OPERATION MANUAL
FOR
SINGLE MODE OPTICAL FIBRE FUSION SPLICER

XL-FS53F

Please read this Operation Manual carefully before operating the equipment.
Comply with all safety procedures and warnings in this manual.
Keep this manual properly in a safe place.

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The Optical Fibre Fusion Splicer is designed for the optical quartz glass fibre used in the communications, except which it cannot be used to splice any other substances and for other applications.

Considering the user's personal safety, here we provide the user with a lot of safety cautions， because it is possible to result in electric shock, fire and personal injury if the user improperly uses the Optical Fibre Fusion Splicer.

Please read seriously, by all means, this Operation Manual before operating the equipment.

Comply with all safety requirements and warnings in this manual.

Keep this manual properly in a safe place.

In case of meeting a failure, please stop using the equipment, and contact us as soon as possible

Keep this manual properly in a safe place, so as to refer to it in the future.

WARNINGS AND CAUTIONS FOR SAFE OPERATION

It is necessary to immediately turn off the power switch of the Optical Fibre Fusion Splicer ; pull the AC power cord out of the AC power outlet; and take out the storage battery from the Optical Fibre Fusion Splicer, in case of meeting the following failures: ● Smoke, peculiar smell, abnormal sound or heating abnormalities; ● Liquid or foreign objects into the equipment; ● The Optical Fibre Fusion Splicer has been damaged or broken. If the user has not timely adopted measures to solve failures of the Optical Fibre Fusion Splicer in case of meeting these failures, it may cause the equipment scrap, electric shock, fire or personal injury or even death.
The AC adapter and battery charger of the Optical Fibre Fusion Splicer can only use an AC power source (100V-240V AC, 50hz-60hz). If the user uses the improper AC power source, it may possibly lead to smoke, electric shock, equipment damage, and even cause the fire or personal injury or death. (Note: Usually, AC generators output abnormal high pressure and irregular frequency, so that it is necessary to measure generator's output voltage value with the ammeter before connecting the AC power cord. Abnormal high pressure or frequency can lead to smoke, electric shock, equipment damage, and can even cause fire or personal injury or death. Make sure the generator's regular check and maintenance.
Please use the specific AC adapter. If you use the inadequate AC adapter, it may possibly lead to smoke, electric shock, equipment damage, and cause the fire or personal injury or even death.
Please use the specific batteries. Only the batteries supplied by the manufacturer are allowed to be used for the equipment. Please use the specific battery charger to charge the batteries. If you use other batteries or battery chargers, it may possibly lead to smoke, electric shock, equipment damage, and cause the fire or personal injury or even death.
Don't make bold to disassembly or modify the Optical Fibre Fusion Splicer, the specific AC adapter, or the batteries, esp., any electronic and mechanical devices (fuses or safety switches) inside the equipment can not be removed or bridged. Any improper maintenance may possibly lead to the damage of the Optical Fibre Fusion Splicer, and even cause electric shock, the fire or personal injury or death
It is prohibited to use the Optical Fibre Fusion Splicer in the flammable liquid or gas environments, where the discharge of the Optical Fibre Fusion Splicer may cause the fire or explosion.
Do not use the compressed or canned air cleaner to clean the Optical Fibre Fusion Splicer. Otherwise the arcing generated by splicing will ignite the residual flammable matter.
Don't use the Optical Fibre Fusion Splicer in the environment of high temperature or nearby the high temperature object, and also in the place where there are too much dusts or higher humidity, otherwise it may possibly lead to equipment damage, cause the fire, get an electric shock, degrade the equipment performance, and cause the worse splicing loss.

WARNINGS AND CAUTIONS

Please don't use the wet hand to contact the Optical Fibre Fusion Splicer, the AC power cord and AC power plug, otherwise it may possibly cause the risk of getting an electric shock.

When the surface of the Optical Fibre Fusion Splicer is vapor-condensed, please don't operate the Optical Fibre Fusion Splicer, otherwise it may lead to electric shock or equipment damage.

When the Optical Fibre Fusion Splicer is operating, please don't touch the electrode, otherwise the high pressure and high temperature generated by electrode discharge may cause severe electric shocks and burns (Before changing the electrode, you must firstly turn off the power supply of the Optical Fibre Fusion Splicer, remove the batteries, and pull out the AC power cord.)

Do not let the DC input ports of the Optical Fibre Fusion Splicer be short-circuited. the excessive current may lead to personal injury, smoke, electric shock or equipment damage.

Do not use any chemical substances other than alcohol to clean such devices as the objective lens, the V-shaped groove, reflecting mirror, LCD screen, etc., of the Optical Fibre Fusion Splicer. Otherwise it will cause the imaging to be unclear, with stains, corrosion and damage.

The Optical Fibre Fusion Splicer does not need any lubricant, lubricating oil or grease, which will reduce the performance of the Optical Fibre Fusion Splicer and possibly damage the Optical Fibre Fusion Splicer.

For the Optical Fibre Fusion Splicer having passed through the accurate adjustment and calibration, don't subject it to strong shock or collision, otherwise this may possibly cause damage to the equipment. Please use the provided case to transport and store the Optical Fibre Fusion Splicer, so as to effectively protect it from strong vibration or collision.

Don't let the Optical Fibre Fusion Splicer be positioned at an unstable or uneven place, otherwise it may possibly move and lose its balance and fall over, causing the equipment damage and the personal injury.

For the heat-shrinkable sleeve during heating or just at the end of being heated, please don't touch it, because at this time, the temperature of its surface is very high, if you touch it, this may possibly cause burns to you.

When you need to bring the portable Optical Fibre Fusion Splicer with shoulder-strap carrying case, please check whether the shoulder strap and hook are intact to you or not. If you use a damaged shoulder strap, it may possibly cause the shoulder strap to be ruptured or escape from the hook, resulting in the personal injury or the equipment damage.

The Optical Fibre Fusion Splicer must be maintained and debugged by a professional technician or an engineer. The incorrect maintenance for it may possibly cause the fire and the electric shock. If the Optical Fibre Fusion Splicer fails, please contact a service center.

Please use the storage batteries strictly according to the Operation Manual. The wrong use may cause the battery explosion and the personal injury.

- Do not use certain methods other than those mentioned in the Operation Manual for battery charging;
- Do not dispose of batteries in fire or incinerator;
- Do not charge and discharge the storage batteries at the place being close to the fire or under the direct sunlight;
- Do not let the batteries be subjected to the severe shock;
- If the battery leaks, you must handle it with caution, and pay attention to preventing the battery leaking liquid from touching your skin or eyes. In case that you have accidentally touched the battery leaking liquid, you must immediately and thoroughly clean the touched parts, and seek medical care immediately. At the same time, please properly handle the leaking battery and notify the maintenance service center for solving the related issues.
- In case of charging the batteries, it is not allowed that the batteries will be stacked up on top of the AC adapter or charger.

