KL-300 *series*

JILONG

Optical Fiber Fusion Splicer

------- *User Manual* -------

Version 1.10

Warning (Ignore the warning, non-proper use of fusion splicer could lead to fatal and serious injury)

1. The input voltage of this model of machine is definite; please do not use the voltage outside the scope. Please use the correct AC and DC power supply.

2. When the fusion splicer comes across the following failures, please immediately remove the AC power cord from the power supply input and turn off the fusion splicer, otherwise will lead to the incapable of the repairing and even will cause personal injury, death and fire.
   ★ Smoke, smell, noise or heat anomaly
   ★ Liquid or foreign matter enters the interior of the machine
   ★ Broken or damaged machines

3. This model of fusion splicer does not have the need to maintain internal components, dismantling of fusion splicer and power modules is prohibited; any mistake in maintenance will lead to the machine beyond repair even causing bodily harm.

4. The machine has strictly limitation to the power supply module used.

5. The fusion splicer is prohibited to be used under the environment with the inflammable liquid or flammable gas; otherwise will lead to fire, explosion and other serious consequences.

Notes:
1. The fusion splicer is used for the fusion of quartz glass fiber; please do not use this machine for other usages. Please read this manual carefully before using.
2. Please do not deposit fusion splicer under the environment with high temperature or humidity.
3. If the fusion splicer is used in the environment with lots of dust, it should avoid dust as far as possible.
4. When the fusion splicer moves from the low-temperature environment to high-temperature environment, heating process must be ensured as possible to eliminate condensation.
5. In order to maintain machine's performance, recommend to do complete machine maintenance once a year.
6. The fusion splicer has been precision calibrated, please try to avoid strong vibration, and impact, and use dedicated box for transportation and storage.

   ● The fusion splicer must be repaired and debugged by specialized technical personnel, for the appeared problems, please contact the manufacturers in a timely manner.

1. Brief Introduction

Thank you for buying the product of Nanjing Jilong Optical Communication Co.,Ltd. The manual detailed introduces the performance and usage of KL-300 automatic fiber fusion splicer. The splicer uses high-speed image processing technology and special precision positioning technology, which can make the entire process of fiber splicing in nine seconds automatically. Large-screen LCD monitors make all stages of fiber splicing clear. It is small in shape, light in weight, which is suitable for field work. Its operation is simple, fusion speed is high, fusion loss is small, so it is particularly applicable to Optical Fiber Communication engineering and maintenance of communication fields such as telecommunications, broadcasting, railways, petrochemical, power supply, the armed forces, public security and other areas, and the teaching and research of research institutes. In order to complete fusion operation more accurately, please read this manual in detail.

1．1 Applicable scope

Single-mould and multi-mould quartz glass fiber。

Fiber diameter is 125 μ m (standard), coating diameter is 0.2 to 1.5 mm;

1.2 Function indexes

● The aligning method for the fibers: "Clad" aligning or "Core" aligning

● The method of image processing: Digital processing

● Typical Splicing Loss: 0.02 dB (single-module optical fiber of the same kind), 0.01dB (multi-module fiber of the same kind)

● Typical fusion time: 9 seconds

● Typical heating time: 30 seconds (heating time can be set, the temperature of the heater can be adjusted.)

- Splice Mode: 53 groups of factory mode, 40 groups of user mode.

- Heating mode: 9 groups of factory mode, 24 groups of user mode.

- Amplification of the fiber:300 times(X or Y axis), 150 times (X and Y axis)

- Standby time of the battery: 150 times of average fusion when fully charged (heating at the same time)

- Electrode life: 2500 times

- Proof Test: 2N

- Real-time power monitoring

- Multilingual user interface

- Inner lights (convenient for placing fiber)

- Subsequent loss memory: 4000 groups latest follow results, 20 parameters for each group.

- Display: 5.7 Inch TFT Color LCD

- USB Interface: connected to computer to facilitate data transmission, storage and printing

- VGA Interface: can link PC and LCD TV

- Operating Temperature: -10 to 50 ℃, Storage temperature: -40 to 60 ℃

- Work Humidity: <95% RH (not condensing), Storage Humidity: 0～95%

   Elevation:0～5000m　Maximum wind speed: 15m/s

- Power: AC 100～240V(Power adapter); Power modules built-in lithium-ion

   Consumption: 25W

- Dimensions: 150mm(L)×150mm(W)×150mm(H)

- Weight: 3.2Kg

1.3 Configuration of fusion splicer

Following is the standard configurations of fiber splicing:

No.	Name	Type	Quantity	Remark
1	fusion splicer	KL-300	1	host
2	carrying case	XDX-300 gallus	1	Accessories
3	spare electrode	DJ-01	1	Accessories
4	Power adapter	ADC-01	1	Accessories
5	AC power cord	ACC-01	1	Accessories
6	plastic tweezer	NZ-01	1	Accessories
7	cleaning brush	MS-01	1	Accessories
8	cooling tray	TP-300	1	Accessories
9	monitors shield	FHZ-300	1	Accessories
10	Usage Manual	SMS-300-10	1	Annex
11	survey report	-	1	Annex
12	Qualification Certificate	-	1	Annex
13	Packing list	-	1	Annex
14	warranty card	-	1	Annex

1. 4 Parts Name of fusion splicer

Wind resistance cover

Heater

Power switch

Key board

USB interface

LCD

VGA interface

Power module

Main Body

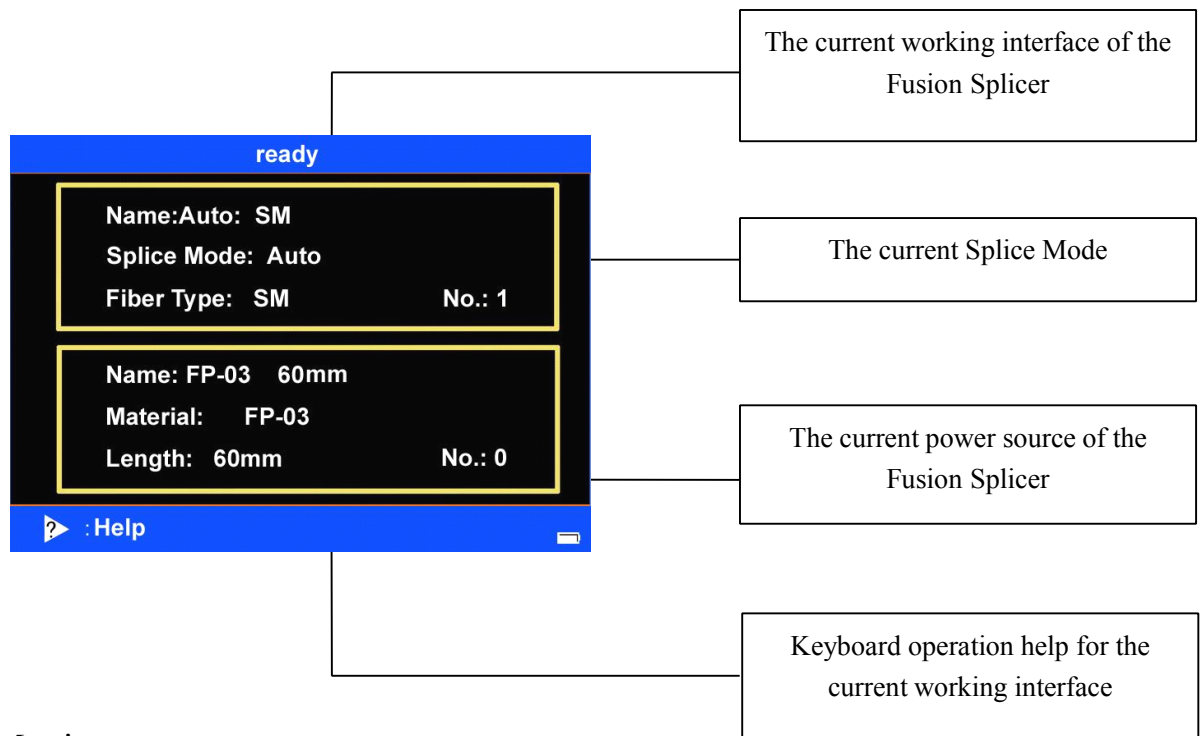Membrane figure of left and right keyboards

1. 5 Descriptions of the Keyboard of the Fusion Splicer

Keyboard	Standby mode	Mode of manual operation	Mode of automatic operation	Mode of parameter menu
(power icon)	Power switch	Power switch	Power switch	Power switch
(up arrow icon)	To increase the brightness of the display	The optical fiber moves upward	Invalid	Increase the parameter quantum or move the cursor
(down arrow icon)	To reduce the brightness of the display	The optical fiber moves downward	Invalid	Increase the parameter quantum or move the cursor
(left arrow icon)	Invalid	The optical fiber moves left	Invalid	Increase the parameter quantum or move the cursor
(right arrow icon)	Turn on the help screen	The optical fiber moves right	Invalid	Increase the parameter quantum or move the cursor
(menu icon)	To enter the menu mode	To switch on the manual driver at pausing state	Invalid	Select→edit the fusion(heating) parameter files
(enter icon)	To enter "select splice parameter files" menu	To enter the "select parameter files" menu	Invalid	To enter the next menu interface/ confirm the modifier
(exit icon)	Invalid	Invalid	Invalid	Exit from the current menu screen
HEAT	Heater switch	Heater switch	Heater switch	Heater switch
RESET	Reset of motor	Reset of motor	Reset of motor	Invalid
SET	Start to fusion	Further propulsion/start fusion	Invalid	Invalid
ARC	Discharging	Discharging	Invalid	Invalid
X/Y	Switch X/Y display screen	Switch X/Y display screen	Switch X/Y display screen	Invalid

● To define the mode of manual operation(Editing Splice Management Select)

1. Set <Pause 1> to "ON" at the Operation Option;

2. Set <Pause 2> to "ON" at the Operation Option.

1. 6   Descriptions of the standby interface of the Fusion Splicer

The current working interface of the Fusion Splicer

The current Splice Mode

The current power source of the Fusion Splicer

Keyboard operation help for the current working interface

ready

Name:Auto: SM
Splice Mode: Auto
Fiber Type: SM   No.: 1

Name: FP-03   60mm
Material: FP-03
Length: 60mm   No.: 0

▷ : Help

LCD Monitor

KL-300 fusion splicer is equipped with a liquid crystal display, it is a sophisticated accessory produced in the strictly quality control factory environment. Nevertheless, there will be some black, red, blue, and green dots on the screen. According to the difference of screen watching perspective, the brightness of the display will be different. These symptoms are not a deficiency of LCD monitor, and it is a natural phenomenon.

2. Basic operation

KL-300 Series fusion splicer is designed for the

fusion of many types of fiber by using core

diameter aiming rationale, its shape is compact,

light weight, which is suitable for field work.

Operation is simple, fusion speed is high,

and fusion loss is small.

2．1 Descriptions of the power modules

KL-300 Series Fusion Splicer uses 2 in 1 power module design, during the work, the Fusion Splicer can be supplied by the polymer lithium ion battery separately; or use AC adapter for electricity supply; when adapter is used for electricity supply, the polymer lithium ion battery is charged at the same time. The lithium battery to be changed must be the model specified by the Company.

2．2 AC operation

2.2.1 When AC power supply is adopted, the AC/DC adapter supplied by the company should be used. The basic parameters of the adapter are as follows:

INPUT: AC100-240V～1.8A 50/60HZ

OUTPUT: DC13.5V/5A

2.2.2 The AC/DC adapter will not be able to supple normal DC output if the input AC voltage is lower than 100V or higher than 240V. At this situation , the DC output line of the adapter must not be inserted into "POWER INPUT "specified on the power module of the Fusion Splicer, otherwise it will results in the damage of fusion splicer.

2.2.3 If lithium battery is arranged in the battery case, the battery pack will also be charged when the adapter is supplying power. However, it is recommended that the Fusion Splicer be shut when charged.

Notes: Do not use power source which does not meet the requirement of the Company, otherwise the Fusion Splicer may be burnt, or it will bring other serious result.

2．3   Battery supply operation

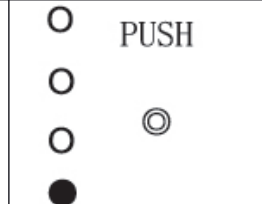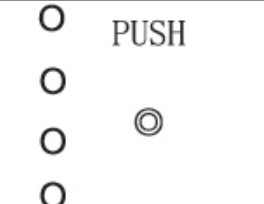The user may choose to use the polymer lithium battery in the splicer to separately supply for the Fusion Splicer.
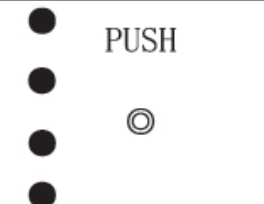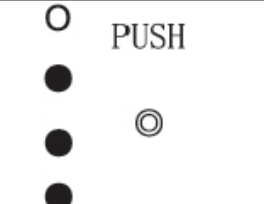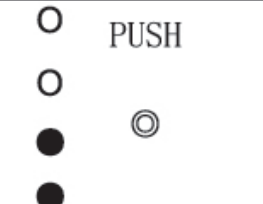
2.3.1 Checking of battery capacity

When the power module is not in the charged state, press the "PUSH" button on the flank of the power module. Then the four battery capacity indicator (red) lights on the left side will be bright. The number of the lit light represents the highness or lowness of the battery capacity. See the following table.

When the power module is in the charged state, the four battery capacity indicator (red) lights on the left side will be bright, which only represents the highness of the current charge voltage, but the capacity of the battery.

The capcity level of battery is as follows: (when presses the Push beside the power module):

● PUSH ● ◎ ● ●	○ PUSH ● ◎ ● ●	○ PUSH ○ ◎ ● ●	○ PUSH ○ ◎ ○ ●	○ PUSH ○ ◎ ○ ○
Battery capciy ≥80% Battery Voltage **12.2V**	**Battery capciy ≥60%** Battery Voltage **11.8V**	**Battery capciy≥40%** Battery Voltage **11.4V**	**Battery capciy≥15%** Battery Voltage **11V**	**Battery capciy≤10%** Battery Voltage <**11V**

● The lights are bright	○ The lights are bright

Notes: the capacity of the built-in polymer lithium battery of the power module: 11.1V

2.3.2 Battery charging

<1> Whether the battery capacity is in adequacy, every time the AC power adapter is inserted into "POWER INPUT "on the Fusion Splicer power module, the power module will start a charging process.

<2> Display of charged state: During the charging, the charging indicator (CHARGE) light is red; after the charging completion, the charging indicator (CHARGE) will be green.

<3> When the splicer is shut down, the maximum charging time is three hours 40 minutes, and the shortest is 40 minutes. The length of the charging time is dependent on the current battery capacity of the splicer.
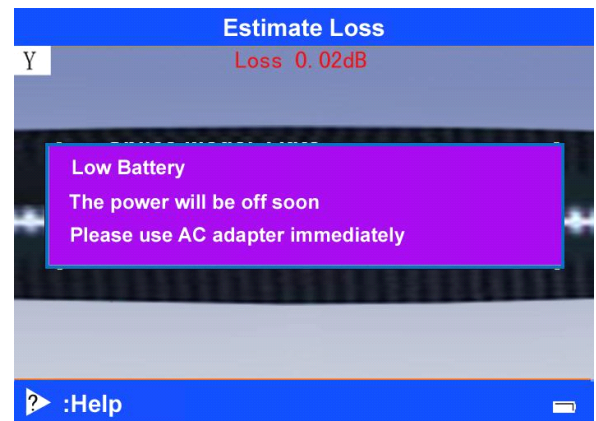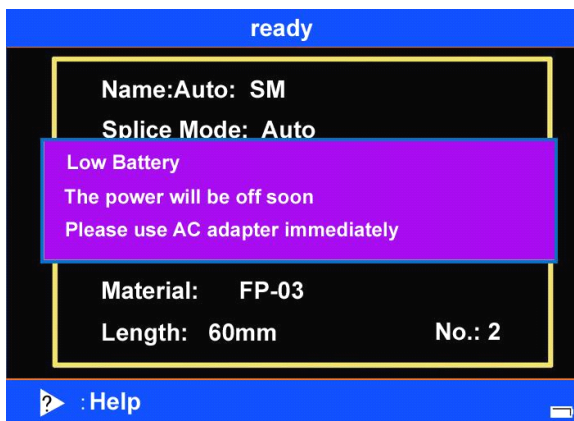
<4> If the splicer is charged when it is active, the charging time should be longer. The user is recommended to charge the battery when the splicer is shut down, thus the charging time will be shortened.

2.3.3   Operation of power saving mode

The user can set the splicer to power saving mode or shut it down within certain duration of time to save unnecessary loss of battery capacity. See [Application Menu] (Section 3.3) for detail.

2.3.4   Under Voltage Alarm

his model of fusion splicer has the function of "Under Voltage Alarm". If the capacity of the lithium battery is lower than the specified value (the default value is around 10.3V), the splicer will automatically alarm and lock the keyboard to disable input. The user should press ⏻   until the Fusion Splicer is shut down, and charge the lithium battery pack as soon as possible, or use the adapter to supply power. See the following pictures.

ready
Name:Auto: SM
Splice Mode: Auto
Low Battery
The power will be off soon
Please use AC adapter immediately
Material: FP-03
Length: 60mm   No.: 2
▷ : Help   🔋

Estimate Loss
Y   Loss 0. 02dB
Low Battery
The power will be off soon
Please use AC adapter immediately
▷ :Help   🔋

2.3.5   The other considerations

<1> Before using fusion splicer, check the capacity level of the battery, if the capacity is relatively low or Under Voltage Alarm; please promptly charge the lithium battery pack as soon as possible, or use the adapter to supply power.

<2> Use the AC/DC adapter supplied by the Company to give the lithium battery pack at least one complete charge every month to avoid battery aging resulted from memory effect of the battery.

<3> Batteries are consumables, have a certain life, when the battery indicator entirely lights, but the using time is still very short, then need to replace batteries. The battery to be changed must be the model specified by the Company.

<4> Please do not charge the battery in the low-temperature environment, so as not to reduce battery life. Using battery in too high or too low temperature, battery power will be reduced.

<5> Do not charge the polymer lithium battery for too long; cut the power as soon as the battery pack is fully charged, otherwise it may result in serious damage to the lithium battery pack.

<6> Do not leave the battery in hot environment or throw it into fire, so as to prevent battery explosion.

●   Prohibition of dismantling power modules

2.4   Turn on and turn off

Turn on

Press ⏻ button on the operator panel until the LED indicator lights turn from green to red, release the button ⏻. When all of the motors return to the initial position, the screen shows the reset menu.
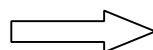
<u>Turn off</u>

Press ⏻ button on the operator panel until the LED indicator turn from red to green, realease the button ⏻, now the machine is turned off.

2.5 Display brightness control

When the external environment is different, the user can adjust the display brightness for the convenience of the Fusion Splicer operation. Display brightness control should be done in the "standby" operation interface.

<1> Press ▼ or ▲ in the "standby" operation interface to change the brightness of the display.

<2> Press ⤶ to confirm the brightness changes, and return to "standby" operation interface.
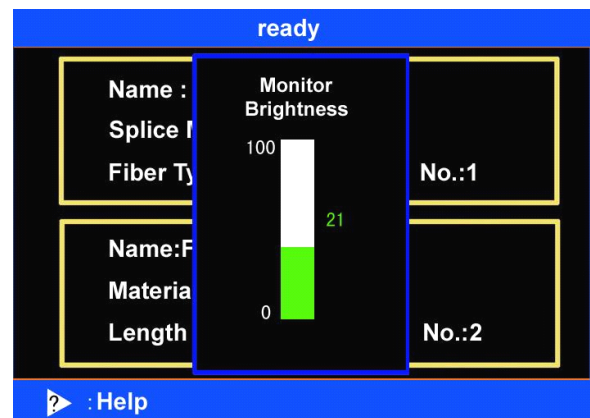
● When the display brightness is moderate, the capacity loss can be reduced, and the endurance of the battery can be prolonged.

