Instruction Manual

Safety Precautions

Please strictly follow the safety guidance of the manual in application of the optical fiber fusion splicer(Hereinafter referred to as Splicer). The ignorance or violence of the rules or notice stressed in the manual may cause electric shock, fire disaster and injuries to users. The manufacturer shall take no responsibilities of accidents caused by improper use.

For your safety, please carefully read and follow the following instructions.

Working Environment

Cautions for use/storage of the splicer:

◆ Working Temperature：-10°C ~ + 45“C

◆ Temperature Limitation： - 20°C ~ + 55°C

◆ Working Humidity：≤95％RH（No condensation）

◆ Maximum Wind Speed：15m / s

◆Storage Conditions： - 10°C ~ + 45°C （With Battery,No Condensation）-20°C + 60°C（No Battery,No Condensation）

◆Don't use the splicer in environment vulnerable to fire, explosion in case any fire disaster or explosion caused.

◆Don't use or store the splicer in environment of high temperature or high humidity in case any damages to the machine caused. When the splicer is moved from low temperature environment to environment of higher temperature please take possible warming up measures to eliminate condensation.

◆Please take suitable dust-resistance measures when using the machine in dusty environment to prevent lots of dust getting into the machines and causing device malfunction.

Power Supply

Please use the matching accessories of the splicer and don't use any power adapter, battery or power cord that are not specified in the instruction.

Please don't use the splicer under the voltages that are not specified for the model in case any fire disasters or electric shock caused. The customized car charger power cord is only available for 12V power supply of gasoline cars. In any circumstances, users shall not use it on diesel car with 24V power supply.

Battery

Please strictly follow the instructions when using the battery. Improper use of battery may cause battery heating up, burst, explosion, fire disaster or injuries to users.

- ◆ Please do not charge the battery with methods that are not specified in the manual.
- ◆ Do not dispose the battery in fire.
- ◆ Do not reverse the positive and negative poles.
- ◆ Do not expose the discharging battery under sunshine or in environment with high temperature or in fire.
- ◆ Do not throw or strike on the battery.
- ◆ If the battery electrolyte leaks out, please handle it carefully. If user's skin or eyes are contaminated by electrolyte accidentally, please wash it thoroughly and look for medical help immediately. At the same time please inform the after-sales department to handle the battery.

Other Cautions

◆ Please prevent any liquid or metal materials getting into the internal structure of the product, or possible fire, electric shock or product malfunction may be caused. Once water or any metal materials get into the product please stop using, cut the power supply, turn off the equipment and contact the maintenance service department.

◆ Please do not touch the electrodes when the equipment is working in case getting hurt by the high voltage. Please do cut the power supply and turn off the equipment before changing electrodes.

◆ Do not disassemble or demolish the splicer, its battery or its adapter in case overheating, burst or fire disaster caused.

◆ Except the components that are allowed to be changed in this manual please do not try to demolish any parts of the splicer. The maintenance or repair of the equipment must be operated by professional technicians from our company, improper operations may cause fire or electric shock. Please contact the maintenance center through 24-hour-on service line when necessary. Product warranty will be invalid for personally disassembled products.

Other Cautions

◆ Do not touch the shrinkable tube in heating process or when it's just finished in case scald caused.

◆ Do not touch the splicer, power cord or power plug with wet hands in case electric shock caused.。

◆ Do not clean the microscope lens, V groove, screen etc with any chemical materials except alcohol, or it may cause image blur or spots on screen, or may even cause corrosion or damage of the equipment.

◆ Please prevent the equipment from strong shaking or crash, or the equipment may be damaged. Please transport or store the splicer by dedicated carrying box.

◆ Please do machine maintenance once a year to maintain the performance of the splicer.

Legal Notices

◆ Any organizations or individuals shall not extract, copy or disseminate any content of the manual without literal authorization from our company.

◆ The product and the features or functions of its accessories are determined by production batches. Thus the product or its accessories described in the manual may not be the same with the ones you purchased. The manufacturer keeps the right of amending the manual whenever it's necessary without formal notice and shall take no responsibility for such actions.

◆ Notice: Please thoroughly read the instruction manual so to operate the splicer more accurately and professionally.

Production Introduction

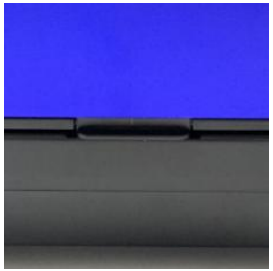
Optical Fiber Fusion Splicer is mainly used for optical fiber cable maintenance and relative operations. Thus it is also called fiber cable splicer. It is a device that uses high precision propulsion structure to push two fibers to get closer to each other and uses an electric arc to melt two optical fibers together at their end faces, to form a single long fiber.

Optical fiber fusion splicers are mainly applied by : Telecom carriers, ISP, network project contractors, laboratories. And they're applied in : Fiber cable network maintenance, telecom projects, emergent repairing, optical experiments, manufacture and testing of optical devices, academic researches in colleges.

