:

Connect the large and small lamp heads with the balance arm (install the small lamp head)

The wires of the same color are docked above the wiring terminals. Tighten the fixing screws clockwise. Beware of poor contact!

6.3 Use of shadowless lamp

After the installation of the shadowless lamp, it shall be powered on for acceptance.

6.3.1 Scope of activity

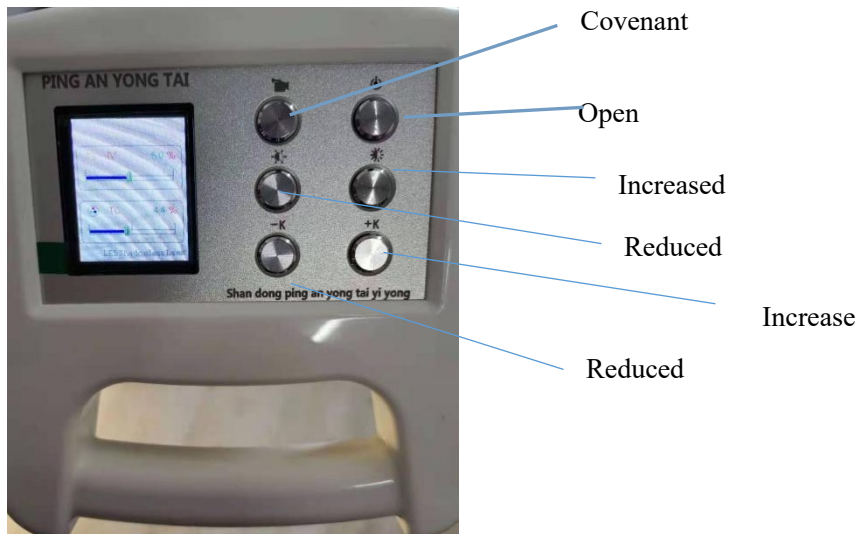
The range of the less lamp is as follows:

Range of action Action project	Lamp head diameter (mm)	
	500	700
The transverse arm rotates around the base	330°	330°
The balance arm rotates around the transverse arm	340°	340°
Balance arm moves up and down	40°	40°
The upper elbow turns around the balance arm	340°	340°
The lower elbow turns around the upper elbow	260°	260°
The lamp head turns around the lower elbow	260°	260°

6.3.2 Lighting regulation

No lamp control panel. After the shadowless light is energized, the power indicator on the control panel is on, and the whole control panel is arranged in six keys, namely power switch key, cavity mode key, brightness increase key, brightness reduction key, color temperature increase key and color temperature reduction key.

6.3.3 Methods of use



1、Brightness open key: long press open or off.

oscope mode key: with normal lights on, long press the endoscope mode key to start the endoscope mode.

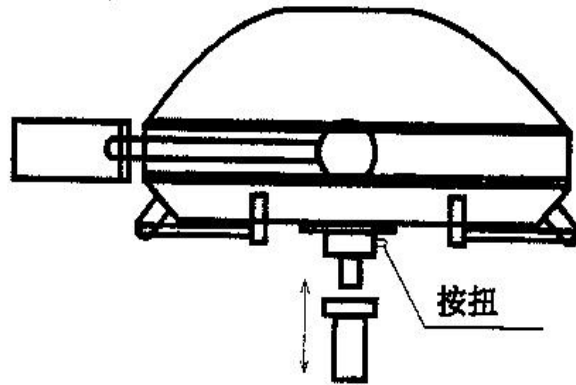
Brightness reduction key: Long press this key to reduce the brightness

Brightness increase key: Long press this key to increase the brightness

Color temperature reduction key: Long press this key to reduce the color temperature

Color temperature increase key: Long press this key to increase the color temperature

2. Pull the lamp body, adjust the height of the lamp head, turn the focus hand, adjust the size and depth of the spot, so that it can achieve the best lighting state at the surgical site. The disinfection handle is recommended for disinfection. Just press the button above the handle sleeve and take it off. When installing the disinfection handle, align the button and lock with a "click" (see the picture below). The shadowless lamp handle is removed (press the door button on the lower base with the thumb) and can be disinfected with 75% alcohol. When the handle is installed back to the seat, make sure to hear a clear "click" sound and the handle all bite the entry button. (The disinfection handle can not be pulled directly by hand to avoid damage to the lamp head)



3. In the work, if several or some of the LED beads are not bright, check and eliminate them after the operation.

4. After each use, adjust the brightness and color temperature of the LED light to below the medium level, and turn off the switch, for the next use of adjustment.