2.6 Cover fiber pyrocondensation tude

The installation of fiber pyrocondensation tude
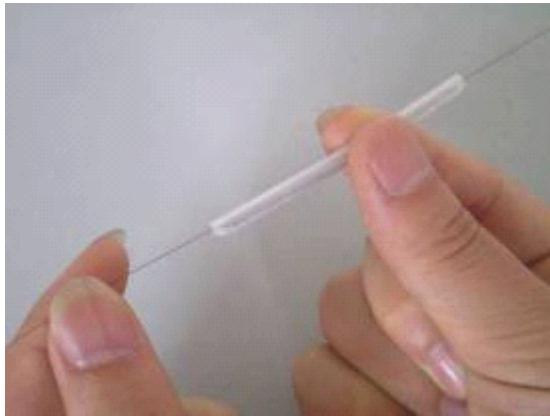

2.7 Preparation of fiber end-face

2.7.1 Open the big and small clips of the cutter; push the sliding plate installed

with blade from the end to the front.
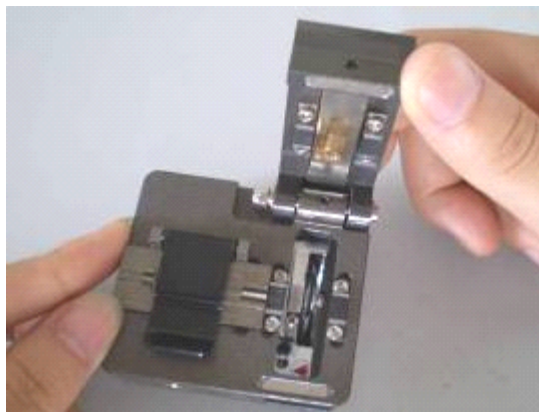
2.7.2 Use fiber stripping pliers to strip fiber coating layer, the length of which is

30-40 mm. Use gauze dipping with alcohol or wadding soft enough to wipe

clean the fiber. Wiping with a clean cotton cloth once, and do not clean it with

the same cloth for the second time. (**Notes:** Please use the alcohol with purity

more than 99%.)
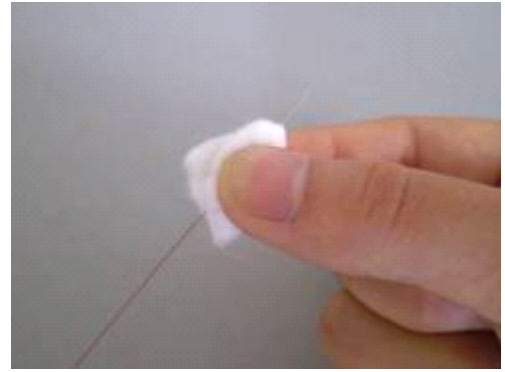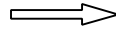
Fiber stripping   Clean

2.7.3   Aim the edge of the fiber coating layer at the "16"calibration of the cutter

yardstick and put the fiber into orientation pressure tank with the left hand,

and be sure that the bare fiber has been straightly put on the right and left

rubber pads.

2.7.4 Close the small clip, big clip by right hand and promote sliding plate

installed with blade to the other side, and then cut the fiber.
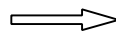
2.7.5 Hold the cutter by left hand and open the big clip by right hand and romove

the fiber chips to put them in fixed containers.

2.7.6 Pinch and hold the fiber with the left hand, and open the small clip with the

right hand at the same time, and carefully remove the fiber.

Notes: the clean cross-section of fiber can not touch other things.

2.8 Place fiber

2.8.1　Open shielding cover and left and right fiber clips.

2.8.2　Put the good fiber end face in the V-shaped

groove, ensure the tip of the fiber between

the tip of the electrode and V-shaped groove's

edge.
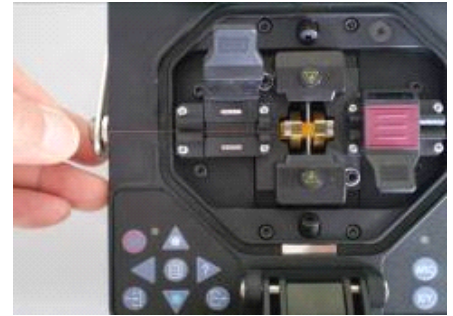
● If the fiber is bending, bending part should be

upward when placing the fiber.

● To ensure the splice quality of the fiber, the clean cross-section of fiber can not

touch other things.

2.8.3 Use fingers to pinch the fiber, and then close the left clip, and press the fiber.

Ensure the fiber is placed in the bottom of V-shape groovy. If the fiber is

placed incorrect, please replace the fiber. The fiber end face don't touch the

V-shape groove when place the fiber.

2.8.4 Place another optical fiber according to the above steps.

2.8.5 Close shielding cover.

2.9 Adjust Monitor Angle

2.9.1 The monitor hinge that fixes the monitor frame may become too loose and does not maintain the monitor position. To fix this problem, tighten monitor hinge screws as is shown in the following picture.
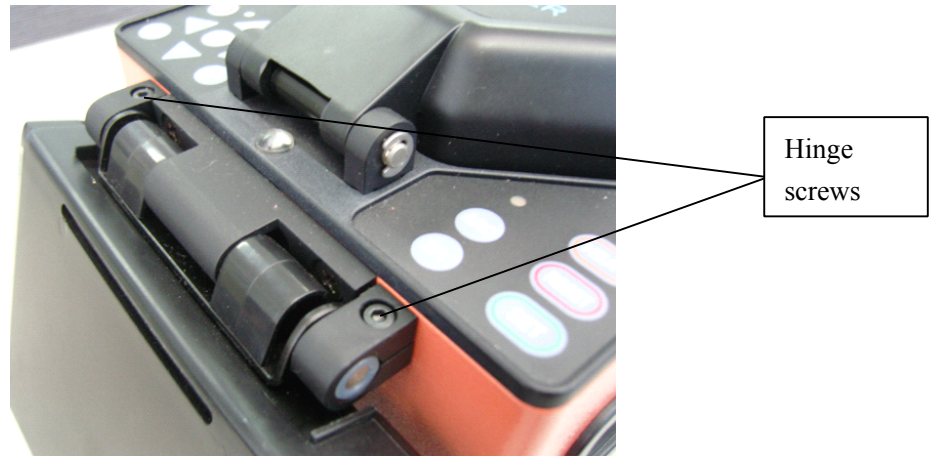
Hinge screws

2.9.2 The monitor hinge may become too tight and makes it hard for the monitor to turn. To fix this problem, drop some lubricating oil to the monitor hinges as is shown in the following picture; do not tighten the monitor hinge screws.

3. Management Menu

The details of managing the options of KL-300 Series Fusion Splicer are described in this chapter.

3.1 Overview of Frist-degree Menus

3.1.1 Four Frist-degree Menus are arranged on the operation interface of KL-300 Series Fusion Splicer, and a number of options are listed in each Frist-degree Menu.
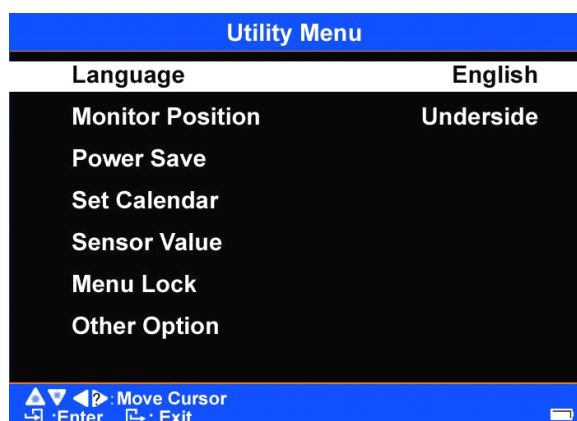
3.1.2 Press ▣ at [standby] state of the current splice, heating modes or after completion of splice to enter "Splice Mode menu"; press ◀ or ▶ to switch between the four Frist-degree Menus; press ⇥ to return to the previous operation interface of [standby]. Options of each Frist-degree Menu and their submenu will be described from Section 3.2
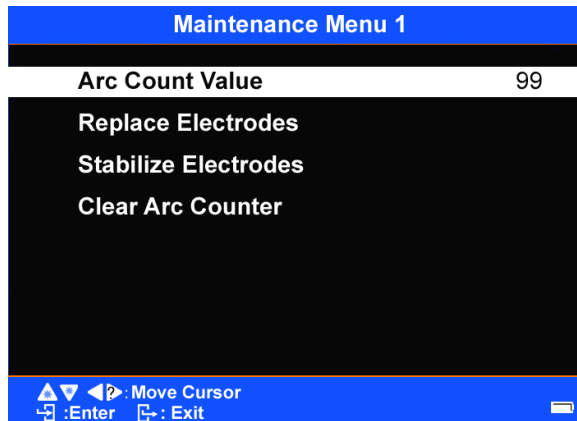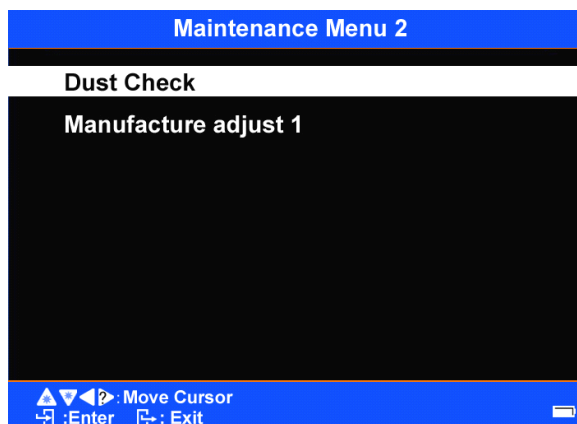
Four Frist-degree Menus are:

A. **"Splice Mode Menu"**

Splice Menu
Select And Edit Splice Mode
Select And Edit Heater Mode
Arc Calibration
Operation Option
Splice Memory
▲▼ ◀▶: Move Cursor ⏎ :Enter ⇥:Exit

B. **"Application Menu"**

Utility Menu	
Language	English
Monitor Position	Underside
Power Save	
Set Calendar	
Sensor Value	
Menu Lock	
Other Option	
▲▼ ◀▶:Move Cursor ⏎ :Enter ⇥: Exit	

C.**"Maitenance Menu 1"**

Maintenance Menu 1

Arc Count Value   99

Replace Electrodes
Stabilize Electrodes
Clear Arc Counter

▲▼ ◀▶ : Move Cursor
⏎ :Enter   ⤷: Exit

D.**"Maintenance Menu 2"**

Maintenance Menu 2

Dust Check
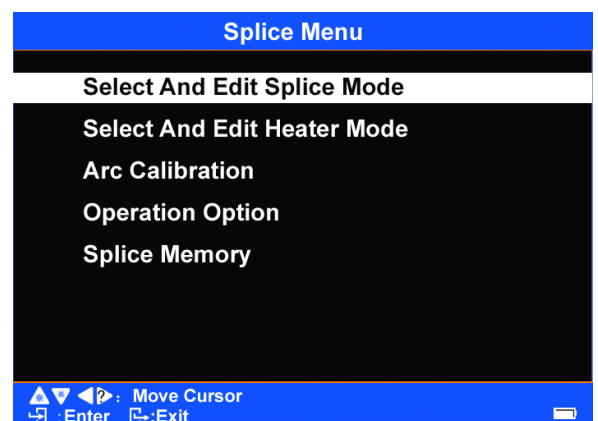Manufacture adjust 1

▲▼ ◀▶ : Move Cursor
⏎ :Enter   ⤷: Exit

3.1.3 In each menu, Press ⬖ or ⬗ and move the cursor up and down to choose the desired option, and press ⎘ to enter; Press ⎙ to return to the previous operation interface.

3.2 Splice Mode Menu

3.2.1 Overview

"Splice Mode Menu "includes options which are closely related to the fusion splice ; it also includes the important parameters and options in the process of fusion splice.

Splice Menu

Select And Edit Splice Mode
Select And Edit Heater Mode
Arc Calibration
Operation Option
Splice Memory

▲▼ ◀▶ : Move Cursor
⏎ :Enter   ⤷:Exit

Splice Mode Menu of the splicer includes the following options:

A. [Select And Edit Splice Mode]

B. [Select And Edit Heater Mode]

C. [Arc calibration]

D. [Operation Options]

E. [Splice Memory]

3.2.2 [Select And Edit Splice Mode]

<1> Select Splice Mode File

Press ![icon] ![icon] in "Splice Mode menu" to select [Select And Edit Splice Mode], and press ![icon] to enter, then a list of "Select Splice Mode File" is displayed. See the following pictures.


The menu of "Select Splice Mode Files"

The following items are displayed for each of the "Select Splice Mode Files" list:

[No.], [File name], [Mode], [Fiber]

<2>　　Editing the "Select Splice Mode Files"

In the interface of "Select Splice Mode Files" list, press 🔺 🔻 and move the cursor to a splice mode file with a certain number, and then press 📑 to enter the menu of "Edit Splice Mode Files". See the following pictures.

Edit Splice Mode File

Name:	**Auto SM**
Splice Mode:	**Auto**
Fiber Type:	**SM**

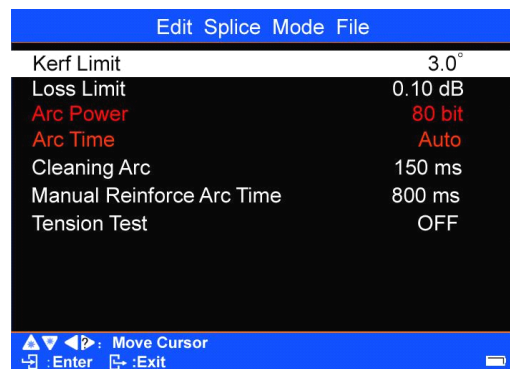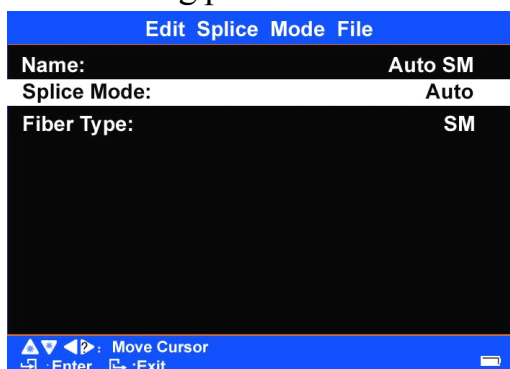🔺🔻◀▶：Move Cursor
⏎ :Enter   ↪ :Exit
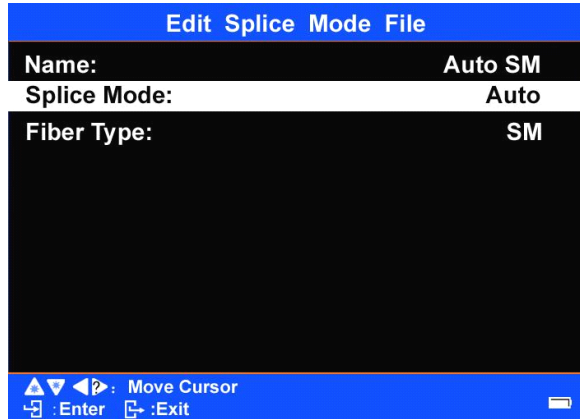
<3>　2 or 7 interfaces are included in a menu of "Edit Splice Mode Files"; two displace interfaces can be opened by each setting of [Mode] (including Auto, Calibrate, Normal or Special); Press ◀ ▶ to switch between different interfaces; Press ↪ one by one to return to the previous operation interface.

Notes:

A. For splice mode files which is set to Auto or Calibrate [Mode], if first press 📑 and then press ◀ ▶, then the menu of "Edit Splice Mode Files" can only switch between 2 screens; Press ↪ one by one to return to the previous operation interface. See the following pictures.

Edit Splice Mode File

Name:	**Auto SM**
Splice Mode:	**Auto**
Fiber Type:	**SM**

🔺🔻◀▶：Move Cursor
⏎ :Enter   ↪ :Exit

Edit Splice Mode File

Kerf Limit	3.0°
Loss Limit	0.10 dB
Arc Power	80 bit
Arc Time	Auto
Cleaning Arc	150 ms
Manual Reinforce Arc Time	800 ms
Tension Test	OFF

🔺🔻◀▶：Move Cursor
⏎ :Enter   ↪ :Exit

Parameter	Description
File name	Title for a splice parameter file can be expressed in up to 15 characters. The title is displayed in the [Select Splice Mode Files] menu.
Splice Mode	The splicer has four options of Splice Mode: Auto, Calibrate, Normal, and Special, wherein the first three are common options.
Fiber Type	A list of splice modes stored in the splicer database is displayed. Upon inputting the appropriate mode, the selected splice mode stored in database area is copied to a selected splice mode in user-programmable area.
Cleave Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceed the selected threshold .
Loss Limit	An error message is displayed if the estimated splice loss exceeds the selected threshold .
Arc power	Under Auto/Calibrate fusion model, Arc power is fixed at 80bits.
Arc time	Under Auto/Calibrate fusion model, Arc time is fixed at 1500ms and cann't amended.
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Rearc Time	Under certain conditions, it shall be mended fusion loss through rearc time again. The duration of the rearc time can be changed by this parameter.
Proof Test	If [Tension Test] is set to "ON", a proof-test is performed automatically.

B. For splice mode file which is set to Normal or Special [Mode], if first press ![icon] and then press ![icon] ![icon] , then the menu of "Edit Splice Mode Files" can switch between 7 screens; Press ![icon] one by one to return to the previous operation interface.
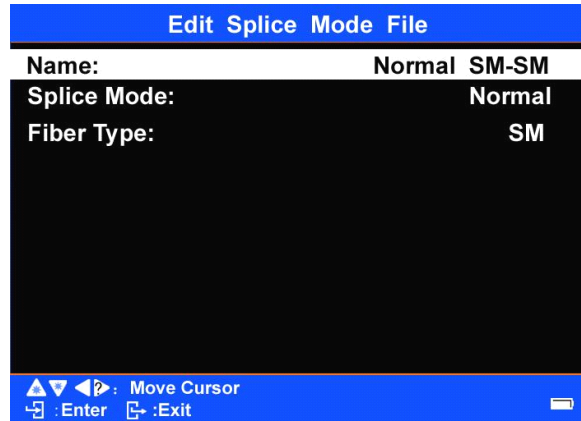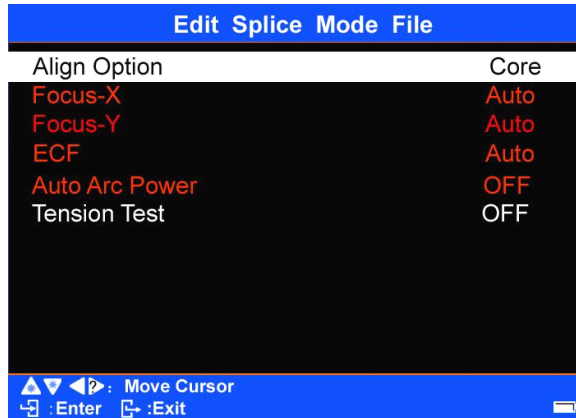
<1> The first screen in the "Edit Splice Mode Files" menu:
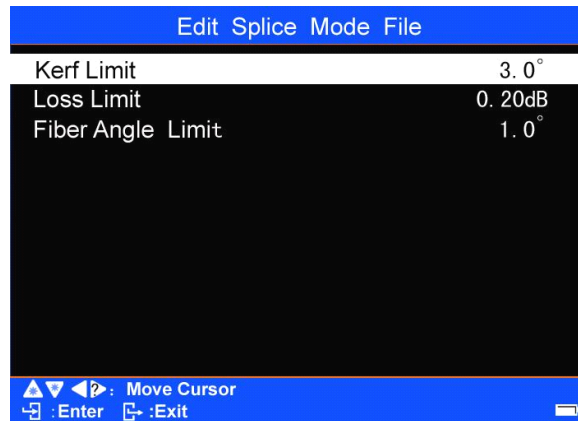

Descriptions for the parameters:

Parameter	Description
name	Title for a splice parameter file can be expressed in up to 15 characters. The title is displayed in the [Edit Splice Mode Files] menu.
Splice Mode	The splicer has four options of Splice Mode: Auto, Calibrate, Normal, and Special, where in the first three are common options.
Fiber Type	A list of splice modes stored in the splicer database is displayed. Upon inputting the appropriate mode, the selected splice mode stored in database area is copied to a selected splice mode in user-programmable area.