Introduction of Function Buttons

Appearance	Name	Function
	Menu / Confirm	Enter menu page/Confirm or save
	Power On / Off	Turn on/off the machine
	Next	Switch to next option/Switch X/Y views
	Start / +	Start current operation/Adjust parameters(Increase/Switch)
	Return / Reset	Return/Reset the motor
	Heating	Start heating

Description of Product Structure

Appearance	Name	Function
	Heat Shrink Furnace	For heating operation of shrinkable tubes.
	Battery Fixing Button	Put on/take off the battery

Product Introduction

Fundamental Parameters

Applicable Optical Fibers

- SM(G.652)，MM(G.651)，NZ(G.655)，DS(G.653)，COS(G.654),BUI(G.657)，EDF
- Applicable Core Type：Single Core
- Applicable Fiber Diameter：Cladding diameter 80-150μm，Coating diameter 100～1000μm

Fundamental Parameters

Splicing Mode

- Pre-store: 8 groups Customize: 792 groups
- Splicing Results Recording: 10000-group splicing records & splicing images recording
- Splicing Speed：9sec(Standard Mode) 7S (Fast Mode)
- Alignment：Core to core alignment、Coat alignment

Fundamental Parameters

Splicing Loss

- Average Splicing Loss：0.02dB(SM)，0.01dB(MM)，0.04dB(DS)，0.04dB(NZ)
- Return Loss：≧60dB
- Splicing Loss Estimation：Exist

Power Supply

- Power Supply：Input 220V±10%、1.4A，50/60Hz output 13.5V/5A
- Battery：11.1V Lithium battery，typically splicing/heating 260 times，charging time 3 h，500 times rechargeable, 5200mAh

Fundamental Parameters

Operation Conditions

- Operation Environment：Altitudes 0～5000m,relative humidity 0～95%（No condensation），temperature -20℃～55℃，maximum wind speed15m/s
- Storage Conditions：Relative humidity 0～95% (No condensation), temperature -40℃～80℃
- Corrosiveness Resistance：The main device, components and their materials meet the requirements of GB/T 2423.54-2005 and are not vulnerable to the corrosiveness of fluid pollution.

Weight and Dimension

- Weight：1.19kg（Without battery)，1.53kg(With battery)
- Dimension：146D×131W×152H(mm)

Product Introduction

Fundamental Parameters

Heating Shrinkable Tube

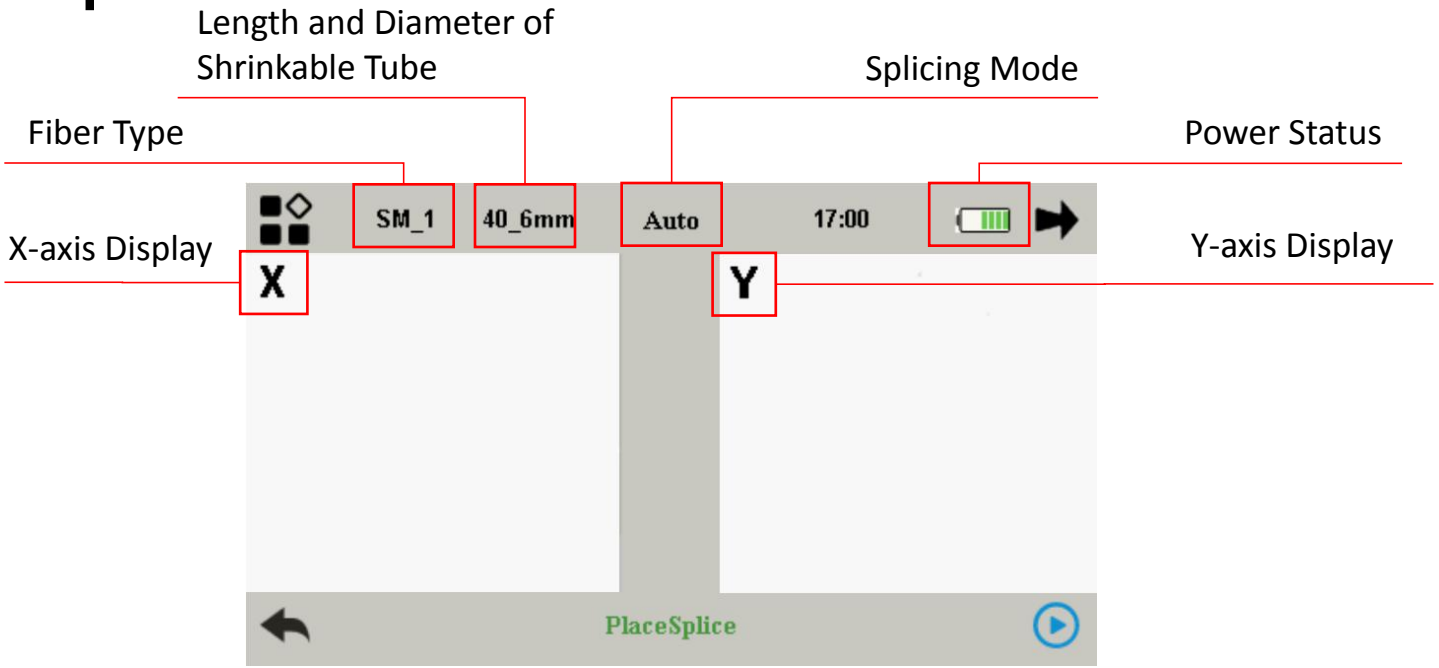
- Applicable Diameter：2mm,3mm,4mm,6mm
- Applicable Length：60mm，50mm，45mm，40mm，25mm，20mm
- Heating Time：2mm tube（10-15S adjustable），4mm tube（14-19S adjustable），6mm tube（17-23S adjustable）
- Heating Temperature：10-260℃（Customizable）
- Automatic Heating ：Auto fiber recognition and heating after covered