7. Maintenance and repair

7.1 shadowless lamp shall be repaired regularly maintained by professional maintenance personnel. refer to Table 2 and record any problems found, please solve them according to the product specification. If it cannot be excluded, please contact the factory in time.

Table 2

project	frequency
Check the status of fasteners for each connection of the lamp	Once every two months
Check whether the shadowless lamp line contact is good	Once every two months
Check the flexibility of each active part of the shadow lamp	Once every two months

7.2 According to the actual situation, medical units should not exceed three days or 5 operations or before each operation, clean and disinfect the lamp head disinfection handle, and can wipe and disinfect with 75% alcohol.(Each shadowless lamp has two sets of disinfection handles and can be disinfected alternately.) When cleaning and disinfection, medical personnel should strictly abide by the relevant national laws and regulations on sanitation and disinfection.

Note: 1. When cleaning and disinfecting the shadowless lamp, the power supply must be cut off first and prevent the liquid from penetrating into the lamp;

2, do not use brush, wire ball and other wear materials to clean the transparent

plate.

3. Users should strictly carry out the above instructions.

7.3 Common imbalance phenomena and treatment methods are shown in Table 3;

order number	phenomenon	processing method
1	The transverse arm tube is too tight or cannot be positioned arbitrarily.	Use the inner hexagon wrench (S=8) to adjust the transverse arm tube damper (marked), rotate clockwise, until the transverse arm tube is rotated and tightened properly, and can balance positioning.
2	The balance arm is too tight or is not positioned when rotating around the transverse arm tube.	Use the inner hexagon wrench (S=6) to adjust the damper above the straight pipe (marked), clockwise until the rotation is appropriate, and can be balanced positioning.
3	When the lamp head rotates around the lower bend, it is too tightly or cannot be positioned arbitrarily.	Use the inner hexagon wrench (S=4) to adjust the adjustment bolt at the connection between the lower bend and the lamp head, clockwise and counterclockwise (the adjustment bolt is under the rubber sleeve), until the lamp head rotates and tightened properly, and can be arbitrarily positioned.
4	The lamp head cannot be positioned arbitrarily when the balance arm swings up and down.	Open the joint box on the upper part of the balance arm, adjust the nut inside the second long oval hole from the outside with a random hexagonal wrench, and spin down, so that it can be positioned arbitrarily.
5	The lamp head is not fixed and floats	1. There is brake damping limit (marked) in the base, use (S=8) hexagonal wrench adjustment. 2. There is a brake damping limit (marked) at the connection of the transverse arm tube and the balance arm, and use the (S=6) hexagon wrench. 3. At the handle control switch (marked), use (S=4) internal hexagon wrench.

Table 3

If the above problems are presented, they can not be solved with the above methods. Please get in touch with us promptly!



Figure 7 (base transverse arm brake limit) Figure 8 (balance arm brake limit)

7.4 Common electrical line faults and troubleshooting, see Table 4:

Table 4

order number	phenomenon	processing method
1	Turn on the external power switch, and the power indicator of the control panel is not on.	<ol style="list-style-type: none"> 1. Check whether there is a power supply to the shadowless lamp holder. 2. Check the switch power supply device. If the switch power supply is burned out, replace the switch power supply of the same specification. 3. If the switching power supply is normal, check the power line and power indicator of the invisible lamp. Or whether the transmission on the transverse arm is in normal contact. Pay special attention to the wire color, the same color wire plug together.
2	Turn on the external power switch and the switch of the control panel, some of the beads are not bright	<ol style="list-style-type: none"> 1. Overhaul the lines. 2. Find the problems and eliminate them.

Note: Maintenance of any electrical line fault must be handled by qualified maintenance personnel.

