





Please read this instruction manual carefully before operating the equipment. Adhere to all safety instructions and warnings contained in this manual. <u>Keep this manual in a safe place.</u> <u>There is a change without a previous notice.</u>

We are not responsible for the products which are not purchased from our authorized distributors.

Please consent beforehand.

The software equipped in splicer and its related documents are protected by copyright laws and international treaty provisions as well as other intellectual property laws.

Copying some or all of instruction manual without notice is forbidden. Moreover, without permission from our company, it cannot use on the Copyright Act except that it uses as an individual.

---Caution for Air Transport---

This product contains Lithium Ion Battery. When shipping this product, please inform the transport company that this product contains the lithium Ion battery before shipping. Please follow the direction of the transport company.

Do not take the protector off the splicer, or consult with the authorized distributor for instruction. Tightening the original screw without the protector may damage mechanism inside.



Environmental performance decreases when the protector is detached.

Table of Contents

Safety Information1
General information
Description of Product8Components of Splicer8Other Necessary Items for Splicing Operation10Description and Function of Splicer11Operation of Sheet Key13
Basic Operation14Splicing work preparation14Power Supply17AC Operation18DC operation with external battery19Battery Operation20Turning Splicer ON/OFF23Up/Down Key function24Splicer Settings Check25Change of the Splice Mode26Change of the Heater Mode28Preparation of fiber31Arc Calibration36Splicing procedure38Storing splicing results42How to input Mode Title/Comment/Password42Fiber Proof Test43Heating protection sleeve43
Maintenance of Splicing Quality45Cleaning and Checking before Splicing45Periodical Checking and Cleaning47Cautions were displayed48
Splice Menu50Composition of Splice Menu50Splice Mode51Select Splice Mode52Memory64Camera Image66Splice Memory Comment67

Table of Contents

Heater Menu	
Setting Menu Composition of Setting Menu Splice Settings Machine Settings. Supervisor Menu Menu Lock Settings.	73 73 74 75 76 77
Maintenance Menu information Replace Electrodes Stabilize Electrodes Clear Arc Count. Clear Cleaver Counter Battery Discharge. Motor Drive Diagnostic Test. Dust Check Arc Calibration Motor Calibration Maintenance Info.	78 78 79 80 80 80 81 81 81 81 81 81 81 81 82 83 83 83 83 84 87 87
Error Message List	88
Questions and Troubleshooting Power Supply Splicing Operation Tube-heating Operation Supervising Other Functions	
Guarantee and Contact Address Guarantee Contact Address.	100 100 101

The splicer has been designed for splicing Silica-based optical fibers for telecommunications. Do not attempt to use this machine for other applications.

Fujikura Ltd. gives much consideration and regard to personal injury. Misuse of the machine may result in electric shock, fire and/or serious personal injury.

Follow all safety instructions

Read and understand all safety instructions.

Stop using it when it malfunctions

Ask our service centers for repair as soon as possible.

Instruction Manual

Read this instruction manual carefully before operating this machine. Store this instruction manual in a safe place. The following alert symbols are used in this instruction manual and machine to indicate warnings and caution for safe use. Understand the meanings of these symbols.



There is a possibility of death or serious injury resulting from improper use by ignoring this indication.



There is a possibility of personal injury or physical loss resulting from improper use by ignoring this indication.

Symbol means "Pay attention"



Pay attention to hot surface!

Symbol means "Must not do"



You must not disassemble!

Symbol means "Must do"



You must disconnect a plug!





ьные приборы и оборудова

www.tehencom.com

Safety Information





RECYCLING and DISPOSAL

In European Union

In accordance with the European Parliament Directive 2002/96/EC, electrical parts and materials that can be re-used and/or recycled have been identified in order that the use of new resources and the amount of waste going for landfill can be minimised.

In the European Union, do not discard this product as unsorted municipal waste. Contact your local authorities.

In other countries

[Recycling]

To recycle this product, disassemble it first, sort each part separately by material components and follow your local recycling regulations.

[Disposal]

This product can be disposed of same as the standard electric poroducts. Follow your local disposal regulations.

General information

Introduction

This fusion splicer 62S is a fusion splicer which can connect a single optical fiber. Moreover, a new function was added and made the 62S splicer much improved in versatility. In order to master 62S, please read this instruction manual.



Splice mode

The 62S has not only standard splice modes, but also automatic modes, AUTO mode. The AUTO mode consists of [SM AUTO], [MM AUTO], [NZ AUTO], [DS AUTO] mode. When using AUTO mode, the automatic arc calibration function is enabled.

The special modes consist of [SM-SM] for SMF (ITU-T G652), [NZ-NZ] for NZDSF (ITU-T G655), [DS-DS] for DSF (ITU-T G653) and [MM-MM] for MMF (ITU-T G651). This mode requires executing [Arc Calibration] before splicing.

Automatic arc calibration function

This function calibrates the arc power at every splice. When the automatic arc calibration function is enabled, performing the [Arc calibration] function before a splice operation is not necessary. The automatic arc calibration function works in AUTO modes only. It doesn't work in the standard splice modes. When using those modes, performing [Arc calibration] before splicing is strongly recommended.

General information

Use of the work table

On the carrying case, there is a work table. The work table enables immediate use of the 62S. The work table can be attached / detached to the carrying case.



Upgrade of software

The software of 62S is upgradable from on the Internet. Please install Data Connection in attached CD.



Components of Splicer

Standard Equipment

The standard equipment of the splicer is the following. Check the equipment items mentioned of list.

Standard Package List.



Other Parts

Option List.



Using J-plate (JP-08)

Attach the J-plate onto the splicer by installing from upside.



Other Necessary Items for Splicing Operation

Tools

Fiber coating	UV Coating	Ny Coating		
diameter	0.25mm	0.9mm		
Fiber protection sleeves	<u>Standard sleeve</u> 60mm length [FP-03] 40mm length [FP-03 (L = 40)]			
	<u>Micro sleeve</u> 15mm length [FPS01-400-15]	<u>Micro sleeve</u> 20mm length [FPS01-900-20]		
Fiber stripping tools	Primary coat stripper [PS-02]	Jacket stripper [JS-01]		
Fiber Holder (Option)	Fiber Holder [FH-60-250]	Fiber Holder [FH-60-900]		
Fiber cleaving tools	Fiber Cleaver [CT-30]			
Fiber cleaning tools	Alcohol Pot [AP-01] with alcohol (purity > 99%) Lint-free tissue or gauze			

Description and Function of Splicer

structure





ООО "Техэнком" Контрольно-измерительные приборы и оборудование www.tehencom.com

Description of Products





12

Operation of Sheet Key



Key Name	Key Function
ON/OFF Power key	To turn ON/OFF the power.
ARO Arc Key	Arc discharge manually at the time of READY state.
X/Y X/Y Key	Change the X/Y images
HEAT Heat Key	To start the heating process by the tube heater. If the HEAT key is pressed once during heating, LED will blink. Heating operation will be stopped if the HEAT key is pressed once again during blink.
RESET Reset Key	To quit from any state except the heating process by tube heater. After pressing this key, the splicer will return to the ready state with a beep sound.
<u>SET</u> Set Key	<i>To start the splicing operation, or to go through to the PAUSE state.</i>
ESC Escape Key	To change the X/Y view image and display the data at the "Ready", "Pause", "Finish" state. To quit from input data at the Menu state.
	To adjust the brightness of the monitor screen at the ready state. (Down key)
Up/Down Arrow Keys	These arrows are used to move the cursor for selecting the items at the menu state, or to change the value or letter of the discharge conditions and comments. During manual motor control, these arrows serve as the "Backward" and "Forward" keys to operate the motors.
MENU Menu Key	Open Main menu and go to next page.
ENT Enter Key	To select the command and decide the parameter at the menu state.

Splicing work preparation

Multiple work environment configurations can be created using the carrying case and work table.

How to use the work table on the carrying case

The work table can be attached / detached to the carrying case.

Detach the work table from the carrying case by loosening the screw.



Tighten the screw behind the work table to secure the splicer.





Place necessary items for splicing operation on the table.



Holes on the work table can be used to create your original work table suitable for your unique splicing style.





 \geq

Arrange safety belts/devices for equipment and accessories on the tray before use. Straps for small accessories may be recommended. In case the equipment/accessories were dropped to a person under operation area, this would result in serious injury or fatal accident.

In the case of use only with splicer

Use in a location which does not have vibration, a shock, etc. at the time of performing fusion splice work. In work [at the unstable place where a main part is shaky], the possibility of damage from a fall becomes high.

Sleeve Loader (62S only)

Sleeve loader for holding the Protection sleeve during Splicing. It is possible that there are dust, rain water, etc. depending on work environment, and garbage, moisture, etc. mix to the protection sleeve under splice.

Putting a protection sleeve on the ground etc. directly by using a sleeve loader is lost, and mixing of garbage or moisture can be prevented.

Moreover, since the protection sleeve was held near the connection position, workability also became good.







Power Supply

The power supply of a splicer can be operated with AC power supply and a battery.

Inserting or detaching power unit

Inserting power supply unit

Insert power unit into Power unit dock until it clicks into place.



Detaching power supply unit.

Turn off the splicer before removing the power unit. Press the release button, located on the side of the splicer body, and remove the unit from the other side of the release button.



AC Operation

This section describes the procedures for using the power supply with the equipment. Splicer is operated with AC adapter (ADC-18) or the internal battery. Use the only external AC adapter (ADC-18) and AC Coad (ACC-**) with Splicer.





AC Adapter [ADC-18]

AC Coad [ACC-**]

ADC-18

Insert AC cord into the AC inlet of the AC adapter. The power ON LED of the AC adapter changes green color when suitable AC voltage is supplied. If high AC Voltage is supplied, the AC adapter will immediately be damaged.



AC generators commonly produce abnormally high AC output voltage.

Measure the output AC voltage with a circuit tester before connecting the AC power cord. Such abnormally high voltage or frequency from a generator may cause fuming, electric shock or equipment damage and may result in personal injury, death or fire.





DC operation with external battery

Open shutter for DC inlet of AC adapter.





> Do not supply DC16V or greater, the AC adapter will be damaged immediately.

Plug DC cord (DCC-12 or DCC-13) into DC inlet of AC adapter. The ON LED turns on (green color) when suitable DC voltage is supplied. In case DC16V or greater is supplied, or polarity (positive / negative) is wrong, The AC adapter protection circuit shuts down the DC output and DC Warning LED [HIGH ~ INPUT] turns on (red color)





Battery Operation

Check the remaining battery capacity. If it is 20% or less before operation, splicer can only work a few times.



How to check remaining battery capacity

If splicer is already equipped with the battery, turn splicer ON. Power source of "Battery" is automatically identified and the remaining battery capacity is displayed on the "READY" screen.



Remaining battery capacity display	Remaining battery
	95~100%
	65~95%
	40~65%
	15~40%
Flashing	Less than 15%

The residual quantity check method of a battery

If battery is not inserting in the splicer, simply press the battery check push button on the battery pack. The remaining battery capacity is indicated on the LED indicator.