Fundamental Parameters

Other Parameters

- Tension Test：≧2N（Optional）
- Display：5 inches TFT true color HD LCD screen，support multi-language selection
- Magnification：X/Y:200 times，X/Y:400 times
- USB Port：USB2.0
- Illumination：LED double white light

Description of UI



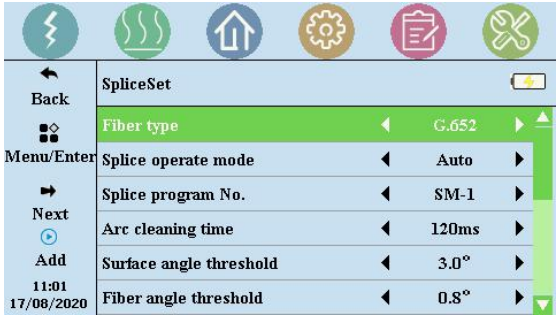
Function Introduction of the Splicer

Function

Parameters	Description
Arc compensation	When this function is on, the splicer will adjust the discharging electricity current automatically according to real-time splicing conditions.(Recommended)
Tension test	When it's on, the tension test will be executed after splicing.
Auto starting	Automatically splicing once cover closed.
Auto heating	Automatically heating once cover closed.
Force heat	When this function is off, push the heating button, it will not heat when no fiber is detected. When this function is on, push the heating button, it will heat no matter there is fiber or not.
Reset waiting time	The waiting time for auto reset after cover opened after splicing when tension test is off. (When tension test is on, this function will be disabled.)
Auto save splice	When this function is on, system will automatically save splicing images, otherwise it won't.

Function Introduction

SpliceSet



Parameters	Description
Fiber type	Select according to used fibers. There are SM, MM, DS and NZ etc.
Splice operate mode	Manual mode, semiautomatic mode, automatic mode optional
Splice program No.	Different codes represent different splicing programs. 800 groups settable.
Arc Cleaning time	Purifying discharge means cleaning the tiny impurity on the surface of the fiber through a short-time discharge. The time limit may be 0-0.2s.
Surface angle threshold	End face angle limit settings. When the end-face angles of both fibers exceed limited values there will be error notice on screen. The setting range is 0-8°
Fiber angle threshold	The limited value of the angle between the 2 fixed fibers. When it exceeds the value there will be error notice on the screen. The range can be 0-4°.

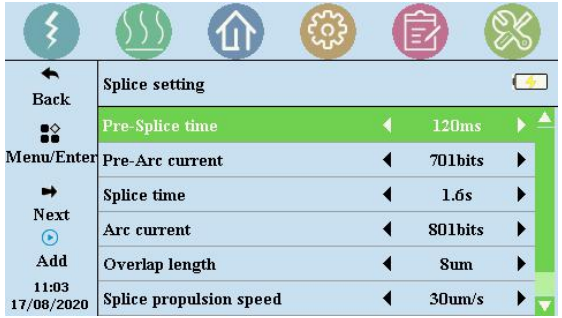
Function Introduction

SpliceSet

Parameters	Description
Align offset threshold	The deviation limitation of 2 aligned fibers. The setting range is 0.0-1.5μm.
Loss threshold	When the estimated splicing loss exceeds the limited value there will be discharge compensation notice on screen. The setting range is 0-0.2db
Compensation arc time	Set the re-discharge time durance, in some conditions, splicing losses can be reduced by re-discharge.
Fiber alignment mode	Accurate Alignment, Cladding Alignment, Core Alignment, Manual Alignment, Semiautomatic Alignment. The default setting is Core Alignment.
Fast splice mode	On/off Optional. When this is on, the time costed for splicing will decrease,the fastest speed is 7S.
Force Splicing	When this is on, the user can still splice by pushing operating button even the angles are detected not qualified. In the same condition, when this is off, the system will exit splicing process automatically.
Edit splice program	Edit the splicing parameters of splice programs.

Function Introduction

Edit Splice Program



Splice setting	
Pre-splice time	The time of pre-splicing from the beginning of discharge to fiber propulsion.
Pre-Arc Current	Pre-discharging intensity of pre-splicing
Splice Time	Discharging time length of splicing.
Arc Current	Current intensity of splicing.
Overlap Length	The overlap length of fibers propelled to each other.
splice propulsion Speed	The propelling speed of motors.
The second arc	To set if additional discharge needed.
The second arc time	Discharging time length of additional discharge.
The second arc Current	Current of additional discharge.

