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# Optical Fiber Fusion Splicer Instruction

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# Safety Information and Instructions

Under any situation of using the optical fiber fusion splicer (hereinafter referred as "fusion splicer"), we must follow the below general safety measures. Any behavior violates the machine safety standards for the design, manufacture, and usage, the company is not responsible for the consequences which is cause by the users violation of the requirements.

Before the power connected, please be sure that the power voltages is supplied as requirement and all safety measures are taken.

The power adapter must be company original, and the output characteristics must meet the following requirement: voltage: 10V ~ 13.5V; current: ≤6A; excessive voltage will damage the machine. The input AC voltage of the power adapter is 100~240V, 50/60Hz. If the input voltage exceeds this range, the adapter may be permanently damaged!

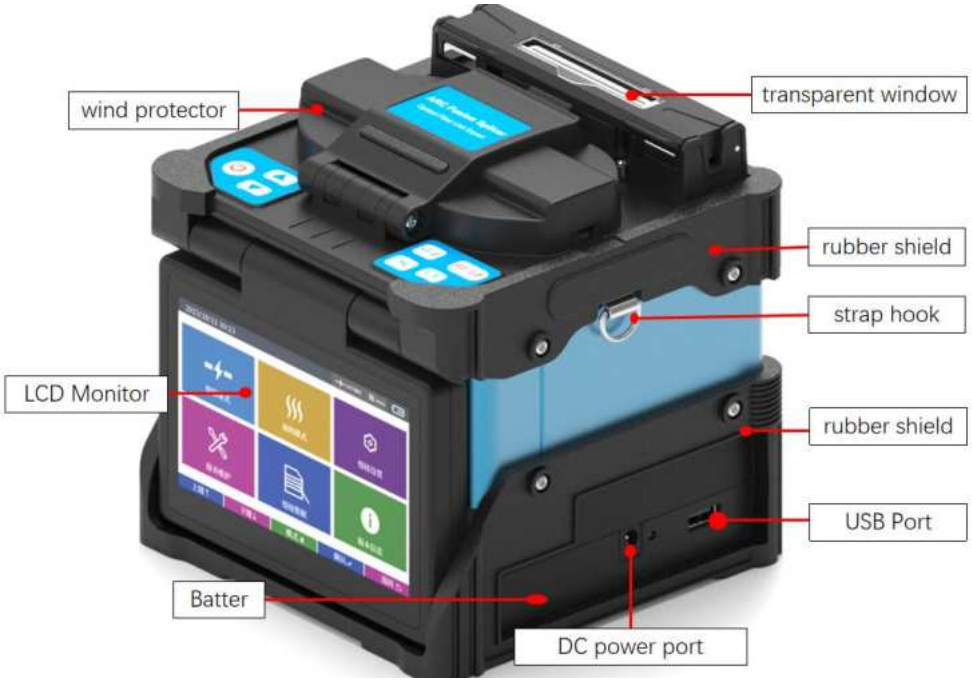
The Fusion Splicer is designed for welding quartz glass fibers and cannot use for any other purpose. The fusion splicer is a very delicate instrument and should be carried carefully. When using and carrying, the requirements of this manual should be followed. For the consequences caused by the user's violation of these requirements, the company does not assume any responsibility:

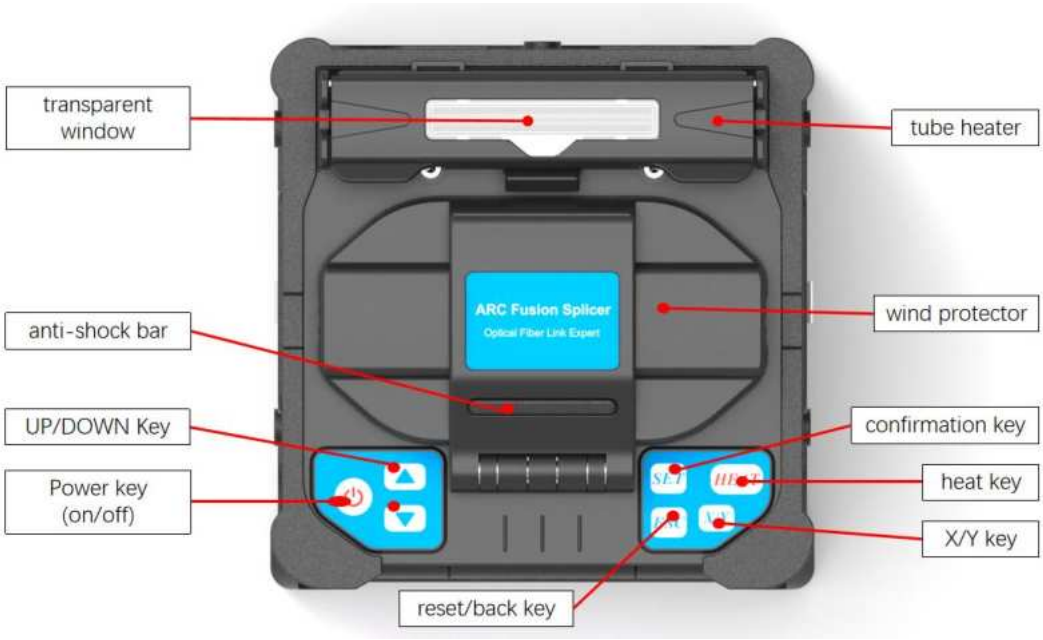
- Do not operate in explosive atmosphere, do not operate the tool in the presence of flammable gases or fumes.
- Do not use compressed or canned gas cleaner to clean the fusion splicer, otherwise the arc generated while welding may ignite residual combustibles.
- Do not touch the electrodes during working time, otherwise it may cause personal injure. Please turn off the fusion splicer and cut off the power supply before replacing electrodes.
- Always wear goggles during fiber preparation and splicing, otherwise it is very dangerous if fiber debris touches the eyes, skin or gets swallowed.
- Do not disassemble/install any part of the fusion splicer without authorization, only authorized agency can operate it.
- When liquid or foreign objects falls in to machine, or smoky, odor, noise etc. or splicer is damaged or dropped, please immediately shut down the machine and pull out the AC power.
- Do not touch the splicer, AC power cord, and AC plugs with wet hands.
- Do not use another manufacturer’s charger or adaptor. Other manufacturers’ chargers may overcharge and damage the battery.。
- Do not place any heavy objects on the power cord while charging, do not heat or change the power cord, otherwise it may cause fire, personal injury or death.
- Avoid using corrosive cleaners such as acetone and paint thinner to clean any part of the fusion splicer, otherwise it may cause damage to the machine.
- When the machine is not working, please put it away to keep the machine clean and dry. When handling and transporting, the machine needs to be placed in the original tool box to avoid damage or contamination.
- Do not place a battery on moist environment. Moisture may create a short circuit and damage the battery.

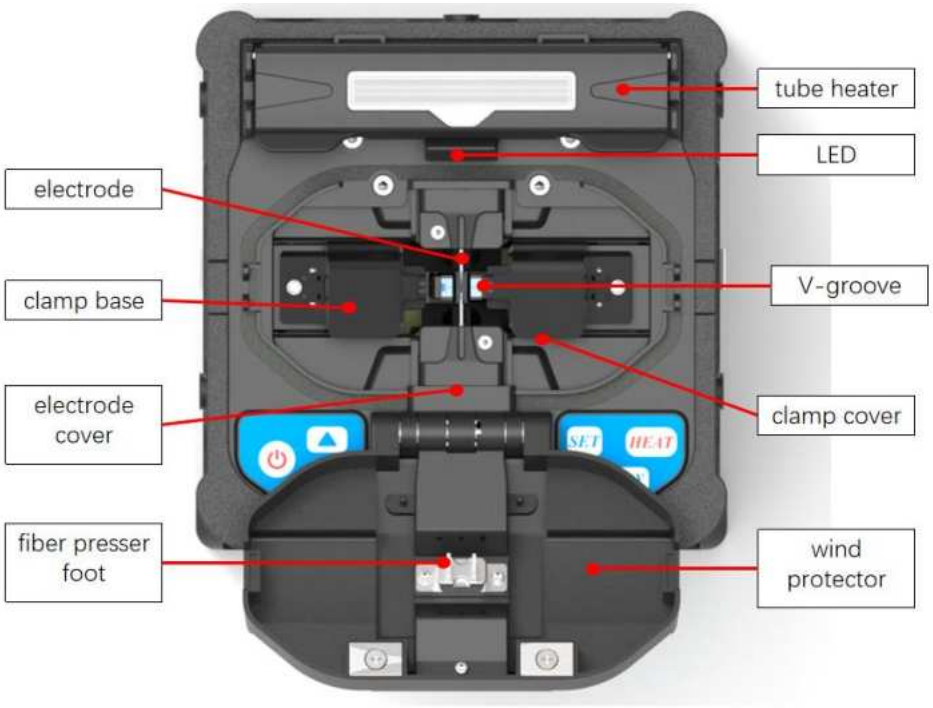
The battery in the machine is a special lithium-ion battery, and using other batteries may damage the fusion splicer and endanger the personal safety. The precautions for batteries are as follows:

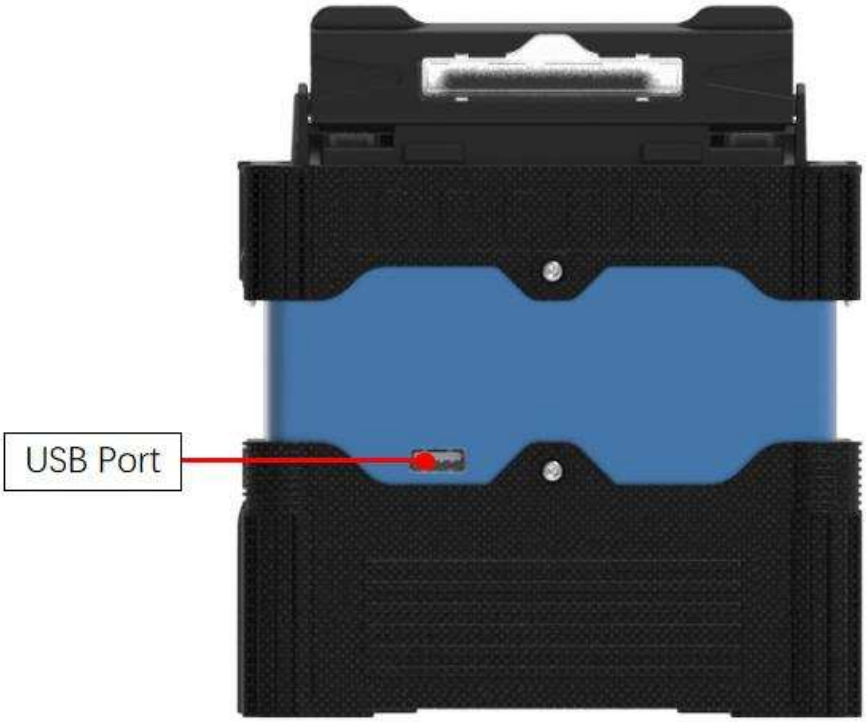
1) Do not hit the battery with sharp parts
2) Do not transport or store batteries with metal objects
3) Do not throw, drop, impact, bend the battery, or hit the battery with a hammer, step on the battery etc
4) Do not short-circuit the positive and negative electrodes of the battery with metal objects
5) Do not disassemble the battery pack under any circumstances
6) Do not immerse the battery in water
7) Do not use or place batteries near heat sources
8) Do not directly welding the battery
9) Do not use damaged batteries. Batteries with electrolyte leakage or electrolyte smell should be kept away from fire sources to avoid battery fire or explosion.

# Overview Splicer and Keyboard Introduction




tube heater
LED
electrode
clamp base
V-groove
electrode cover
clamp cover
SET
HEAT
fiber presser foot
wind protector


USB Port

# Technical Parameter

| Model | CR-OFS6 |
|---|---|
| CUP | Industrial grade dual CPU with 4 cores |
| Fiber Alignment | Core alignment/auto-focus |
| Applicable Fibers | SM (G.652), MM (G.651), DS(G.653), NZDS(G.655),BIF/UBIF(G.657) |
| Fiber Diameter | Cladding diameter:80~150um/Coating diameter:100um~3mm |
| Fiber Cleave Length | 5-16mm |
| Align Mode | Auto focus |
| Splicing Mode | Manual/Auto |
| Welding/Heating mode | Preset a variety of welding mode and heating mode, can be customized |
| Average Splicing Loss | 0.02dB (SM),0.04dB (MM),0.04dB (DSF),0.04dB(NZDSF) |
| Splicing Time | 6S |
| Heating Time | 15S |
| Storage | 10000groups |
| Image Magnification | 380times |
| Screen | 5-inch digital high-quality touch LCD screen |
| Lighting | Built-in high beam lighting |
| Power Supply | Input AC100~240V(50-60Hz), output DC10~13.5V |
| External Interface | DC adapter, USB interface |
| Tensile Testing | 1.96~2.25N |
| Shrinkable Sleeve | 10mm~60mm |
| Battery Life | 300cycles splicing and heating |
| Electrode lifetime | 5000counts |
| Communication Interface | U-disk automatic software upgrade,Melding data export |
| Operating Condition | Altitude:0~5000m, Wind speed:15m/s,<br>Temperature: -10~+50℃, Humidity:0~95％RH |
| Resistance | Dust/Shock/Water |
| Weight (including battery) | 2 KG (including battery) |
| Storage Condition | Humidity:0-95％RH, Temperature: -20~50℃, Battery Storage: -20-30℃ |
| Dimension (LxWxH) | 144mm(L)×142mm(W)×151mm(H) |

# Splicer Interface and Function

1. Boot Interface

Press the power button for 3 seconds, the machine will automatically turn on and enter the boot screen. Scan the QR code on the interface and follow the company's WeChat public account to know the latest developments of this product and the latest version of the firmware.

2. Standby Interface

The standby interface shows some brief setting information of the machine, which will help you enter the work more quickly.

3. Main Page

By up/down key, press enter key to enter related settings.

- Splicing Mold

① Selecting the appropriate splicing mode helps to get lower splice loss.

② According to different situation, the relevant parameters can be adjusted.

◆ Heating mold

① Select the appropriate heating mode according to the specification of the heat shrinking tube used

② According to the actual use, modify the heating time.

◆ Splicing Setting

① Change the relevant machine settings according to the actual usage and personal usage habits.

◆ Splicing Data

① Check the machine splicing times（not including cleaning discharging）

② Check the machine splicing data

③ Delete the relevant splicing data

④ Export the splicing data

Note: when export the data, please use U-Disk in FAT or FAT32 format.

◆ Auto Calibration

① When first time to use the machine, or replacing the electrode, or when the welding loss is not as good as expected, please perform discharge correction.