8 Storage and transportation

1) Storage conditions

Storage conditions:

Ambient temperature range: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$;

shadowless lamps shall be stored in a room with relative humidity not exceeding 80% and no corrosive gas and well ventilated.

Atmospheric pressure range: 860 hpa ~ 1060 hpa;

2) Storage: If the storage time is more than 15 weeks, the general condition of all parts and packages should be checked regularly

3) For hoisting and transportation, take precautions:

Filmless lamp hoisting and pay attention to the "up", strictly prohibit the roll push.

Shadow less lamp is fragile, easy to withstand sharp or hard objects scratch or damage products, in the process of transportation, please use the original packaging, no hand hook and stacking can not exceed three layers, pay attention to moisture, can not be caught in the rain. It shall be transported by an experienced transport agent.

9 Safety instructions for the environment

1. Disposing of packaging materials

1) Wooden box —— is environmentally friendly and recyclable. Should be shipped to the designated recyclable material storage point.

2) Styrene packaging profiles and plastic bags —— are harmful to the environment, and should be transported to the designated storage point of non-recyclable materials for centralized treatment.

2. Disposal of the equipment

When the equipment reaches its service life, it must be stopped. The dismantled equipment shall be classified according to the different materials of the product components.

Warning: First, cut off all the power supply of the connected equipment, and then remove the equipment.

1) Metal components —— are environment-harmless and recyclable. Should be shipped to the designated recyclable material storage point.

2) Plastic parts —— are harmful to the environment, and should be transported to the designated storage point of non-recyclable materials for centralized treatment.

3) Glass components —— are environment-friendly and recyclable. Should be shipped to the designated recyclable material storage point.

4) Electronic and electrical devices —— are harmful to the environment, and should be transported to the designated storage point of non-recyclable materials for centralized treatment.

3. The disposal of the equipment shall comply with the provisions of the relevant national laws.

10 Date of specification / revision

Compilation date: July, 2020

11. Safe service period

The safe service period of this product is 6 years (from the production date), and the product validity period is obtained by the accelerated aging test.

Box list of LED surgical lamp products

order number	name	Quantity (double head)	Quantity (single head)	unit
1	lamp holder	2	1	individual
2	Disinfection handle	4	2	single
3	The lamp base	1	1	individual
4	balance arm	2	1	single
5	Big cover	1	1	cover
6	transformer	2	1	individual
7	Install chassis	1	1	individual
8	Tool screw	1	1	cover
9	46 Soft white cover	2	1	individual
10	39 Soft white cover	2	1	individual

Dear users:

First of all, thank you very much for using our products!

Under your support and trust, in order to protect your interests and make you get better and better quality service, our company hereby makes the following commitments:

The implementation of the three guarantees policy in China, 7 days package return, 15 days package replacement, one year warranty, lifelong maintenance! The parts of foreign customers can be returned and replaced within one year if they are damaged by human reasons.

1. The free warranty period is one year, calculated from the date of invoice.
2. Warranty point: the place of the buyers equipment.
3. Emergency maintenance schedule: if you receive a call from the hospital for maintenance, respond within 2 hours, deal with and solve the problem within 24 hours.
4. The following circumstances do not implement three guarantees, the implementation of paid maintenance.
 - a. Failure caused by man-made damage, improper operation, or irresistible natural disasters.

- b. Fault caused by the product transformation, decomposition and assembly.
5. If the warranty period, responsible for lifelong maintenance, all parts are the lowest price in the current market.
6. Mode of transportation: The Supplier is responsible for transporting the products to the place designated by the Demander.

warranty card

customer name			
Customer address		telephone	
product name		model	
identification of product		date of manufacture	
Fault description			

1. The machine is free of warranty for one year, lifelong maintenance.
2. All the following cases are not covered by the warranty:
 - 1) Damable parts are not covered by warranty.
 - 2) Damaged to the machine due to improper operation.
 - 3) The product model, product number and production date in the warranty card cannot be altered, otherwise it will be invalid.

The product model, product number and production date in the warranty card cannot be altered, otherwise it will be invalid.

The performance of the equipment will be gradually optimized, all products are subject to the physical object, the appearance size and other parameters are subject to change without notice!