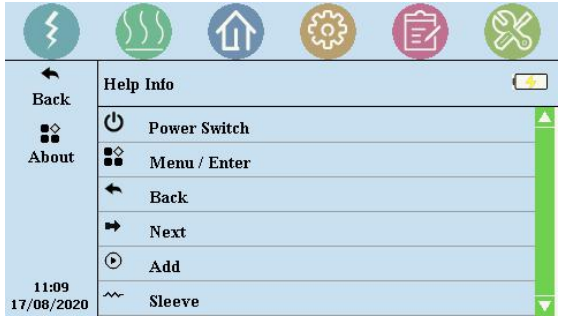
Function Introduction

SleeveSet

Parameters	Description
Heating Program	There are many heating programs for different shrinkable tubes pre-stored in the system, also many self-set programs are offered to users.
Casing Type	10mm-60mm normal tube、FC、SC
Heating Temperature	The temperature limit of heating process
Casing diameter	1-8mm
Heating Time	The time costed for tube heating

Function Introduction

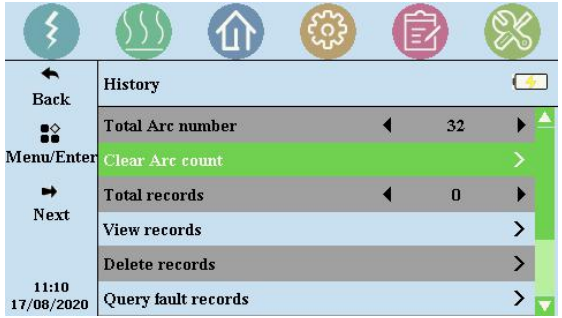
Help Info



See more in the introduction of function buttons

Function Introduction

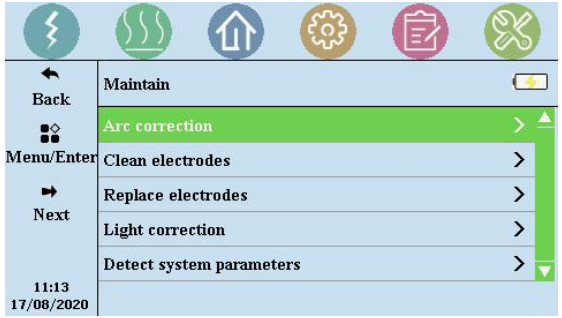
History



Parameters	Description
Total Arc number	The number of discharging activities counted since last record clearance.
Clear Arc count	Please clear discharging record when replacing the electrodes.
Total recods	The number of splicing records saved by system.
View records	10000 groups splicing records savable. Splicing date, Fiber core angle, Fiber types, Loss estimation checkable.
Delete records	Delete all splicing records. Not available for users.
Query fault records	Check the current operating conditions including warnings, malfunction etc.

Function Introduction

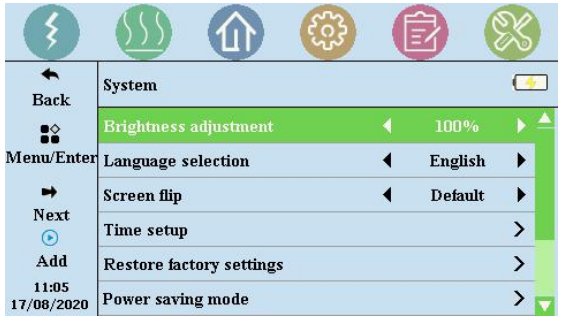
Maintain



Parameters	Description
Arc correction	Automatically correct the discharge current.
Clean electrodes	Clean the electrodes by a couple of times of high current discharge .
Replace electrodes	Automatically detect discharge position and stabilize new electrodes by discharges after electrodes changing.
Light Correction	Automatically correct the light source of the red light.
Detect system parameters	Automatically check the position of electrodes, test the motors etc.

Function Introduction

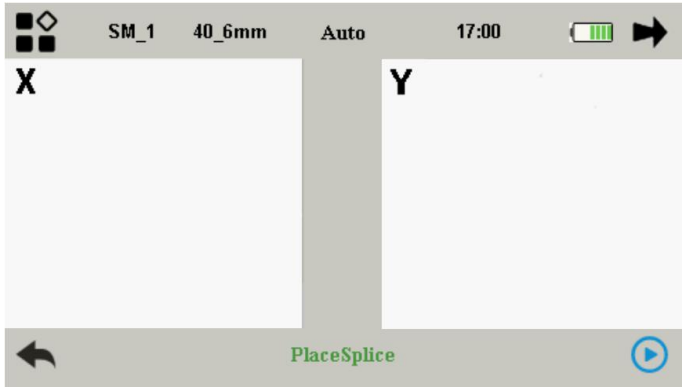
System



Parameters	Description
Brightness adjustment	Adjust the brightness of the screen.
Language selection	Chinese, English, Spanish, French, Portuguese optional. (Default: Chinese)
Screen flip	The displayed content on screen will be rotated for 180° to adapt display needs of different directions.
Time setup	Settings of system date. Including years, months, days, hours, minutes.
Resetore factory seting	Reset all the parameters to factory settings.
Power saving Mode	Auto-sleep, auto-off time can be set here.
Slient Mode	Turn buzzer on/off.
Version	Version code of current system.