Please correctly use the electrodes according to the Operation Manual.

- Use only the specific electrodes;
- Correctly replace the electrodes;
- The electrodes must be replaced in pairs;

If the above instructions are ignored, it may cause the abnormal discharge of the Optical Fibre Fusion Splicer, the splicing performance degradation or even damage to the equipment.

The manufacturer or Seller will not assume the responsibility for the Buyer's or user's personal injury and losses of the articles or equipment caused by that the user ignores the warning and uses or repairs the Optical Fibre Fusion Splicer incorrectly .

Recycling and Disposal

EU countries:

According to the EU's European Parliament's implementation standard:2002/96/EC, in order to use the new resources and make the number of buried waste to be minimized, the reusable and / or recycling electronic components and materials have been identified and recognized. If you are in the EU countries, please do not use this product as unsorted municipal living solid waste to be discarded. Please contact your local relevant agencies.

Other countries:

For recycling this product, please firstly disassemble it, and then classify each part according to different materials, and keep to the relevant local regulations related to the recycling.

WARNINGS AND CAUTIONS

1. STANDARD CONFIGURATION OF OPTICAL FIBRE FUSION SPLICER

Serial No.	Designation
1	Main Equipment of Optical Fibre Fusion Splicer
2	Storage Battery
3	AC Adaptor
4	Cooling Salver
5	Quick Operation Instruction
6	Notice And Warnings
7	Guidance CD
8	Carrying Case

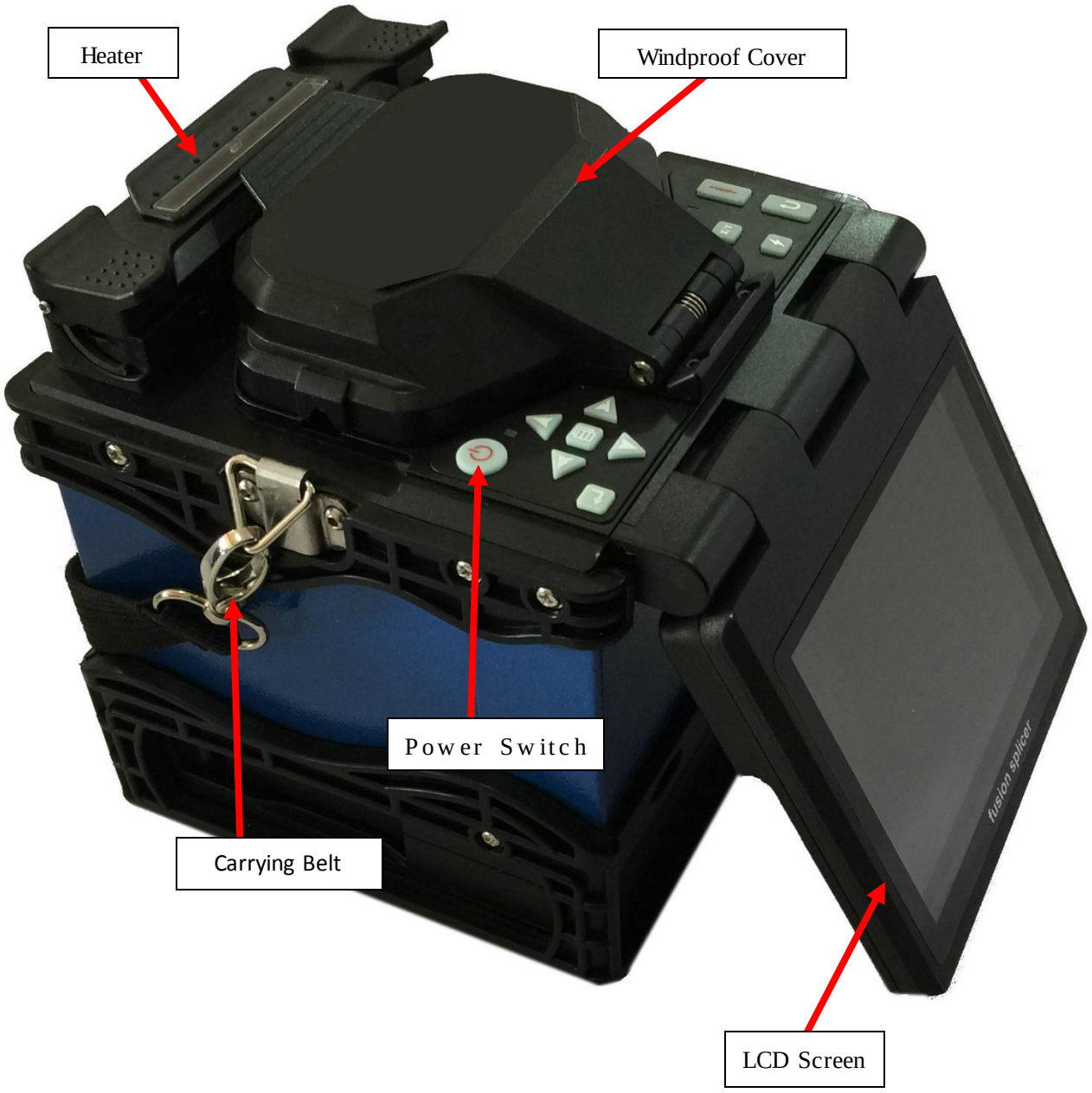
2. OPTIONAL CONFIGURATION OF OPTICAL FIBRE FUSION SPLICER

Serial No.	Designation
1	USB Connecting Cable
2	Optical Fibre Stripper
3	Optical Fibre Cleaver
4	Spare Electrode

3. OTHER NECESSARY ACCESSORIES FOR SPLICING OPERATION

Serial No.	Designation
1	Optical Fibre heat-shrinkable sleeve
2	Alcohol Without Water（Purity: >99%）
3	Tissue, Gauze or Skim Cotton Cloth

4. DESIGNATION OF COMPONENTS OF OPTICAL FIBRE FUSION SPLICER



1. How to Get Small Splicing Loss

1-1. Necessary Regular Cleaning Jobs

● To Clean V-Shaped Groove
● To Clean Reflecting Mirror
● To Clean Optical Fibre Pressure Head
● To Clean Objective Lense.