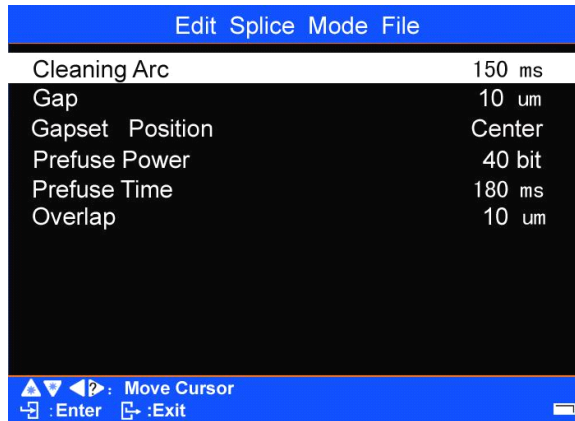<2> The second screen in the "Edit Splice Mode File" menu:

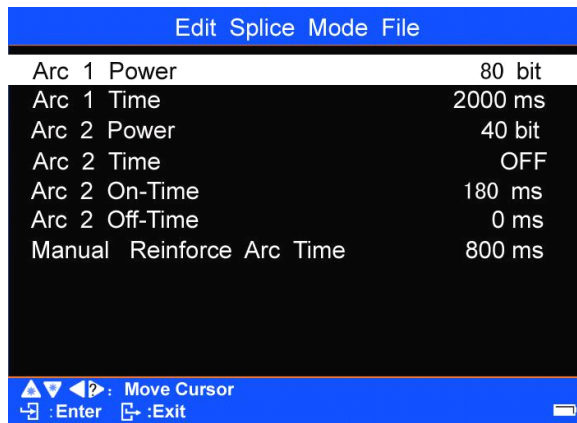| Parameter	Description
Align Option	Sets the aligning method for the fibers. "Core": Aligns fibers by core position. "Clad": Aligns fibers by center position of the cladding of the fiber. "Manual": Aligns fibers manually.
Focus-X (KL-300 T Without this function)	This function is set as "Auto" and can not be changed by the user. Each time before fibers are forwarded and aligned, left and right fibers are focused independently; therefore optimum focusing can be achieved even if different fibers are spliced .
Focus-Y (KL-300 TWithout this function)	This function is set as "Auto" and can not be changed by the user. See X image focus.
ECF	This fuction is set as "auto" and can not be changed by the user.
Auto Arc Power	This fuction is set as "off" and can not be changed by the user.
Tension Test	If [Tension Test] is set to "ON", a tension-test is performed automatically.

<3> The third screen in the "Edit Splice Mode File" menu:

Edit Splice Mode File	
Kerf Limit	3. 0°
Loss Limit	0. 20dB
Fiber Angle Limit	1. 0°

▲▼◀▶：Move Cursor
⤶ :Enter ⤷ :Exit

Parameter	Description
Kerf Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceed the selected threshold .
Loss Limit	An error message is displayed if the estimated splice loss exceeds the selected threshold .
Fiber Angle Limit	An error message is displayed on the screen if the bend angle of the two fibers spliced exceeds the selected threshold .

<4> The fourth screen in the "Edit Splice Mode File" menu:

```
            Edit  Splice  Mode  File
  Cleaning Arc                      150  ms
  Gap                                10  um
  Gapset   Position               Center
  Prefuse Power                      40  bit
  Prefuse Time                      180  ms
  Overlap                            10  um



  ▲▽ ◀▷ :  Move Cursor
  ⤸ : Enter    ⤶ :Exit                      ▭
```

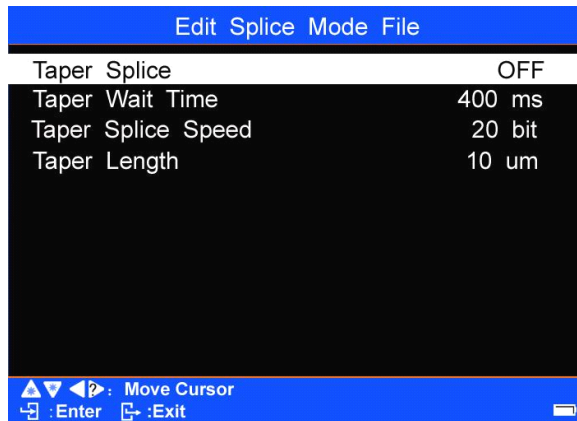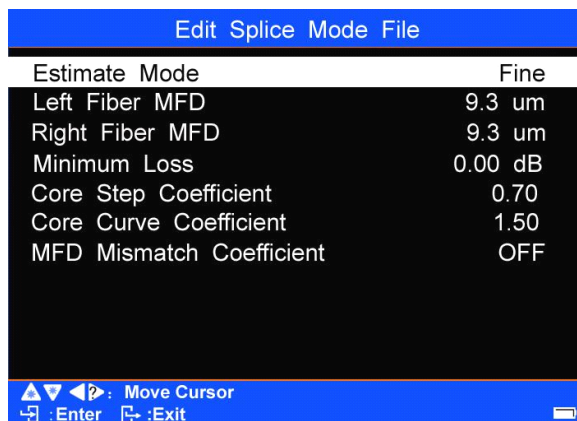| Parameter	Description
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Gap	Sets the end-face gap between the left and right fibers at the time of aligning and pre-fusion discharge.
Gapset Position	Sets the relative position of the splicing location to the center of electrodes. Splice loss may be improved in the case of dissimilar fiber splicing by shifting [Gapset Pos] towards a fiber whose MFD is bigger than the other fiber MFD.
Prefuse Power	Sets the power of the pre-fusion arc, which is an arc discharge occurring from the beginning until the fibers begin stuffing. If [Pre-fusion Power] is set too low, axial offset may occur if cleaved angles are relatively poor. If [Pre-fusion Power] is set too high, fiber end faces are fused excessively and splice loss gets worse.
Prefuse Time	Sets the duration of the pre-fusion arc, which is arc discharge occurring from the beginning until the fibers begin stuffing. Longer [Pre-fusion Time] is synonymous with higher [Perfusion Power].
Overlap	Sets the overlap amount of fibers at the fiber stuffing stage. Relatively small [Overlap] is recommended if the [Pre-fusion Power] is low, while relatively large [Overlap] is recommended if the [Pre-fusion Power] is high.

<5> The fifth screen in the "Edit Splice Mode File" menu:

```
        Edit  Splice  Mode  File
 Arc  1  Power                    80  bit
 Arc  1  Time                   2000 ms
 Arc  2  Power                    40 bit
 Arc  2  Time                      OFF
 Arc  2  On-Time                 180  ms
 Arc  2  Off-Time                  0 ms
 Manual   Reinforce  Arc  Time   800 ms



 ▲▼◄►:  Move Cursor
 ⊡ :Enter   ⊡ :Exit              ▭
```

Parameter	Description
Arc1 Power	Arc discharge can be separated into two stages. Arc1 Power is the first stage. This sets Arc1 Power.
Arc1 Time	Sets Arc1 time. Caution:If Arc1Time is set 1 sec. or less and Arc2 Power is set to "OFF", the splice may break during proof-test stage.
Arc2 Power	Arc2 is the second arc discharge stage. This sets Arc2 Power.
Arc2 Time	Sets the total Arc2 time.　Usually set this value to "OFF".　It is possible to set a very long arc time. However, when the total of the Arc 1 time and Arc2 time exceeds 30 seconds, always adjust the function [Arc2 ON Time] and [Arc2 OFF Time] to weaken the arc power.　A continuous arc over 30 seconds, without weakening the arc power, may damage the arc discharge unit.
Arc2 ON- Time	During Arc2 discharge, arc power can be pulsed by turning the arc on and off. This sets the amount of time that Arc2 is ON.
Arc2 OFF- Time	Sets Arc2 OFF Time during Arc2.　When the Arc2 discharge is intermittent, re-arc discharge is also intermittent.When continuous re-arc discharge is necessary, set this parameter to "OFF".
Manual　Reinforce　Arc Time	Sets Rearc Time. In other splice modes, the Re-arc power is automatically fixed to the same arc power of [Arc2 Power]. If Arc2 is set ON and OFF, Re-arc is automatically set ON and OFF.

<6> The sixth screen in the "Edit Splice Mode File" menu:

```
          Edit  Splice  Mode  File
 Taper  Splice                      OFF
 Taper  Wait  Time              400  ms
 Taper  Splice  Speed           20  bit
 Taper  Length                  10  um




 ▲▼ ◀▶:  Move Cursor
 ⊡ :Enter   ⊡ :Exit              ▭
```

Parameter	Description
Taper Splice	Control opening and closing of "Taper Splice" function.
Taper Wait Time	Taper wait time can be set up to 30000ms.
Taper Splice Speed	Taper Speed is used to control the fiber pulling speed.
Taper Length	Taper Length is used to control the fiber pulling length.

<7> The seventh screen in the "Edit Splice Mode File" menu:

```
          Edit  Splice  Mode  File
 Estimate  Mode                    Fine
 Left  Fiber  MFD              9.3  um
 Right  Fiber  MFD             9.3  um
 Minimum  Loss                 0.00  dB
 Core  Step  Coefficient          0.70
 Core  Curve  Coefficient         1.50
 MFD  Mismatch  Coefficient       OFF



 ▲▼ ◀▶:  Move Cursor
 ⊡ :Enter   ⊡ :Exit              ▭
```

Parameter	Description
Estimate Mode	Selects splice loss estimation mode to "OFF", "CORE", or "CLAD".When MM fibers are spliced, select "CLAD".
Left fiber MFD	Sets MFD of the left and right fibers. Both MFD-L & R are taken into account for estimating splice loss.
Right fiber MFD	
Minimum Loss	This amount is added to the estimated splice loss originally calculated. When splicing specialty or dissimilar fibers, a high actual splice loss may occur even with optimized arc conditions. To make the actual splice loss concur with the estimated splice loss, set the minimum value of estimate to the minimum optimized actual splice loss.
Core Step Coefficient	Determines how Core step, Core curve and MFD mismatch influences splice loss estimate. If Est. Mode is set "OFF" or "CLAD", these Core step, Core curve and MFD mismatch are automatically set "OFF". If the estimated splice on certain fiber combinations needs adjustment, Core step, Core curve and MFD mismatch are used. These are advanced splicer functions and should be discussed with your representative before changing.
Core Curve Coefficient	
MFD Mismatch Coefficient	

Note1: Edit Splice Mode File

A. In the interface of "Edit Splice Mode File" list, press and move the cursor to select an item to change, and then press to enter.

B. Press or to change the parameter or settings, and then press to confirm the change.

C. Press one by one to return to the previous operation interface.

The screen displays as follows when the choice is entered:
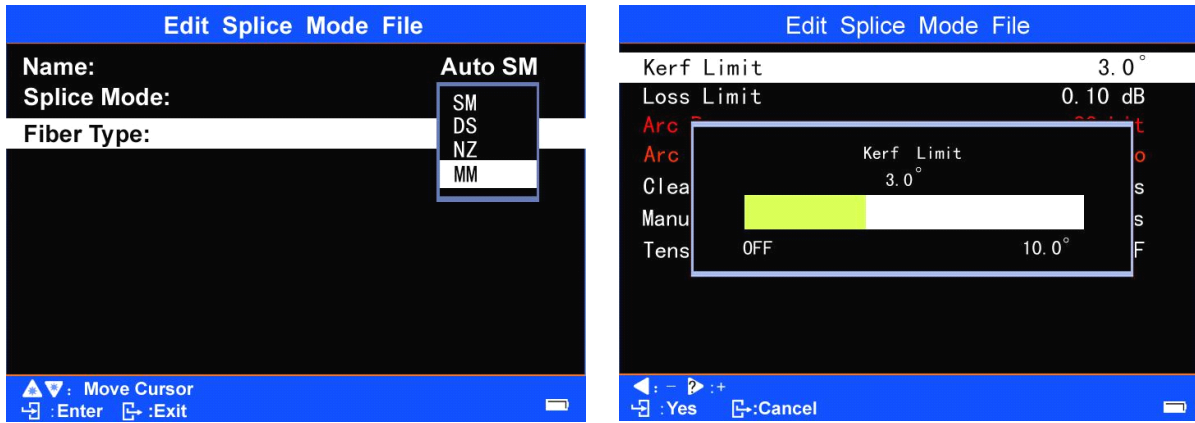
Note2: Descriptions about Referring or editing splice mode

See [Referring or editing splice mode] in Chapter 4.1.2..

3.2.3   [Select And Edit Heater Mode]

<1> Select And Edit Heater Mode

Press ☀ ❄ in "Splice menu" to move the cursor and select [Select And Edit Heater Mode], and press ⤵ to enter, then a list of "Select Heater Mode Files" is displayed. See the following pictures.
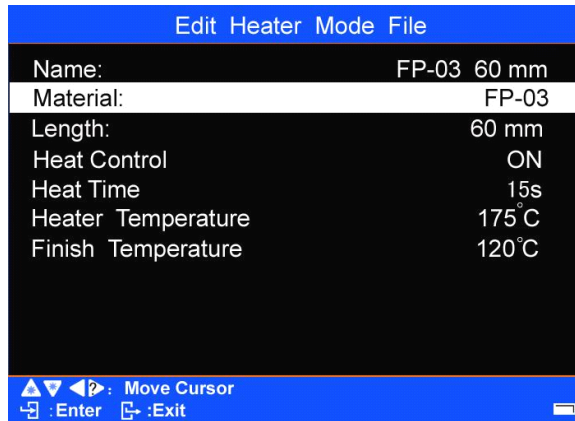
"Select Heater Mode Files" menu

The following items are displayed for each of the "select splice mode" list:

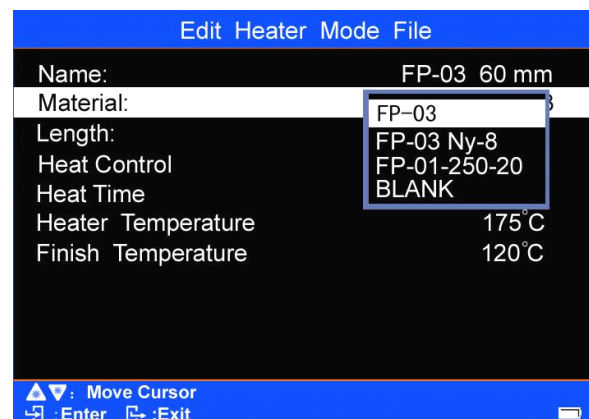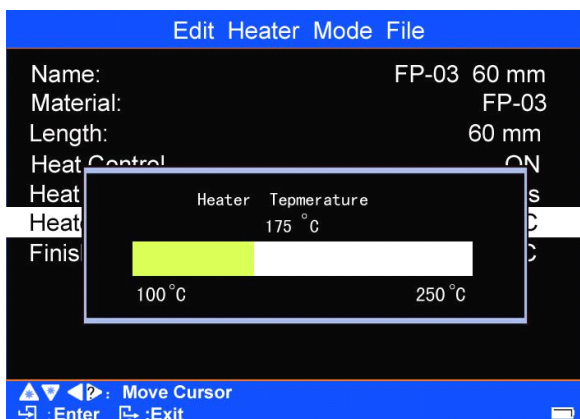[No.], [File Name], [Material], [Length]

<2>   Edit Heater Mode File

In the interface of "Select Heater Mode Files" list, press [icon] [icon] and move the cursor to select a heating parameters file with the number of"××", and then press [icon] to enter the menu of "Edit Heater Mode File". See the following pictures.

Edit Heater Mode File

Name:	FP-03 60 mm
Material:	FP-03
Length:	60 mm
Heat Control	ON
Heat Time	15s
Heater Temperature	175°C
Finish Temperature	120°C

▲▼◄?： Move Cursor
⇲ :Enter   ⇲ :Exit

B. Press [icon] [icon] to move the cursor to select the items to change (See the above "Edit Heater Mode File" menu. The six options are: Material, Length , Heater Control, Heat Time, Heater Temperature, and Finish Temperature).

C. Press [icon] to enter the "parameter box" of the items to change; press [icon] [icon] or [icon] [icon] to change the parameters or settings in the "parameter box"; double press [icon] to complete modifying and setting of the selected parameters.

Edit Heater Mode File

Name:	FP-03 60 mm
Material:	FP-03
Length:	60 mm
Heat Control	ON
Heat	s
Heat	
Finis	

Heater Tepmerature
175 °C

100°C   250°C

▲▼◄?： Move Cursor
⇲ :Enter   ⇲ :Exit

Edit Heater Mode File

Name:	FP-03 60 mm
Material:	
Length:	
Heat Control	
Heat Time	
Heater Temperature	175°C
Finish Temperature	120°C

FP-03
FP-03 Ny-8
FP-01-250-20
BLANK

▲▼： Move Cursor
⇲ :Enter   ⇲ :Exit

D. Press [icon] to return to the interface of "Select Hearter Mode File" and move the cursor to select the heating mode with the number of "××"; to select the heating mode, press [icon] to move "+" to the number it.

Select Heater Mode File			
No.	File Name	Material	Length
0		Blank	
1	FP-03 40mm	FP-03	40mm
2	FP-03 60mm	FP-03	60mm
3	FP-03 Ny-8	FP-03 Ny-8	60mm
4	FP-03 Ny-8	FP-03 Ny-8	40mm
5	FP-03 Ny-8	FP-03 Ny-8	20mm
6	FPS-01-250-60	FPS-01-250-20	60mm
7	FPS-01-250-40	FPS-01-250-20	40mm

▲▼◀▶: Move Cursor
目:Edit   ⤵ :Enter   ⤷ :Exit

Select Heater Mode File			
No.	File Name	Material	Length
0		Blank	
1	FP-03 40mm	FP-03	40mm
+	FP-03 60mm	FP-03	60mm
3	FP-03 Ny-8	FP-03 Ny-8	60mm
4	FP-03 Ny-8	FP-03 Ny-8	40mm
5	FP-03 Ny-8	FP-03 Ny-8	20mm
6	FPS-01-250-60	FPS-01-250-20	60mm
7	FPS-01-250-40	FPS-01-250-20	40mm

▲▼◀▶: Move Cursor
目:Edit   ⤵ :Enter   ⤷ :Exit

E.Double press [icon] to return to the current [Ready] operation interface. The heating mode (edited) marked with the "+"number will be used by the Fusion Splicer for the working of heater.

ready

Name: Auto SM
Splice Mode: AUTO
Fiber Type: SM   No.: 1

Name: FP-03   60mm
Material: FP-03
Length: 60mm   No.: 2

▶ : Help

Details of the heating parameters are described in the following table.

Parameter	Description
Material	Sets sleeve type.　List of all heating modes are displayed. Select a mode in the list and this is copied to a user-programmable mode. (Note: Select and confirm the "BLANK", then the heating mode is a "blank file")
Length	Set length type. The length type list is displayed on the screen. Choose a mode in the list and the mode can be copied to user adjustable mode.
Heat Control	Heater control "open" or "close" option, confirm and return to the [Splice Mode menu].
Heat Time	Sets heating time from the beginning to the end
Heater Temp	Sets heating temperature.
Finish Temp	Sets the finish temperature.When heater approaches this temperature, the buzzer beeps announcing the sleeve is cooled down and is ready to be taken out of the heater.

3.2.4　Creating heating mode

<1> The default of heating mode

When the machine left the factory, there are 8 Splice Modes within it, that is, there are 8 heating modes, which are numbered from 1 to 8; others are all displayed as [BLANK]. The user can increase and copy Splice Modes into the (BLANK).

No.	File Name	Material	Length
0		BLANK	
+1	FP−03　40mm	FP−03	40mm
2	FP−03　60mm	FP−03	60mm
3	FP−03　Ny−8	FP−03　Ny−8	60mm
4	FP−03　Ny−8	FP−03　Ny−8	40mm
5	FP−03　Ny−8	FP−03　Ny−8	20mm
6	FPS−01−250−60	FPS−01−250−20	60mm
7	FPS−01−250−40	FPS−01−250−20	40mm

Select Heater Mode File

▲▼◀▶： Move Cursor
🗐 :Edit　🔁 :Enter　↪ :Exit

No.	File Name	Material	Length
8	FPS−01−250−60	FPS−01−250−20	20mm
9		BLANK	
10		BLANK	
11		BLANK	
12		BLANK	
13		BLANK	
14		BLANK	
15		BLANK	

Select Heater Mode File

▲▼◀▶： Move Cursor
🗐 :Edit　🔁 :Enter　↪ :Exit

<2>   Increase and copy Splice Mode according to the following steps.

A. Press ![icon] ![icon] in the "Splice menu"; select [Select And Edit Heater Mode], and press ![icon] to enter, and then the list of [Select Heater Mode Files] is displayed.

Splice Menu
Select And Edit Splice Mode
Select And Edit Heater Mode
Arc Calibration
Operation Option
Splice Memory
△▽◄►: Move Cursor
↵ :Enter ↳:Exit

No.	File Name	Material	Length
0		BLANK	
+1	FP–03 40mm	FP–03	40mm
2	FP–03 60mm	FP–03	60mm
3	FP–03 Ny–8	FP–03 Ny–8	60mm
4	FP–03 Ny–8	FP–03 Ny–8	40mm
5	FP–03 Ny–8	FP–03 Ny–8	20mm
6	FPS–01–250–60	FPS–01–250–20	60mm
7	FPS–01–250–40	FPS–01–250–20	40mm

Select Heater Mode File

△▽◄►: Move Cursor
▤ :Edit   ↵ :Enter   ↳ :Exit

B. Press ![icon] ![icon] (Press ![icon] ![icon] to turn pages) in the [Select Heater Mode Files] menu; move the cursor to select a blank heating mode numbered "✕✕" (such as Number "10") (BLANK).