Basic Operations

1. Turn on the power



Optical fiber observation interface: Push the power switch then the indicator on the operation panel will turn to red and the buzzer will be sounds like “Di Di”. All motors will return back to their initial positions and the fiber observation interface shows.

2. Preparation before splicing

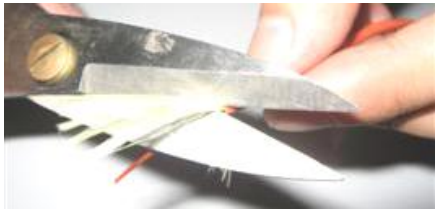
①Put the shrinkable splicing tube on

Put the fiber through the splicing tube so to protect fusion point after splicing. Make sure there is no impurity inside the tube and keep the tube parallel with the fiber.

②Stripe down the protective layers except the class coating layer.

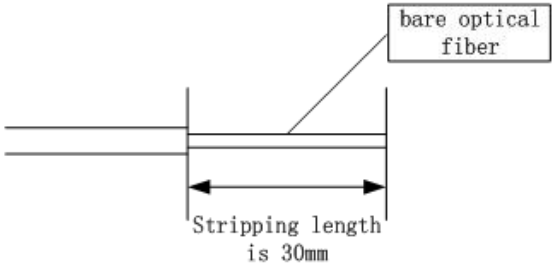
For bow-type fiber please use bow-type stripper to stripe the outer layer for 40mm.

Pigtail and patch cord: Use the big hole of 3-hole stripper to stripe the outer plastic layer and stripe the internal layer with small hole.



Cut the wire with scissors.

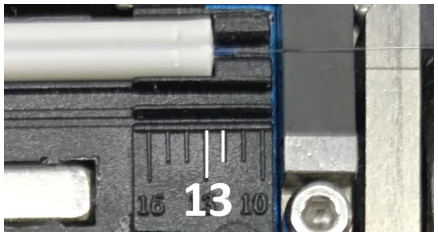
3.Stripping and cleaning of fiber coating layer

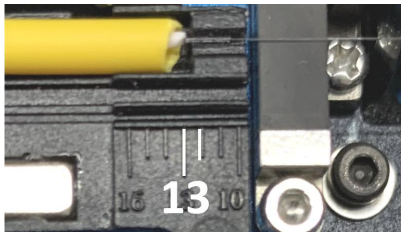


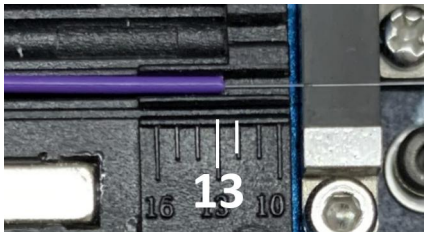
① Use the smallest hole of 3-hole stripper to stripe down the coating layer of fiber(Preserve 3-5mm of coating layer)，the length shall be about 30mm。

② Use dust-free cloth dipping with 99% purity alcohol to clean the fiber. From the stripped point to the end face of the bare fiber, wipe around the fiber and get rid of the debris of coating layers.

4.Fiber Cutting







① Put the fiber on the fiber fixture. Put the not stripped part according to the scales. At the position between13-13.5 is suggested；

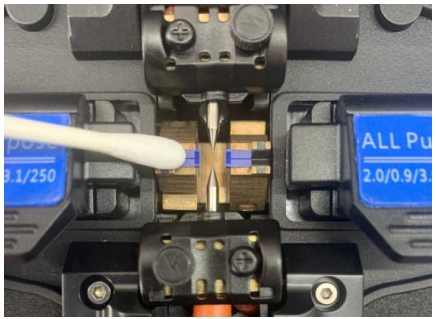
② Keep the slider at outer side. Then cover the pressure pad.

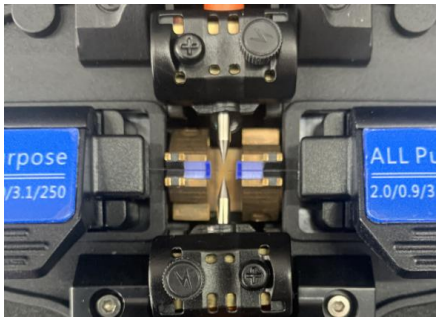
③ Push the slider and finish the cutting.

④ Open the fixture and open up the pressure pad, take the fiber and keep it away from other items in case it may get polluted.

Notice: When the cutting fails please adjust the blade of fiber cleaver. What's more, we'd like to suggest you to use specified fiber cleavers equipped with our machines.