② When the machine breaks down, please enter the self-test.

③ The optical fiber is abnormally advanced, and the core adjustment is slow. Please enter the motor calibration to achieve the best fusion status.

④ According to personal needs, you can enter the manual welding mode.

⑤ Under the instruction of the authorized agency, please enter the Menu page to set the relevant parameters.

◆ Version Information

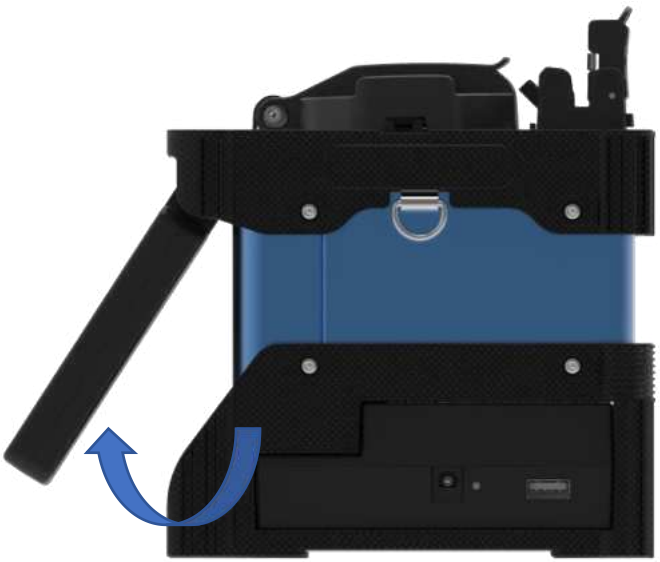
① Query the machine's serial number, software version, date of manufacture, place of origin and other information

② With -disk, can upgrade the machine to the latest version.

Note: when export the data, please use U-Disk in FAT or FAT32 format

# Basic Operation

1. To adjust the LCD Screen to a comfortable place to use

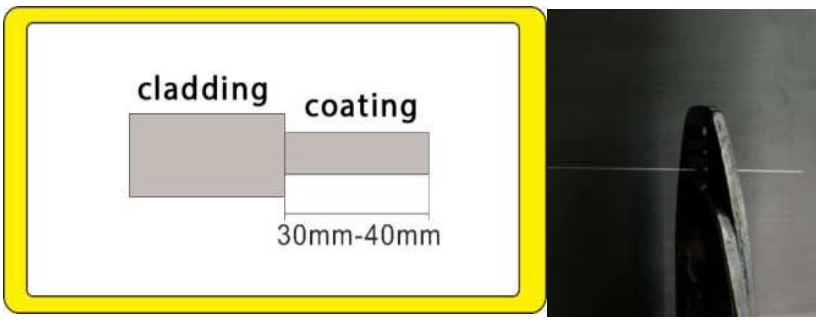


2. Press the power button for 3seconds， when the machine turn on and it enters to standby interface.
3. Put on the fiber heat-shrinking tube：

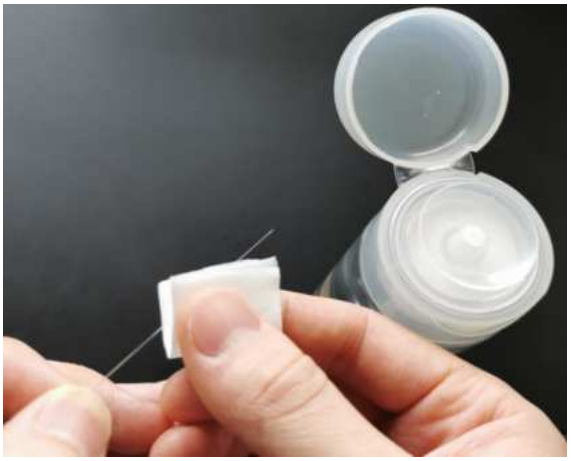
4. Fiber Preparation：

A. Bare Fiber：

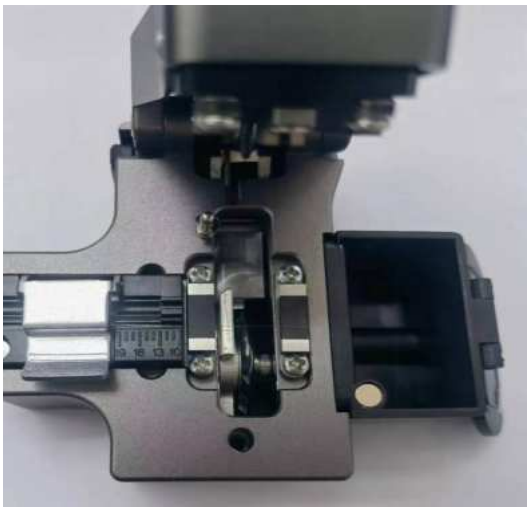
1) Take the stripper to remove the first plastic layer of fiber, about 30mm-40mm length.




2) Use cotton wipe with anhydrous alcohol to cleave the waste that may remain on fiber.