No.	File Name	Material	Length
8	FPS–01–250–60	FPS–01–250–20	20mm
9		BLANK	
10		BLANK	
11		BLANK	
12		BLANK	
13		BLANK	
14		BLANK	
15		BLANK	

Select Heater Mode File

△▽◄►: Move Cursor
▤ :Edit   ↵ :Enter   ↳ :Exit
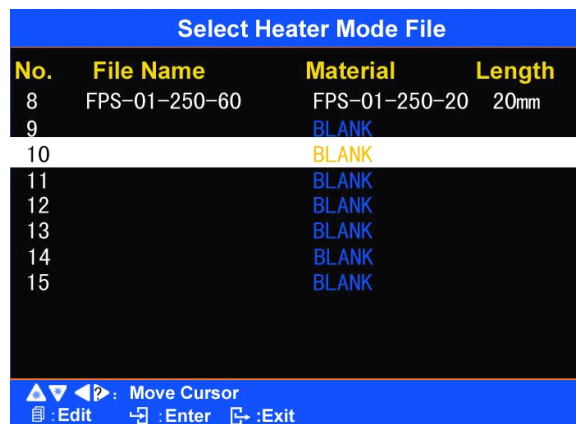
C. Press ![icon] to enter the Template Library of heating parameter files (there are one to nine duplicable heating parameter files in the Template Library); press ![icon] ![icon] and move the cursor to a heating parameter file with a desired number (such as Number '1'in the Template Library).

Select Heater Mode File			
No.	**File Name**	**Material**	**Length**
0		BLANK	
1	FP-03 60mm	FP-03	60mm
2	FP-03 40mm	FP-03	40mm
3	FP-03 20mm	FP-03	20mm
4	FP-03 Ny-8	FP-03 Ny-8	60mm
5	FP-03 Ny-8	FP-03 Ny-8	40mm
6	FP-03 Ny-8	FP-03 Ny-8	20mm
7	FPS-01-250-60	FPS-01-250-20	60mm

△▽ ◀▷ : Move Cursor
🗐 :Edit   ⤷ :Enter   ⤶ :Exit

Select Heater Mode File			
No.	**File Name**	**Material**	**Length**
8	FPS-01-250-40	FPS-01-250-20	40mm
9	FPS-01-250-20	FPS-01-250-20	20mm

△▽ ◀▷ : Move Cursor
🗐 :Edit   ⤷ :Enter   ⤶ :Exit

D. Press ⤷, then the selected heating parameter file with a desired number (such as Number '1'in the Template Library) is copied into the blank heating parameter file (BLANK) numbered "××" (such as Number"10"); at the same time, the newly copied file parameters are displayed in the interface of [Edit Heat Mode Files]

Edit Heater Mode File	
Name:	FP-03 60 mm
Material:	FP-03
Length:	60 mm
Heat Control	ON
Heat Time	15s
Heater Temperature	175°C
Finish Temperature	120°C

△▽ ◀▷ : Move Cursor
⤷ :Enter   ⤶ :Exit

E. Press ⤶ to return to [Select Heater Mode File] menu; the cursor will highlight the newly copied heating mode numbered "××" (such as Number"10"); that is, files with heating parameters are confirmed and copied into the previous blank heating file (**BLANK**).

Select Heater Mode File			
No.	**File Name**	**Material**	**Length**
8	FPS-01-250-20	FPS-01-250-20	20mm
9		BLANK	
10	FP-03 60mm	FP-03	60mm
11		BLANK	
12		BLANK	
13		BLANK	
14		BLANK	
15		BLANK	

△▽ ◀▷ : Move Cursor
🗐 :Edit   ⤷ :Enter   ⤶ :Exit

F. After the copying of heating parameter files is completed, double press
[icon] to return to [Ready] operation interface.

Note1: If the user needs to set the newly copied heating parameter file numbered
"✕✕" (such as Number"10") to be the current heating mode of the
Fusion Splicer, press [icon] after the above Step "E" is completed, and
move the "+" onto the number of the file to select the heating parameter
file; then double press [icon] to return to the current [Ready] operation
interface.

Select Heater Mode File			
No.	File Name	Material	Length
8	FPS-01-250-20	FPS-01-250-20	20mm
9		BLANK	
10	FP-03 60mm	FP-03	60mm
11		BLANK	
12		BLANK	
13		BLANK	
14		BLANK	
15		BLANK	

▲▼◀▶: Move Cursor
🗐 :Edit   ⤵ :Enter   ⤷ :Exit

ready
Name: Auto SM
Splice Mode: AUTO
Fiber Type: SM   No.: 1
Name: FP-03   60mm
Material: FP-03
Length: 60mm   No.: 10

▷ :Help

Note2: If the user needs to delete the newly copied heating mode numbered "✕✕"
(such as Number"10"), press [icon] after the above Step "E" is completed to
enter [Edit Heater Mode Files] interface; press [icon] [icon] and move the
cursor to [Material]; then press [icon] to enter the"FP-03,FP-03 Ny-08,FPS-
01-250-20,BLANK"option; press [icon] to make the cursor select
"BLANK"; then double press [icon] , and the copied heating mode
numbered "✕✕" (such as Number"10") is deleted, that is, the file is
changed back into blank heating mode (**BLANK**).
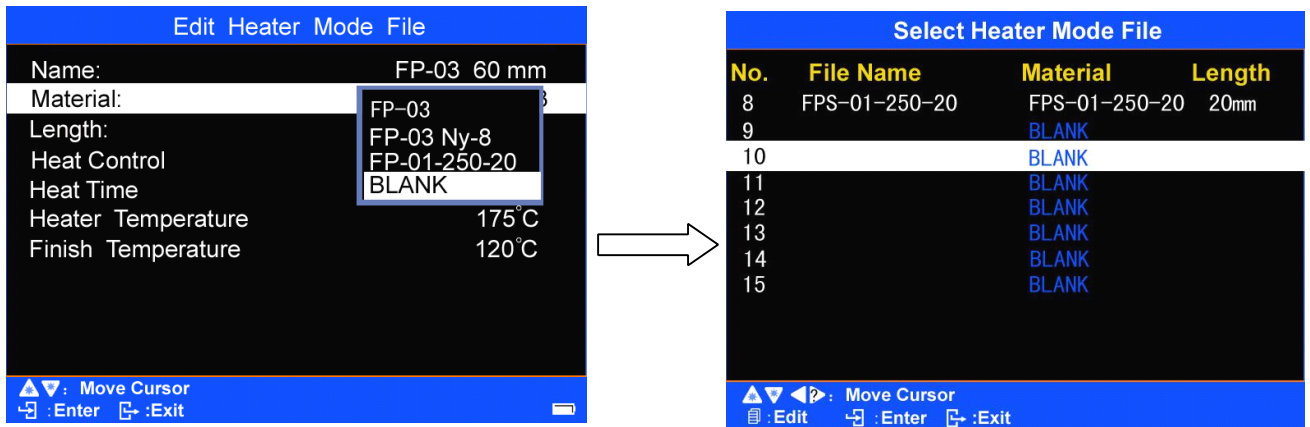
Note3: The user may also modify some parameters of the newly copied heating file numbered "××" (such as Number"10"). Refer to Chapter 3.2.3 [Select And Edit Heater Mode]-<2> Edit Heater Mode Files.

3.2.5 [Arc Calibration]

<1> Electrode wears and glass adhesion may result in changes in arc power. Also, the center position of arc discharge sometimes shifts to the left or right. In this case, it is necessary to perform an arc power calibration to eliminate these problems. [Arc Calibration] of this machine has the function to test the current arc intensity and revises it into the standard intensity.

<2> Discharge calibration is divided into two steps: "Step I of discharge calibration", "Step II of discharge calibration".

In the "Splice Menu", press ![up] ![down] to move the cursor to [Arc Calibration]; after the fiber is prepared and arranged, press ![enter] to enter the interface of "Step I of discharge calibration"; and is automatically started.

Discharge calibration starts from "Step I of discharge calibration". See the following picture.
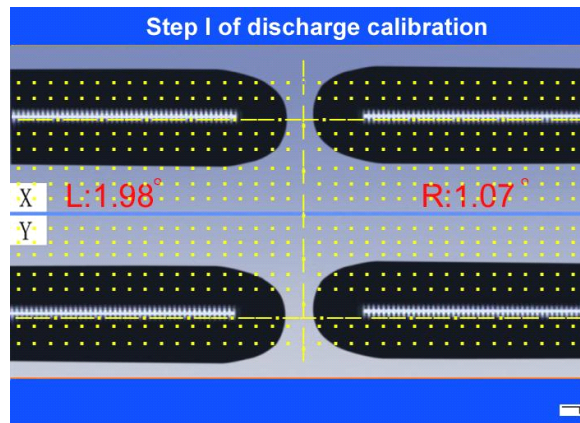
Step I of discharge calibration

If the "Step I of discharge calibration" displays as "not completed", the "Step II of discharge calibration" will not start. However, auto current setting has started and memorized in the machine; thus the operator should repeatedly prepare and arrange the fiber according to the clue. "Step II of discharge calibration" will automatically start as soon as "Step I of discharge calibration" is completed. See the following picture.
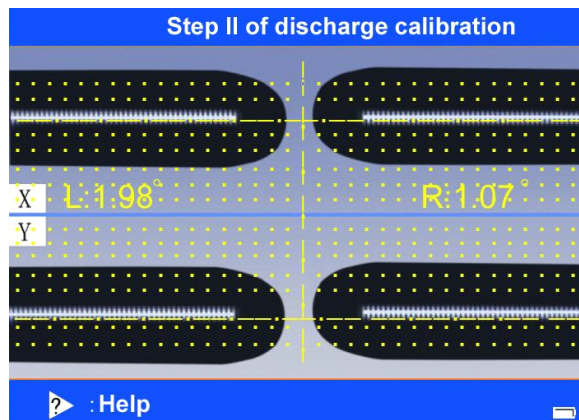
Step II of discharge calibration

The operator should repeatedly prepare the fiber so that the Fusion Splicer can achieve auto discharge calibration, until the Fusion Splicer indicates that "Step II of discharge calibration completed", which means the process of discharge calibration (Step 1 and Step 2) is finished. After three consecutive completions of the "Step II of discharge calibration", the Fusion Splicer automatically exits from the discharge calibration interface and enters "Splice Menu" operation interface.
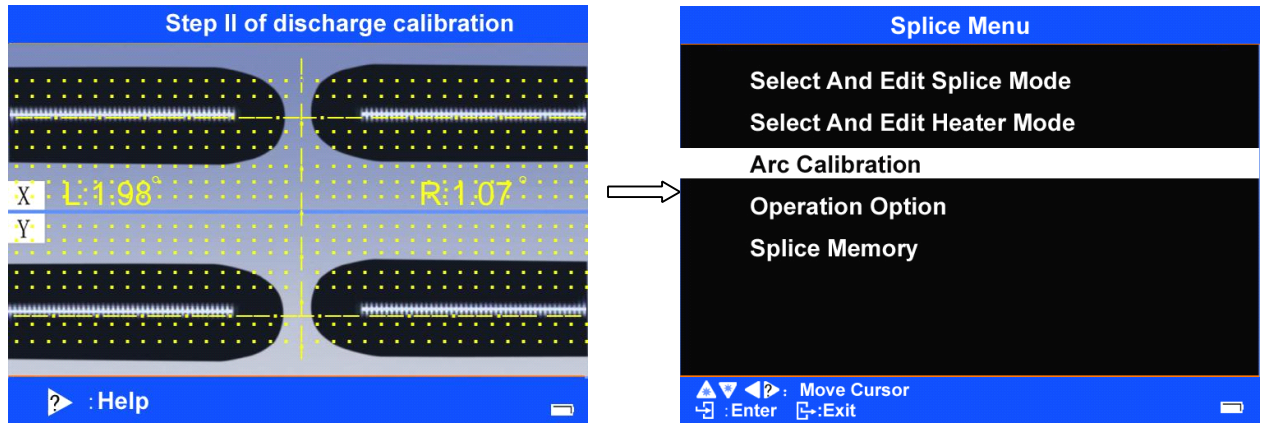
The screen of "discharge calibration completed"

Note**:** To ensure high quality of fusion splice, further calibration is strongly recommended, until three times of discharge calibration are completed, that is, the "Step II of discharge calibration completed" message is displayed for three times; at that time, the discharge calibration interface will automatically exits.

3.2.6   [Operation Options]

The [Operation Options] option allows for a number of important settings for Fusion Option.

A. In the "Splice Mode" menu, press   to select [Operation Options] Option, then press to enter, and then the "Operation Options" menu is displayed. See the following pictures.
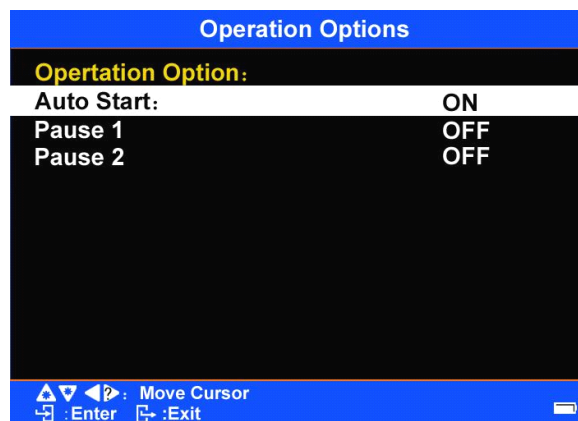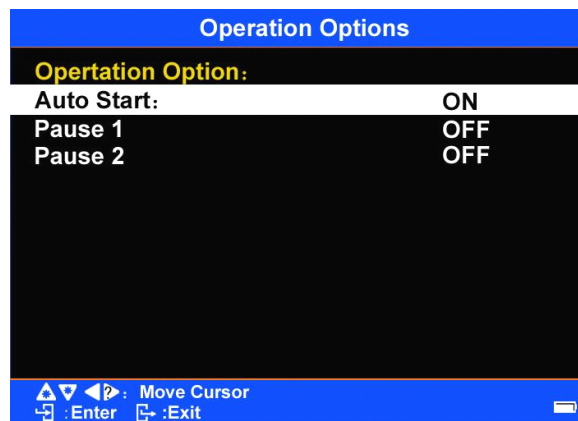

"Operation Options" menu

B.   Press [icon] [icon] , and then six optional screens are displayed in the "Operation Options" menu (the yellow words in the screen are descriptions for the function of the picture); in the optional screen, Press [icon] [icon] and move the cursor to select the option to be changed; then press [icon] to enter the selected option.

C. Press [icon] [icon] or [icon] [icon] to change the parameters or the settings. Finally, press [icon] to confirm the changes. Press [icon] to return to the previous operation interface.

The 6 optional screens and the parameters of the options are shown in the following picture.

<1> Operation Options:

"Operation Options" screen I

Descriptions of the parameters:

| Parameter	Description
Auto Start	If "Auto Start" is set to "ON", splicing starts automatically as soon as the wind protector is closed. Fibers should be prepared and placed into the splicer in advance.
Pause1	If "Pause1" is set to "ON", splicing operation pauses when fibers are forwarded to gap-set position. Cleave angles are displayed during the pause.
Pause2	If "Pause 2" is set to "ON", splicing operation pauses after fiber alignment is completed. With ECF "ON", core-to-core alignment is made after this pause.

<2> Data Display:

"Operation Options" screen II

Parameters of the menu options:

| Parameter	Description
Cleave Angle	"ON" displays the results of cleave angle measurement of the left and right fibers. In other splice modes, the results of core angle measurement are also displayed.
Axis Offset	"ON" displays the amount of core axial offset and the amount of cladding axial offset on the screen.

<3> Ignore Splice Error:
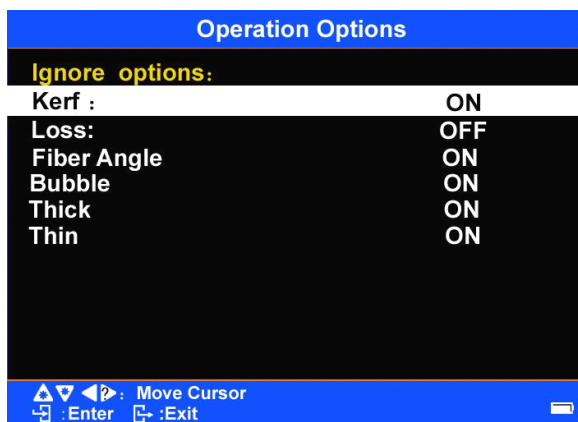
"Operation Options" screen III

Parameters of the menu options:

Kerf	
Loss	
Fiber Angle	Setting to "Disable" prevents the splicer from normally finishing its operation
Bubble	
Thick	
Thin	

<4> Arc Compensation:
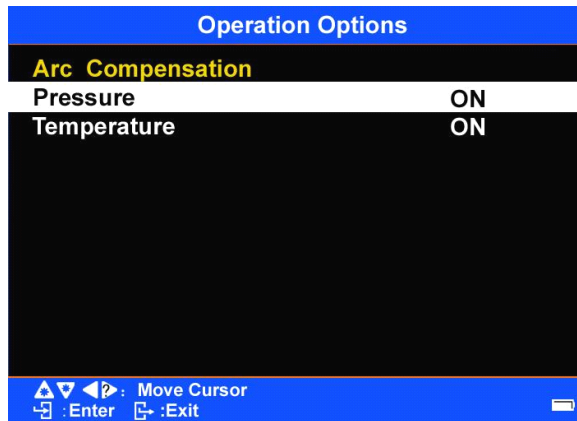
"Operation Options" screen IV

Parameters of the menu options:

Pressure	Setting to "OFF" turns off arc power compensation by pressure and temperature changes.
Temperature	

<5> Fiber Image Display:
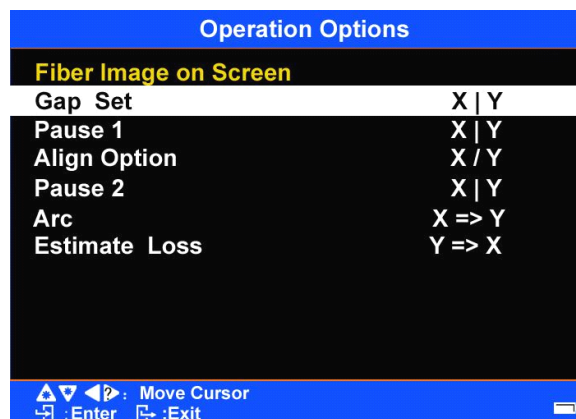
"Operation Options" screen V

Parameters of the menu options:

Gapset	Set the method of displaying the fiber image on the screen during
Pause1	splicing operation.
Align Option	X : Enlarged display of X-axis image Y : Enlarged display of Y-axis image
Pause2	X/Y :Composite display vertically of X-axis and Y-axis images
Arc	X|Y : Composite display horizontally of X-axis and Y-axis images
Estimate Loss	X=>Y : Change from Y-axis enlarged image to X-axis enlarged image during operation Y=>X : Change from Y-axis enlarged image to X-axis enlarged image during operation

<6> others:
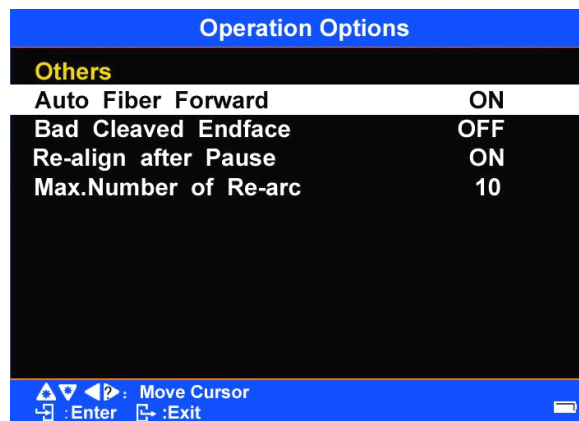
"Edit Fusion Operation" screen IV

Parameters of the menu options:

Auto Fiber Forward	If "Auto Start" is set to "ON", the "Auto Fiber Forward" setting are inactive, and splicing starts automatically as soon as the wind protector is closed. If "Auto Start" is set to "OFF", then there are two functions: if the setting of "Auto Fiber Forward" is active, press SET , the fiber forwards and splicing starts automatically as soon as the wind protector is closed; if the setting of "Auto Fiber Forward" is inactive, the fiber forwards automatically as soon as the wind protector is closed; press SET , splicing starts automatically.
Bad Cleaved Endface	Error message is displayed if the cleaved end face of either left or right fiber exceeds the selected threshold .
Re-align after Pause	After a long time in the [PAUSE] state, alignment may be lost. Therefore, the splicer performs the realigning function after the end of [PAUSE] state. Setting this function to "OFF" prevent the realignment function. When splicing fibers and making axial offset at [PAUSE], it is recommended to use the manual splice mode instead of setting this function to "OFF."
Max.Number of Re-arc	The re-arcing process sometimes improves the splice loss, but sometimes worsens it. Re-arcing decreases the splice strength. With this function, it is possible to limit the number of re-arcs or to disable re-arc discharge.