5.Fiber Placement





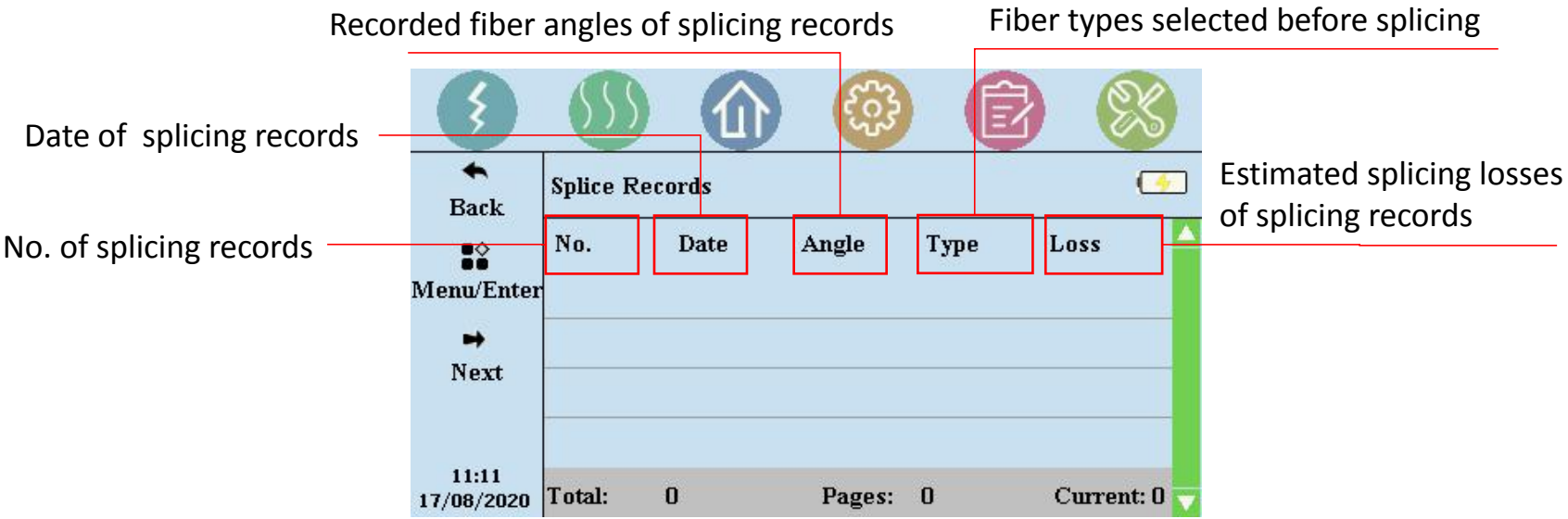
① Open the wind-proof cover and check if the V-groove is clean. If not please use dust-blowing ball or blade to clean the V-groove

② Put the cut fibers in the V-grooves of the splicing modules and make sure the fibers are right in the V-groove.

③ Check if the end-faces of the fibers are in the position between the electrode tips and the V-grooves. And make sure they're close to the electrodes tips. Or the fibers shall be re-placed.

④ Close the wind-proof cover gently and start splicing.

6.Check Splicing Result



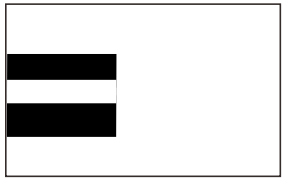
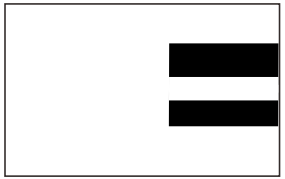
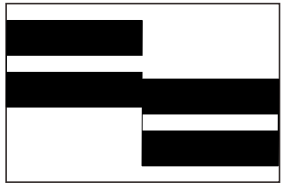
7. Auto-alignment and End Face Correction

To assure splicing quality, the product uses image processing system to observe fibers. But in some conditions the system may not be able to detect the splicing errors. So we still need to inspect the splicing process with eyes through display screen to get better splicing quality.

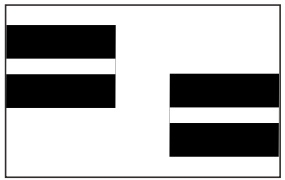
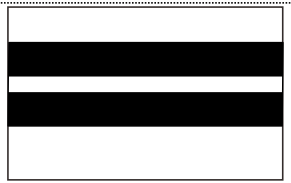
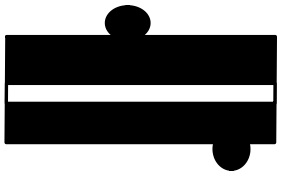
Close the wind-proof cover the fibers on both sides will be automatically put aligned to each other. The system will check the cut faces after cleaning discharge, if the end faces are not qualified the splicing will not be started and there will be error notice on the screen. If the cut faces are qualified the aligning process will continue. After alignment the end-face angles of fibers on both sides will be showed on the screen. If the detected angles exceed the limited angle there will be error notice on the screen. The fibers will need to be re-cut.

If it shows following images or notice info in aligning process the system will reset the motors. Users can also push reset button to reset motors and retry to cut or put fibers.