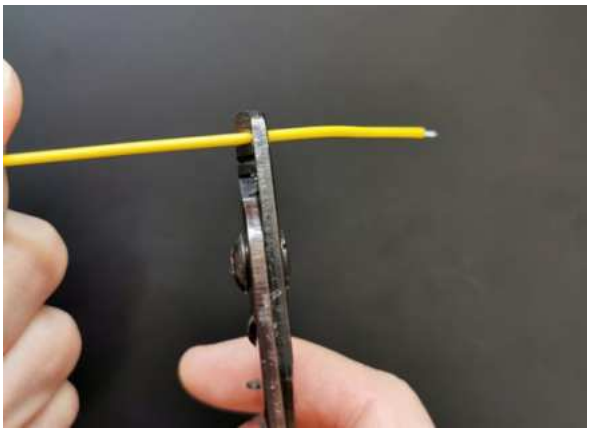


3) Cut the fiber with a fiber optical cleaver.

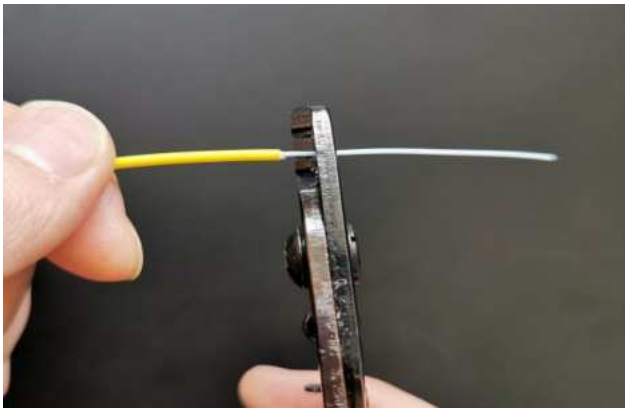


B. Patch Cords：

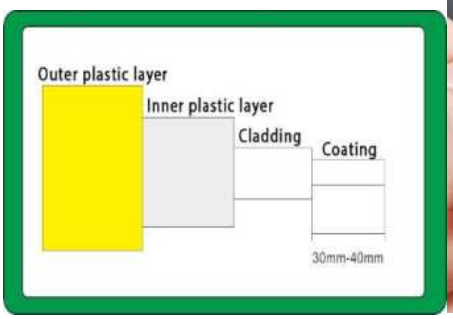
1) Take the stripper its 1st cutter to remove the plastic lay, length about 35 – 40 mm.

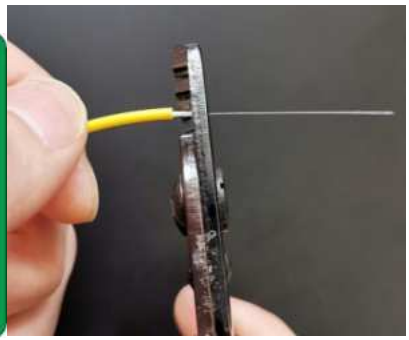


2) Take the stripper its 2nd cutter to remove the inner lay plastic, length about 30mm – 40 mm.



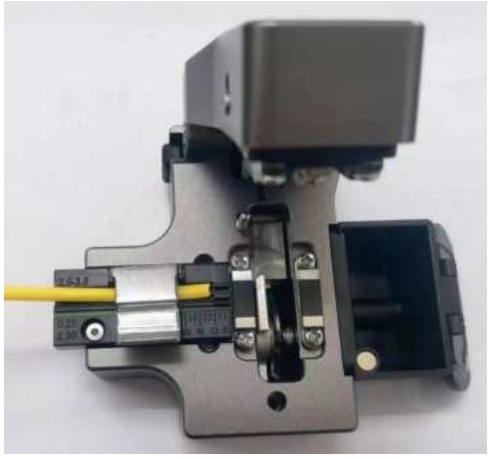
3) Use the stripper 3rd cutter to remove the last layer about length 30mm – 40 mm.



4) Use cotton with anhydrous alcohol to cleave the waste that may remain on fiber

5) Cut the fiber with a fiber optical cleaver.



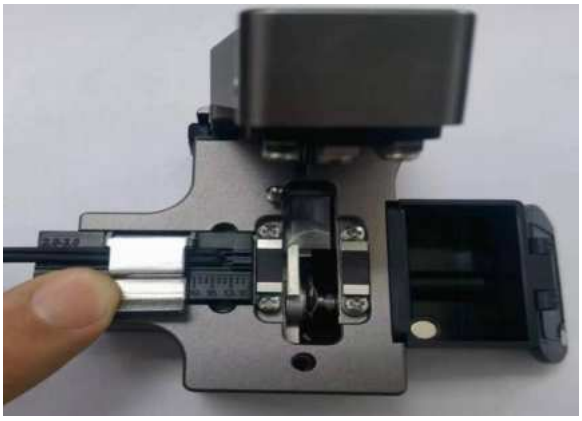
C. Drop Cable

1) Use the stripper to cut the drop cable, and then remove the plastic layer.30mm --

40mm.