Remaining batter	Remaining battery	
0000	95~100%	
0000	3 LED	65~95%
0000	2 LED	40~65%
0000	1 LED	15~40%
0000	1 LED Flashing	Less than 15%

The battery residual quantity indicator on a screen is only as a guide. Just after turning splicer ON, if battery capacity is not enough to do operation, a warning message appears in the LCD monitor. After discharge, recharge battery.



In order to increase the number of fiber splices and times of heating, please change to a power-saving mode setup.

How to charge the battery

Open shutter for battery charge plug inlet of the Battery Pack. Plug the supplied battery charge cord (DCC-18) into both the battery charge inlet of the AC adapter (ADC-18) and the battery charge terminal located on the battery (BTR-09) side.

The CHARGE LED turns ON (orange color) and battery charging begins. Battery charge is completed in approximately five hours. After completion, disconnect battery charge cord, and then DC or AC cord.





 \triangleright

The battery pack can be charged also with AC and DC.

- When connecting the cords to AC adaptor, plug DC or AC cord before battery charge cord. When disconnecting them, unplug the battery charge cord before DC or AC cord.
- Do not place battery on top of AC adapter or vise-versa. The battery can be charge while splicer is in use. Installed BTR-09 into power dock and connect to ADC-18 AC adapter/ battery charger.
- CHARGE LED turns off when battery charge is completed. If CHARGE LED flashes, replace the battery with a new one.
- If battery charge does not complete in five hours or CHARGE LED does not turn ON the battery, AC adapter or both need replacement. Ask your service agent for further instruction.

Turning Splicer ON/OFF

Turning Splicer ON

Press ON/OFF key and hold it until the green LED turns on. The following warning screen is displayed.





The license message is displayed twice a month when the splicer is turn on.
There is a possibility that a language is fixed depending on the country of shipment.

The READY screen is displayed after all the motors are reset to their initial positions when you select [Agree]. The power source type is then identified. If the battery is used, the remaining battery capacity is displayed.

Turning Splicer OFF

Press ON/OFF key and hold until the red LED turns off and then detach.



Up/Down Key function

The following operations are carried out by pressing the Up/Down key on a READY screen.

LCD brilliance control function

If the **Down** key is pressed on a READY screen, the monitor brightness adjustment menu will appear. Monitor visibility changes depending on environmental conditions. To change monitor brightness, press **Up/Down** Arrow key to change value and press **ENT** key to set value.



Splicer Settings Check

Composition of a READY screen

Splice Mode

Select appropriate splicing mode for the specific fiber combination. Current mode is displayed on the READY screen.

Heater Mode

Select appropriate heating mode for the specific protection sleeve used. Current mode is displayed on the READY screen.

READY	(111
Splice Mode	
AUTO SM/NZ/DS/BIF/MM	
Heater Mode	
60mmS FP-03	
Load Fibers	

Change of the Splice Mode

The optimal splice setting for a specific fiber combination consists of the splicing parameters listed below. In other words, the optimal splicing parameters depend on the fiber combinations, and are different depending on the fiber used.

- Parameters for controlling arc discharge.
- Parameters for calculating estimated splice loss.
- Parameters for controlling fiber alignment and splicing procedures.
- Threshold for error messages.

A series of optimal splice parameters for major fiber combinations are already stored in the splicer. These parameters are stored in the database area and can be copied to the user-programmable area. These splice parameters can be edited for a specific fiber combination.

How to select the Splice Mode						
	۶	[AUTO SM/NZ/DS/BIF/MM] Use this mode if the fiber type is not identified				
	\triangleright	ISM AUTOI and others				
		Use this mode if the fiber type is identified.				
	۶	[SM FAST] and others fast Use this mode if the fiber type is identified and prefer quick splice with high yield to consistent splice loss.				
	~	[SM-SM] and others Use this mode for splicing special fibers. This mode enables to set specific parameters for each splicing. Execute [Arc Calibration] before using this mode.				

Splice Mode selection

Select an appropriate splice mode for type of fiber to be spliced.

- 1. Press MENU key at [READY], [PAUSE] or [FINISH] state to open [Splice Menu]. Select [Select Splice Mode] and the [Select Splice Mode] menu is displayed.
- 2. Move cursor by pressing Up/Down Arrow key and press ENT key to select [Splice mode].



Splice Menu

3. Splice Mode can be checked on a READY screen.





Change of the Heater Mode

Each tube-heating mode is optimized for a type of Fujikura protection sleeve. These modes can be found in database area for reference. Copy the appropriate one and paste it to the user-programmable area. The operator can edit the user-programmable modes. The parameter in Heater mode becomes an addition and change with upgrade of software.

Data Base				
Parameter	Description			
60mmS	For standard 60mm protection sleeve,			
FP-03	Such as Fujikura FP-03 or FP-03M protection sleeves.			
10mmS	For standard 60mm protection sleeve,			
4011113 ED_03(1 - 10)	Such as Fujikura FP-03 or FP-03M protection sleeves.			
FF-03(L-40)	Note : Cleave length 8mm.			
15mmS	400 or less um of diameters of coating. Splice of the interference			
FPS01-400-15	length of 5 mm or less.			
** mmS	400 or less um of diameters of coating. In addition, there are 20, 25,			
FPS01-400-**	and 34 or 40 mm length.			
20mmS	900 or less um of diameters of coating. Splice of the interference			
FPS01-900-20	length of 6 mm or less			
** mmS	900 or less um of diameters of coating. In addition, there are 25, and			
FPS01-900-**	34 or 40 mm length.			
60mmS	Ear Splice of a drama cable			
FPS01-DC-60				
FUSE2/3				
ST-FC				
FUSE900	For Euso connect splice			
SC-LC-ST-FC	For Fuse connect splice.			
FUSE2/3				
SC-LC				
40mmR	For standard 40mm protection sleeve,			
FP-05	Such as Fujikura FP-05 protection sleeves.			
40mmR	For standard 40mm protection sleeve,			
FP-04T	Such as Fujikura FP-04T protection sleeves.			
28mmR	For standard 28mm protection sleeve,			
FPS-08-28	Such as Fujikura FPS08-28 protection sleeves.			
30mmR	For standard 30mm protection sleeve,			
FPS-04-30	Such as Fujikura FPS04-30 protection sleeves.			
** mmS-L	900 or less um of diameters of coating with Covering material of			
FPS01-900-**	Hytrel. In addition, there are 25, and 34 mm length.			

The dimensions of the Protection Sleeve after heat shrink

Form	Tension member	Sleeve length	Prepare fiber length	Diameter of an adaptation optical fiber	Diameter of a result
FP-03	SUS	60mm	16mm or less	250~900um	3.1 <i>mm</i>
FP-03(40mm)	SUS	40mm	10mm or less	250~900um	3.1 <i>mm</i>
FP-04T	Glass Ceramic	40mm	10mm or less	250~900um	4.0mm
FPS01-400-15	SUS	15mm	5mm or less	~400um	1.5mm
FPS01-900-20	SUS	20mm	6mm or less	~900um	2.3mm

* The dimensions of the protection sleeve after shrink are varied depending on the diameter of the fiber.



Selecting Heater mode

Select the heater mode most suitable for the protection sleeve to be used.

- 1. Press <u>MENU</u> key in [READY], [PAUSE], [FINISH] state and press <u>MENU</u> key to display [Heater Menu].
- 2. Select [Select Heater Mode] in [Heater Menu]. [Select Heater Mode] menu is displayed.
- 3. Move cursor by pressing Up/Down Arrow key and press ENT key to select a heater mode.



4. The check in the heater mode selected on the OK screen can be performed.



When a setup of "Auto Cover Open" is OFF, the cover will be in the state where it was closed. A cover opens, if the HEAT key is pressed once before doing heating work. Moreover, heater cover does not open automatically at the time of the end of heating. So please push HEAT key and take out the sleeve.

- When using a protection sleeve which is not made by Fujikura, please set parameters based on the specific sleeve.
- When the sleeve of another company is used, the durability of a protection point cannot be warrantied.

Preparation of fiber

Cleaning optical fiber

Clean optical fiber with alcohol-moistened gauze or lint-free tissue approximately 500mm from the tip. Dust particulates from the fiber coating surface can enter inside the protection sleeve and might result in a future fiber break or attenuation increase.

Placing protection sleeve over fiber

Place the protection sleeve over the Right side fiber.



Since a left hand serves as a standard at the time of fiber conveyance, the method of inserting a sleeve in a right-hand side fiber is recommended.



Fiber coating stripping and cleaning of bare fiber

Strip the outer coating 30 to 40 mm from fiber tip with a stripping tool. Clean the fiber with alcohol moistened gauze or lint-free tissue thoroughly. Frequently replace cleaning gauze to insure splice quality.



Use a high quality alcohol, greater than 99% pure.

Fiber Cleaving in the case of using a sheath clamp

To unlock the cutting lever, press it gently and slide the stopper. Push the slide button until it locks and set the stripped optical fiber on the cleaver.



Press down the cutting lever. Release the pressure on the cutting lever. A spring force will bring it to its open position.



> Confirm the sheath of fiber is not on pad when fiber holder is used.




Fiber Cleaving in the case of using a Fiber holder

Set the fiber onto fiber holder

Set the fiber onto the fiber holder with the fiber sheath 3mm from the end of the fiber holder and then close the fiber holder lid.

Close the lid of a fiber holder while pressing down with a finger on the coating (refer to figure below).
 Select a suitable fiber holder based on the fiber coating diameter.
 If fiber coating has some memory curl, place fiber so that the curve of memory is turned downwards.

essing down with a finger Adjusting sheath edge 3mm

To unlock the cutting lever, press it gently and slide the stopper. Push the slide button until it locks and set the stripped optical fiber on the cleaver.



Press down the cutting lever. Release the pressure on the cutting lever. A spring force will bring it to its open position.



> Confirm the sheath of fiber is not on pad when fiber holder is used.



Not Good







Do not put fingers in the driving area of the slide button as personal injury may result.
 After pressing it only half way down, releasing the pressure on the cutting lever may result in bad cleaving quality.

Loading fiber to splicer

Using sheath clamp

- 1. Open the wind-protector and sheath clamps.
- 2. Place prepared fiber onto v-groove so that the fiber tip is located between the v-groove edge and tip of electrode.



- Be careful not to contact the prepared fiber tips into anything to maintain fiber end-face quality.
- 3. Hold fiber with fingers and close sheath clamp so that the fiber does not move. Make sure the fiber is placed in the bottom of the v-grooves. If fiber is not placed properly, reload fiber.

The prolonged storage back and when splicing for the first time, we recommend you execute for an Arc Calibration. Refer to [Arc Calibration].

Using Fiber Holder

1. Remove a screw beside sheath clamps and take the sheath clamps off the splicer.



2. Place fiber holders so that the guide pins on the stage go to guide-holes in the fiber.





Be careful not to contact the prepared fiber tips into anything to maintain fiber end-face quality.

3. Close the wind-protector and press <u>SET</u> key. The splicer starts the splice procedure. If "Auto Start Trigger" is set up "Cover Close", the splicer starts the splice procedure without <u>SET</u> key.

The prolonged storage back and when splicing for the first time, we recommend you execute for an Arc Calibration. Refer to [Arc Calibration].