In case of cleaning Objective Lens， it is unnecessary to remove needle electrodes

1-2. Selection/Usage of Appropriate Splicing Modes

Please select the appropriate splicing modes according to different sorts of the Optical Fibres.

1-3 Equipment Clean-up before Each Fusion Splicing Operation

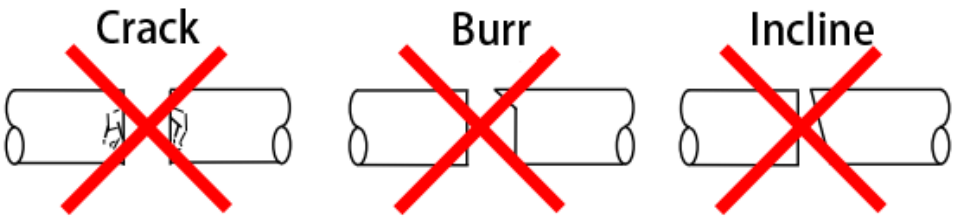
● To Clean the blades of Optical Fibre Stripper.
● To Clean the rubber pad and blades of the Optical Fibre Cleaver.

1-4. FUSION SPLICING PROCEDURES

● Make sure that the coating residue and other contaminants on the optical fiber will have been removed after stripping the optical fiber.
● Please use the pure alcohol with a concentration of more than 99% .
● Do not let the well-cut end of the optical fibre touch any object or be contaminated.
● Please put the end of the optical fibre at the place between the edge of the V-shaped groove and the center of electrode.
● Please put the optical fibre rightly on the bottom of the V-shaped groove.

Make sure the correct cut length. If the cut length is too short, the optical fibre’s coating edge may possibly encounter the V-shaped groove, so that two optical fibers can not be, in the discharge process, fully close to each other, resulting in undesirable loss of fusion splicing.

● Do not tight the optical fibers, otherwise, two optical fibers can not be, in the discharge process, fully close to each other, resulting in undesirable loss of fusion splicing.
● Please check the cutting angle and shape of the optical fiber’s end face. The optical fibre’s cutting angle will affect the fusion-splicing quality, and a large cutting angle will increase the loss of fusion splicing.



● It is possible to observe the discharge from the display screen. If the discharge "vibration" or "flickering light" are being observed, the discharge may be unstable at this time and will result in adverse loss.
● In case of heating, the Optical Fibre heat-shrinkable sleeve shall be placed in the centre of the heater, so as to avoid uneven heating and lead to additional losses.

2. Power Supply

Please only use the AC Adaptor provided by the manufacturer.

Please only use the Storage Battery and Battery Charger provided by the manufacturer.

2-1. Avoidance of Damage to AC Adapter

● The AC generators may possibly produce abnormal output of AC high voltage or irregular frequency.

● The abnormal high voltage and frequency output from the generator may possibly lead to smoke, electric shocks and damage to the equipment, and even cause the fire, the personal injury or death. So, before connecting the AC power supply, you must use a multimeter to measure the generator output voltage.

2-2. Storage Battery

● Even if the storage battery is not used, its capacity will also gradually go down along with the time goes, and if it is fully discharged, it would never be able to charge into the electricity. So, if it will be stored for a long time or it has been used, please charge it in time.

● if it is necessary to store a pack of storage battery for a long time, and no matter how much electricity quantity it has been charged before , you should charge it every six months.

● For operating/charging/longtime storing the storage battery, please refer to the conditions as below:

Operating: -10 ℃ ~ +50 ℃

Charging: 0 ℃ ~ +40 ℃

Longtime Storing: +20 ℃ ~ +30 ℃-

1. POWER CONNECTION

OPTICAL FIBRE FUSION SPLICER provide two power-supply modes: ① Storage Battery; ② AC Adapter. Please make sure that OPTICAL FIBRE FUSION SPLICER shall be turned off .in case of operating it.

1-1. Insertion of the Storage Battery.

Insert the storage battery into the battery slot until it is properly in place.

1-2. Removal of the Storage Battery

Using one hand to press and hold the release button and also support the edge of OPTICAL FIBRE FUSION SPLICER, and the other hand to push the storage battery out.

1-3. Connection of the AC Adapter

Insert the plug via aiming at its location point and then screw it till it is tightened.

1-4. Disconnection of the AC Adapter

Unscrew the plug cover and pull out the plug.

2. TURNING ON POWER OF OPTICAL FIBRE FUSION SPLICER

Press power button  to switch ON/OFF device.

3. LAYING OPTICAL FIBRE

1) To open the wind-protector cover and the optical fibre clamp cover;
2) To get the ready optical fibre to be placed in the V-shaped groove, and make the end of optical fiber be placed at the position between the edge of the V-shaped groove and the electrode tip;
3) To use fingers to nip the optical fibre, then to close the optical fibre clamp cover so as to ensure that the optical fibre will not move, and make sure that the optical fibre will be placed at the bottom of the V-shaped groove. If the optical fibre is placed incorrectly, please place the optical fibre over again;
4) To place another optical fibre according to the above step;
5) To close the windproof cover.

4. SPLICING OPERATION

4-1.Optional Operation Modes：AUTO/MANUAL

AUTO：By pressing the AUTO key, it is able to start the fusion splicing operation.
MANUAL：For the Manual operation, please refer to the details on P15.

4-2.Optional Types of Optical Fibres: Single Mode (SM) / Multi Mode (MM) /Non-Zero Dispersion-Shifted (NZDS) / Erbium-Doped (ED) Optical Fibre

4-3.Pause Functions: Open/Close

Open: After the completion of the core-to-core, press the AUTO key to perform the fusion splicing.
Close: After the completion of the core-to-core, automatically perform the fusion splicing.

5. TAKING OUT OPTICAL FIBRE AND HEAT IT UP

BASIC OPERATIONS

1) Open the heater lid;
2) Open the windproof cover;
3) Open the optical fibre clamp covers at the left and right;
4) Take out the optical fiber and move Optical Fibre heat-shrinkable sleeve to the splicing point;
5) Place the Optical Fibre heat-shrinkable sleeve in the centre of the heater and cover the heater lid;
6) Press the HEAT key to heat, the heat indicator will also light up;
7) When the heat indicator goes out and a hint sound appears, the heating is completed;
8) Turn on the heater lid, and take out the optical fibre to check and see if the optical fibre contains air bubbles or not;
9) After completing the checks, place the optical fibre in the Cooling Salver to cool it.

MAINTENANCE OF FUSION SPLICING QUALITY

1. CLEANING AND CHECKING BEFORE FUSION SPLICING

The following describes the maintenance checks for the key cleaning points and the important parts.