3.2.7   [Splice Memory] menu

[Splice Memory] menu offers options about the memory of the Fusion Splicer. This machine can store up to 4000 memories of the Fusion Splicer.

<1>   The interface of [Splice Memory] menu

A. In the "Splice Mode" menu, Press and and move the cursor to select the [Splice Memory] menu, and press to enter, then the [Splice Memory] menu is displayed. There are 3 options in the [Splice
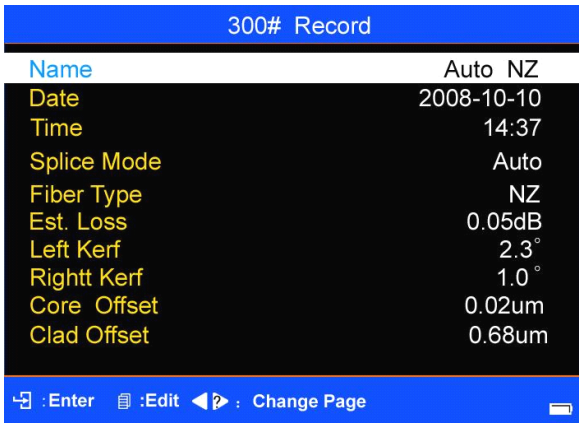
Memory] menu.   See the following picture.

B.   Press ![] ![] and move the cursor to select the [Display Record];
press ![] to enter; then the [Select Record] interface is entered; in this
interface, the user can consult the splice results or change the name the
results

<2> Details of the Splice Memory

In the above screen, Press ![] ![] and move the cursor to select a
specific memory number; press ![] and ![] ![] to see the
details of Splice Memory; there are 3 pages of data in each memory.

See the following pictures.

300# Record	
Name	Auto NZ
Date	2008-10-10
Time	14:37
Splice Mode	Auto
Fiber Type	NZ
Est. Loss	0.05dB
Left Kerf	2.3°
Rightt Kerf	1.0°
Core Offset	0.02um
Clad Offset	0.68um

:Enter :Edit ◀▶ : Change Page

300# Record	
Kerf Limit	3.0
Loss Limit	0.2dB
Arc 1 Power	75 bit
Arc 1 Time	2000ms

:Exit ◀▶ : Change Page

300# Record	
Arc 2 Power	40bit
Arc 2 Time	OFF
Refuse Power	40 bit
Refuse Time	180ms
Overlap	10um
Gap	10um
Gapset Position	Center

:Exit ◀▶ : Change Page

<3> Change Splice Memory

A. Move the cursor to "name"; press , then the "name" can be changed. See the following pictures.

300# Record	
Name	Auto NZ
Date	2008-10-10
Time	14:37
Splice Mode	Auto
Fiber Type	NZ
Est. Loss	0.05dB
Left Kerf	2.3°
Rightt Kerf	1.0°
Core Offset	0.02um
Clad Offset	0.68um

:Enter :Edit ◀▶ : Change Page

300# Record

Name   Auto SM   Yes Cancel

```
i  "  #  $  %  &  "    (  )  *  +  -  .  /
0  1  2  3  4  5  6  7  8  9  :  ;  <  =  >  ?
@  A  B  C  D  E  F  G  H  I  J  K  L  M  N  O
P  Q  R  S  T  U  V  W  X  Y  Z  [  \  ]  ^  _
~  a  b  c  d  e  f  g  h  i  j  k  l  m  n  o
p  q  r  s  t  u  v  w  x  y  z  {  |  }  ~
```

△▽◀▶ : Underside Cursor
 :Top Cursor   : Yes : Cancel

B. See [Application of Soft Keyboard] (Chapter 4.8) for details of the input of "name" characters.

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<4> Clearing splicing results in memory.

① Clearing parts of Splicing results

A. In the operation interface of [Splice Memory] menu, Press ▲ ▼ and move the cursor to [Delete Partial Records]; press 🔲 to confirm; then a screen appears with the words "Select delete Record". See the following pictures.

Splice Memory	
Record Number	29
Blank Space	3971
Display Record	
Delete Partial Records	
Delete All Records	
▲▼ : Move Cursor	
🔲 :Enter ⤶ :Exit	

Splice Memory	
Record Number	29
Blank Space	3971
Display Record	
Select Delete Record	
From 0 To 0	
◀▶ : Move Cursor ▲:− ▼:+	
🔲 :Yes ⤶ :Cancel	

B. Press ▲ ▼ to change the number of the memory; press ◀ ▶ to select a specific number (begin-number and end-number) of splicing results; press 🔲 to confirm. Then a screen appears displaying a warning message:

Splice Memory	
Record Number	29
Blank Space	3971
Display Record	
Warning	
All Records Will be Deleted!	
🔲 : Yes	
⤶ : Cancel	

C. Press 🔲, then the memory results with the selected numbers (from*to*) are deleted. The machine then automatically returns to [Splice Memory] menu. At the same time, the number of memory results automatically decreases.

② Clearing parts of Splicing results

A. In the [Splice Memory] menu, press ![icon] ![icon] and move the cursor to the option of "Delete All Records"; press ![icon] to confirm. Then a screen appears displaying a warning message:
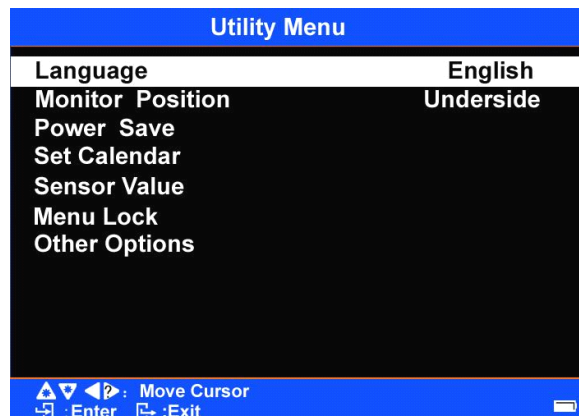

B. When a warning message appears, press ![icon] to confirm. Then all the memory results are deleted, and the machine automatically returns to the [Splice Memory] menu. The number of memory results is automatically cleared.

3.3 Application Menu

3.3.1 Descriptions for menu options

The Application Menu is set for the convenience of application. See the following pictures.

Descriptions for menu options:

Parameter	Description
Language	Sets a language to be displayed on the screen. There are four languages for option.
Monitor Position	Set the position to display a screen. There are two options: the upper position and the lower position.
Power Save	Set the power saving mode. The user can set "sleeping time" and" Auto Off" time.
Set calendar	Set date in the machine
Sensor Value	Consult a specified working mode of the machine.
Menu Lock	Used for an administrator to limit functions for the operator to select or change. This menu is secured by password.
Other settings	Sets other parameters not included in [Power On Option] and [Menu Lock]. This menu is secured by password.

3.3.2 Change parameters

In the ［Utility Menu］Menu, press or and move the cursor to select

a   parameter to change; press to confirm the change of the parameter.

Press to return to the previous operation interface.
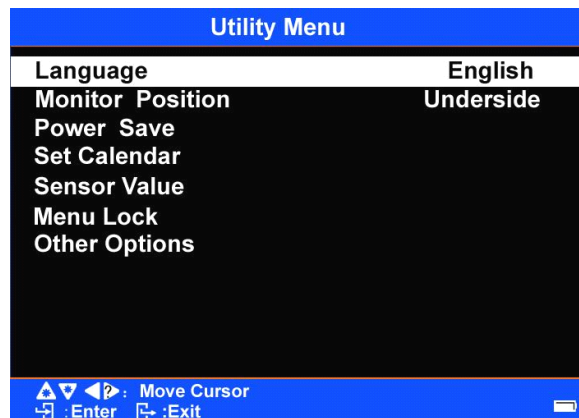
<1> Monitor Position

The default set is fronting. To change monitor position to the rear, turn the monitor along the fixed frame to a desired angle; then in the ［Utility Menu］ move the cursor to the [Monitor Position] option. Press , the Monitor Position is changed.
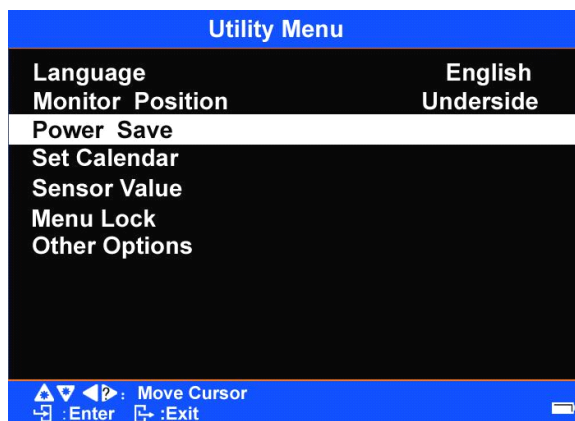
<2> Power Save

This function is important for energy conservation. If the power saving function is not set during battery pack use, the service life of the battery and the monitor will be shortened. When this function is active, the splicer automatically enters into sleeping mode or powers off in the specified time.

Power Save

① Sleeping mode

a. In the ［Utility Menu］ Menu, press or and move the cursor to the [Power Save] option.

. b. Press to enter [Power Save] and move the cursor to [sleep]. Press to enter the application screen of "sleep" or "never"(close "sleep function"). The user can change or select the sleeping time: sleeping wait time: "10~59 minutes" or "never".

c. Press to confirm sleeping function. Press one by one to return to the previous operation interface.

② **Auto Shut down**

[Auto Shut down] enables the user to change the "Auto Off" wait time or "never" (close "Auto Off"). The setting method is the same with ①"Sleep mode".

The details are shown in the following table.

| Parameter	Description
Sleep	The user can set the "sleep" wait time or close the "sleep" function.　The Fusion Splicer turns off the power supply to the LCD monitor if the splicer performs no operation after a certain period of time. Thus the power dissipation is reduced to too much loss of battery capacity. When the power supply to the LCD monitor turns off, the LED indicator near the ⏻ key turns green; Press any key to activate the machine and resume the work. Then the LED indicator near the ⏻ key turns red. The scope for sleeping wait time is 10~59 minutes.
Auto Shut down	When this option is activate and Auto Off wait time is set, the Fusion Splicer automatically turns off the power if the splicer performs no operation after a certain period of time. The scope for sleeping wait time is 10~119minutes.

3.3.3 Menu Lock

In order to avoid parameter changes of the Fusion Splicer due to mishandling, which will reduce splice quality, the administer of the Fusion Splicer can lock some menus of the Fusion Splicer. This performance needs password. Notes: the initial password of the Menu Lock is the sequence number of the machine.

<1> In the［Utility Menu］Menu, press 🔺 or 🔻 and move the cursor to select [Menu Lock]. Press 🔲 , and the Input Password screen is displayed. See the following pictures. Password Input method is

described in Chapter 4.8 [Application of Soft Keyboard].
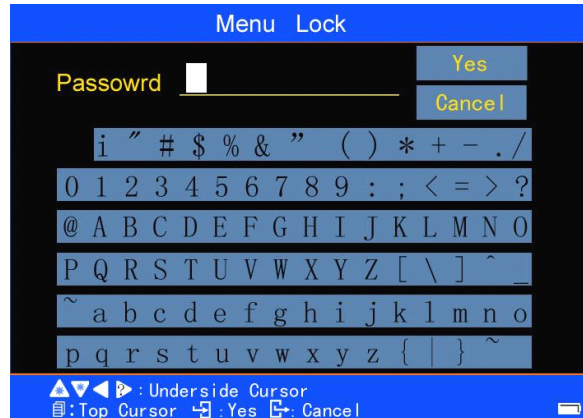
<2> Input the correct password. The following screen appears.
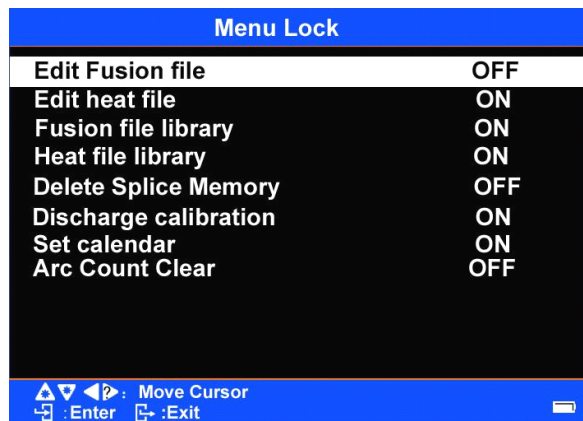
In this screen, the user can select specified menu options to lock.

The menu is not locked if the option "ON" is active. The menu is

locked if the option "OFF" is active. Press [icon] to switch between

"ON" and "OFF". Press [icon] to confirm and return to ［Utility Menu］

Menu.

<3> when the menu items are locked, the results are as follows.

① Edit Fusion file

Setting to "OFF", it allows the user to enter splice parameter files

to consult the parameter configurations. The modified or edited

results will not be saved;

② Edit heat file

Setting to "OFF", it allows the user to enter heating parameter files to consult the parameter configurations. The modified or edited results will not be saved;

③ Fusion file library (splice template library)

If it is set to "OFF", the user can not call the splice parameter files library to consult or copy the file;

④ Heat file library (heat template library)

If it is set to "OFF", the user can not call the heating parameter files library to consult or copy;

⑤ Delete Splice Memory

If it is set to "OFF", a password input screen appears every time the user chooses to delete the Splice Memory. See the following picture.Input correct password, the delete performance continues.
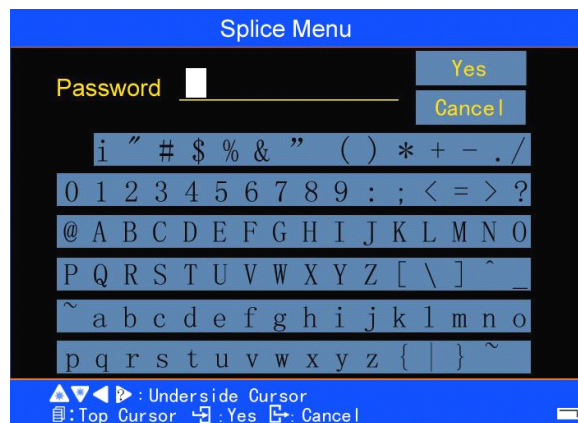

⑥ Discharge calibration

If it is set to "OFF", discharge calibration done by the user will not result in discharge changes;

⑦ Set calendar

If it is set to "OFF", the user can enter Set calendar screen to consult, but he can not change the set;

⑧ Arc Count Clear

If it is set to "OFF", the following screen appears indicating to enter the password every time the user chooses to clear the Arc Count. Input correct password, the Arc Count Clear performance continues.
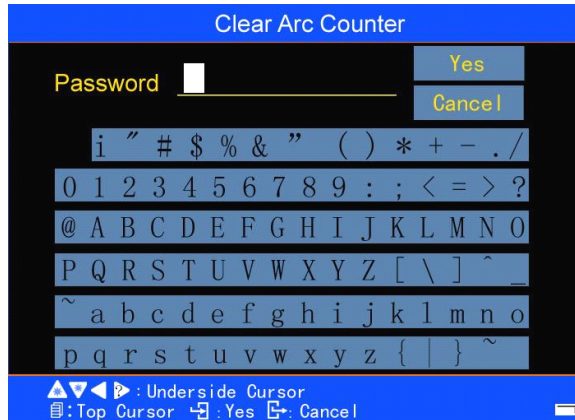
3.4   Maintenance menu 1

"Maintenance menu 1" includes 4 options associated with electrode maintenance. The user can use it to help electrode maintenance. See the following pictures.
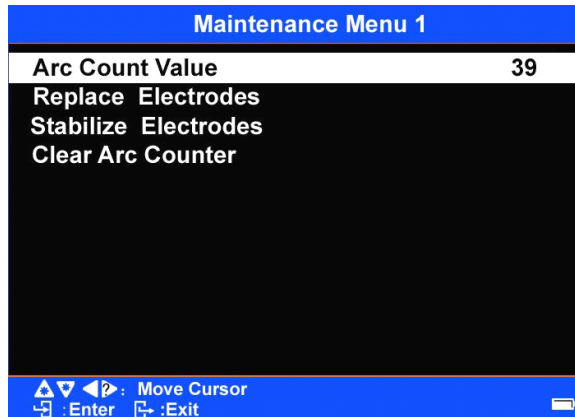
Descriptions of the options

<1> [Arc Count Value]

This option displays Total Count of the electrode the Fusion Splicer currently uses.

<2> [Replace Electrodes]

Press 　 to enter this option before changing electrode. See <5.5

change electrode > of this manual.

<3> [Stabilize Electrodes]

Press ⬚ to enter this option after changing electrode. See <5.5 change electrode > of this manual.

<4> [Clear Arc Counter]

To delete the Arc Count, press ⬚ to enter this option. See <**5.7** Arc Count Clear > of this manual.

3.5   Maintenance menu 2

"Maintenance menu 2" contains only one option: [Dust Check]. Dust Check function Checks the optical path for dust or dirt and indicates the location. See <**5.8**   Dust Check > of this manual.

3.6   Help menu

A "help" menu is set for the convenience of the user. The "help" menu gives a brief description about the basic functions of every key on the left and right keyboards of the Fusion Splicer.

Access to the Help menu is:

<1> In the [Ready] mode of the current fusion and heat interface, or after fusion is completed, press ⬚ to enter the [Help] screen. See the following picture.

<2> Press ⬚ to return to the previous operation interface.

4   Senior Settings

4.1   Select And Edit Splice Mode

Select splice parameters according to the optical fiber types, because different fibers need different splice parameter. The suitable parameters based on the current specified optical fiber types are stored in the Fusion Splicer. These parameters can also be copied into the options which can be adjusted by the user. These data can be emitted when some unusual fibers are spliced.

4.1.1 Select Splice Mode according to optical fiber types

In the Fusion Operation option, the user can select a suitable Splice Mode according to the current optical fiber types.

<1> In the "Splice menu", press ![icon] ![icon] to select and enter [Select And Edit Splice Mode]. Press ![icon] to enter, and then the list of "Select Splice Mode Files" is displayed. See the following pictures.

No.	File Name		Mode	Fiber
0			BLANK	
1	Auto	SM	Auto	SM
2	Auto	DS	Auto	DS
3	Auto	NZ	Auto	NZ
4	Auto	MM	Auto	MM
5	Calibrate	SM	Calibrate	SM
6	Calibrate	DS	Calibrate	DS
7	Calibrate	NZ	Calibrate	NZ

△▽ ◀▷ : Move Cursor
🗐:Edit ⇥ :Enter ↳:Exit

<2>   In this menu, the user can select specified splice parameters according to the spliced optical fiber types. Each splice parameter is marked with the suitable optical fiber types.

Descriptions of some fiber types

Optical fiber types	Description
SM	For splicing standard Single-mode fiber. MFD : 9 to 10 um at wavelength of 1310 nm.
NZ	For splicing Non-zero dispersion-shifted fiber. MFD : 9 to 10 um at wavelength of 1550 nm. WDM fiber also works in this splice mode.
DS	For splicing Dispersion-shifted fiber. MFD : 9 to 10 um at wavelength near 1550 nm.
MM	For splicing Multi-mode fiber. MFD : 50.0 to 62.5 um
Other splice modes	There are many types of splice modes in this splicer, other than the ones stated above, stored in the splicer database. You can consult your sales agent for the latest splice mode you need.