Arc Calibration

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing, which creates variability in the arc temperature. This splicer is equipped with temperature sensor that is used in a constant feedback monitoring control system to regulate the arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion cannot be corrected automatically. Also, the center position of arc discharge sometimes shifts to the left or right. In this case, the fiber splicing position has to be shifted in relation to the arc discharge center. It is necessary to perform an arc power calibration to eliminate both of these issues.

- Arc calibration is performed automatically using [AUTO] mode only. So arc calibration does not have to be performed when splicing in this mode.
- Execute [Arc calibration] before using non-auto mode.
 - When performing the [Arc Calibration] function change the arc power "factor" value. The factor value is used in the algorithm program for all splicing. The arc power value will not change in the splice modes.

Operation procedure

T

T

- 1. Select [Arc Calibration] in [Maintenance Menu] to display Arc Calibration screen.
- 2. Set prepared fibers onto the splicer.



- > Use standard SMF ITU-T G652 fiber for Arc Calibration.
- Use well prepared fibers for arc calibration. Dust on the fiber surface affects arc calibration.
- Cleave angle threshold does not link to the parameter "Cleave Limit" in splicing modes. Cleave angle threshold is independently set for arc calibration. See section [Machine Settings] to change cleave angle threshold.
- 3. The ARC Calibration will begin after pressing ENT key.

"Good" message

Arc power and splicing position calibration are successfully completed. Press **ESC** key to exit.



Result: Good

"Not Adequate" message

Arc power and splicing position calibration are completed but further calibration is strongly recommended, as the change from the previous arc calibration is too large. Press **ENT** key to perform arc calibration, or **ESC** key to exit even though arc calibration is not completed.



Result: Not Adequate

- In some cases, multiple iterations of arc calibration are needed until the calibration process is successfully completed and the "Test Finish" message is displayed. Arc calibration can be considered almost completed if multiple iterations are completed without receiving the message.
- Number threshold can be set so that "Test Finish" message is displayed after specific number of arc calibrations is performed. See section [Machine Settings] for detail.

Splicing procedure

To make a good splice, the optical fiber is observed with the image processing system equipped in the 62S. However, there are some cases when the image processing system cannot detect a faulty splice. Visual inspection with the monitor is often necessary for better splicing yield. The instruction below describes standard operating procedure.

1. Fibers loaded in the splicer move forward toward each other. The fiber forwarding motion stops at a certain position shortly after the cleaning arc is performed.



- 2. Next, the cleave angle and end-face quality are checked. If the measured cleave angle is greater than its set threshold or fiber chipping is detected, the buzzer will sound and an error message warns the operator.
- 3. If no error message is displayed, the below stated end-face conditions are used for visual inspection. If observed, remove the fiber from the splicer and repeat fiber preparation. These visual defects may cause a faulty splice.



Pause after cleave angle check and fiber alignment can be set "disabled". See section [Splice Settings] for detail.



- The cleave angle threshold can be changed. See section [Splice Menu]
- The cleave angle error message can be ignored by pressing <u>SET</u> key to go on to the next step. To disable the cleave angle error. See section [Splice Settings] for detail.
- Cleave angle, during the splicing operation can be hidden. See section [Splice Settings] for detail.

- 4. After fiber inspection, the fibers are aligned core-to-core or cladding-to-cladding and then, arc discharge is performed to splice the fibers.
- 5. Estimated splice loss is displayed after completion of splicing. Splice loss is affected by certain factors stated. These factors are taken into account to calculate, or estimate, splice loss. The calculation is based on certain dimensional parameters, such as MFD.

If either the cleave angle measured or the estimated splice loss exceeds its set threshold, an error message is displayed. If the spliced fiber is detected as abnormal, the "Fat", "Thin" or "Bubble" error message 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 loss may be improved in some cases by additional arc discharges. Press <u>ARC</u> key for an additional arc discharge (re-arc). Splice loss estimate and splice check are performed again.

Restriction of the number of times of additional arc discharge can be set up. Since excessive additional arc discharge becomes the cause of worsening splice intensity and a splice loss, it can forbid the arc discharge more than the suitable number of times. Refer to [Splice Settings] for details.

T



Splice loss increase: Cause and remedy

Symptom	Cause	Remedy
Axial offset	Dust on v-groove or	
	fiber clamp chip	Clean v-groove and fiber clamp chip.
Fiber angle	Dust on v-groove or fiber clamp chip	Clean v-groove and fiber clamp chip.
	Bad fiber end-face quality	Check if fiber cleaver is well conditioned.
Core Step		
	Dust on v-groove or fiber clamp chip	Clean v-groove and fiber clamp chip.
Core Curve	Bad fiber end-face quality.	Check if fiber cleaver is well conditioned.
	Prefuse power too low or prefuse time too short.	Increase [Prefuse Power] and/or [Prefuse Time].
MFD Mismatch		
	Arc power too low	Increase [Arc Power] and/or [Arc Time].
Combustion	Bad fiber end-face quality	Check the cleaver
	Dust still present after cleaning fiber or cleaning arc.	Clean fiber thoroughly or Increase [Cleaning Arc Time]
Bubbles	Bad fiber end-face quality	Check if fiber cleaver is well conditioned.
	Prefuse power too low or prefuse time too short.	Increase [Prefuse Power] and/or [Prefuse Time].

Symptom	Cause	Remedy
Separation	Fiber stuffing too small	Perform [Motor Calibration]
	Prefuse power too high or prefuse time too long.	Decrease [Prefuse Power] and/or [Prefuse Time].
Fat	Fiber stuffing too much	Decrease [Overlap] and perform [Motor Calibration].
Thin	Arc power not adequate	Perform [Arc Calibration].
٥٥	Some arc parameters not adequate	Adjust [Prefuse Power], [Prefuse Time] or [Overlap].
Line	Some arc parameters not adequate	Adjust [Prefuse Power], [Prefuse Time] or [Overlap].



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

A loss becomes high when the following errors occur.

Electric discharge may become unstable when usage environment changes significantly. In such a case, please use it after performing "Stabilize Electrodes".



When ENT key has been pushed, "Stabilize Electrodes" is performed. Please perform an "Arc Calibration" after the end of "Stabilize Electrodes" according to the directions on a screen.

Storing splicing results

Splicing results is stored in memory.

After the 2000th result is stored, 2001st splice result is written over 1st result.

Storing results automatically

The splice result is automatically stored in memory when **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.

Once a certain comment is recorded, the same comment is recorded into subsequent splice results. To change comments, see the next paragraph.

How to input Mode Title/Comment/Password

Character list below is displayed by selecting Mode Title / Comments / Password.

- Move the cursor by pressing Up/Down Arrow key, MENU key, and press ENT key to input the selected character. If an incorrect character is inputted, move the cursor to [BS] and press ENT key to highlight the character, and then input the proper character over it.
- 2. Move cursor to [ENTER] on right side and press ENT key on completion of inputting characters.
- 3. In the case of Password input, the next screen image is displayed if the correct password is inputted. If the input password is incorrect, the previous screen image is displayed.



43

Fiber Proof Test

The strength of the splice point can be checked. After splicing when a proof-test is performed by pressing the **SET** key.



Heating protection sleeve

1. Hold left fiber with left hand at the edge of splicer.





> Keep holding fiber until fiber is completely transferred to tube heater.

- 2. Open the right side sheath clamp lid.
- 3. Place the protection sleeve over the Right side fiber to splice point.
- 4. Hold right fiber with right hand, and remove the splicer.
- 5. A protection sleeve is moved to a splice point, holding a fiber with the left hand. Be careful there is no slack at a splice point. However, excessive tension may also cause fracturing of the fiber.



- Check that the splice point is located in the center of a protection sleeve.
- > Check whether the twist has occurred on the right-and-left fiber.
 - > Put a tension member below the splice point.

6. Optical fiber is conveyed to a heater unit, and it takes down to a heater part and holds.



Make sure the splice point is located at the center of the protection sleeve.



If a protection sleeve is not centered with tube heater, the protection sleeve may not shrink completely. In this case, please set to a heater once again and perform re-heating.

7. Heater lid automatically closes when fiber is set. The heating cycle starts automatically as soon as the tube heater is closed.



Apply tension to the fiber until heater cover closes completely.

- If HEAT key is pressed during tube heating, the HEAT LED blinks. If HEAT key is pressed again, the tube heating process is aborted.
 - To disable the "Auto Start" function, set [Auto Start Trigger] in [Heater Menu] to turning off. Press HEAT key to start tube heating when "OFF" is selected.
- 8. If heat processing is completed, buzzer will sound and HEAT LED turns off.



 \geq

T

- Protection sleeve may stick to heater plate surface. Use a cotton swab to remove sleeve from heater.
- Since it gets very hot in the heater and the sleeve will get hot, you should not touch the sleeve immediately after heating.
- 9. Open tube heater lids and remove protected fiber from the tube heater. Apply some tension to the fiber while removing it from the tube heater.
- 10. Visually inspect the finished sleeve to verify no bubbles or debris/dust is present in the sleeve.

Cleaning and Checking before Splicing

It is possible to maintain the performance of the splicer for a long time with proper cleaning and maintenance.

Critical cleaning points and maintenance checks are described below.

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.
- Clean the bottom of the V-groove with an alcohol-moistened thin cotton swab. Remove excess alcohol from the V-groove with a clean dry swab.





Be careful to not contact the electrode tips.

 If the contaminants in the V-groove cannot be removed with an alcohol-moistened thin cotton swab, use a cleaved fiber end-face to dislodge contaminants from the bottom of the V-groove. Repeat step section 2 after this procedure.





Cleaning Fiber Clamp Chips

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. To clean the clamp chips do the following:



- 1. Open the wind-protector.
- 2. Clean the surface of the chip clamp with an alcohol-moistened thin cotton swab. Remove excess alcohol from the chip clamp with a clean dry swab.

Cleaning Fiber Cleaver of CT-30

If the circular blade or 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. Clean the circular blade or clamp pads with cotton swab moistened with alcohol.



Arc Calibration

See Section [Arc Calibration].

Periodical Checking and Cleaning

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

Cleaning of Objective Lens

If the surface of the objective lens becomes dirty, inaccurate observation of the fiber position may occur, resulting in higher splice loss or poor splicer operation. Therefore, clean objective lens. Otherwise, dirt may accumulate and become impossible to remove. To clean the objective lens, do the following:

- 1. Before cleaning the objective lens, always turn off the splicer.
- 2. Gently clean the lens with an alcohol-impregnated thin cotton swab. Remove excess alcohol from the lens surface with a clean dry swab.



Remove electrodes before cleaning objective lens.

Do not hit or touch the tip of the electrode when cleaning.



- 3. The lens surface should be clean and free of streaks or smudges.
- 4. Turn on the power and make sure no smudges or streaks are visible on the monitor screen. Perform the Dust Check procedure.

Cautions were displayed

Cleaver Blade Alarm displayed

Position Changing CT-30Cleaver Blade

If the cleaver does not cleave properly, rotate the blade 1/16th of a turn to replace the worn out blade position with a sharp blade position. Blade life is normally 1000 cleaves per blade position. To rotate the blade, do the following:

1. Push the slide button until it locks. And using a 1.5mm hex wrench, loosen the blade lock screw.



- 2. Rotate the circular blade 1/16th of a turn. (Use Cotton Swab)
- 3. Tighten the blade lock screw.