2) Use cotton with anhydrous alcohol to cleave the waste that may remain on fiber

3) Cut the fiber with a fiber optical cleaver



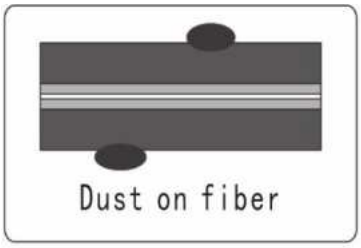
5.Fiber Placing：

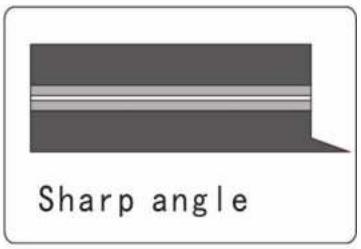
1) Open the wind-protector

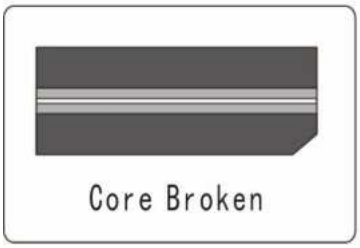
2) Place the ready-fiber into V-groove, leave the fiber as close as to the electrodes, then close the clap to hold the fiber.

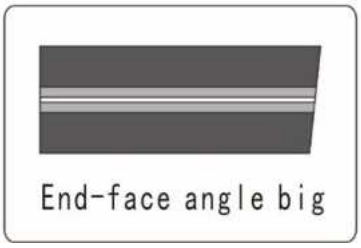
6. Close the wind-protector:

The machine will automatically align the cores in both vertical and horizontal planes, then the fusion process starts. If below faults happen, please re-prepare the fiber:



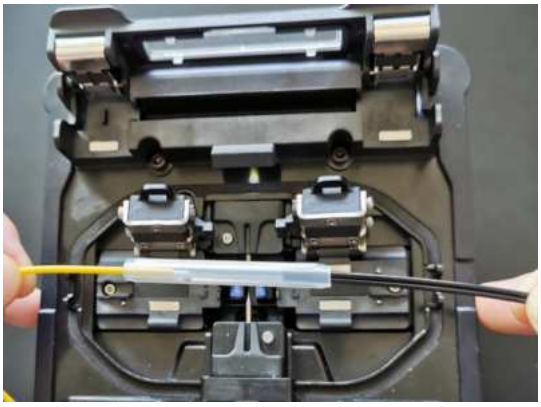



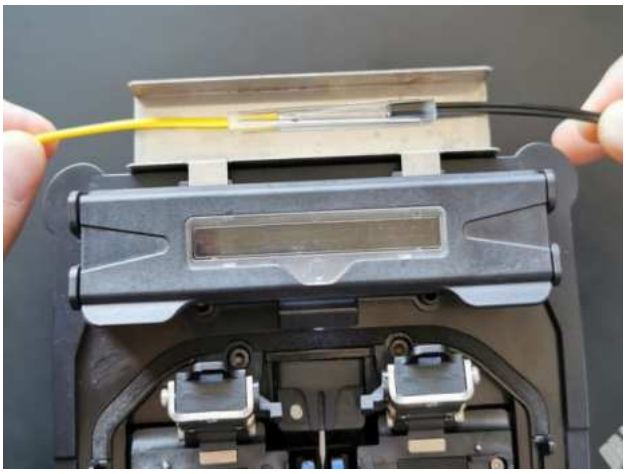

7. After splicing finishes, open the tube heater and take the welded fiber out as below,

8. Move the heat shrinking tube to the splicing part gently.



9. Put the fiber to the heating tube, and it will automatically heat.

10. Take out the ready fiber and place it to the cooling tray waiting the fiber tube to cool down, then the whole process finished.



# Maintenance

1. Cleaning
   1) V-groove cleaning: once a week

   2) Cleaning the upper and lower pressure pads of the clips: once a month.

   3) Cleaning objective lens: once in 6 months

4) Replacing electrode: depends on the situation to replace or clean.

5) Cleaning the fiber presser foot: once a month

6) Optical fiber cleaver cleaning: once a day.

2.Spare parts replacement

1) Electrode Replacement

It is recommended to replace the electrodes in time after the fusion splicer has been discharged for 4500 times. When the number of discharges reaches 5000 times, if they continue to be used without replacing them, it is likely to cause a very large welding loss and greatly reduce the strength of the welding point. In some cases of high-intensity load work, frequent cleaning of the electrode is also a very effective method to prolong the service life of the electrode.

2) Replacing cleaver cutting blade

3. Arc Calibration

1) When first time to use the machine, please do arc calibration first, to achieve the best welding result.

2) Every 500 times splicing after, arc calibration is recommended

3) When the environment changes (altitude, temperature or humidity etc) , doing arc calibration helps reduce the splicing loss.

4. Storage

1) If the machine not working in a long time, please store it in a dry environment at 25℃.