1-1.Cleaning the V-Shaped Groove

If there are dusts or contaminations in the V-shaped groove, the optical Fiber Pressure Head can not suppress the Optical Fiber correctly, resulting in that the loss of fusion splicing is larger. So, in regular operation, it is necessary to check more often and clean regularly the V-shaped groove.

- To open the windproof cover.
- To clean the bottom of the V-shaped groove with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol in the V-shaped groove with a dry cotton swab.
- If contaminations in the V-shaped groove can not be removed with a cotton swab just having had a dip in alcohol, you can use the well-cut end face of the optical Fiber to clean the bottom of the V-shaped groove, and then repeat the previous step.
- In case of cleaning the V-shaped groove, be careful and don't exert an excessive force, so as to avoid damage to the V-shaped groove.
- Be careful and don't touch the tip of the needle electrode.

1-2. Cleaning Up the Optical Fiber Pressure Head

If there are contaminations on the Optical Fiber Pressure Head, the optical Fiber Pressure Head can not suppress the Optical Fiber normally, resulting in degrading the quality of fusion splicing.

- To open the windproof cover.
- To clean the surface of the Optical Fiber Pressure Head with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the surface of the Optical Fiber Pressure Head with a dry cotton swab.

1-3. Cleaning the Windproof Cover and Reflecting Mirror

If there are contaminations on the surface of the Reflecting Mirror, the definition of the light pathways will drop, to cause the position of the optical Fiber's core to be inaccurate, and to lead to the increase of the loss of fusion splicing.

- To clean the Windproof Cover and Reflecting Mirror with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the surfaces of the Windproof Cover and Reflecting Mirror with a dry cotton swab.
- There should be no Stripes and stains on the surfaces of the Windproof Cover and Reflecting Mirror.

1-4. Cleaning the Optical Fiber Cleaver

If there are contaminations on the blades of the Optical Fiber Cleaver. or the rubber pad, the cleaving quality will be degraded, and lead to dusts on the surface of the optical Fiber, resulting in the increase of the loss of the fusion splicing. It is necessary to clean the blades of the Optical Fiber Cleaver. or the rubber pad with a cotton swab just having had a dip in alcohol (above 99% alcohol)

1-5. Discharge Tests

Atmospheric environment, such as: temperature, humidity, air pressure, is constantly changing, so that the discharge temperature is also changing. Due to the electrode wear, it is unable to automatically correct the discharge strength caused by the bonding of the optical Fiber debris. The center of the discharge sometimes will move to the left or to the right. At this time, it is necessary to make the discharge tests to solve these problems.

MAINTENANCE OF FUSION SPLICING QUALITY

It is also necessary to do discharge tests in case of using the Optical Fiber Fusion Splicer under the following conditions: such as ultra-high temperature, ultra-low temperature, very dry, very wet, electrode degradation, fusion splicing of the heterogeneous optical Fibers, cleanness, after replacing the electrode, or in the case that above conditions exist simultaneously.

2. REGULAR CHECKING AND CLEANING

In order to ensure the better splicing quality, it is suggested to check and clean the Optical Fiber Fusion Splicer regularly.

2-1. Cleaning the Objective Lens

If there are contaminations on the surface of the Objective Lens, the normal location of the observed optical Fiber core may be affected, resulting in the increase of the fusion splicing loss or poor fusing splicing, so, it is necessary to regularly clean two objective lenses, otherwise, the cumulative contaminations are difficult to remove.

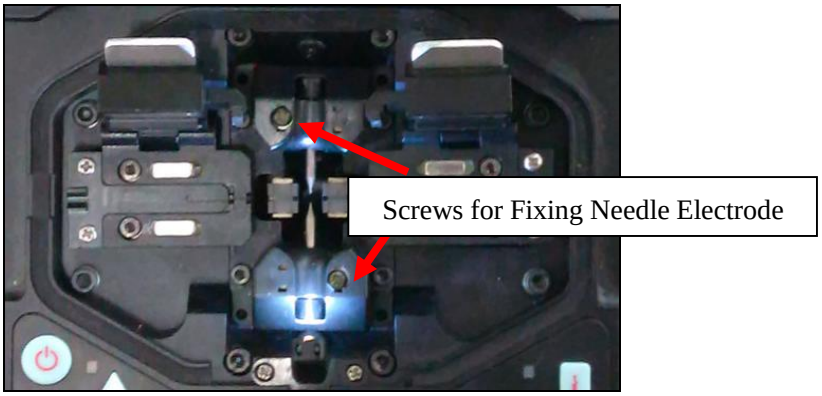
- Before cleaning, please firstly turn off the power supply.
- Using a cotton swab just having had a dip in alcohol (above 99% alcohol), to gently wipe the surface of the objective lens, starting the wipe from the middle of the lens to do a circular movement until the edge of the lens, and repeating several times until there are no contaminations or stains or stripes. Finally, use a clean and dry cotton swab to wipe out the residual alcohol on the surface of the objective lens.
- Be careful and don't touch the electrode tip in case of cleaning.
- It is recommended to clean the lens in case of replacing the needle electrode.

2-2.Replacing the Electrode

The electrode will wear in use, and the electrode tip will be aggregated with silicon oxide, so, to regularly clean the oxide can effectively extend the life of the needle electrode. It is recommended to replace the electrode after Optical Fiber Fusion Splicer has discharged 3000 times. If you continue to use the electrode, it may most probably lead to have a very large fusion-splicing loss and reduce the strength of the fusion-splicing points.

Steps of replacement of the needle electrode:

- To turn off the power supply of the Optical Fiber Fusion Splicer.
- To screw out fixing screws, and remove the old needle electrode suffered from electric shock.
- To use a tissue just having had a dip in alcohol to clean the new needle electrode, and then install correctly the needle electrode on the Optical Fiber Fusion Splicer and tighten the fixing screws.
- To turn on the power, and put the prepared fiber into the Optical Fiber Fusion Splicer to do the discharge tests.



1. How to Enter and Select the Menu

Once the system is “ready”, press to enter the menu, and press the keys “◂”, “▸” to select Menu 1 to Menu 5.