T

When rotating the blade, do not touch the cutting edge. Move the blade with a thin cotton swab, for easy and safe rotation.

Blade Height changing

 \geq

After the circular blade has been rotated a complete revolution (16 positions), its height needs to be adjusted to compensate for the wear.

- 1. Push the slide button until it locks. And using a 1.5mm hex wrench, loosen the blade lock screw
- 2. Using a 1.5mm hex wrench, loosen the adjuster lock screw.

cleaver does not cleave properly, rotate the blade.

3. Using a 1.5mm hex wrench, turn the adjuster clockwise so that the reference dot aligns with the next position mark. Never attempt to rotate the adjuster more than 2 position marks.

After blade height adjustment, the 16 blade positions can be used again. If the

4. Tighten the adjuster lock screw.





Blade Replacement

After the circular blade has been raised 2 times and rotated through all 3 positions (a total of approximately 48,000 fiber splices), it needs to be replaced. Contact the authorized distributor.

Electrode Caution displayed

Replace Electrodes

See Section [Replace Electrodes].

Another error displayed

Diagnostic Test

See Section [Diagnostic Test].

Composition of Splice Menu

Common parameters for the modes for splicing and machine setting can be set.

- 1. Press MENU key at [READY], [PAUSE] or [FINISH] state to open [Splice Menu].
- 2. Move cursor by pressing Up/Down Arrow key to a parameter to be selected.
- 3. Press ENT key to change values and settings.



Setting parameters

Parameter	Description
Select Splice Mode	Mode according to the fiber to splice can be chosen.
Pause1	f "Pause1" is set to "ON", the 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", the splicing operation pauses after fiber alignment is completed. With ECF "ON", core-to-core alignment is made after this pause.
Auto Start Trigger	Select of "On", and "OFF" can be performed.
Memory	A situation can be checked after splicing with this machine.
Splice Memory Comment	A comment can be added to the memory saved at the time of the end of connection.

Splice Mode

T

The optimal splice setting for a specific fiber combination consists of the splicing parameters listed below. In other words, the optimal splicing parameters depend on the fiber combinations, and are different from fiber to fiber.

- Parameters for controlling arc discharge.
- Parameters for calculating estimated splice loss.
- Parameters for controlling fiber alignment and splicing procedures.
- Threshold for error messages.

A series of optimal splice parameters for major fiber combinations are already stored in the splicer. These parameters are stored in the database area and can be copied to the user-programmable area. These splice parameters can be edited for a specific fiber combination.

How to select the "Splice Mode

- [AUTO SM/NZ/DS/BIF/MM] Use this mode if the fiber type is not identified.
- > [SM AUTO] and others
 - Use this mode if the fiber type is identified.

[SM FAST] and others

Use this mode if the fiber type is identified and prefer quick splice with high yield to consistent splice loss.

[SM-SM] and others Use this mode for splicing special fibers. This mode enables to set specific parameters for each splicing. Execute [Arc Calibration] before using this mode.

Below is a figure showing the Arc discharge conditions (relationship between "Arc power" and "Motor motion"). The conditions can be edited by changing the splicing parameters listed below. Depending on splice mode, certain parameters cannot be changed.



Select Splice Mode

Database of splice mode (AUTO)

Splice Mode	Description
AUTO SM/NZ/DS/BIF/ MM	This splice mode can splice standard telecommunications grade fiber, including SMF (ITU-T G.652), NZDSF (ITU-T G.655) and DSF (ITU-T G.653). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge and adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
SM AUTO	This splice mode can splice the standard SM fiber (ITU-T G.652).The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting The arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
MM AUTO	This splice mode can splice the standard MM fiber (ITU-T G.651). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting The arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
NZ AUTO	This splice mode can splice the standard NZDS fiber (ITU-T G.655). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.
DS AUTO	This splice mode can splice the standard DS fiber (ITU-T G.653). The amount of heat applied to the fiber is calibrated in real time by analyzing the cladding illumination during arc discharge then adjusting the arc current accordingly. This splice mode does not require the operator to perform an arc calibration.

Points to note: of AUTO SM/NZ/DS/BIF/MM mode

NZDS is specified using the splicing mode for standard NZDS fiber. However, for best results, it is recommended that the optimum splice mode be selected for a specific type of NZDS fiber. This is due to the variation in the NZDS fiber properties and optimum splicing parameters are different from one type of NZDS fiber to the next.

Database of splice mode (Special)

Splice Mode	Description
SM-SM	For splicing standard Single-mode fiber (ITU-T G652). The MFD is 9 to 10 um at wavelength of 1310 nm. Automatic arc calibration doesn't work in this splice mode.
NZ-NZ	For splicing Non-zero dispersion-shifted fiber (ITU-T G655). The MFD is 9 to 10 um at wavelength of 1550 nm. Automatic arc calibration doesn't work in this splice mode.
DS-DS	For splicing Dispersion-shifted fiber (ITU-T G653). The MFD is 7 to 9 um at wavelength near 1550 nm. Automatic arc calibration doesn't work in this splice mode.
ММ-ММ	For splicing Multi-mode fiber (ITU-T G651). Core diameter : 50.0 to 62.5 um Automatic arc calibration doesn't work in this splice mode. This mode is programmed to achieve the best splice loss of MM fiber. The appearance of splice point doesn't look fat

Profile type

SMF :	ITU-T G652	MFD : 9~10 um, Wave length : 1310nm
NZDSF :	ITU-T G655	MFD : 8~10 um, Wave length : 1550nm
DSF :	ITU-T G653	MFD : 7~9 um, Wave length : 1550nm
MMF :	ITU-T G651	Core : 50.0um, 62.5 um

It is possible to set the parameters for this mode. Suitable condition for fiber splicing can be achieve by adjusting the parameters. Please execute Arc Calibration before adjustment. Typical splicing modes with similar and dissimilar fiber types are available. You may adjust the parameters of these splicing modes for suitable splicing performance.

Database of splice mode (FAST)

Splice Mode	Description
SM FAST	For splicing standard Single-mode fiber (ITU-T G652). The MFD is 9 to 10 um at wavelength of 1310 nm.
	Automatic arc calibration doesn't work in this splice mode. Execute [Arc Calibration] before splicing.
MM FAST	For splicing Multi-mode fiber (ITU-T G651). Core diameter : 50.0 to 62.5 um Automatic arc calibration does not work in this mode. Execute [Arc Calibration] before splicing.
NZ FAST	For splicing Non-zero dispersion-shifted fiber (ITU-T G655). The MFD is 8 to 10 um at wavelength of 1550 nm. Automatic arc calibration doesn't work in this splice mode. Execute [Arc Calibration] before splicing.
DS FAST	For splicing Dispersion-shifted fiber (ITU-T G653). The MFD is 7 to 9 um at wavelength near 1550 nm. Automatic arc calibration doesn't work in this splice mode. Execute [Arc Calibration] before splicing.

Database of splice mode (Attenuation)

Splice Mode	Description
AT1 (SM)(DS)	[AT1] creates an intentional core axial offset and splices fibers. [AT1] mode provides an estimated splice loss, but this should be regarded as a reference as the estimated splice loss may not be correct in some cases, depending on fiber properties. A power meter is recommended for correct splice loss measurements.
AT2 (SM)(DS)(MM)	This mode allows the users to set a starting core offset value and a finishing core offset value. Set [Start Offset] manually and then splicing starts. Re-arcing is performed continuously / automatically until the axial offset reaches [Stop Offset] value. A splice loss estimate is not performed.

Referring or editing splice mode

Splicing parameters in each splice mode can be modified. Arc power and Arc time are considered the two most vital parameters. To edit parameters follow below steps:

- 1. In [Select Splice Mode] menu, move cursor to a splice mode to be modified. Press MENU key to display [Edit Splice Mode] menu.
- 2. Move cursor by pressing Up/Down Arrow key to a parameter to be changed.

1 5 Arc	8			5 // 8 Arc	
Arc1 Power	STANDARD		Arc1 Power	0.000	STANDARD
Arc1 Time	2000 ms		Arc1 Time	Arc1 Time	2000 ms
Arc2 Power	STANDARD		Arc2 Power	1500	STANDARD
Arc2 Time	0 sec		Arc2 Time	30000	0 sec
Arc2 On-Time	180 ms		Arc2 On-Time		180 ms
Arc2 Off-Time	0 ms		Arc2 Off-Time		0 ms
				0	
▲▼+ ← Select 🗐 Next Page Exit		ENT key		Change — Apply ESC Exit	

Initialization in the edited parameter

It can perform easily by returning mode to initial setting to return a preset value by package after changing a setup of each parameter.

- 1. The fiber classification of splice edit mode is chosen by the <u>ENT</u> key. Choose the same splice mode within splice mode.
- 2. Since the following display will come out if the <u>ENT</u> key is pressed after selection, Press the <u>ENT</u> key after a check.



Editting or erasing splice mode

How to create splice mode

There are necessary splice modes stored when the splicer is first delivered, and all the other modes are displayed [BLANK]. Follow the below steps to add a splice mode.

Select a "BLANK" splice mode and press <u>MENU</u> key. Typical splice modes stored in the splicer database are displayed. Select one splice mode to be copied. Press <u>ENT</u> key to execute. Press <u>ESC</u> key to verify the fiber type is named in the specific splice mode.



How to erase splice mode

Splice mode can be erased. Follow the below steps to erase splice mode.

- 1. Select the specific splice mode and press SET key to go to [Edit Splice Mode] menu. Select [Fiber Type] by pressing ENT key.
- 2. Select the "BLANK" and press ENT key to execute.
- Mode No.1 cannot be erased.
 Mode No.1 is automatically selected after erasing a splice mode.



57

AUTO mode: [SM AUTO]], [MM AUTO]], [NZ AUTO]], [DS AUTO]

Below is a list of Splicing parameters for AUTO modes Only a limited number of parameters listed below are displayed for AUTO modes to simplify the operation. Additional hidden parameters are all fixed values set at the factory.

Parameter	Description
Fundamental	Settings
Fiber Type	List of splice modes stored in database is displayed. A selected splice mode stored in the database area is copied to a selected splice mode in the user-programmable area.
Mode Title1	Title for a splice mode expressed in up to 11 characters.
Mode Title2	Detail explanation for a splice mode expressed in up to 15 characters. Title2 is displayed at the [Splice Mode Select] menu.
Rearc Time	Splice loss may be improved by an additional "rearc" discharge in some cases. The duration of this additional arc can be changed by this parameter.
Proof test	An ON/OFF setup of the proof test done after splice is performed.
Arc	
Cleaning Arc	A cleaning arc removes 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.
Arc Power	The Arc Power is fixed at STANDARD for AUTO modes. The Arc Power is changed automatically.
Arc Time	Arc Time is fixed at 6000ms. This is automatically set depending on the cladding illumination during Arc Discharge.
Error Limit	
Cleave Angle Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceeds the selected threshold (cleave limit).
Cleave Shape Error	Error message is displayed if the cleaved end face of either left or right fiber exceeds the selected threshold (cleave shape).
Fiber Angle Limit	An error message is displayed if the fiber offset exceeds the selected threshold (Fiber Angle).
Loss Limit	An error message is displayed if the estimated splice loss exceeds selected threshold (loss limit).
Bubble Sensitivity	An error message is displayed if the bubble of fiber exceeds the selected threshold (bubble).