<3> Press or   and move the cursor to a specified splice parameter file. Press

 and move the "+" to the selected file number. The splice parameter file is

then selected.

```
                  Select  Splice Mode File
No.     File Name              Mode        Fiber
 0                            BLANK
+1      Auto    SM           Auto          SM
 2      Auto    DS           Auto          DS
 3      Auto    NZ           Auto          NZ
 4      Auto    MM           Auto          MM
 5      Calibrate  SM        Calibrate     SM
 6      Calibrate  DS        Calibrate     DS
 7      Calibrate  NZ        Calibrate     NZ



▲▼ ◄ ▶ ：  Move Cursor
📄 : Edit   ⮐ : Enter   ⤷ : Exit
```
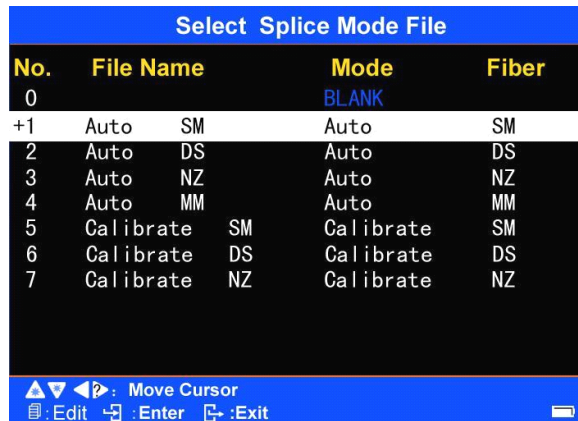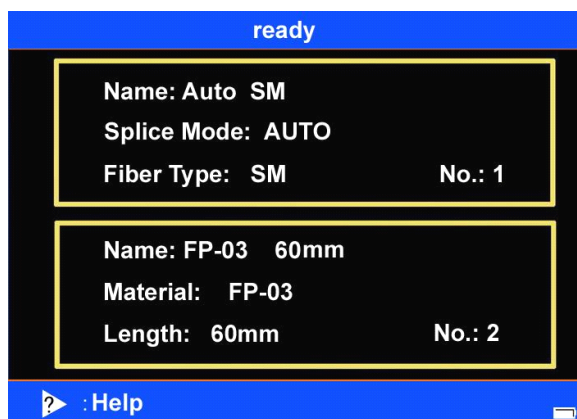
<4> Double press to return to the [Ready] screen. The splice parameter file

identified with the "+" is the Splice Mode which the Fusion Splicer currently

uses.

```
                    ready

     Name: Auto  SM
     Splice Mode:  AUTO
     Fiber Type:  SM              No.: 1


     Name: FP-03    60mm
     Material:    FP-03
     Length:  60mm                No.: 2


  ▶ : Help
```

4.1.2   Referring or editing splice mode

<1> Descriptions

When the machine is produced, for the first eight splice parameter files (No. 1-8) in the [Select Splice Mode File] menu, there are two operation interfaces for the user to change and edit the splice parameters; for the next four splice parameter files (No. 9-12) in the [Select Splice Mode File] menu, there are seven operation interfaces for the user to change and edit the splice parameters. In each splice parameter file, the values of some parameters are limited; others can be edited.

<2> To edit parameters do the following

1> In [Select Splice Mode Files] menu, press ▼ or ▲ and move the cursor to a splice parameter file to be modified.

No.	File Name		Mode	Fiber
0			BLANK	
1	Auto	SM	Auto	SM
2	Auto	DS	Auto	DS
3	Auto	NZ	Auto	NZ
4	Auto	MM	Auto	MM
5	Calibrate	SM	Calibrate	SM
6	Calibrate	DS	Calibrate	DS
7	Calibrate	NZ	Calibrate	NZ

▲▼ ◀▶： Move Cursor
▤:Edit ⊟ :Enter ⤷:Exit

2> Press ▤ to enter (some) operation interfaces of the "Edit Splice Mode Files" menu. Press ◀ ▶ to switch between different operation interfaces.

Edit Splice Mode File	
Kerf Limit	OFF
Loss Limit	0.20 dB
Arc Power	80 bit
Arc Time	Auto
Cleaning Arc	150 ms
Manual Reinforce Arc Time	800 ms
Tension Test	OFF

▲▼ ◀▶： Move Cursor
⊟ :Enter ⤷:Exit

3> Press ⬇ or ✻ and move the cursor to a splice mode to be modified. Press 🔁 to enter the "parameter box" of the selected option. Press ▲ ▼ or ◀ ? to change the parameter values or setting of the "parameter box". Double press the 🔁 button to complete parameter editing of the option. That is, selecting a proper group of splice parameters.
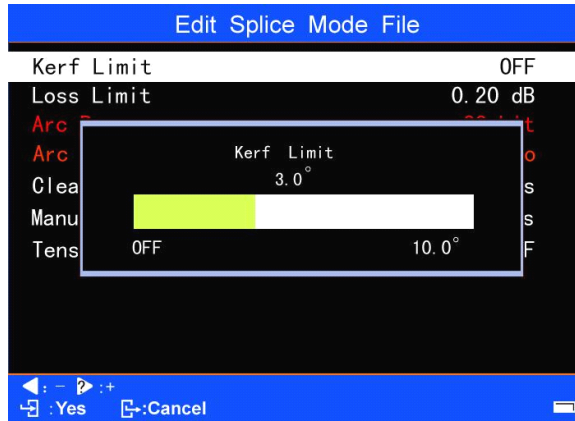
4> Different options to be modified are displayed in each "Edit Splice Mode Files" menu, because the splice parameter files are different.

A. If the [mode] is set to Auto or Calibrate, the following parameters will be displayed in each page.

Parameter	Description
Name	Title for a splice parameter file can be expressed in up to 15 characters. The title is displayed in the [editing splice parameter files] menu.
Splice Mode	The splicer has four options of Splice Mode: Auto, Calibrate, Normal, and Special, where in the first three are common options.
Fiber Type	A list of splice modes stored in the splicer database is displayed. Upon inputting the appropriate mode, the selected splice mode stored in database area is copied to a selected splice mode in user-programmable area.
Kerf Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceed the selected threshold .
Loss Limit	An error message is displayed if the estimated splice loss exceeds the selected threshold .
Arc Power	Under Auto/Calibrate fusion model, Arc power is fixed at 80bits.
Arc Time	Under Auto/Calibrate fusion model, Arc time is fixed at 1500ms and can't amended.
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Manual Reinforce Arc Time	Under certain conditions, it shall be mended fusion loss through rearc time again. The duration of the rearc time can be changed by this parameter.
Tension Test	If [Tension Test] is set to "ON", a proof-test is performed automatically.

B. If the [mode] is set to Normal, the following parameters will be displayed in each page.

Parameter	Description
Fiber Type	A list of splice modes stored in the splicer database is displayed. Upon inputting the appropriate mode, the selected splice mode stored in database area is copied to a selected splice mode in user-programmable area.
Align Option	Sets the aligning method for the fibers. "Core": Aligns fibers by core position. "Clad": Aligns fibers by center position of the cladding of the fiber. "Manual": Aligns fibers manually.
Focus-X Focus-Y (KL-300T without this function)	This function is set as "Auto" and can not be changed by the user. Each time before fibers are forwarded and aligned, left and right fibers are focused independently; therefore optimum focusing can be achieved even if different fibers are spliced .
ECF	This fuction is set as "AUTO" and can not be changed by the user.
Auto Arc Power	This fuction is set as "OFF" and can not be changed by the user.
Tension Test	If [Proof Test] is set to "ON", a proof-test is performed automatically.
Kerf Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceed the selected threshold .
Fiber Angle Limit	An error message is displayed on the screen if the bend angle of the two fibers spliced exceeds the selected threshold .

Parameter	Description
Loss Limit	An error message is displayed if the estimated splice loss exceeds the selected threshold .
Cleaning Arc	A cleaning arc burns out micro dust on the surface of the fiber with an arc discharge for a short period of time. The duration of the cleaning arc can be changed by this parameter.
Gap	Sets the end-face gap between the left and right fibers at the time of aligning and pre-fusion discharge.
Gapset Position	Sets the relative position of the splicing location to the center of electrodes. Splice loss may be improved in the case of dissimilar fiber splicing by shifting [Gapset Positon] towards a fiber whose MFD is bigger than the other fiber MFD.
Prefuse Power	Sets the power of the pre-fusion arc, which is an arc discharge occurring from the beginning until the fibers begin stuffing.　If [Prefuse Power] is set too low, axial offset may occur if cleaved angles are relatively poor. If [Prefuse Power] is set too high, fiber end faces are fused excessively and splice loss gets worse.
Prefuse Time	Sets the duration of the pre-fusion arc, which is arc discharge occurring from the beginning until the fibers begin stuffing. Longer [Prefuse Time] is synonymous with higher [Prefuse Power].
Overlap	Sets the overlap amount of fibers at the fiber stuffing stage.　Relatively small [Overlap] is recommended if the [Prefuse Power] is low, while relatively large [Overlap] is recommended if the [Prefuse Power] is high.
Arc1 Power	Arc discharge can be separated into two stages.　Arc1 Power is the first stage. This sets Arc1 Power.
Arc1 Time	Sets Arc1 time. Caution If Arc1Time is set 1 sec. or less and Arc2 Power is set to "OFF", the splice may break during proof-test stage.

Parameter	Description
Arc2 Power	Arc2 is the second arc discharge stage. This sets Arc2 Power.
Arc2 Time	Sets the total Arc2 time. Usually set this value to "OFF". It is possible to set a very long arc time. However, when the total of the Arc 1 time and Arc2 time exceeds 30 seconds, always adjust the function [Arc2 ON Time] and [Arc2 OFF Time] to weaken the arc power. A continuous arc over 30 seconds, without weakening the arc power, may damage the arc discharge unit.
Arc2 ON -Time	During Arc2 discharge, arc power can be pulsed by turning the arc on and off. This sets the amount of time that Arc2 is ON.
Arc2 OFF -Time	Sets Arc2 OFF Time during Arc2. When the Arc2 discharge is intermittent, re-arc discharge is also intermittent. When continuous re-arc discharge is necessary, set this parameter to "OFF".
Manual Reinforce Arc Time	Sets Rearc Time.
Estimate Mode	Selects splice loss estimation mode to "OFF", "CORE", or "CLAD". When MM fibers are spliced, select "CLAD".
Left Fiber MFD	Sets MFD of the left and right fibers. Both MFD-L & R are taken into account for estimating splice loss.
Left Fiber MFD	
Minimum Loss	This amount is added to the estimated splice loss originally calculated. When splicing specialty or dissimilar fibers, a high actual splice loss may occur even with optimized arc conditions. To make the actual splice loss concur with the estimated splice loss, set the minimum value of estimate to the minimum optimized actual splice loss.
Core Step coefficient	Determines how Core step, Core curve and MFD mismatch influences splice loss estimate. If Est. Mode is set "OFF" or "CLAD", these Core step, Core curve and MFD mismatch are automatically set "OFF". If the estimated splice on certain fiber combinations needs adjustment, Core step, Core curve and MFD mismatch are used. These are advanced splicer functions and should be discussed with your representative before changing.
Core curve coefficient	
MFD Mismatch Coefficient	

4.2. Creating splice mode

4.2.1 Default Splice Mode

when the machine is produced, there are three Splice Modes (Auto, Calibrate, Normal) and 12 splice parameter files (No. 1~12) installed; the other modes are displayed as (BLANK) Splice Mode (blank mode). The user can add or copy new Splice Modes in the (BLANK) items.

No.	File Name		Mode	Fiber
0			BLANK	
+1	Normal	SM-SM	Normal	SM
2	Auto	DS	Auto	DS
3	Auto	NZ	Auto	NZ
4	Auto	MM	Auto	MM
5	Calibrate	SM	Calibrate	SM
6	Calibrate	DS	Calibrate	DS
7	Calibrate	NZ	Calibrate	NZ

▲▼◀▶：Move Cursor
▤:Edit 　:Enter 　:Exit

No.	File Name		Mode	Fiber
8	Calibrate	MM	Calibrate	MM
9	Normal	SM-SM	Normal	SM
10	Normal	DS-DS	Normal	DS
11	Normal	SM-SM	Normal	SM
12	Normal	MM-MM	Normal	MM
13			Blank	
14			Blank	
15			Blank	

▲▼◀▶：Move Cursor
▤:Edit 　:Enter 　:Exit

4.2.2 Add or copy Splice Modes

<1> In "Splice menu", press [icon] [icon] to select [Selecting And Edit the Splice Mode]. Press [icon] to enter. The list of [Select Splice Mode File] is displayed.

No.	File Name		Mode	Fiber
0			BLANK	
+1	Auto	SM	Auto	SM
2	Auto	DS	Auto	DS
3	Auto	NZ	Auto	NZ
4	Auto	MM	Auto	MM
5	Calibrate	SM	Calibrate	SM
6	Calibrate	DS	Calibrate	DS
7	Calibrate	NZ	Calibrate	NZ

▲▼◀▶：Move Cursor
▤:Edit 　:Enter 　:Exit

<2> In [Select Splice Mode File] menu , press ▽ ☀ (Press ◁ ？ to turn pages), and move the cursor to select a blank Splice Mode (BLANK) which is numbered as"××" (such as No"16").

No.	File Name	Mode	Fiber
16		Blank	
17		Blank	
18		Blank	
19		Blank	
20		Blank	
21		Blank	
22		Blank	
23		Blank	

Select Splice Mode File
△▽ ◀▷： Move Cursor
🗐:Edit 🔁 :Enter 🡒 :Exit

<3> Press 🗐 to enter the template library of the splice parameter files (there are one to fifty-three duplicable splice parameter files in the template library). Press ▽ ☀ and move the cursor to the desired splice parameter file which is numbered as '××' (such as a file in No. '1' template library)
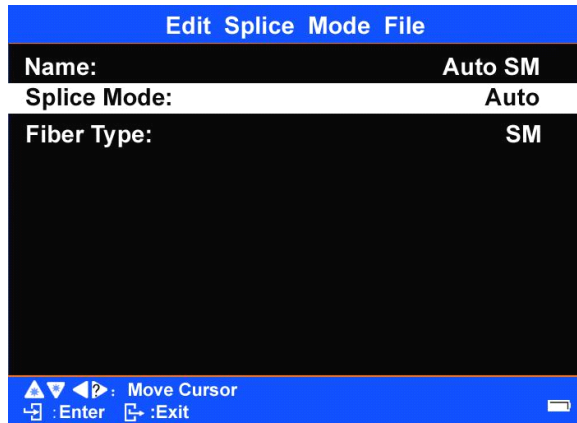
Select Splice Mode File

No.	File Name		Mode	Fiber
0			BLANK	
1	Auto	SM	Auto	SM
2	Auto	DS	Auto	DS
3	Auto	NZ	Auto	NZ
4	Auto	MM	Auto	MM
5	Calibrate	SM	Calibrate	SM
6	Calibrate	DS	Calibrate	DS
7	Calibrate	NZ	Calibrate	NZ

△▽ ◀▷： Move Cursor
🗐:Edit 🔁 :Enter 🡒 :Exit

Select Splice Mode File

No.	File Name		Mode	Fiber
48	Special	HE-SM	Special	HE-SM
49	Special	HE-HI	Special	HE-HI
50	Special	HE-FX	Special	HE-FX
51	Special	R37-SM	Special	R37-SM
52	Special	R37- HI	Special	R37-HI
53	Special	R37- FX	Special	R37-FX

△▽ ◀▷： Move Cursor
🔁 :Enter 🡒 :Exit

<4> Press 🔁. Thus the splice parameter files which is numbered as '××' (such as a file in No. '1' template library) is copied into the blank splice mode file (**BLANK**) which is numbered as"**××**" (such as No. '16'). At the same time, the parameters of the newly copied splice file are displayed in the [Edit Splice Mode File].
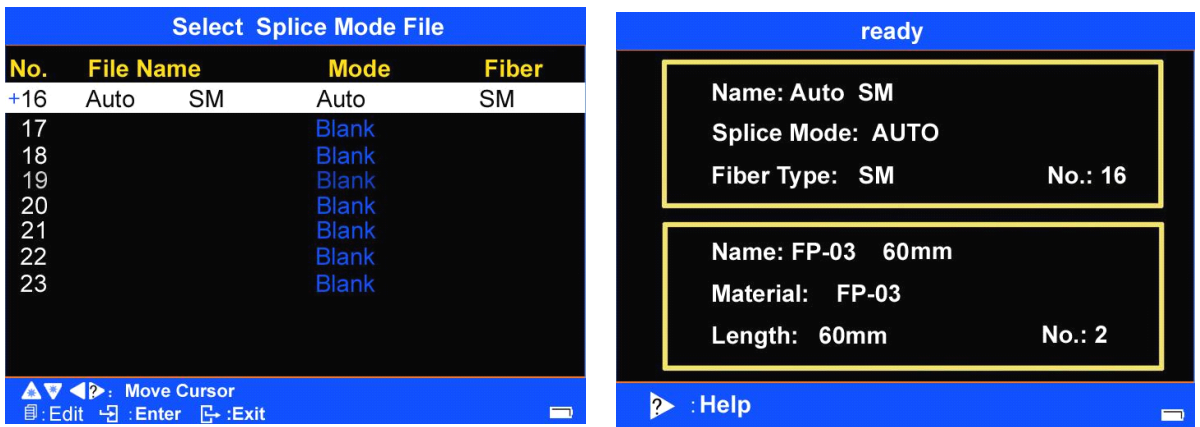
Edit Splice Mode File

Name:	Auto SM
Splice Mode:	Auto
Fiber Type:	SM

△▽◁▷：Move Cursor
⏎ :Enter　↪ :Exit

<5> Press [icon] to return to [Select Splice Mode File] menu. The cursor will highlight the newly copied splice file which is numbered as "××" (such as No. '16'). This means the blank Splice Mode (BLANK) has been changed into splice Mode files.

Select Splice Mode File

No.	File Name		Mode	Fiber
16	Auto	SM	Auto	SM
17			Blank	
18			Blank	
19			Blank	
20			Blank	
21			Blank	
22			Blank	
23			Blank	

△▽◁▷：Move Cursor
🗐:Edit　⏎ :Enter　↪:Exit
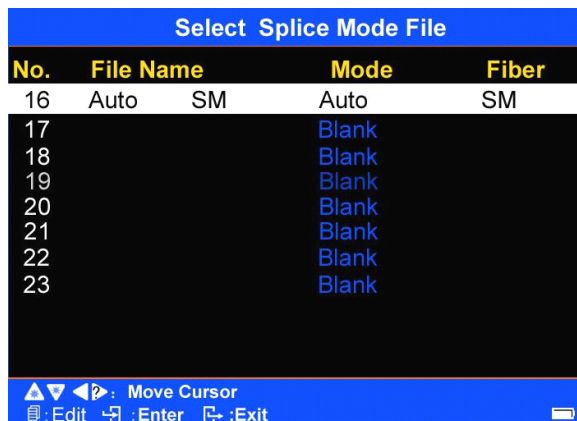
<6> After the splice mode file is copied, double press [icon] to return to the [Ready] mode.

Note1: If the user needs to set the newly copied splice mode file numbered "××" (such as Number"16) to be the current splice mode of the Fusion Splicer, press [icon] after the above Step<5>is completed, and move the"+" onto the number of the file to select the file; then double press [icon] to return to the current [Ready] operation interface.

Note2: If the user needs to delete the newly copied heating parameter file numbered "××" (such as Number"16), press after the above Step <5> is completed to enter [Edit Splice Mode File] interface; Press to enter "Auto, Calibrate, Normal, Special, Blank" option. Press and move the cursor to select the "Blank". Double press , and the copied splice parameter file numbered "××" (such as Number"16") is deleted, that is, the file is changed back into blank Splice Mode (BLANK).
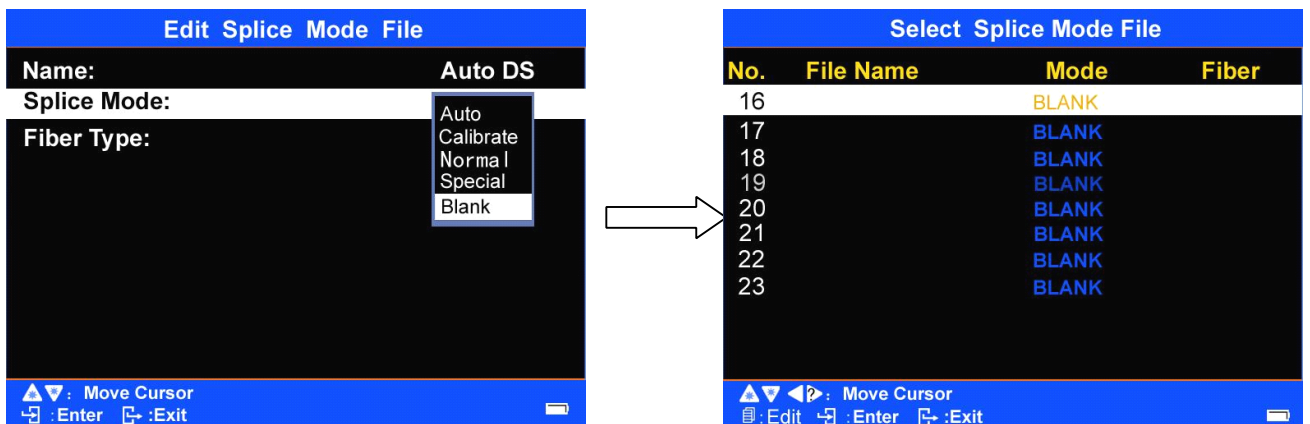

Note3: The user may also modify some parameters of the newly copied splice file numbered "××" (such as Number"16"). Refer to **4.1.2 –** <2> extract and edit the Splice Mode.