Menu 1 for “System Settings”

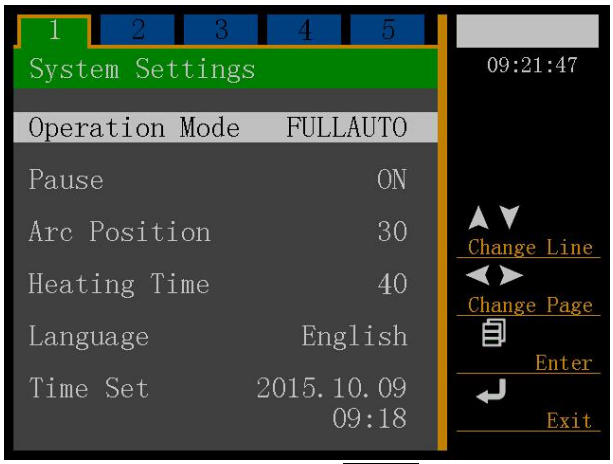
Menu 2 for “Fusion Splicing Mode”

Menu 3 for “Fusion Splicing Record”

Menu 4 for “Maintenance Menu 1”

Menu 5 for “Maintenance Menu 2”

2. “System Settings” Menu



Press the keys “▲”, “▼” to move the cursor; press the key to enter the program that you want to get into; press again the keys “▲”“▼” to modify the parameter values（via moving the cursor in the small pane）; and press the key to confirm，so that the modification has completed.

2-1. “Operation Mode” Menu

Press the key to enter the “Operation Mode” Menu; press the keys “ ▲ ”, “ ▼ ” to move the cursor, so as to select one of the two operation modes, “AUTO” mode or “MANUAL” mode. After completing the selection, press to confirm and save it. After completing the modification, press to exit.

- “AUTO” Operation Mode

After the normal optical fibers have been cleaned and cleaved off, press , then the program for fusion splicing will automatically execute the optical fiber core-to core fusion splicing. In case of normal fusion-splicing operation, generally select the operation mode.

- “MANUAL” Operation Mode

  In case of the “MANUAL” Operation Mode, each step of the optical fiber core-to core, the discharge and the fusion splicing is controlled by the operator via the keypad.

Keypad Functions in the “MANUAL” Operation Mode are as below:

as a “Select” key：It is able to select the operation modes of such four motors as the Left, Right, X, and Y motors.

as a “Shift” key: It is able to move the cursor up or down, so as to select the operation commands.

as an “Optical Fiber Forward” key: It is able to get the Optical Fiber to advance.

“◂”and”▸”separately as the “Forward” key and “Back” key of the left and right motors: Being able to separately control the left and right motors to go forward or to back off”.

“▲”and”▼”separately as the “Upward” key and “Downward” key for tuning the cores of the X and Y motors: Being

able to separately control the X and Y motors to go upward or downward.

2-2. “Pause” Function

Press to enter “Pause” function menu, press “▲” or “▼” to select the pause function to be “on” or “off”. After completing the selection, press to confirm and save it.

In normal fusion-splicing operation, generally the “Pause” function is “off”.

2-3. “Arc Position" Function

Press to enter the “Gap Position” function menu, press “▲” “▼” to modify the parameter values. After completing the modification, press to confirm and save it. Then, press to exit.

“Gap Position " means the central position between two optical fibers and the electrode, after tuning the optical fiber core and before the fusion splicing. Range is taken as 00-60. For the normal discharge position, the gap position value is 30. In doing discharge tests, if the discharge position shift occurs, and the discharge tests have resulted in that the ball on the left is big, the gap position value has to be less than 30. If the discharge tests have resulted in that the ball on the right is big, the gap position value has to be greater than 30.

2-4."Heating Time" Function

Press to enter the “Heating Time” function menu, and press “▲” “▼” to modify parameter values. After completing the modification, press to confirm and save it. Then, press to exit.

Range: 20-90 Default: 55

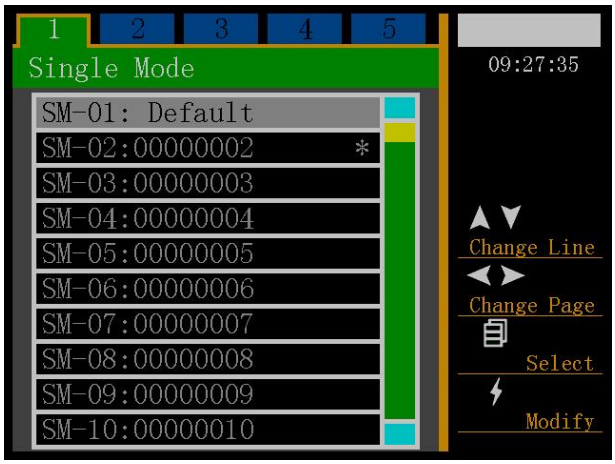
2-5. "Language" Function

2-6."Time Set" Function

Press to enter the “Time Set” function menu, press “▲” “▼” to select “year, month, day, hour, minute”, and press “◄”, “►” to modify the parameters. After completing the modification, press to confirm and save it. Then, press to exit.

3. “Parameter Set” Menu

Press “▲” “▼” to move the cursor, and press to enter the “Fusion Splicing Mode” program that you want to get into.

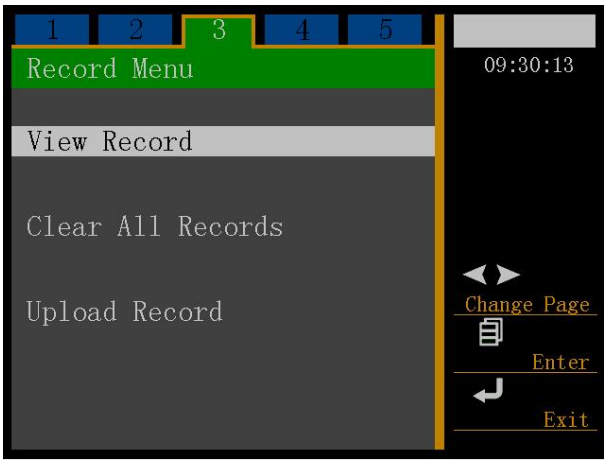


Press "▲" "▼"over again to select the program number that you want to execute and modify; press to select the program (If it is marked with the sign "*", it is the current executive program.) that you desire to use. If you need to modify the parameters in the program, press to enter the program so as to modify the definite parameter values.（The default is set in the factory and unable to be modified.）

Press "▲" "▼" to move the cursor; press to enter the menu which needs to be modified; press "▲" "▼" to modify the parameters; Press over again to confirm and save it. After completing the modification, press to exit.