> Menus change when [Select Splice Mode] is set to [SM], [NZ], [DS] and [MM] mode.

Special mode: [SM], [NZ], [DS], [MM]

Splicing parameters: special modes

In special modes in the user-selectable database, the user can select from a series of factory-set splicing modes for various splicing combinations. Below are the descriptions of the various parameters used in these modes.

Parameter	Description
Fundamental S	ettings
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.
Mode Title1	Title for a splice mode expressed in up to 11 characters.
Mode Title2	Detail explanation for a splice mode expressed in up to 15 characters. Title2 is displayed at the [Splice Mode Select] menu.
Rearc Time	Splice loss may be improved by an additional "rearc" discharge in some cases. The duration of this additional arc can be changed by this parameter.
Proof test	An ON/OFF setup of the proof test done after splice is performed.
Gap Setting	
Cleaning Arc	A cleaning arc removes 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
	[Gapsel Pos] lowards a liber whose MFD is bigger than the other liber MFD.
XY Alignment	[Gapsel Pos] lowards a liber whose MPD is bigger than the other liber MPD.
XY Alignment	[Gapset Pos] towards a fiber whose MPD is bigger than the other fiber mPD.Sets the focal point for fiber observation. The focal point moves closer to the core when [Focus] value is increased."Auto" focus is strongly recommended, as [Focus] optimization is very difficult. Left and right fibers are focused independently even if they are a different fiber type (dissimilar fiber splicing).If the fiber core cannot be observed (e.g. MM fiber), use the "Edge" parameter. [Align] and [Est. Mode] are automatically fixed to the "OFF" setting.
XY Alignment Focus-L/R Align	[Gapset Pos] towards a liber whose MPD is bigger than the other liber MPD. Sets the focal point for fiber observation. The focal point moves closer to the core when [Focus] value is increased. "Auto" focus is strongly recommended, as [Focus] optimization is very difficult. Left and right fibers are focused independently even if they are a different fiber type (dissimilar fiber splicing). If the fiber core cannot be observed (e.g. MM fiber), use the "Edge" parameter. [Align] and [Est. Mode] are automatically fixed to the "Clad" setting. [ECF] and [Auto Power] are automatically fixed to the "OFF" setting. 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.
XY Alignment Focus-L/R Align ECF	[Gapset Pos] towards a liber whose MPD is bigger than the other liber MPD. Sets the focal point for fiber observation. The focal point moves closer to the core when [Focus] value is increased. "Auto" focus is strongly recommended, as [Focus] optimization is very difficult. Left and right fibers are focused independently even if they are a different fiber type (dissimilar fiber splicing). If the fiber core cannot be observed (e.g. MM fiber), use the "Edge" parameter. [Align] and [Est. Mode] are automatically fixed to the "Clad" setting. [ECF] and [Auto Power] are automatically fixed to the "OFF" setting. Sets the aligning method for the fibers. "Core" : Aligns fibers by core position. "Clad" : Aligns fibers manually. Sets the axial offset ratio for ECF. See [ECF Splice] for detail. For a splice mode in which arc time is 5 sec. or longer, setting [ECF] "OFF" is automatically fixed to "OFF". If [ECF] is set "OFF", [Auto Power] is automatically fixed to "OFF".

A continuation of edit parameter list

Parameter	Description	
Prefuse And Stuff		
Prefuse Power	Sets the power of the prefuse 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 prefuse 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.	
Arc		
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 "Osec". 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".	
Tapering		
Taper Splice	Splice loss is sometimes improved when the fiber is tapered (pulled) during arc discharge to make the splice thinner. This sets taper function "ON". The following three parameters determine the taper shape.	
Taper Wait	Sets the taper wait time from the end of fiber stuffing until the start of pulling fiber.	
Taper Speed	Sets the fiber pulling speed.	
Taper Length	Sets the fiber pulling length.	

62S_Rev3

A continuation of edit parameter list

Parameter	Description
Estimation	
Estimating Mode	Selects splice loss estimation to "OFF" "Clad" "Core" "Core-Fine"
MFD-Left	Sets MFD of the fibers. This MFD value is taken into account for estimating
MFD-Right	splice loss.
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.
Wave Length	Sets the wave length. This value is taken into account for estimating splice loss.
Core Bending Coef.	Determines how Core bending (core step / core curve) influences splice loss estimation. If "Estimating Mode" is set "OFF" or "CLAD," Core bending is automatically set "OFF."
MFD Mismatch Coef.	Determines how MFD mismatch influences splice loss estimation. If "Estimating Mode" is set "OFF" or "CLAD," MFD mismatch is automatically set "OFF."
Error Limit	
Cleave Angle Limit	An error message is displayed if the cleave angle of either the left or right fiber ends exceeds the selected threshold (cleave limit). "OFF": Does not make judgment on cleave angle.
Cleave Shape Error	Error message is displayed if the cleaved end face of either left or right fiber exceeds the selected threshold (cleave shape). "OFF": Does not make judgment on cleave shape.
Fiber Angle Limit	An error message is displayed if the bend angle of the two fibers spliced exceeds the selected threshold (Fiber Angle Limit). "OFF": Does not make judgment on fiber angle.
Loss Limit	An error message is displayed if the estimated splice loss exceeds selected threshold (loss limit).
Bubble Sensitivity	An error message is displayed if the bubble of fiber exceeds the selected threshold (bubble).



Menus change when [Select Splice Mode] is set to [SM AUTO], [NZ AUTO], [DS AUTO] and [MM AUTO] mode.

Manual Splice Mode

This mode is to manually align and splice fibers. The following procedure is required, and is different from standard automatic splicing.

1. Select a splice mode that allows the splice parameter [Align] in page two of splice mode edit menu to be changed to "manual" (i.e. SM-SM mode).

Focus-L	Auto
Focus-R	Auto
Align	Core
ECF	
Auto Power	Core Clad Manual

- 2. Press <u>SET</u> key to drive the fibers forward. The fibers stop moving forward at the Gapset position.
- 3. Select a motor to be manually moved by pressing MENU key. The name of the motor to be moved is displayed in the monitor. Motor speed can be selected "fast" or "slow" by pressing SET key.
- 4. Press Up/Down Arrow key to move the selected motor and drive the fibers forward or backward.
- 5. After manual alignment is completed, press ARC key to arc and splice the fibers.



 \geq

- The splicer beeps if motor reaches its limit and stops. Press the opposite arrow key to move the motor again.
- Display messages can be erased by pressing ENT key. The message can be displayed by pressing ENT key again.

Motor	Up Arrow key	Down Arrow key
ZL/ZR	Forward	Backward
X/Y	Upward	Downward
Focus X/Y	Lens moves nearer fiber.	Lens moves away from fiber.

ECF Splice

When fibers having some core concentricity-error are aligned using the core-to-core method, their outer claddings are not aligned in line with each other as shown below. However, surface tension created during arc discharge aligns the fibers cladding-to-cladding due to the viscous self-centering effect. This results in a high splice loss due to the fact that the cores of the fibers are offset during the process.

The ECF (Eccentricity Correct Function) function in the splicer prevents this from happening. The amount of offset expected due to this surface tension phenomenon is calculated in advance, and this is taken into account to determine an intentional core axis offset amount that is added after the fiber cores are aligned. With this function, the fibers are core-to-core spliced even with the effect mentioned above. Some "Core step" may remain at splice point but this gives much lower splice loss than core axial offset. A long arc discharge counteracts ECF, because surface tension eventually aligns and splices fibers cladding-to-cladding. Canceling [ECF] by setting this "OFF" reduces core step amount and increases core axial offset.



Attenuation splice mode

Attenuation splice mode makes an intentional core axial offset to create attenuation at the splice point. Two types of attenuation splice modes are included in the splicer as stated below. Select either "AT1(SM)", "AT1 (DS)", "AT2(SM)", "AT2 (DS) or AT2 (MM) in data base area at [Fiber Type].

[AT1] mode

[AT1] creates an intentional core axial offset and splices fibers. [AT1] mode provides an estimated splice loss, but this should be regarded as a reference as the estimated splice loss may not be correct in some cases, depending on fiber properties. A power meter is recommended for correct splice loss measurements.

Parameter	Description
Target Loss	Sets target splice loss.
Coefficient	If actual splice loss measured does not match [Target Loss], the "coefficient" can be used to adjust this. This is often more practical than "Target loss" or "MFD" in terms of accuracy.
MFD-Left MFD-Right	Sets MFD of fibers to be spliced.
Other Parameters	Refer to other splice modes for complete description.

Splicing parameters

[AT2] mode

This mode allows the users to set a starting core offset value and a finishing core offset value. Set [Start Offset] manually and then splicing starts. Re-arcing is performed continuously / automatically until the axial offset reaches [Stop Offset] value. A splice loss estimate is not performed.

Splicing parameters	
Parameter	Description
Start Offset	Sets axial offset amount before splicing.
Stop Offset	Re-arc is continuously performed until axial offset reaches specific offset amount [Stop Offset]. Axial offset amount decreases as splicing occurs, so [Stop Offset] must always be smaller than [Start Offset]. The maximum amount of [Stop Offset] is 80% of [Start Offset].
Other Parameters	Refer to other splice modes for complete description.

Splicing parameters

[AT2] mode provides more stable performance than [AT1] mode, but some variation may inevitably occur. To decrease variation, set the [Cleave Limit] as low as possible.

- Attenuation splices made with [AT1] / [AT2] modes are not as accurate as power meter attenuation feedback splicing.
- [AT2 (MM)] mode is for attenuation splicing with MM fiber. Cladding alignment is performed with [AT2 (MM)] mode.

ENT key

Memory

This splicer stores up to 2,000 splicing results. Contents of data stored are different depending on splicing mode.

Splice Results Reference or Elimination

Splicing results stored in the memory can be displayed. Comments can be added or edited.



Memory Data can be downloaded by USB. Refer to instruction manual of "Data Connection".

How to display the splice Result data

1. Select [Memory] in [Splice Menu] and select [Splice Results] and press **ENT** key to display [Splice Results] Menu.

1 2 3 4 5			Memory Menu
Splice Menu			Splice Result
Select Splice Mode			Splice Result of Error
Pause 1	ON		Clear All Splice Results
Pause 2	ON		Camera Image
Auto Start Trigger	ON		
Memory			
Splice Memory Comment			
▲V+ ← Select		ENT key	▲V+ ← Select Exit

- 2. Splice memory is displayed.
- Select memory number by moving cursor to a specific memory number and press ENT key. The selected splicing result is displayed. Press MENU key to select a [Jump /Remove] option. Select the oldest data or Latest data by pressing Up/Down Arrow key. This can be removed by pressing ENT.
- 4. The selected splicing result is displayed. For adding or editing comments, press ENT key to display [Input Comment] screen.