8. Solutions of Abnormal Alignment Issues

Displayed Images (X/Y Axis)	Notice	Possible Reasons	Solutions
	Fiber on the right side is improperly placed	Fiber on the right side is not placed into the V-groove or it's too short	Reposition the fiber, recut the fiber
	Fiber on the left side is improperly placed	Fiber on the left side is not placed into the V-groove or it's too short	Reposition the fiber, recut the fiber
	Alignment Error	Fiber on the right/left side is not placed in the V-groove	Reposition the fiber, recut the fiber

8. Solutions of Abnormal Alignment Issues

Displayed Images (X/Y Axis)	Notice	Possible Reasons	Solutions
	Please reposiotion the fiber	Fibers on left/right side are too short (Over-cut)	Reposition the fiber, recut the fiber
	Please reposiotion the fiber	Fibers on left/right side are too long	Reposition the fiber, recut the fiber
	Fibers are not qualified	Dust or dirt on fibers	Clean and reposition the fibers

8. Solutions of Abnormal Alignment Issues

Displayed Images (X/Y Axis)	Notice	Possible Reasons	Solutions
	Angles of fiber end-faces are not qualified	Cutting problems (Tips,Glitches,Bevels, Notches)	Recut the fibers
			
			
			

After fiber alignment the system will automatically discharge and splice. If it is set as semiautomatic mode there will be finishing notice on screen. Then the users can push start button to splice or push reset button to reset motors.

ARC Correction

When the outer environment suddenly change or for following situations the ARC correction will be needed to adjust current intensity so to ensure low loss, high stability splicing.

① Temperature, humidity or air pressure changes

② Aging or pollution of electrodes

③ Continuous splice fails or high splicing loss

④ Machine is idle for a long time

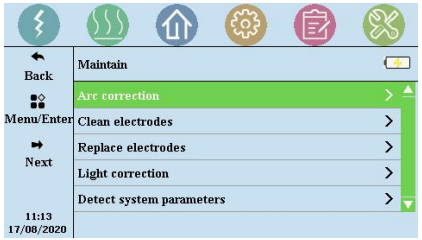
⑤ Electrodes over used

⑥ Electrodes are newly cleaned or replaced

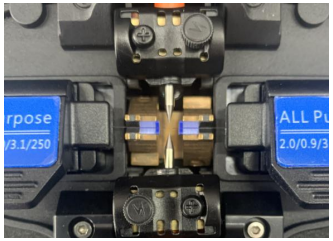
Maintenance

ARC Correction

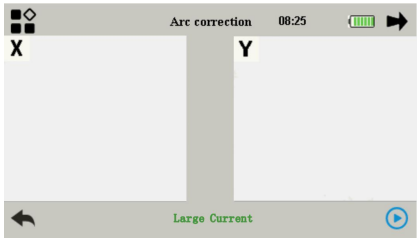
Discharge Correcting Method：



① Choose “Arc Correction” Under “Maintain”



②Put cut fibers on fiber holders and close the wind-proof cover.



③If there is “Large Current”or “Small current”please repeat the operation of ②③ until it shows the correction is successful.

Notice：

The cutting angles under discharge correcting mode are separately set, it's not relative with that under splicing modes. Discharge correction usually need to be repeated for a couple of times. Please operate with patience.

Maintenance

Detect System Parameters

The self-test function offered is able to test and inspect the system based on several important parameters.

We insist to suggest users to do parameters self-test ：

① After system updating

② After replacing/move electrodes

③ After enduring long-distance transportation or strong shock

④ After continuous splicing failures or splicing loss is abnormally high

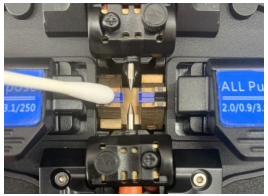
⑤ When there is continuous over-adjusting in alignment process

in case splicing quality may be affected.

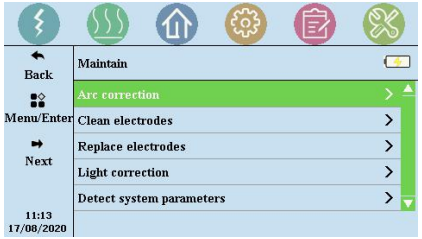
Maintenance

Detect System Parameters

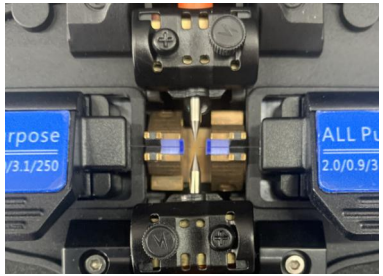
Operations are as following：



①Clean V-groove and pressers with cotton swab dipped with alcohol.



②Choose “Detect system parameters”under “Maintain”



③Put fibers and close the cover the self-test will be on. Normally the test will continue for 2 minutes. Please observe the notice on screen, if the test fails please operate according to instructions on screen and retry it(Step ①).

Notice：

Cleaning is the most important step. Please do clean specified parts before further operations.