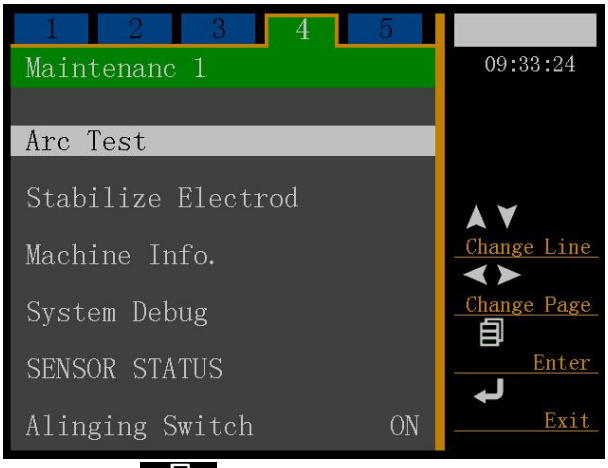
Items of Function	Description of Functions	Range
PreArc Time	Pre-Discharge Time	0-1.0
PreArc Power	Pre-Discharge Strength	0-200
Arc Time	Fusion-Splicing Discharge Time	0-10.0
ARC Power	Fusion-Splicing Discharge Strength	0-200
Forward	The QTY that the motor goes forward in case of fusion-splicing	0-60
Forward Speed	The speed that the motor goes forward in case of fusion-splicing	0-60
Cleave Angle	The angle of the end-face of the cleaved optical fiber	0-15
Gap	The gap between the left and right optical fibers after completing the core-to-core	0-50

4. "Record Menu" Menu



Press [icon] to enter “View Record” Menu, and press “◄”, “►” to select and view the Fusion-Splicing Records. Under this menu, it is possible to view the Fusion-Splicing Records for operating 6000-times.

5. "Maintenance Menu 1"Menu



Press “▲” “▼” to move the cursor, press [icon] to enter the program that you desire to get into, press “▲” “▼” over again to modify the parameter values(via moving the cursor in the small pane); and press the key [icon] to confirm, so that the modification has completed. Then, press [icon] to quit.

5-1. “Arc Test” Function

In order to ensure the stable fusion-splicing quality, the user should regularly operate. It is necessary to do discharge tests in case of using the Optical Fiber Fusion Splicer under the following conditions: such as ultra-high temperature, ultra-low temperature, very dry, very wet, electrode degradation, fusion splicing of the heterogeneous optical fibers, cleanness, or after replacing the electrode.

The discharge tests need to use two optical fibers being ready to be fusion-spliced, and according to the general method of fusion splicing, these optical fibers should be stripped, cleaved off, and placed. Press [icon] to enter discharge tests program.

●After the discharge, a numeric value will be displayed on the screen. If the value is within the range of 20-40, it means that the discharge strength is normal. If the value is less than 20, it means that the discharge strength is weak, and it is necessary to increase the discharge strength corresponding to the executive program. If the value is greater than 40, it means that the discharge strength is too strong, and it is necessary to reduce the discharge strength

corresponding to the executive program.

●After the discharge, if the Optical Fibers at both sides are different in the fusion degrees, it is necessary to increase the “Gap Position” value in the “System Setting” Menu in case that the fusion degree of the optical fiber at the right is high; and it is necessary to reduce the “Gap Position” value in the “System Setting” Menu in case that the fusion degree of the optical fiber at the left is high.

5-2. “Stabilize Electrode” Function

When a sudden change occurs in the external environment, the discharge strength may sometimes be unstable, resulting in larger fusion-splicing loss, especially, when the optical fiber fusion splicer moves from a low-altitude area to a high-altitude area, it is necessary to take a certain time to stabilize the discharge strength. In this case, the stable electrodes can accelerate the process of discharge strength’s stability, but it is necessary to do discharge trials many times so as to stabilize the electrode.

5-3. Machine Info

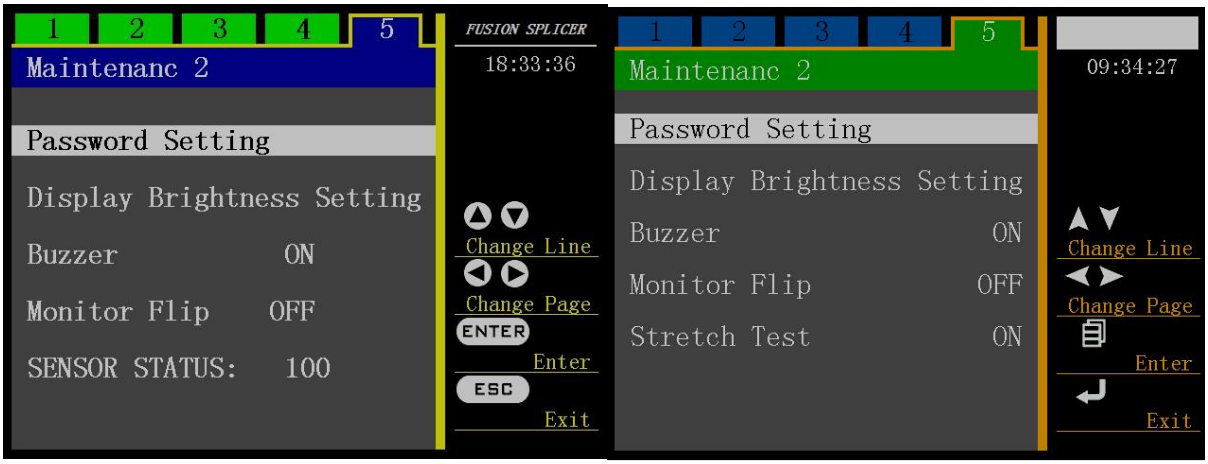
Upon entering the menu, it is able to see the factory serial number, software version number, firmware version number and the total discharge times of the optical fiber fusion splicer.

5-4. System Debug

5-5. Sensor status

5-6. Aligning Switch

6. “Maintenance Menu 2” Menu



6-1. “Password Setting” Function

6-2. “Display Brightness Setting” Function

Press [menu] to enter the “Display-Brightness Adjustment” function menu, and press “▲” “▼” to adjust the display brightness. The adjustment range is within 0-3. After completing the modification, press [menu] to confirm and save it. Press [enter] to exit the menu.

6-3. “Buzzer” Function

Press [menu] to enter the “Key Sound” function menu, and press “▲” “▼” to select to close or open the Key Sound. After completing the modification, press [menu] to confirm and save it. Press [enter] to exit the menu.

6-4. “Monitor Flip” Function

Press [menu] to enter "Image Flip" function menu, and press “▲” “▼” to select to close or open the image flip. After completing the modification, press [menu] to confirm and save it. Press [enter] to exit the menu.

Front-view image on the display screen or the displayed image having been flipped 180 degrees..

1. TURNING ON POWER OF OPTICAL FIBRE FUSION SPLICER AND POWER SUPPLY

● Turn on the power switch, but the power supply does not respond.

Reason:

a. Power outlet is not plugged in.

b. The contact of the power switch is bad.

c. The storage battery is not properly inserted in.