How to Clear the Splice Results data

- 1. Press MENU key in [Splice Result] Menu.
- 2. Press MENU key in [Jump / Remove] Menu.
- 3. Select the first data in the range to be deleted by ENT key.
- 4. Select the last data in the range to be deleted by Up/Down arrow key.
- 5. Press ENT key to select the highlighted range. Press ENT key to delete the memory.

	Splice Result			Select Data	to Be Removed	
294: SM AUTO 295: AUTO:MM 296: SM AUTO 297: SM AUTO 298: SM AUTO 299: SM / 300: SM / 301: SM /	2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 2015.03.20 Jump / Remove Jump to Oldest Jump to Latest Remove Close	14:30 15:30 15:41 15:49 15:59 16:04 16:07 16:12		294: SM AUTO 295: AUTO:MM 296: SM AUTO 297: SM AUTO 298: SM AUTO 300: SM AUTO 300: SM AUTO 301: SM AUTO 302: AUTO:SM	2015. 03. 20 2015. 04. 02 ↓ + ← Select 1	14:30 15:30 15:41 15:49 15:59 16:04 16:07 16:12 08:48 Data To
	→	5	Splice Res Do you want to re selected data from	ult move the memory? Cancel		

How to display the splice Result of error

Only the memory which the error generated like the splice result memory display method can be displayed.

- 1. Select the splice result of error by pressing ENT key.
- 2. Only a memory with an error is displayed.

Clear All Splice Results

All splicing results can be cleared at once.

- 1. Move cursor to [Clear All Splice Result] in Memory Menu. And Press the ENT Key.
- 2. Press ENT key to display [Clear All Splice Result].

Memory Menu	Clear All Splice Results
Splice Result	
Splice Result of Error	
Clear All Splice Results	
Camera Image	If you execute, all memory data will be lost.
EN	T key

Clear All Splice Results

Camera Image

This function is used to store the fiber image after splice or error occurred. A total of 100images can be stored.

- 1. Select [Memory] in [Splice Menu].
- 2. Select [Camera Image] and press ENT key to display [Camera Image] Menu.

How to store the Camera Image Data

Select [No Image] by moving cursor to a specific memory number and press **ENT** key. The fiber image data is stored.



Max number of image storage is 100, and the image cannot be over-written, so delete some images to store new images.

How to display Camera Image Data

Select memory number by moving cursor to a specific memory number and press **ENT** key. The fiber image data is displayed.

How to delete Camera Image Data

Select the number in [Camera Image] and press the MENU key. The confirmation screens are displayed, and then press ENT key.

Splice Memory Comment

The splicing result is automatically stored in memory when <u>SET</u> or <u>RESET</u> 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. Once a commented is entered, the same comment is used for subsequent splice results.

At the time of shipment from factory, there is no comment inputted.



Select Sp Pause 1	lice Mode	ON
Pause 2		ON
Auto Star	t Trigger	Cover Close
Memory		
Splice Me	emory Comment	
		FUJIKURA
	▲V+ ← Select]Next Page

Heater Menu

Select Heater Mode

Each tube-heating mode is optimized for a type of Fujikura protection sleeve. These modes can be found in database area for reference. Copy the appropriate one and paste it to the user-programmable area. The operator can edit the user-programmable modes. The parameter in Heater mode becomes an addition and change with upgrade of software.

Data Base		
Parameter	Description	
60mmS	For standard 60mm protection sleeve,	
FP-03	Such as Fujikura FP-03 or FP-03M protection sleeves.	
40mmS	For standard 60mm protection sleeve,	
	Such as Fujikura FP-03 or FP-03M protection sleeves.	
TF-03(L-40)	Note : Cleave length 8mm.	
15mmS	For 400 or less um of diameters of coating and splice of the	
FPS01-400-15	interference length of 5 mm or less	
** mmS	For 400 or less um of diameters of coating. In addition, there are 20,	
FPS01-400-**	25, and 34 or 40 mm length.	
20mmS	For 900 or less um of diameters of coating. Splice of the interference	
FPS01-900-20	length of 6 mm or less	
** mmS	For 900 or less um of diameters of coating. In addition, there are 25,	
FPS01-900-**	and 34 or 40 mm length.	
60mmS	For Splice of a drops cable	
FPS01-DC-60		
FUSE2/3		
ST-FC		
FUSE900	For Euso connect splice	
SC-LC-ST-FC	For Fuse connect spince.	
FUSE2/3		
SC-LC		
40mmR	For standard 40mm protection sleeve,	
FP-05	Such as Fujikura FP-05 protection sleeves.	
40mmR	For standard 40mm protection sleeve,	
FP-04T	Such as Fujikura FP-04T protection sleeves.	
28mmR	For standard 28mm protection sleeve,	
FPS-08-28	Such as Fujikura FPS08-28 protection sleeves.	
30mmR	For standard 30mm protection sleeve,	
FPS-04-30	Such as Fujikura FPS04-30 protection sleeves.	
**mmS-L	900 or less um of diameters of coating with Covering material of	
FPS01-900-**	Hytrel. In addition, there are 25, and 34 mm length.	
The dimensions of the Protection Sleeve after heat shrink

Form	Tension member	Sleeve length	Prepare fiber length	Diameter of an adaptation optical fiber	Diameter of a result
FP-03	SUS	60mm	16mm or less	250~900um	3.1 <i>mm</i>
FP-03(40mm)	SUS	40mm	10mm or less	250~900um	3.1 <i>mm</i>
FP-04T	Glass ceramic	40mm	10mm or less	250~900um	4.0mm
FPS01-400-15	SUS	15mm	5mm or less	~400um	1.5mm
FPS01-900-20	SUS	20mm	6mm or less	~900um	2.3mm

* The dimensions of the protection sleeve after shrink vary depending on the diameter of the fiber.



Selecting Heater mode

Select the heater mode most suitable for the protection sleeve to be used.

- 1. Press <u>MENU</u> key in [READY], [PAUSE], [FINISH] state and press <u>MENU</u> key to display [Heater Menu].
- 2. Select [Select Heater Mode] in [Heater Menu]. [Select Heater Mode] menu is displayed.
- 3. Move cursor by pressing Up/Down Arrow key and press ENT key to select a heater mode.

Heater Menu				Se	elect Heate	er Mode	9
1 2 3 4 5					Select Heater	Mode	
Heater Menu			1.	60mmS			ED 02
Select Heater Mode			1.1	60mmS		ED 01	FP-03
Auto Start Trigger	ON		3:	15mmS		FPS01-	-400-15
	_		4:	20mmS		FPS01-	-400-20
	_		5:	25mmS		FPS01-	-400-25
			6:	34mmS		FPS01-	-400-34
			7:	40mmS		FPS01-	-400-40
			8:	20mmS		FPS01-	-900-20
			9:	25mmS		FPS01-	-900-25
▲V+	E	NT key		AV-	Esc Exit	Edit Mode	
MENU kev							

4. The check in the heater mode selected on the OK screen can be performed.



When a setup of "Auto Cover Open" is OFF, the cover will be in the state where it was closed. A cover opens, if the HEAT key is pressed once before doing heating work. Moreover, heater cover does not open automatically at the time of the end of heating. So please push HEAT key and take out the sleeve.

- When using a protection sleeve which is not made by Fujikura, please set parameters based on the specific sleeve.
- When the sleeve of another company is used, the durability of a protection point cannot be warrantied.

Referring to or Editing Heater Mode

Tube-heating conditions stored in heater mode can be edited or changed.

- 1. Move cursor and select a mode to be edited in [Select Heater Mode] menu. Press MENU key to display [Edit Heater Mode] menu.
- 2. Press Up/Down Arrow keys to move cursor to a parameter to be changed then press ENT key to enter.
- 3. Change value by pressing Up/Down key, then press ENT key to enter.



Heater mode parameters

Parameter	Description
Sleeve type	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.
Mode Title1	Title of a heater mode that is displayed in the lower right part of the monitor during the splicing/heating process. Max number of characters used is 7.
Mode Title2	Description of a heater mode in the [Sleeve Type] screen. Max number of characters used is 15.
Heat Time	Sets heating time from the beginning to the end (cool-down completion). Heating time is automatically adjusted with atmospheric conditions, such as ambient temperature. Heating time may be longer or shorter than [Heat time] set.
Heat Temperature	Sets heating temperature.
Finish Temperature	Sets the finish temperature. The buzzer beeps after completion of the heating. Caution Do not touch the shrunken sleeve after removing the fiber from the tube heater. It may be hot. Hot sleeves easily deform and can cause some residual stress at the splice point. Use J-plate to cool down the sleeve.

Tube-heating for Splice-on-connector

The heater of this splicer corresponds to connector. It can be used for connectors from other companies by changing the sheath clamp portion, and the heating operation can be performed easily.

Exchange of a heater clamp

1. Remove the rear screw of the heater.



2. Clamp unit is made to slide and exchanged for other size.





When using Fujikura Fuse Connect, removing the clamp is unnecessary. Heating contraction work can be done in the usual state. *The sleeve position may need to be shifted prior to heating.

Setting Menu

Composition of Setting Menu

Common parameters for all the modes for splicing can be set.

- 1. Press MENU key in [READY], [PAUSE], and [FINISH] state and press MENU key to display [Setting Menu].
- 2. Select [Splice Settings] in [Setting Menu] to display [Splice Settings] menu.
- 3. The password will be required. Enter the password.
- 4. Select a parameter to be changed. Press ENT key to change values.
- 5. Change the value by pressing Up/Down key, then press ENT key to enter.



Splice Menu

Setting Menu

Setting Menu

Splice Settings

The parameter about warning and a maintenance item can be changed.

- 1. Press MENU key in [READY], [PAUSE], or [FINISH] state to display [Splice Menu].
- 2. Select [Splice Settings] in [Splice Menu] to display [Splice Settings] menu.
- 3. Select a parameter to be changed. Press ENT key to change values.
- 4. Change value by pressing Up/Down key, then press ENT key to enter.

Splicing Settings parameters

Parameter	Description
Fiber Image on so	reen
Gapset	Sets the method of displaying the fiber image on the screen during
Align	Splicing operation.
Arc	Y Enlarged display of X-axis image Y Fnlarged display of Y-axis image
Estimate	X▲ ▼ Y : Composite display vertically of X-axis and Y-axis images
Pause1	Sets the method of displaying the fiber image on the screen during Splicing operation.
Pause2	X : Enlarged display of X-axis image Y : Enlarged display of Y-axis image
Finish	X▲▼Y : Composite display vertically of X-axis and Y-axis images DATA : Displays result of cleave angle and offset measurements.
Ignore Splicing E	rror
Loss	
Bubble	Set to "Enable" or "Disable".
Fat	Enable : An operator can accept and bypass an error shown on the left
Thin	Disable : An operator can't bypass an error shown on the left.
Dust Burned	
Cleave Angle	Set to "Enable" or "Disable". Enable : An operator can accept and continue with the error as shown on
Cleave Shape	the left by pressing the <u>SET</u> key. Disable : An operator can't override the error as shown on the left. The
Fiber Angle	unit repeats the alignment when the operator presses the <u>SET</u> key.
Others	
Max Num. of Rearcs	The re-arcing process sometimes improves the splice loss. However, excessive re-arcing may decrease the splice strength. With this function, it is possible to limit the number of re-arcs or to disable re-arc discharge.
Cleaver Counter Mode	When splicing, the splice increments the "Cleave Count".