4.3 Fusion operation

KL-300 has installed an image processing system to observe the fiber. However, in certain circumstances, the image processing system might not have found error in fusion. Therefore, to achieve good fusion results, we have to carry out visual inspections on optical fiber through the display. The following describes the standard fusion steps.

left side cutting perspective

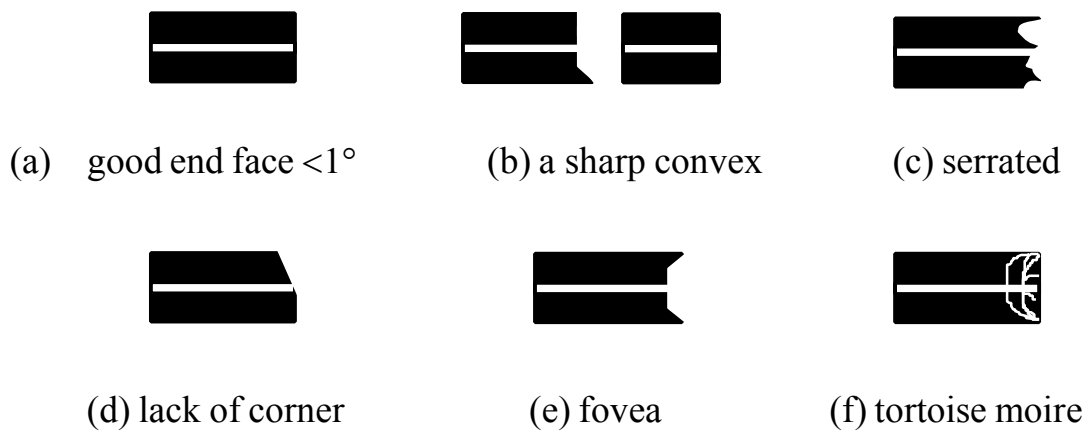### 4.3.1 checking of fiber cutting angle and fiber end face

<1> After two optical fibers being put into fusion splicer, two optical fiber will move at the same direction, After discharge and cleaning, fiber stops at an setted position. Then check the quality of cutting angle and the end face of fiber.

Focusing

X L:0. 4°   R:0. 2°
Y   right side cutting

▶ : Help
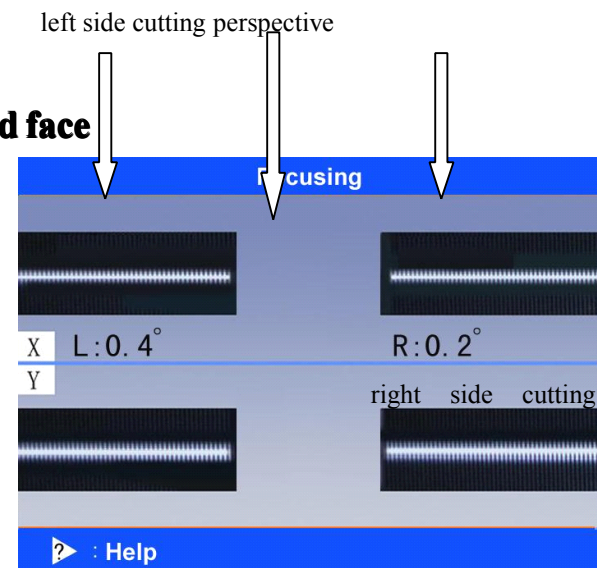
If the measured fiber cutting angle is greater than the set limits, or checked out fiber end face has burrs, buzzer will ring and at the same time, the display will show an error message to warn the operator. At the same time, the fusion process will be suspended. The user may reset the limit of cutting angle and the quality of the end face of fusion fiber according to the oneself's need for fusion index, and editor in [Edit Splice Mode File] of this user manual.

<2> Even if no error message appears indicating that the measured fiber cutting angle is greater than the set limits, the operator should also check artificial the fiber end face. If the similar following situation is found, remove the fiber from the fusion splicer, and then make re-preparation. Surface defect of the fiber may lead to a failure of the fusion.

<3> The quality of fiber end face has enormous impact on the loss of the contacting point; so efforts should be mad as possible to make the end face plane, and the angle of the place with the fiber cross-sectional plane should be less than 1 °. Figure Five (a) is a good end face, which can be fused. (b) to (f) are ineligible face end, which should be re-done.

| (a) good end face <1° | (b) a sharp convex | (c) serrated |
| (d) lack of corner | (e) fovea | (f) tortoise moire |

4.3.2 Auto calibration and splice

After the inspection of fiber, it will be aimed accurately in accordance with the core-core or cladding-cladding manners. After completion of fiber alignment, arc discharge is performed to splice the fibers.

4.3.3 Splice loss estimation

Estimated splice loss is displayed upon completion of splicing.
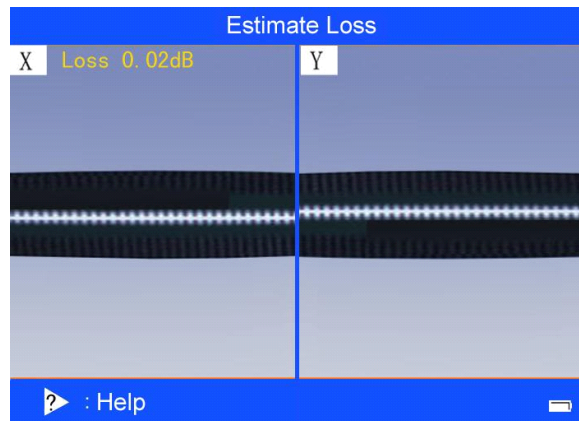
If the spliced fiber is detected as abnormal, such as "Fat", "Thin" or "Bubble", splice failure or estimated splice loss is displayed. If no error message is displayed but the splice looks poor by visual inspection through the monitor, it is strongly recommended to repeat the splice from the beginning.

● Splice point sometimes looks a bit fatter than other parts. This is considered a normal splice, and does not affect splice loss.

● To change threshold for estimated splice loss, editor in [Edit Splice Mode File] and see [Splice Menu] for details.

● If the estimated splice loss exceeds its set threshold, an error message is displayed to warn the operator. The user can remove the error message display by changing the settings in the [Edit Splice Mode File] menu. Splice loss may be improved in some cases by additional arc discharges. Press ARC for an additional arc discharge (re-arc).

● Splice loss may be worsened in some cases by additional arc discharges (re-arcs). Additional arc discharge can be set to "disabled", or limited to the number of additional arcs. See [Edit Splice Mode File] for details.

Splice loss increase: Cause and remedy are as followed:

Symptom	Cause	Remedy
Core axis direction error	V-shape groove or fiber pressure feet have dust	Clean v-groove and fiber clamp chip.
Core angle error	V-shape groove or fiber pressure feet have dust	Clean v-groove and fiber clamp chip.
	Bad fiber end-face quality	Check whether the fiber cutter is well.
Core step	V-shape groove or fiber pressure feet have dust	Clean v-groove and fiber clamp chip.
Core bending	Quality of fiber end is poor	Check whether the cutter is well.
	Pre-fusion power too low or pre-fusion time too short.	Increase [Pre-fusion Power] and/or [Pre-fusion Time].
Mode filed diameter	Discharge intension is too low	Increase [Arc Power] and/or [Arc Time].
Dust	Quality of fiber end is poor	Check whether the cutter is well.
	Dust still present after cleaning fiber or cleaning arc.	Clean fiber thoroughly or Increase [Cleaning Arc Time]
Bubble	Quality of fiber end is poor	Check whether the cutter is well.
	Pre-fusion power too low or pre-fusion time too short.	Increase [Pre-fusion Power] and/or [Pre-fusion Time].
Fiber separation	Fiber stuffing too small	Perform [Motor Calibration]
	Pre-fusion power too high or pre-fusion time too long.	Decrease [Pre-fusion Power] and/or [Pre-fusion Time].
Too thick	Fiber stuffing too much	Decrease [Overlap] and perform [Motor Calibration].
Too thin	Arc power not adequate	Perform [Arc Calibration].
	Some arc parameters not adequate	Adjust [Pre-fusion Power], [Pre-fusion Time] or [Overlap].
Thin line	Some arc parameters not adequate	Adjust [Pre-fusion Power], [Pre-fusion Time] or [Overlap].

- A vertical line sometimes appears at the splice point when MM fibers or dissimilar fibers (different diameters) are spliced. This does not affect splice quality, such as splice loss or tensile strength.

4.4 **Tention Test**

If [Tention Test] is set to "ON", a proof-test of the Splice point is performed upon completion of fusion splicing. To activate the Proof Test function, refer to [Referring or editing splice mode] (4.1.2). See the following pictures.
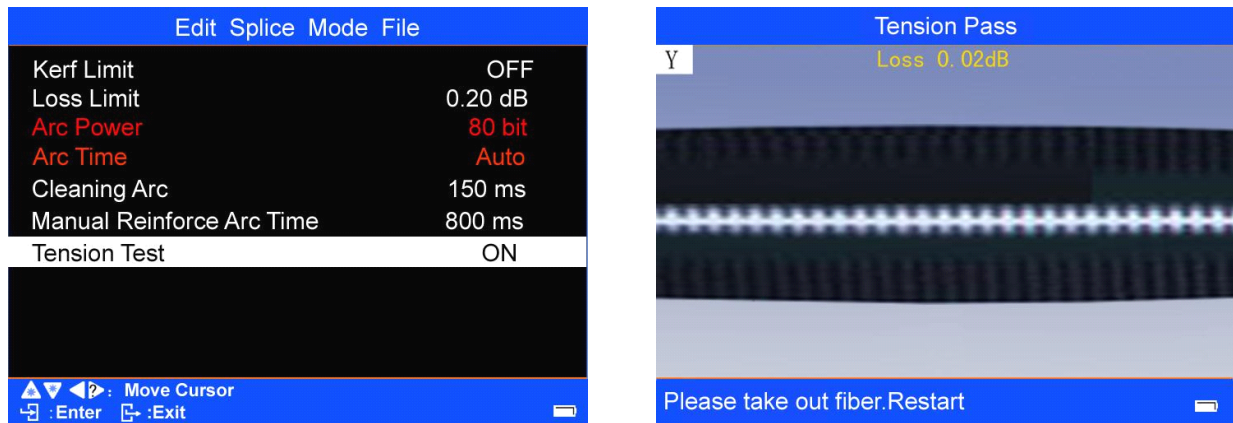
4.5 **Storing splicing results**

4.5.1 The splicing result is automatically stored in memory when SET or RESET is pressed upon completion of the splice at the [Finish] screen, or when the wind protector is opened upon completion of the splice at the [Finish] screen.

4.5.2 After the 4000th result is stored, 4001st splice result is written over 1st.

4.6 **Reinforce the fusion point**

<1> Open tube heater lids and transfer fiber with protection sleeve from V-grooves of the Fusion Splicer to tube heater.

<2> Make sure the splice point is located at the center of the protection s leeve. Put the protection sleeve at the center of theheater. Apply some tension on the fiber so the tubeheater lids close.

Notes:

● Make sure the strength member in the protection sleeve is placed downwards

● Ensure no retorting of the fiber.

<3> Press [HEAT] to start tube heating. The heating process includes: start heating (the LED indicator turns green); constant temperature period (the LED indicator turns red); temperature fall period (the LED indicator turns green); the buzzer beeps and the HEAT LED Indicator (green) turn off when heating is completed. If [HEAT] is pressed again, the tube heating process is aborted.

<4> Open tube heater lids and remove protected fiber from the tube heater.

● Protection sleeve may stick to bottom plate of heater. Use a cotton swab to help remove sleeve from heater.

<5> Visually inspect the finished sleeve to verify no bubbles or debris/dust is present in the sleeve.

4.7 Manually move the motor

The four motors (forwarding, adjusting the core) in the Fusion Splicer can be manually operated individually. In the "edit splice operation" menu, set [pause 1] and [pause 2] to "ON". The motor will automatically paused when the fusion splice process reaches the stage of [pause 1] and [pause 2]. At that time, the motor can be manually moved.

Operation Options	
Operation Option	
Auto Start	ON
Pause 1	ON
Pause 2	ON

△▽◀▷ : Move Cursor
⏎ :Enter ⤷ :Exit
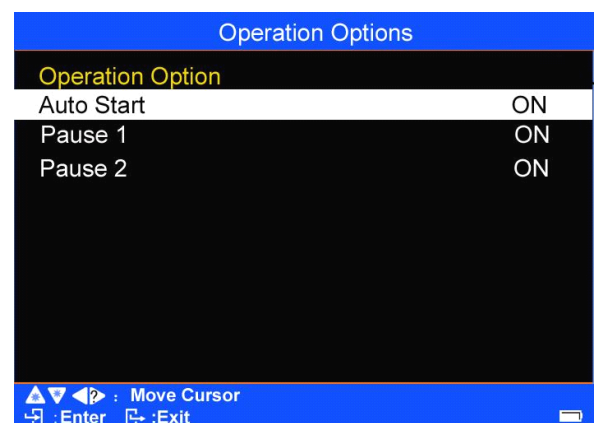
Operation Procedure

<1> In the [pause 1] or [pause 2] mode during the fusion process, Press [📄] can switch from the four moving modes of motor, namely, "left/right motor driving" and "X/Y view motor alignment"
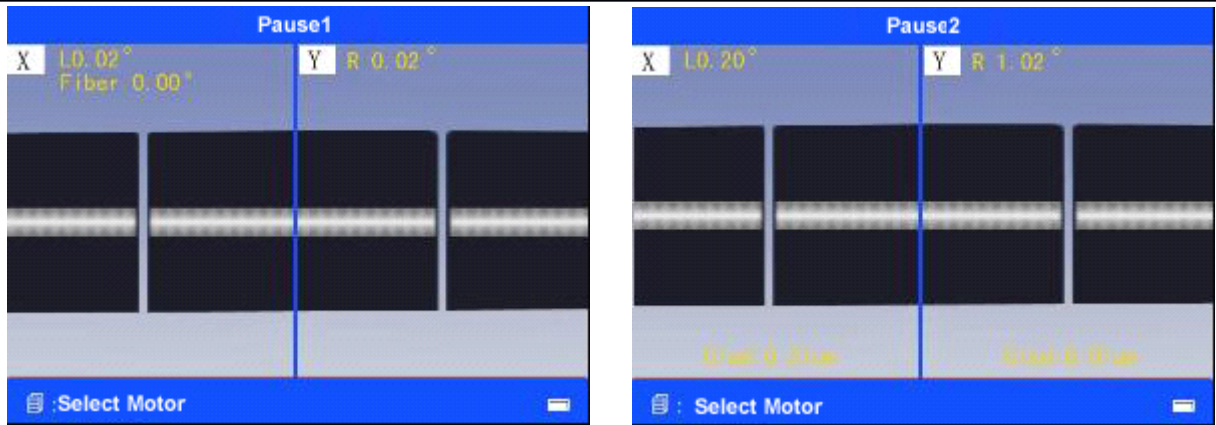
<2> In the "left/right motor driving" mode, press ◀ or ▶ to make the selected motor move forward or backward.

<3> In the "X/Y view motor alignment", press 🔺 or 🔻 to make the selected motor move upward or downward.

"left/right motor driving"	▶	◀
"left motor driving"	forward	backward
"right motor driving"	backward	forward
"X/Y view motor alignment"	🔺	🔻
"X view motor alignment"	upward	downward
"Y view motor alignment"	upward	downward

When the motor reaches the limit of the operating range in the "left/right motor driving" mode, the motor stops. Press the opposite key to manually move the motor again.

● In the [pause 1] mode during the fusion process, press **SET** to enter the [pause 2] mode of the fusion process.

● In the [pause 2] mode during the fusion process, manually move the motor and make the fiber reach the best position. Press **ARC** to make fibers core-to-core spliced. If **SET** is pressed instead of **ARC**, the fibers are spliced after realignment. After the fibers are spliced, the machine automatically calculates the estimated loss value and displays it on the screen.

4.8 Application of Soft Keyboard

This section can be referred to for password input, editing file names, or other character input performances. The following is an example of inputting [name] in the [Edit Splice Mode File] operation interface. The other character input performances are similar to it.
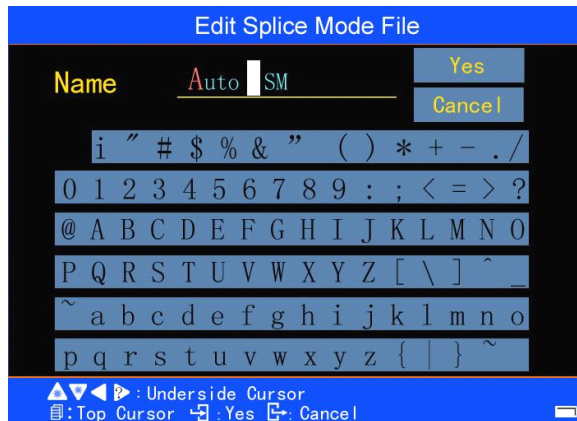

The method of inputting characters:

<1> In the [Edit Splice Mode File] operation interface, press ▲ ▼ and move the cursor to select [name] option. Press ⤶ to enter, and then the screen of "editing file names" is displayed.
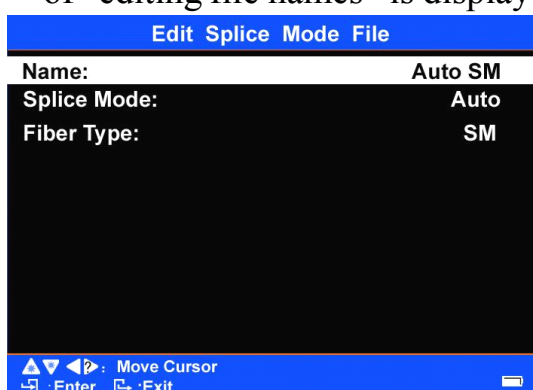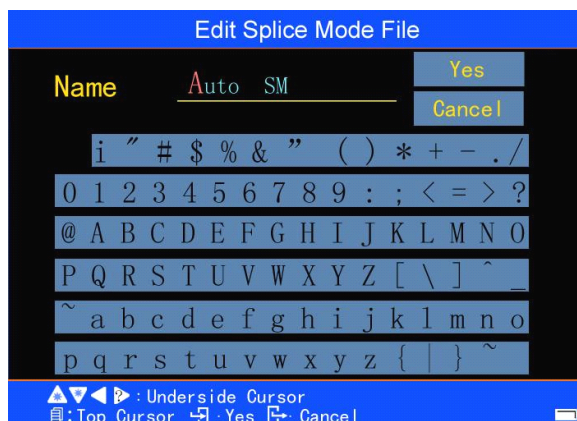
<2> Press ⬚ and move the "upper cursor" to select a character position of a specified [name].

<3> Press ⬚ ⬚ or ⬚ ⬚ and move the "lower cursor" to select a specified character. Press ⬚ to input the specified character.

<4>After all the characters of [names] are input, press ⬚ and move the "upper cursor" to ［Yes］. Press ⬚ to confirm the input of the characters.

<5> Double press ⬚ to return to "Splice　menu" operation interface

For example, to change the name "Auto SM" into "Auto NZ" in the above screens:

A. Press ⬚ for six times and move the "upper cursor" to "S";

B. Press ⬚ ⬚ or ⬚ ⬚ and move the "lower cursor" onto the letter "N" on the Soft Keyboard;

C. Press ⬚ to confirm. The letter "N" is then put onto the position of "S"; thus the letter "N" replaces the letter "S".

D. Use the similar method to input "Z".

5. Check and Maintenance

Critical cleaning points and maintenance checks are described below.

5.1 Cleaning V-grooves

If contaminants are present in the V-grooves, proper clamping may not occur, resulting in higher splice loss. The V-grooves should be frequently inspected and periodically cleaned during normal operation. To clean the V-grooves do the following:

<1> Open the wind protector.

<2> Clean the bottom of the V-groove

With an alcohol-impregnated thin cotton

swab. Remove excess alcohol from

the V-groove with a clean dry swab.

- Be careful to not contact the electrode tips.

- Do not use excessive force when cleaning

  the V-groove. The V-groove arm may

  get damaged.