2) Fully discharge the battery for at least three months, otherwise the capacity of the battery will decrease due to memory effect

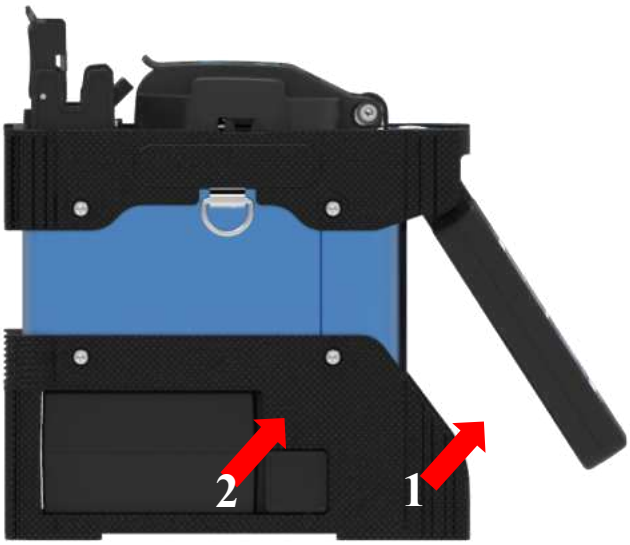
3) Before storage, please get machine full charged. Power connection and the battery usage instruction

Two methods to supply the power to the machine：

1. Battery

① When the battery power is less than 20%, please charge it asap, otherwise the power is not enough for operation of splicing and working.

② Press the release button next to the battery, and push it to take the battery out charging, pic as below:




2. Directly input the adapter to supply the power. Please use the OEM adapter.

① Plug in the adapter, the machine can over charging over working

Instruction light Red: charging statue

Instruction light Green: Charging finished

② Take out the battery and charge it separately。

Instruction light Red: charging statue

Instruction light Green: Charging finished

Reverse Charge:

① The battery can provide 5V, 2A power for the external as emergency power

Parameters

✧ Applicable Fibers:

- SM(ITU-TG.652)
- MM(ITU-TG.651
- DS(ITU-TG.653)
- NZDS(ITU-TG.655)
- BIF/UBIF(ITU-TG.657)

✧ Splicing Loss：

Using the same fiber for welding, the typical value of the splice point loss measured by the ITU-T standard shearing method is:

- SM：0.02dB
- MM：0.01dB
- DS：0.04dB
- NZDS：0.04dB
- BIF/UBIF：0.02dB

✧ Splicing Mode：

- 10 Preset / User Definable Modes 300 groups
- Storage Of Splice Results: 10000 results
- Splicing time：SM Fast Mode - 6S

✧ Tube heating：

- Tube sleeve size： 10mm – 60mm
- Heating time: 10s – 60s, adjustable
- Typical Heating time: 14s
- Tube heating mode: 6 presets

✧ Power supply：

- Input Voltage：AC100～240V，50/60Hz
- Output voltage：DC13.5V

✧ Dimension & weight：

- Dimension：L*W*H=144mm*142mm*151mm
- Weight：2kg (with battery)/1.6kg

✧ Environment：

- Operation Conditions:

Altitude: 0 – 5000m; temperature: -10～+50℃; Humidity: 0～95%;

Wind speed: ＜15m/s.

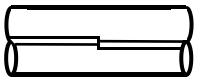
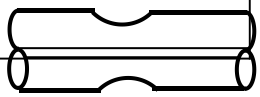
- Storage Conditions:

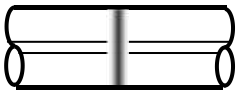
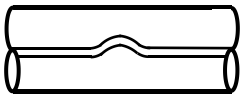
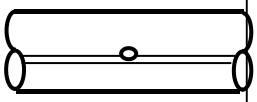
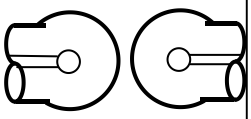
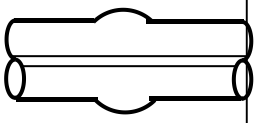
Temperature: -12℃～ +50℃； Humidity: 0～95%,-20～50℃

✧ Others:

- Observe & Display：2 cameras, 5-inch LCD Monitor
- X/Y single display: 300x magnification; X&Y both display: 180x magnification
- Tension test：1.96~2.25N
- USB（Battery）：reverse charge
- USB（machine）：Upgrade software, data output

Splice Loss Increase and Solution

| Symptom | Name | Cause | Solution |
|---|---|---|---|
|  | Core axial offset | Dust on V-groove or fiber clamp chip | Clean V-groove and fiber clamp chip |
|  | Thin | Arc power not | Preform Arc Calibration |

| | | | |
|---|---|---|---|
| | | adequate | |
| | | Some arc parameters not adequate | Adjust Prefuse Power, Prefuse Time, or Overlap |
|  | Line | Some arc parameters not adequate | Adjust Prefuse Power, Prefuse Time, or Overlap |
|  | Core Curve | Bad fiber end-face quality | Check if fiber cleaver is clean and in good condition |
| | | Prefuse power too low, or prefuse time too short | Increase Prefuse Power or Prefuse Time |
|  | Bubble | Bad fiber end-face quality, and dust | Check if fiber cleaver is clean and in good condition |
| | | Prefuse power too low, or prefuse time too short. | Increase Prefuse Power or Prefuse Time |
|  | Seperation | Fiber stuffing too small | Perform Motor Calibration |
| | | Prefuse power too high or prefuse time too long | Decrease Prefuse Power and Prefuse Time |
|  | Fat | Fiber stuffing too much | Motor calibration or Decrease Overlap |
| | | Prefuse power too high | Arc calibration |

Note: if repeat the above symptoms, please contact the local authorized distributor for solving problems.