Machine Settings

The parameter about warning and a maintenance item can be changed.

- 1. Select [Machine Settings] in [Maintenance Menu] to display [Machine Settings] menu.
- 2. Select a parameter to be changed. Press ENT key to change values.
- 3. Change value by pressing Up/Down key, then press ENT key to enter.

Available to set the parameters about warning and maintenance item.

Parameter	Description
Basic Settings	
Language	Sets a language to be displayed on the screen. Select a language to be displayed. The language that can be displayed changes by a software version and region code.
Buzzer Volume	Sets the sound volume of the buzzer.
Monitor Position	Sets the operational direction of splicer. [Front] is for front monitor operation. [Rear] is for rear monitor operation. [Auto] is switched to front monitor operation or rear monitor operation automatically.
V-groove	ON/OFF setup of V-groove illumination when the wind protector
illumination	opened.
Power Saving Timer	
Sleep(Battery)	Setting Sleep function turns off the power supply to the LCD Monitor if the splicer performs no operation after a certain period of time. When power saving mode starts and the LCD monitor's power
Shut Down(Battery)	supply is turned off, LED of the SET key side blinks. When returning from a sleep state it returns by pressing keys other
Sleep(AC)	than <u>HEAT</u> key. Automatically turns off the power supply to the splicer if it performs no operation for a certain period of time. The function
Shut Down(AC)	serves to prevent the battery capacity from running low if the splicer is left on for an extended period of time.
Power On Option	
Opening Title 1	Sets the message to be displayed when the splicer power is turned on.
Opening Title 2	Max number of characters: 15
Electrode	
Electrode Caution	When the number of splices exceeds the selected [Electrode Caution] value, the caution message prompting the operator to replace the
Electrode Warning	When the number of splices exceeds the selected [Electrode Warning] value, the caution message changes to the warning message.
Alarm Display during Reset	ON/OFF setup of displaying the above message when the splicer return to the ready state.
Cleave Blade Alarm	
Blade Position Change Blade Height	ON/OFF setup of the warning of the Cleaver counter can be performed.
Change	In OFF, warning is not indicated on a screen.
Blade Replacement	

A continuation of edit parameter list

Parameter	Description
Arc Calibration	
Cleave Limit	Sets the threshold of cleave angle error for the [Arc Calibration].
Max Number of Tests	Sets the number which ends an inspection compulsorily for the [Arc Calibration].

Supervisor Menu

Supervisor Settings: Used for Administrator to limit operator from selecting or changing certain functions.

Parameter	Description
Supervisor Settings	
Calendar	This function sets the date and time in the calendar
Supervisor Password	Changes the password to access the [Supervisor Menu].
Boot Password	Changes the password to access the [Boot password].
Password Boot Lock From	From selected date set and beyond, a password is required at splicer boot up in order to operate it.
Boot Lock Message 1	Sets the messages to be displayed at the boot password entry
Boot Lock Message 2	screen. Max number of characters: 15

Setting Menu

Menu Lock Settings

Parameter	Descriptions			
Password Setting				
Menu Lock Password	Changes the password to access the [Menu Lock Settings].			
Splice Mode				
Select Splice Mode	Setting to "Disable" prevents unauthorized editing and selecting of			
Edit Splice Mode	splice modes.			
Heater Mode				
Select Heater Mode	Setting to "Disable" prevents unauthorized editing and selecting of			
Edit Heater Mode	heater modes.			
Memory				
Clear All Splice Results	Setting to "Disable" prevents unauthorized erasing of splice result data on the memory.			
Splice Settings				
Splice Operation				
Ignore Splicing Error	[Splice Settings] Menu cannot be edited if this is set to "Disable"			
Fiber Image on Screen				
Others				
Machine Settings				
Basic Settings				
Power Saving Timer				
Power On Option	Setting to "Disable" prevents unauthorized editing of the [Machine			
Electrode	Settings] menu.			
Cleaver Blade Alarm				
Arc Calibration				
Maintenance Menu				
Replace Electrodes				
Stabilize Electrodes				
Clear Arc Count				
Clear Cleaver Counter				
Battery Discharge	Setting to "Disable" prevents operation of various functions related			
Motor Drive	to the [Maintenance Menu].			
Diagnostic Test				
Dust Check				
Arc Calibration				
Motor Calibration				



Maintenance Menu information

The splicer has the ability to perform routine maintenance. This section describes how to use the maintenance menu.

- 1. Press MENU key in [READY], [PAUSE] or [FINISH] state. Press MENU key to display [Maintenance].Select the [Maintenance Menu] press ENT key.
- 2. Select a function to perform.

Splice Menu Select Splice Mode Pause 1 ON Pause 2 ON Auto Start Trigger Cover Close Memory Splice Memory Comment Select Next Page Select Next Page Maintenance Replace Electrodes Stabilize Electrodes Stabilize Electrodes Clear Arc Count Clear Arc Counter Battery Discharge Motor Drive Image: Next Page Image: N		1 2 3 4	4 5		
Select Splice Mode Pause 1 ON Pause 2 ON Auto Start Trigger Cover Close Memory Splice Memory Comment Splice Memory Comment Image: Select Image: Se			Splice Menu		
Pause 1 ON Pause 2 ON Auto Start Trigger Cover Close Memory Splice Memory Comment Splice Memory Comment Image: Splice Close Cover Close Maintenance Next Page Maintenance Next Page Replace Electrodes Stabilize Electrodes Stabilize Electrodes Stabilize Electrodes Stabilize Electrodes Discharge Stabilize Flectrodes Dust Check Arc Calibration Maintenance Battery Discharge Motor Drive		Select Splice Mode			
Pause 2 ON Auto Start Trigger Cover Close Memory Splice Memory Comment Splice Memory Comment Image: Splice Memory Comment Imaintenance Imaintenance Replace Electrodes Stabilize Electrodes Stabilize Electrodes Stabilize Electrodes Clear Arc Count Clear Arc Count Clear Arc Count Clear Arc Count Clear Arc Count Clear Arc Count Clear Arc Count Maintenance Battery Discharge Motor Drive		Pause 1		ON	
MENU key Auto Start Trigger Nemory Splice Memory Comment Image: Splice Memory Comment <tr< td=""><th></th><td>Pause 2</td><td></td><td>ON</td><td></td></tr<>		Pause 2		ON	
MENU Key Splice Memory Comment Splice Memory Comment Image: Splice Memory Comment		Auto Start Trigger		Cover Close	x
Splice Memory Comment Image: Select in Next Page Image: Stabilize Electrodes Stabilize Electrodes Clear Arc Count Battery Discharge Motor Drive Image:	MENU Key	Memory			
Image: Select Stabilize Electrodes Clear Arc Count Clear Arc Count Clear Arc Count Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Image: Motor		Splice Memory Cor	nment		
1 2 3 4 5 Maintenance Maintenance Maintenance Diagnostic Test Stabilize Electrodes Clear Arc Count Clear Cleaver Counter Dust Check Clear Cleaver Counter Battery Discharge Motor Drive Motor Calibration Motor Drive Motor Drive Maintenance Info. Maintenance Info.			Select 曰Next Par	ne er	MENU key
1 2 3 4 5 Maintenance Maintenance Maintenance Replace Electrodes Diagnostic Test Stabilize Electrodes Diagnostic Test Clear Arc Counter Dust Check Battery Discharge Motor Drive Motor Drive Image: Select Intervention Motor Drive Image: Select Intervention Image: Select Intervention <th></th> <td></td> <td></td> <td>je</td> <td></td>				je	
1 2 3 4 5 Maintenance Maintenance Maintenance Replace Electrodes Diagnostic Test Stabilize Electrodes Diagnostic Test Clear Arc Counter Dust Check Battery Discharge Motor Calibration Motor Drive Maintenance Info. Motor Drive Image: Select Diagnostic Test Dust Check Arc Calibration Motor Drive Image: Select Diagnostic Test Image: Diagnostic Test Dust Check Arc Calibration Motor Calibration Maintenance Info. Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Diagnostic Test Dust Check Arc Calibration Motor Drive Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image: Diagnostic Test Image:			ESC EXIL		
1 2 3 4 5 Maintenance Maintenance Maintenance Replace Electrodes Diagnostic Test Stabilize Electrodes Dust Check Clear Cleaver Counter Dust Check Battery Discharge Motor Drive Motor Drive Image: Select in Next Page					
1 2 3 4 5 Maintenance Maintenance Maintenance Replace Electrodes Diagnostic Test Stabilize Electrodes Dust Check Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Motor Drive Image: Clear Arc Calibration Motor Drive Image: Clear Arc Calibration Motor Calibration Motor Drive Image: Clear Arc Calibration Motor Calibration Maintenance Info. Image: Clear Arc Calibration Motor Calibration Maintenance Info. Image: Clear Arc Calibration Meintenance Info. Image: Clear Arc Calibration Meintenance Info. Image: Clear Arc Calibration Meintenance Info. Image: Clear Arc Clear Arc Calibration Motor Calibration Maintenance Info. Image: Clear Arc					
Maintenance Replace Electrodes Stabilize Electrodes Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Motor Drive Image: Discharge Motor Drive Image: Discharge Motor Drive Image: Discharge Image: Dischar				1 2 3	4 5
Replace Electrodes Stabilize Electrodes Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Motor Drive Menu key Menu key Diagnostic Test Dust Check Arc Calibration Motor Calibration Maintenance Info. Menu key Menu key	Maintenance				Maintenance
Stabilize Electrodes Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Motor Drive Image: Discharge Motor Drive Image: Discharge Motor Drive Image: Discharge	Replace Electrodes			Diagnostic Test	
Clear Arc Count Clear Cleaver Counter Battery Discharge Motor Drive Motor Drive Menu key Menu key	Stabilize Electrodes			Dust Check	
Clear Cleaver Counter Motor Calibration Battery Discharge Maintenance Info. Motor Drive Menu key Menu key Menu key	Clear Arc Count			Arc Calibration	
Battery Discharge Maintenance Info. Motor Drive Maintenance Info. Menu key Menu key	Clear Cleaver Counter			Motor Calibration	
Motor Drive Motor Drive Menu key MENU key Key Key	Battery Discharge			Maintenance Info	
MENU key	Motor Drive				
MENU key					
Image MENU key Image Image MENU key Image					
	🗚 🗸 🕂 🚝 Select 🗐 Next Page		MENU kev	AV+	- 😝 Select 🗐 Next Page
	ESC Exit		niento noy		ESC Exit

Replace Electrodes

When the number of arc discharges reaches a count of setting value a message prompting to replace the electrodes is displayed immediately after turning on the power. Using the worn electrodes will result in greater splice loss and reduced splice strength. Use attached screw driver (SD-01).

Replacement Procedure

- 1. Execute [Replace Electrodes] in [Maintenance Menu].
- Instruction messages will appear on the screen to turn off the power. Press and hold ENT key till the LED color changes from green to red.
- 3. Remove the old electrodes.