- If the contaminants in the V-groove cannot

  be removed with an alcohol-impregnated thin

  cotton swab, use a cleaved fiber end-face to

  dislodge contaminants from the bottom of

  the V-groove. Repeat step 2 after this

  procedure.
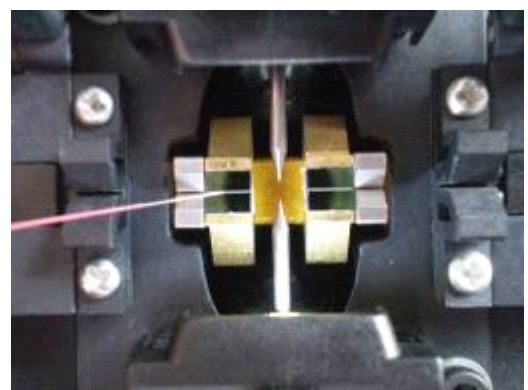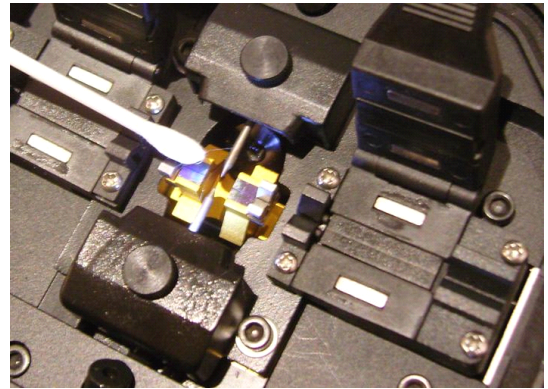
5.2 Cleaning Fiber Clamp Chips

<1> If contaminants are present on the clamp chips, proper clamping may not occur, resulting in poor quality splices. The fiber clamp chips should be frequently inspected and periodically cleaned during normal operation.

<2> To clean the clamp chips, do the following: Open the wind protector. Clean the surface of the chip clamp with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the chip clamp with a clean dry swab.

5.3 Cleaning Wind Protector Mirrors

If the wind protector mirrors become dirty, the fiber core position may be incorrect due to decreased optical path clarity, resulting in higher splice loss. To clean the mirrors, do the following: Clean the mirror surface with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the mirror surface with a clean dry swab. Mirror should look clean with no streaks or smudges.

5.4 Cleaning Objective Lenses

If the objective lense's surface becomes dirty, normal observation of the core position may be incorrect, resulting in higher splice loss or poor splicer operation. Therefore, clean both of them at regular intervals. Otherwise, dirt may accumulate and become impossible to remove.Cleaning Objective Lenses：

<1> Before cleaning the objective lenses, always turn off the splicer.

● Do not hit or touch tip of electrode when cleaning it.

<2>Gently clean the surface of lenses (X-axis and Y-axis) with an alcohol-impregnated thin cotton swab.　Using the cotton swab, start at the center of the lens and move the swab in a circular motion until you spiral out to the edge of the lens surface. Remove excess alcohol from the mirror surface with a clean dry swab. The lens surface should be clean and free of streaks or smudges.

<3> Turn on the power and make sure no smudges or streaks are visible on the monitor screen.　Press X/Y to change the screen and check the state of the lens surface on both the X- and Y-screens. Perform dust check.

5.5 Replace Electrodes

Electrodes wear with use and also must be cleaned periodically due to silica oxide buildup. It is recommended that the electrodes should be replaced after 1,000 arc discharges. When the number of arc discharges reaches a count of 1,000, a message prompting to replace the electrodes is displayed immediately after turning on the power. Using the electrodes without a replacement will result in greater splice loss and reduced splice strength.

Replace Electrodes

<1> Execute [Replace Electrode] in [Maintenance Menu 1].

<2> Instruction messages will appear on the screen to turn off the power. Press and hold ⏻ till the LED color changes from green to red.
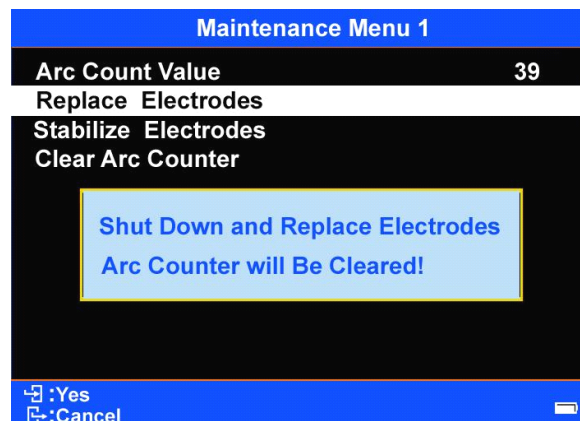
<3> Remove the old electrodes and Method for tearing:

a. Loosen screw located on electrode cover.

b.Take electrode out of electrode cover. (Electrode is fixed in the electrode cover)

<4> Clean the new electrodes with alcohol-impregnated clean gauze or lint-free tissue and install them in the splicer.

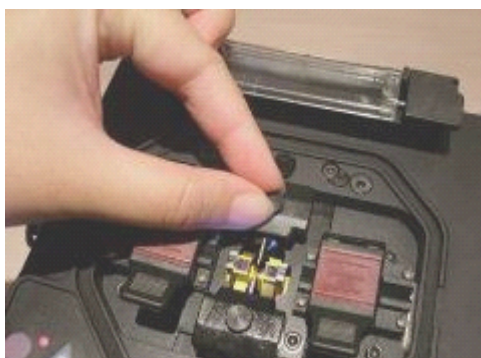<5> Place the electrode cover and tighten screw

● Do not pull out wiring when replacing electrode.

● The tightening of the screw should not exceed the strength of fingers.

5.6 Stabilizing Electrodes

In the event of sudden change in environmental conditions, etc., the arc power sometimes becomes unstable, resulting in higher splice loss.　Especially when the splicer is moved from lower altitudes to higher altitudes, it takes time for the arc power to stabilize. In this case, stabilizing electrodes will expedite the process of making the arc power stable.

Operation Procedure

<1> Execute [Stabilizing Electrodes] in [Maintenance Menu 1].

<2> Select the [Stabilize Electrodes].

<3> Press [image] or [image] and move the cursor to select and set the parameters of "Arc power"（ the default value is recommended）, Duration of time （ the default value is recommended）, "Arc Times"（ the default value is recommended）

<4> Select "Run". Press [image] to confirm. Stabilizing Electrodes is performed according to the parameters which are set in <3> of this section.

<5>To achieve best arc discharge, execute ［Arc Calibration］ for three times after Stabilizing Electrodes is completed.

5.7 Clearing Arc Count

This function enables the stored number of arc discharges to be reset.

<1> In [Maintenance menu 1], Press ▼ or ✳ and move the cursor to select [Clear Arc Counter]

<2> Press 🔲. Then a screen appears displaying a warning message "arc counter will be cleared". Press 🔲 to execute clear function.

5.8 Dust Check

The splicer observes fibers through image processing. Dust or contaminants on the cameras, lenses and wind protector mirrors disturbs normal observation of fibers and may result in improper splicing. This function checks the optical path for the presence of contaminants and indicates the position.

5.8.1 The Fusion Splicer has dust check function, which allows the user to check the optical path for dust or dirt and judge whether they disturb fiber observation. If contamination exists, this function indicates the location.

5.8.2 Operation Procedure

<1> Before the start of the test, remove the fibers from the splicer.

<2> In [Splice Menu] menu, press ◀ or ? to enter [Maintenance menu 2]. Press 🔲 to enter [Dust Check] in the X screen. Press SET to execute the check process. The message "checking, please wait" is displayed in the lower part of the screen.

<3> In [Dust Check] operation interface, press X/Y to switch to X screen or Y screen to perform checking. Press SET to perform checking in another screen.

<4> A message appears on the Dust Check screen indicating that "X(Y) image check is approved". Press ⭲ to return to the previous operation interface. Normal fusion splicing can be performed now.

● If message appears on the screen indicating that "image is dirty" after Dust Check, clean the wind protector mirrors and objective lenses and redo [Dust Check]. If the dirt or dust still remains, contamination may have entered the optical path. Contact your nearest sales agency.

5.9 Maintenance of blade

5.9.1 Cleaning Fiber Cleaver

<1>If the circular blade or elastomeric clamp pads of the fiber cleaver become contaminated, the cleaving quality could degrade. This may lead to fiber surface or end-face contamination, resulting in higher splice loss.

<2> Clean the circular blade or elastomeric clamp pads with cotton swab soaked with alcohol.

5.9.2 Rotating Cleaver Blade

If the cleaver does not cleave properly, rotate the blade 1/16 of a turn to replace the worn out blade position with a sharp blade position. To rotate the blade, do the following:

<1> Use a hexed-angle spanner provided by the cleaver to loose the hexed-angle screw.

<2> Lean the cleaver to an angle of 45 degree. Use a hexed-angle spanner provided by the cleaver or other pointed items to insert into operation hole. Rotate the blade clockwise to one to sixteen valid position marks.

<3> Tighten the blade lock screw.

● Do not touch the edge during the installation.

5.9.3 Blade Height Adjustment

In normal condition the blade height need not to be adjusted. If anomaly occurs, perform the following steps to verify if it is due to blade error.

<1> Loosen the hexed-angle screw. Then use the spare 1.5mm hexed-angle spanner which is at the bottom of cleaver to insert into the hole in the bottom of cleaver. Finally the hexed-angle screw is loosened.

<2> It is recommended to rotate clockwise the adjusting shaft at the middle of the tool post about half a scale or less. The pressure will increase the quality of the cut end face.

<3> Tight the screw.

<4> Repeat the previous operation until the blade is adjusted to a proper position.

5.9.4 Blade Replacement

After the circular blade has been raised 3 times and rotated through all positions, it needs to be replaced. Contact your splicer distributor.

● In order to maintain the splicing quality of the splicer, periodical inspection and cleaning are recommended.

5.10 Set Calendar

This function sets the date and time in the calendar incorporated in the splicer.

<1> In the ［Utility Menu］Menu, press ▼ or ▲ and move the cursor to select the [Set Calendar]

<2> Press ⬆ to enter [Set Calendar] interface.

Press ◀ or ▶ and move the cursor to select the item to be changed. Press ✦

✦ to adjust the value.

<3> After completion of calendar setting, press ⇥ . The date and time are stored.

5.11 Heater/Battery/Environment

In the ［Utility Menu］ Menu, press ▼ or ▲ and move the cursor to [Sensor

Value]. Press ⇥ to display the values measured by different sensors.

● The value measured by the temperature sensor sometimes is displayed higher than

that of the ambient temperature due to self-heating of the splicer.

5.12 Change the spare lithium battery pack

Change the spare battery according to the following procedures.

5.12.1 Open the cover of the battery case

Lean the Fusion Splicer; open the cover of the battery case which is at the

bottom of the Fusion Splicer. See the following picture:

5.12.2 Remove the old battery

Remove the lithium battery pack in the battery case of the Fusion Splicer;

pluck off the connector between the battery pack and the interior of the

power module; change the lithium battery pack. See the following

pictures:
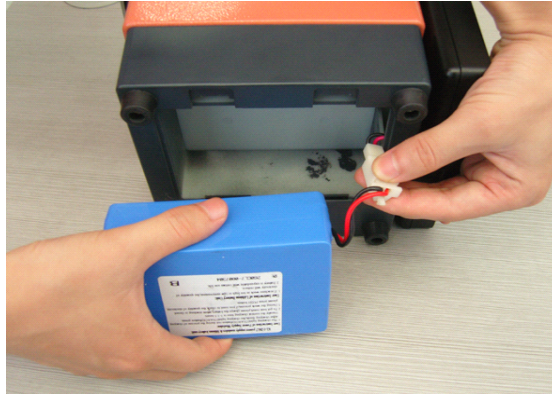
5.12.3 Place new battery pack

Joint the cord of the new lithium battery pack with the power supply wire in the battery case. Verify that the two are securely connected. First put the cord into the side hole in the battery case; then place the battery pack; finally, close the cover of the battery case which is at the bottom of the Fusion Splicer.

6．Questions and Troubleshooting

6.1 Power Supply

Power does not turn off when pressing ⏻

Press ⏻ and hold the key until the LED color changes from red to green. Release ⏻ to shut off the machine.

Few splices can be made with a fully charged battery pack

- If the power saving function is not enabled, battery power degrades faster.

- The battery pack uses chemical reaction. The capacity decreases at low temperature, especially at lower than 0 degree.

- At high altitude, the arc discharge current is increased. In this condition, battery power degrades faster due to large power consumption.

- The AC/DC adapter is not the model supplied by the Company, or the charging time is not long enough.

"CHARGE" LED on AC adapter blinks during battery recharge

- Atmospheric temperature is too high (more than 50 degrees C), or the battery pack is charged under exposure to sunlight.

- The battery pack has a fault or has reached the end of its service life.   Install a new battery pack.   If the LED blinks again after install, contact your nearest sales agency.

The AC/DC adapter is not the model supplied by the Company.

6.2 Splicing Operation

Inconsistent splice loss / High splice loss

- Clean the V-grooves, fiber clamps, wind protector mirrors, and objective lenses. Refer to [Check an Maintenance] (chapter 5)

- Replace electrodes, please refer to [Replace Electrodes] (chapter 5.5)

- If the fiber is bending, bending part should be upward when placing the fiber.

- The splice loss varies according to the cleave angle, arc conditions and fiber cleanliness.

- If the splice loss is still too high or inconsistent after performing the above-mentioned remedies, contact your nearest sales agency. Regular service (at least once a year) is recommended to maintain high splicing quality.

Confirmation of splicing procedures

- Refer to [Referring or editing splice mode] (chapter **4.1.2**).

Monitor suddenly turned off

- The power saving function is opened by users when using a battery pack.   The splicer switches to the power saving state after an extended period of splicer inactivity.   Press any key to return to the normal state.   To change the length of

time before the splicer switches to the power saving state, refer to[Power Save]

- Method to resume discharging condition parameter

- Refer to [Referring or editing splice mode]

Method to change error thresholds for Cleave angle, Splice loss and Fiber angle

- Refer to [Referring or editing splice mode] (chapter **4.1.2**).

Error message can be over-ridden

- Refer to [Splice Menu] under [Select and Edit Splice Mode] to allow error message

  override.

Unable to change Arc Power and Arc Time

- The settings cannot be changed in calibrate or auto modes.

- Performing Arc Calibration maintains adequate arc power in these modes.

- If using the Normal or special modes, the Arc Power and Arc Time can be changed

  excepting be locked by administrator.

Method to display Cleave Angle, Fiber Angle and Core / Cladding Offsets

Refer to [Select and Edit Splice Mode] (section 3.2.6) to set Cleave Angle, fiber

angle, and Core / Cladding Offsets.

In the [pause 2] mode, "Core / Cladding Offsets" can be displayed .

Incorrect splice mode selected and used in AUTO mode

The AUTO mode can detect only standard SM, DS, NZ and MM fibers.   Refer to

 [Select   And   Edit Splice Mode]

Mismatch between Estimated splice loss and Actual splice loss

The estimated loss is a calculated loss, so it can be used for reference only.

The optical components of the splicer may need to be cleaned.

When splicing specialty fibers, adjust [Left Fiber MFD], [Right Fiber MFD], [Core

Step Coefficient] and [Core Curve coefficient]. When splicing dissimilar fibers, adjust also [Minimum   Loss] and [MFD Mismatch Coefficient]. To adjust these parameters, refer to parameter settings of the other splice modes stored in the database area.

6.3 Heating Operation

Fiber protection sleeve does not shrink completely

● Extend the heating time. Refer to [Select And Edit Heater Mode] (chapter 3.2.3).

Fiber protection sleeve adhered to heating plate after shrinking

● Use a cotton swab or a similar soft tip object to push and remove the sleeve.

Method to cancel heating process

● Press ⬭HEAT button one time.

6.4 Senior Settings

Method to lock "selection" or "editing" of Splice or Heater mode

● Refer to [Menu Lock]

6.5 Other Functions

Method to hide messages on [READY] screen

Change the fiber image from X/Y view to X magnified view or Y magnified view by pressing ⬤X/Y

Too many repetitions until "Test Finish" indicated in [Discharge Calibration]

● The splicer needs to repeat fiber preparation and arc calibration after replacing the electrodes or when the environmental conditions change drastically. After "Step 1 and Step 2 of discharge calibration completed is continuously displayed for 3 times,

the Fusion Splicer automatically exits from the discharge calibration interface and enters "Splice mode" menu.

"Test Finish" is never indicated after many repetitions in [Discharge Calibration]

● Execute [Stabilize Electrodes] function in [Maintenance menu I].　If the splicer still does not indicate "Test Finish", replace the electrodes. (Chap ter 5.5).

No arc power change after [Discharge Calibration]

● An internal factor is calibrated and adjusted for the specific arc power selected. The displayed arc power in each splice mode does not change.

● The calibration results affect all splice modes.

Addenda A:

Summary of quick operating

I. Preparing

1. Verify that the machine is plugged in power or the battery capacity is enough; then press ⏻ and hold the key until the machine is booted.

2. In the standby mode, press ▤ to enter "Splice Menu" menu. Move the cursor to [Operation Options]; press ⤵ to enter. Set [Auto Start] [pause 1],[pause 2] respectively as "ON","OFF","OFF".

3. Discharge Calibration

Discharge calibration is needed because constant changing of atmospheric conditions such as temperature and pressure, and the long service of the machine creates variability in the arc temperature and position.

Step of discharge calibration:

In the [Ready] mode, press ▤ to enter "Splice Menu" menu. Then prepare and place fiber according to the method described in fiber preparation. Close the wind protector. Press ⤵ to enter [Arc Calibration]. Discharge calibration automatically starts. The user is recommended to repeatedly prepare and place fiber in discharge calibration interface, until the "Step II of discharge calibration completed" message is displayed for three times.

Note:∗ Discharge calibration is needed only arc power fluctuates strongly; it is not necessary upon boot every time. After discharge calibration is completed, the machine will adjust the arc discharge current according to the Calibration results to ensure fusion quality.

II.　Fiber preparation

1. Put the tube over one end of the fiber.

2. Use fiber stripping pliers to strip fiber coating layer, the length of which is 30-40 mm. Use gauze dipping with alcohol or wadding to wrap the fiber, and then clean the bare part.

3. Use a fiber cleaver to cut the fiber。 Bare fiber length is 16 mm around.

4. Put the finished fiber in the Fusion Splicer. Cross-section of fiber can not touch other things.

III.　Cover the wind protector, then the fiber fusion automatically starts and the splicing loss is displayed.

IV.　Reinforce the fusion point

1.Transfer fiber with protection sleeve from V-grooves to tube heater;

2. Make sure the splice point is located at the center of the protection sleeve. Put the tube at the center of the heater.

3. Press HEAT to start tube heating. The buzzer beeps and the HEAT LED turn off when tube heating is completed.

4. Remove the tube from the heater when the heater is cool. The whole process of Fusion Operation is completed.

V.　Repeat Step II, III, IV to continue splicing.

Addenda B:

Guarantee period and limits

If the splicer becomes out of order within two year from the date of delivery, we will repair it free of charge. However, note that repairs will be charged for the following cases regardless of the guarantee period:

★Trouble or damage due to natural disaster

★ Trouble or damage due to abnormal voltage supply

★ Trouble or damage due to mishandling.

★Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual

★Consumable items (discharge electrodes etc.)

● Before shipping the splicer, please consult your nearest sales agency first.

Necessary information needed for repair (please affixes the information as follows)

<1> Your full name, section, division, company, address, phone number, fax number and e-mail address.

<2> Model name and serial number of the splicer

<3> Problems encountered

● What problems did your splicer get into and when?

● What is its present operational state?

● The state of the monitor and the contents of the relevant error message and etc.

Addenda C:

Contact manner

If any failure exists, please send the splicer to our agent or factory

with an exact failure explanation at once.

The address is as follows:

Business contact: NANJING JILONG OPTICAL COMMUNICATION CO., LTD
Add: 17F, HongWu Mansion, No.267 Hongwu Road, Nanjing China

Tel /Fax: +86-25- 84573372   84573382

P.C.:   210002

24 hours hotline: 025-81788466

E-mail:sales@jilongfiber.com

Website:www.jilongfiber.com

After service: Bengbu Branch of NANJING JILONG OPTICAL COMMUNICATION

CO., LTD

Add: No.5, Qianjin Road, Bengbu, Anhui   P.C.:   233000

Tel: +86-0552-3010702   Fax: +86-0552-3016335

P.C.:   233000

★   Notice: This Company's products are ameliorated continually; modification won't be informed.