Solution: Check to see if the power plug or the storage battery is plugged/inserted in well or not, and is connected to the optical fibre fusion splicer well or not. Then, check to see if the power switch is good or not.

● In case of turning on the optical fibre fusion splicer, it has no reaction. (The screen does not brighten.)

Reason:

a. The power supply fuse disconnects.

b. There is the short-circuit or the failure occurs inside the optical fibre fusion splicer .

c. The electricity capacity of the storage battery is not large enough or the polarity is connected in reverse direction.

d. The AC adapter is bad, the voltage output is not correct.

e. The display screen is bad.

Solution:

Check to see if the power supply fuse disconnects or not, and to see if there is the short-circuit or other failure occurs inside the optical fibre fusion splicer. Replace the power supply fuse on the main board. If there is the short-circuit or other failure inside the optical fibre fusion splicer, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

Check to see if the electricity capacity of the storage battery is large enough or not. If it is not large enough, it is necessary to discharge the storage battery. Check to see if the battery polarity is connected in correct direction or not. If it is connected in reverse direction, it is necessary to correct it.

Check to see if the voltage output of the AC adaptor is normal or not.（The output voltage should be 12V.).If it is not normal, it is necessary to replace the former AC adaptor by a new one. Please contact your dealer to replace the former AC adaptor by the special AC adapter.

The brightness of the display screen has been well adjusted at the factory, if the display screen can not properly show, it indicates that the display screen is faulty, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

● After turning on the optical fibre fusion splicer, it always shows "system reset" and the equipment is at all times in the “Reset” status.

Reason:

a. The photoelectric switch of the optical fibre fusion splicer is faulty.

b. The motor or the motor drive is faulty.

Solution: please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

2. FUSION SPLICING OPERATIONS

● After having placed the optical fibre, there appears a very dark image or a dim image on the half of the display screen.

Reason:

a. The windproof cover is not correctly put in its position

b. The reflecting mirror in the windproof cover is positioned with a deviation angle.

c. The corresponding light does not shine.

d. The corresponding CCD signal control lines fall off or the CCD is faulty.

Solution: Check to see if the windproof cover is covered or not, with or without foreign body sticking the windproof cover. Adjust the angle of the reflecting mirror to the right position. Check to see if the corresponding light does shine or does not. If it does not shine, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

● Press the "AUTO" key, but the optical fibre stops moving; press the "RESET" key, and it is able to normally reset the system, but the optical fiber still does not move.

Reason:

a. The optical fiber is broken off.

b. The press board of the optical fiber did not pin the optical fibre.

Solution: Produce the optical fiber again. Lay the optical fiber again. Shut the press board, and gently pull the optical fiber back by hand. If the optical fibre can be easily pulled to move, it indicates the press board did not pin the optical fiber. Check to see if the compaction bar of the optical fiber is able to bounce or not. If the compaction bar is not able to bounce, it needs to be repaired.

●Press the "AUTO" key, and the optical fibre moves forward to a certain position, and then moves forward again, and finally there will be shown " Lay Optical Fibre Again" .

Reason:

a. The length of the cleaved optical fibre is unable to meet the requirements.

b. There is an obstacle for the press board of the optical fiber to move forward.

Solution: The length of the cleaved optical fibre should be about 16mm. If it does not meet the requirements, it is necessary to produce the optical fibre again. In the advancing direction of the press board of the optical fibre, gently push by hand the press board of the optical fibre, and to check to see if it has an obstacle or not. If it has an obstacle, it is necessary to find its location, and handle it.

●Press the "AUTO" key, and in the course of the core-to-core of the optical fibres, the image of the optical fibre at one side is moving up and down in the vertical direction, and the end-faces of the optical fibre at two sides are not core-to-core, so that it is unable to do the fusion splicing.

Reason:

a. There is the dust on the precision V-shaped groove, so that the position of the optical fibre at one side is somewhat higher, the data of which is greater than the max. position value of the optical fibre at the other side moving up and down.

b. There are the dust and dark spots on the objective lens' surface, the lights, the reflecting mirrors, and the CCD has dust or dark spots.

Solution: Clean the bottom of the V-shaped groove with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol in the V-shaped groove with a dry cotton swab. If contaminations in the V-shaped groove can not be removed with a cotton swab just having had a dip in alcohol, you can use the well-cut end-face of the optical fibre to clean the bottom of the V-shaped groove, and then repeat the previous step. Also, clean the objective lens' surface, the lights, and the reflecting mirrors with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the objective lens' surface, the lights, the reflecting mirrors with a dry cotton swab. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●There often occurs that the fusion splicing is done despite of optical fibres being not core-to-core, so that after completing the fusion splicing, there will be shown a large loss or a failure in the fusion splicing.

Reason:

a. An optical fibre is dirty, and its end-face is bad.

b There are the dust and the dark spots on the objective lens' surface, the lights, the reflecting mirrors.

Solution: Produce the qualified optical fibre again. Clean in the same way, the objective lens' surface, the lights, and the reflecting mirrors with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the objective lens' surface, the lights, the reflecting mirrors with a dry cotton swab. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●There always occurs that the end-face of the optical fibre at one side is not good.

Reason:

a. In the Menu， the value of "End-Face Setup " is somewhat small.

b. There are the dust and dark spots on the objective lens' surface, the lights, and the reflecting mirrors' lens.

c. The corresponding light does not shine.

d. There is the dust in the V-shaped groove, or the optical fibre had not properly been laid into the V-shaped groove.

Solution: Enter the Menu, and increase the value of "End-Face Setup ". Clean in the same way, the V-shaped groove, the objective lens' surface, the lights, and the reflecting mirrors with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the V-shaped groove, the objective lens' surface, the lights, and the reflecting mirrors with a dry cotton swab. Check to see if the corresponding lights are normal or not, and to see if the optical fibre had properly been laid into the V-shaped Groove or not. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

● The electrode does not discharge in the course of the fusion splicing.

Reason:

a. The program without the set parameters had been selected or in the program the discharge strength is set to 0.

b. The high-voltage power supply is damaged or the electrode connecting cable falls off.

Solution: Check to see if the selected program is correct or not, or to see if the set discharge strength in the program are proper or not. If it is still impossible to discharge normally, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

● The fusion splicing phenomenon is normal, but the loss of the fusion splicing has been somewhat large at all times or there occurs the failure in the fusion splicing.

Reason:

a. There occurs the failure in the detection system or there is the dust on the objective lens and the reflecting mirrors' lens.

b. In the parameters, the value of "End-Face Setup" of the optical fibre is larger.

c. After the operations of the electrode discharge and the fusion splicing, the windproof cover is opened before the equipment has completed its detection.