Common Fault and Solution

| Error | Reason | Solution |
|---|---|---|
| Turn on the machine, there is no reaction on LCD Screen or the light | 1. Adaptor wrong plug in or damaged<br>2. Low battery | 1. Confirm the adaptor plugin in right way<br>2. Check the adaptor output |

| | | |
|---|---|---|
| inside wind-protector is not on, | 3. Short circuit or malfunction inside the machine<br>4. Battery damaged<br>5. Battery not fully inserted to the machine | voltage is 13-14V<br>3. Check whether foreign objects inside machine lead to short circuit, then restart the machine. If still problem, please contact the local distributor for solving problem.<br>4. Re-insert the battery |
| Fiber image on the screen is blur | Fiber got wrong placed, not into the V-groove | 1. Again open and close the wind-protector<br>2. Replace the fiber<br>3. Clean the V-groove |
| Without aligning to splicing, the splice loss is big or failed. | 1. Dirt on fiber, or bad fiber end-face<br>2. Dust or dirt on the lens | 1. Adjust the fiber cleaver, and cut the fiber again<br>2. Clean the lenses |
| Fiber can't enter V-groove smoothly, and image blur | 1. Dust or dirt on V-groove<br>2. Dirt on fiber presser<br>3. Lens focal length not reset<br>4. Incorrect place fiber in clipper | 1. Clean the V-groove<br>2. Use cotton to clean the fiber presser<br>3. Press reset button<br>4. Replace the fiber |
| Electrodes do not discharge | 1. Electrodes damaged or the high-voltage board is fault<br>2. Low battery | 1. Replace the electrodes<br>2. Charge the battery<br>3. Contact the after sales service for maintenance |
| Splicing smoothly but the loss is big | 1. Inappropriate discharge current<br>2. Fiber push error<br>3. Electrodes over work | 1. Discharge arc calibration<br>2. Motor calibration<br>3. Increase/decrease splicing overlap<br>4. Replace the electrodes |
| Spliced fiber has bubble, gets fat etc. | 1. Fiber gets dirt<br>2. Bad fiber End-face<br>3. Incorrect splicing mode | 1. Use anhydrous alcohol to clean the fiber then cut<br>2. Set the correct splicing mode |
| Heater failed to complete heat the hot shrinking sleeve | 1. Auto heating mode turn off<br>2. The sensor foot on the heater is not pressed by the fiber<br>3. Inappropriate heating mode<br>4. Inappropriate heating time | 1. Manually press the heating button<br>2. Replace the hot-shrinking tube<br>3. Setting relevant heating mode according to the tube type<br>4. Increase the heating time |

Note: If tried all above method and still not solve the problem, please contact the after-sales service for the local authorized distributor for it.

# Warranty

We do not recommend that users repair the product by themselves.

- Our Company will provide its product promise, and the warranty period is valid within 18 months from the date of shipment. When the purchased product was found to have quality problems during this period, Our Company will make appropriate repairs or replacements.
- If a problem occurs during the use of the instrument, the solution based on the common failure indication cannot be resolved. Please contact the company's marketing or after-sales personnel. Users are not allowed to open the chassis without authorization; otherwise, they will not provide warranty service.
- For quality failure due to production defects, the manufacturer is responsible for free repair or replacement of the meter. This guarantee is only applicable to the normal use of the meter and no one is damaged or improperly used.

Warranty of does not include wearing parts and problems/faults caused by the following reasons：

1） Unauthorized repair or modification of the instrument

2） Improper use, negligent use, accident, etc

# ***Appendix II***

*Warranty notice*

1. During the warranty period, the user can present this warranty card and invoice or receipt (photocopy) in the event of a malfunction in using this product under normal conditions, and can enjoy unpaid maintenance services.

2. In the following cases, it is necessary to pay for repairs, and charge certain materials, maintenance fees and shipping charges as appropriate;

   1) Failure occurred when the product is used under normal conditions, but it has exceeded the warranty period.
   2) The warranty card is not presented. The warranty card is missing, altered or missing.
   3) Use under abnormal conditions, such as man-made damage, or under abnormal conditions such as high temperature, high pressure, and humidity, pay for maintenance normally depending on the damage.
   4) Failure and damage caused by non-product quality problems.
   5) Faults and damages that are not caused by the instructions and precautions in the manual.

3. The following circumstances, the company will not be maintained:

   1) Unauthorized repair or modification of the instrument without the consent of the company.
   2) Products not produced and sold by the company.