Maintenance

Electrodes Replacement

The electrodes will be attrited due to long time use. Please replace the electrodes after 5000-time discharges or the splicing quality will be affected and higher loss as well as lower steadiness of spliced fibers will be caused. The system will automatically remind you that the electrodes need to be replaced when the discharging count reaches 5000. After electrodes replacement the discharging record shall be reset. Be careful of sharp tips of electrodes when replacing them. The operations are as following:

① Users shall cut the power and turn off the machine before replacing electrodes.

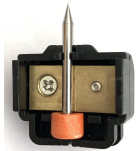
② Unscrew the screws on electrode cover, take off the electrodes.

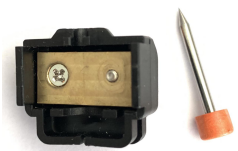
③ Put new electrodes into the electrode groove then put the cover back and tight the screws gently.

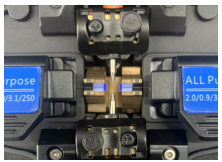
④ Check if the two electrodes are at the same horizontal line and the same vertical line. If not please re-put the electrodes.

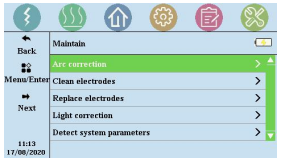
⑤ Turn on the machine and put well cut fiber into the machine, choose “Replace Electrodes” under “Maintain”

⑥ Please “Detect system parameters” and do “Arc Correction”









Maintenance

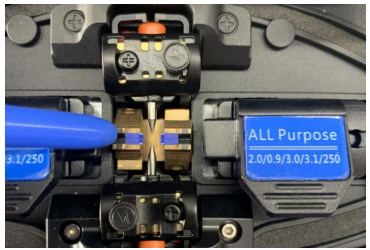
V-groove Cleaning

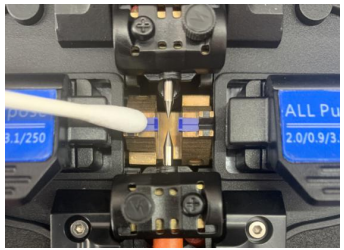
If there is contaminant in V-groove the fibers will deviate from normal position and thus the alignment will be affected so that the splicing loss may be abnormally higher. So users must check and clean V-groove regularly. The operations are as below:

① Open the wind-proof cover.

② Clean the contaminant on V-groove with equipped dust-blow ball.

③ Clean the bottom of the V-groove with cotton swab dipped with alcohol.Notice: Do not touch the tips of electrodes. Clean the V-groove gently and do not use any hard stuff (Blade etc.) to clean the groove in case any damages affecting normal functions caused.





Maintenance

Microscope lens Cleaning

The splicer is loaded with image processing system to observe fibers, if the microscope lens are polluted the normal observation will be affected, thus may result in bad splicing experience or quality. Users shall clean the 2 lens regularly to ensure they are clean.

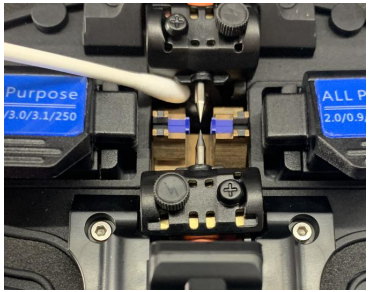
① Turn off the machine and open the wind-proof cover.

② Clean the lens gently with cotton swab dipped with alcohol.

③ Notice: Do not touch the electrodes. Do not touch the lens with hard stuff.

④ Clean the residual alcohol with dry cotton swab and make sure there is no contaminant left.

⑤ Turn on the machine, observe the image on screen and check if there is dust or other contaminant, if so, please clean the lens again.



Maintenance

Fiber Pressers Cleaning

Dust on fiber pressers may cause fiber fixing or fiber holding issues and it will directly affect splicing quality. Users shall check and clean the fiber pressers regularly.

① Open the wind-proof cover.

② Clean the pressers with cotton swab dipped with alcohol and clean the residual alcohol with dry swab after cleaning.

Troubleshooting

Abnormal Phenomenons	Reasons	Solutions
Abnormal sounds when discharging	Improper installation of electrodes	Please strictly following the instruction when installing electrodes
Delayed discharge or no discharge	1. Improper installation of electrodes 2. The tips of electrodes are wrapped by silicon oxide	1. Please strictly following the instruction when installing electrodes 2. Clean the tips of electrodes or replace the electrodes
The machine crash when discharging	Improper installation of electrodes	Please strictly following the instruction when installing electrodes
Discharge Correction Failure	Current environment is interfering the discharging process	If it keeps warning overcurrent, please lower the current before discharge correction. Otherwise please increase the current. If it still fails please contact after-sales department.
Fibers alignment failures	1. There is dust on lens, LED light, V-groove. 2. Power system malfunction.	Try to clean lens, LED lights and V-groove. If the problem still exists please contact after-sales department.。
Low quality of splicing point	1、Dust on fibers 2、Wrong fiber type settings or wrong splicing program 3、Splicing environment changes 4、Controlling motor malfunction	1、Re-prepare the fibers and splice again. 2、Choose right fiber type and right splicing program 3、Do discharge correction to adjust current to normal intensity 4、Retry parameters self-test