Solution: Clean in the same way, the objective lens' surface, the lights, and the reflecting mirrors with a cotton swab just having had a dip in alcohol (above 99% alcohol), and remove the excess alcohol on the objective lens' surface, the lights, the reflecting mirrors with a dry cotton swab. Check to see if the value of "End-Face Setup" of the optical fibre is larger in the parameters or not. Then operate the electrode discharge tests again, until the discharge current is moderate. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●Press the "AUTO" key, and the gap setting and the core-to-core adjustment are normal, but it fails in completing the fusion splicing, resulting in always two balls.

Reason:

a. The fusion-splicing current is too large, and the environmental humidity is too high.

b. The advancing amount is somewhat small or is 0; the advancing speed value is somewhat large.

c. The optical fibre's press board did not pin the optical fibre.

d. The quality of the optical fibre itself is poor, being disengaged from its cladding.

Solution: Change the fusion-splicing environment to a dry one, to see if there is that issue. Confirm that for the fusion-spliced optical fibre, there is no phenomenon that it is disengaged from its cladding. Enter the "Applications Program" menu; check the parameter setting and set the correct parameters; and then do the electrode discharge tests again, until the discharge current is moderate. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●The multi-mode optical fibre is blistered, becoming thicker or thinner after its fusion splicing.

Reason:

a. The end-face of the optical fibre is unqualified or the surface of the optical fibre is dirty.

b. There is an issue about the parameter setting in the program.

Solution: Ensure that the end-face of the optical fibre is good, do the electrode discharge tests until the discharge current is moderate. If the optical fibre is still becoming thicker or is blistered, it is necessary to increase the values of the "Pre-Fusion Current" and "Pre-Fusion Time" in the program. In reverse, if the optical fibre is still becoming thinner or is blistered, it is necessary to decrease the values of the "Pre-Fusion Current" and "Pre-Fusion Time" in the program, and increase the quantity of the "Fusion-Splicing Boost". If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●The fusion splicing loss index has been somewhat large at all times.

Reason:

a. There is the dust on the optical fiber, and in the V-shaped groove of the Fusion Splicer.

b. The discharge current is not moderate.

c. Do the optical fibre fusion splicing without having made the optical fibres being core-to-core.

d. The electrode aging.

e. The parameters set in the program are not proper.

f. The end-face of the optical fibre is not good, and there is an issue about the optical fibre cleaver.

g. The operating environment is rather poor, such as: the gale or wet, etc.

h. The optical fibre is more special.

Solution: First of all, it is required that the test method should be correct, then do all kinds of cleaning (for the V-shaped groove, the objective lens, the lights, the reflecting mirror, and the needle electrodes); select the appropriate procedures to do the discharge tests; adjust the optical fiber cleaver to ensure that the end-face of the optical fibre is well-cleaved . If the fusion splicing loss index is still somewhat large, you may do the parameter setting many times so as to find the better parameters for the fusion splicing, by way of increasing or decreasing the values of the "Pre-Fusion Time, Pre-Fusion Strength, Pre-Fusion Boost Quantity, and Pre-Fusion Boost Speed", or you may reset the parameters to be the default parameters set at the factory. If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

●It is sparking on the electrodes or the electrode is sparking to the metals nearby it.

Reasons:

a. The electrode connecting cable is loose.

b. The operating environment is humid.

Solution: Check to see if the electrode connecting cable is loose or not. Change the operating environment to be the dry one, to see if there is the said phenomenon or there is not . If it is still impossible to solve these issues, please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

3. HEATING OPERATION

● The optical fibre heat-shrinkable sleeve has not completely shrinked.

Reason:

a. The set heating time is too short.

b. As the outside temperature is too low so that the heating has not been fully and completely done.

Solution: Adjust the program to extend the heating time.

● The optical fibre heat-shrinkable sleeve adheres in the heating tank.

Reason: Some optical fibre heat-shrinkable sleeve may cause adhesions.

Solution: Take out the optical fibre heat-shrinkable sleeve after it is completely cooled. Or use a cotton swab to lightly poke at its edges to break it away from the heating tank.

● The heating indicator light does not shine, but the normal heating can be done.

Reason:

a. The heater is faulty.

b. The heating indicator light is bad.

Solution: Please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

● The heating indicator light shines, but the heater does not heat. Or the heating indicator light does not shine; also the heater cannot heat.

Reason: The heater is faulty, or the heating control circuit is faulty.

Solution: Please contact your dealer to repair/maintain it or send it back to the factory for repair/maintenance.

QUESTIONS AND TROUBLE SHOOTING

1. GUARANTEE

1-1. Warranty Period and Conditions

If there occurs a failure in the optical fibre fusion splicer within one year starting from the date of goods delivery, we will provide a free repair/maintenance. However, we will not provide a free repair/maintenance within the Warranty Period, if there occur the following events:

(1) Failure or damage caused by natural disasters;

(2) Failure or damage caused by the wrong operation;

(3) Failure or damage caused by ignoring the operation instructions and procedures in this manual to make bold to operate;

(4)The parts being easy to wear off or to be consumable. (For example, needle electrodes);

(5) Failure or damage caused by the abnormal voltage power supply.

1-2. Before delivering the Optical Fibre Fusion Splicer, please contact its manufacturer's agent in advance.

1-3. Information required for repair/maintenance

Along with the Optical Fibre Fusion Splicer, please attach the following information:

(1)Your full name, industry, company, department, address, telephone number, fax number and e-mail box.

(2) The model and the serial number of the Optical Fibre Fusion Splicer.

(3) Problems about the Optical Fibre Fusion Splicer you have met:

When did the Optical Fibre Fusion Splicer have the problem ? Which problem has happened? How about the present situation? and so on.

1-4. Transportation of the Optical Fibre Fusion Splicer.

As the Optical Fibre Fusion Splicer is a high precision instrument, you should by all means use the original carrying case to transport and store it, so as to protect it against the moisture and shock. If you need repair/maintain the Optical Fibre Fusion Splicer, please put the related fitting accessories in the carrying case before sending it.

1-5. Information recorded before the repair/maintenance

Please record in advance the stored info contents in the Optical Fibre Fusion Splicer, such as the fusion splicing results, fusion splicing modes, etc., because these information and data may be lost in case of the repair/maintenance.

GUARANTEE AND CONTACT

2. CONTACT

Please contact the manufacturer's agent nearest to your location or the following organization if the user needs supports or services.

Note: If the program has been updated and the structure been changed, resulting in errors and the unconformity to the manual, please take the actual product as the reference standard.