To remove and replace the electrodes:

- *i.* Remove the electrode cover and loosen screw located on electrode holder.
- *ii.* Take electrode out of electrode holder. (Electrode is fit in electrode holder)





- 4. Install the new electrodes with care; do not hit the electrode tips.
- *i.* Fit the electrode in the electrode holder.
- *ii.* Place the electrode holder on the splicer and tighten screw.
 - > Apply tightening torque of 20cNm when tightening screw to fix electrode.
 - > Make sure the electrodes are attached firmly after tightening screws.

- 5. Turn on the power, prepare fibers into the splicer and press **ENT** key. After executing the arc calibration, the splicer will repeat arc discharge to stabilize the electrodes.
- 6. Upon completion of repeated arc discharge, the splicer executes an arc calibration again. The operator should repeat arc calibration until the "Test Finish" message appears. For details of the arc calibration process, see section [Arc Calibration].

Stabilize 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. If many tests are needed until the "Test OK" message appears in [Arc Calibration], use this function as well.

Operation Procedure

1. Select the [Stabilize Electrodes].



- 2. Set the prepared fibers in the splicer.
- 3. Press **ENT** key and the splicer begins to stabilize the electrodes in the following ways:
- 4. After completing stabilization, always perform an additional [Arc Calibration].

Clear Arc Count

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

- 1. Select the [Clear Arc Count].
- 2. As the confirmation screen "Is it OK to clear?" appears, press ENT key to clear.



- This function is included in the [Replace Electrodes] function.
- The number of arc discharges in the "Total Arc Count" field displayed on the [Maintenance Info.] screen cannot be reset.

Clear Cleaver Counter

This function was the stored number of [Cleaver Counter] to be reset.

- 1. Select the [Clear Cleaver Counter].
- 2. As the confirmation screen "Is it OK to clear?" appears, press ENT key to clear.

Parameter	Descriptions
Cleave Count	The number of times of cleave is displayed.
Blade Position	The position of a blade is displayed.
Blade Height	The height of a blade is displayed.

It performs, after adjusting Cleaver who is using it.

Battery Discharge

The battery pack (BTR-09) uses Li-ion cells. If the battery is repeatedly charged, the battery indicator may become different from the actual battery capacity. If such a phenomenon occurs, execute [Battery Discharge] to reduce the actual remaining capacity and the battery indicator to zero. Then, recharge the battery pack.

The power saving function turns off automatically during [Battery Discharge].

Operation Procedure

- 1. Insert the battery pack inside the splicer that is intended to discharge completely, and turn on the power.
- 2. Change the screen from [Main Menu] to [Maintenance Menu] and execute [Battery Discharge].
- 3. The [Battery Discharge] screen is displayed, and the remaining battery voltage is indicated.
- 4. Upon completion of full discharge, the buzzer sounds and the power turn off.
- 5. Recharge the battery pack.



If the battery pack is almost fully charged, it will take a significant amount of time to discharge it completely. It is recommended that this function be used after considerable time of use when the capacity is low.

Motor Drive

Some motors in a splicer can carry out manual operation separately. In the course of splicing, the motors can also be operated by calling this menu in the [PAUSE], or [FINISH] state.

- 1. Select the [Motor Drive].
- 2. Pressing MENU key changes motor selection. The name of the selected motor is displayed in the upper section of the screen.
- 3. Press Up/Down Arrow key to drive the motor in the desired direction.

Motor	Up Arrow key	Down Arrow key
ZL/ZR	Forward	Backward
X/Y	Upward.	Downward.
Focus X/Y	Lens moves nearer fiber.	Lens moves away from fiber.

- When the motor reaches the limit of the operating range, the buzzer sounds and the motor stops. Press the opposite arrow key to reverse and move the motor again.
- Display messages can be erased by pressing ENT key. The message can be displayed by pressing ENT key again.
- > If the motor is moved too much with respect to the spliced fiber, the fiber may break.

Diagnostic Test

The 62S has a built in diagnostic test feature that allows the operator to perform a simple one step evaluation of splicer performance covering several different critical variables. Perform this function in the event of splicer operation trouble.

Operation Procedure

Check Item	Description
LED Check	Measures and adjusts the brightness of the illumination LED.
Dust Check	Checks the optical path for dust or dirt and judges whether they disturb fiber observation. If contamination exists, this function indicates the location.
Motor Check	Check the Motor Limit Sensor.
Motor Calibration	Check the Motor Calibration.
Arc Calibration	Automatically calibrates the arc power factor and fiber splicing position.
I/O Port Check	Checks for normal operation of the input and output terminals of the internal circuit.
Memory Check	Checks the memory of the internal circuit.

1. Select the [Diagnostic Test] in the [Maintenance Menu] and execute [Diagnostic Test]. The following checks will be made.



- > Before the start of the test, remove the fibers from the splicer.
- When the Motor check is completed, prepare and load the fibers into the splicer and press ENT key.
- 2. Upon completion of all checks and adjustments, a list of results is displayed. If the dust check result is not good, clean the objective lenses. In the case that cleaning cannot eliminate contamination, there is a possibility that the contamination may have entered the inside of the optical path. Please contact the authorized distributor for additional instructions.

The dust check and Motor Calibration functions exist as independent instructions in [Maintenance Menu]. It is possible to execute them independently.

Dust Check

The splicer observes fibers through image processing. Dust or contaminants on the cameras and lenses disturb normal observation of fibers and may result in improper splicing. This function checks the optical path for the presence or absence of contaminants and judges whether they cause trouble for fiber splicing.

Operation Procedure

- 1. Select the [Dust Check] in the [Maintenance Menu].
- 2. If fibers are set in the splicer, remove them and press **ENT** key again. The splicer begins the dust check.
- 3. After observation, the location of contamination judged as a potential problem blinks. If contamination is discovered, clean the objective lenses and redo [Dust Check] for cleaning instructions.
- 4. Press ESC key to finish dust check.



Execute Esc Exit

- In case you have cleaned the objective lenses and dirt or dust still remains, contact the authorized distributor.

Arc Calibration

Atmospheric conditions such as temperature, humidity, and pressure are constantly changing, which creates variability in the arc temperature. This splicer is equipped with temperature sensor that is used in a constant feedback monitoring control system to regulate the arc power at a constant level. Changes in arc power due to electrode wear and glass adhesion cannot be corrected automatically. Also, the center position of arc discharge sometimes shifts to the left or right. In this case, the fiber splicing position has to be shifted in relation to the arc discharge center. It is necessary to perform an arc power calibration to eliminate both of these issues.

- Arc calibration is performed automatically using [AUTO] mode only. So arc calibration does not have to be performed when splicing in this mode.
- > Execute [Arc calibration] before using non-auto mode.
 - When performing the [Arc Calibration] function change the arc power "factor" value. The factor value is used in the algorithm program for all splicing. The arc power value will not change in the splice modes.

Operation procedure

T

T

- 1. Select [Arc Calibration] in [Maintenance Menu] to display Arc Calibration screen.
- 2. Set prepared fibers onto the splicer.



- ▶ Use standard SMF ITU-T G652 fiber for Arc Calibration.
- Use well prepared fibers for arc calibration. Dust on the fiber surface affects arc calibration.
- Cleave angle threshold does not link to the parameter "Cleave Limit" in splicing modes. Cleave angle threshold is independently set for arc calibration. See section [Machine Settings] to change cleave angle threshold.
- 3. The ARC Calibration will begin after pressing ENT key.

"Good" message

Arc power and splicing position calibration are successfully completed. Press ESC key to exit.



"Not Adequate" message

Arc power and splicing position calibration are completed but further calibration is strongly recommended, as the change from the previous arc calibration is too large. Press **ENT** key to perform arc calibration, or **ESC** key to exit even though arc calibration is not completed.



Result: Not Adequate

IF

- In some cases, multiple iterations of arc calibration are needed until the calibration process is successfully completed and the "Test Finish" message is displayed. Arc calibration can be considered almost completed if multiple iterations are completed without receiving the message.
- Number threshold can be set so that "Test Finish" message is displayed after specific number of arc calibrations is performed. See section [Machine Settings] for detail.

Motor Calibration

Motors were adjusted at the factory before shipping. However, settings could change due to various reasons. This function automatically calibrates the speed of all motors.

Operation Procedure

- 1. Select the [Motor Calibration] in the [Maintenance Menu].
- 2. Load prepared fibers in the splicer and press **ENT** key.
- 3. Speeds for all motors are automatically calibrated.

Perform this function when "Fat" or "Thin" error has occurred.

Maintenance Info

The maintenance information on this equipment can be checked.

Maintenance Info.		Maintena
Serial Num.		Cleave Count
Version	00.0112	Blade Position
Arc Count	517	Blade Height
Total Count	517	Power Source Type
Last Authorized Service	2008.01.01	
Next Authorized Service	2009.01.01	

Change Page 🔀 Exit

ice Info.

16 1 Low Battery Pack 13072311

	Select the	<i>Maintenance</i>	Infol.	The follo	wina info	rmation i	s displaveo	1.
--	------------	--------------------	--------	-----------	-----------	-----------	-------------	----

Change Page Esc Exit

Parameter	Description
Serial Num.	Displays the serial number of the splicer.
Version	Displays the version number of the software.
Arc Count	Displays the number of arc discharges after electrode replacement. Performing the function [Replacements Electrode] or [Clear Arc Count] resets this parameter to zero.
Total Count	Displays the total number of arc discharges.
Last Authorized Service	Displays the date of last authorized service.
Next Authorized Service	Displays the scheduled date of next authorized service.
Cleave Count	Displays the total number of Cleave Count.
Blade Position	Displays the current Blade Position.
Blade Height	Displays the current Blade Height.
Power Source Type	Displays the using Power Source.

Press ENT when an error is shown on the monitor. The [HELP] screen displays the following.

When an error is in the list below, the splicer repeats the alignment when the operator presses the SET key.

·L-Too Long Fiber
·R-Too Long Fiber
·LR-Too Long Fiber
·L-Too Dusty Fiber
·R-Too Dusty Fiber
·ZL Motor Overrun (Forward)
·ZR Motor Overrun (Forward)
·ZL Motor Overrun (Backward)
·X motor Overrun
·Y Motor Overrun
·Focus X Motor Overrun
·Focus Y Motor Overrun
·Cannot detect fiber in AUTO mode

·L/R-Bad Fiber Position

When an error is in the list below, the splicer carries out operation which changes with preset values of "Ignore Splicing Error", when the operator presses the <u>SET</u> key. See Section [Splice Settings].

·Large Cleave Angle

·Large Fiber Angle

·Cleave Shape NG

•Thin

∙Fat

Bubble

Dust Burned

·High Loss Estimated

Follow the solution precisely as shown in the list below. If it is not possible to eliminate the problem, the splicer may require service by a qualified service center. Consult the authorized distributor with the following information:

•Model name of the splicer

 \cdot Serial number of the splicer

Error message

·Situation when the error occurs

Error Message	Reason	Solution
L-Too Long Fiber	·The cleave length (bare	 Confirm the setting position of the stripped fiber end on the fiber cleaver. Check the cleave length. Execute the [Dust Check]. Clean the lens when dust or dirt exists.
R-Too Long Fiber	fiber part) is too long. •Dust or dirt is on the	
LR-Too Long Fiber	objective lens.	
X-Dark Back Ground	•Dust or dirt is on the objective lens.	 Execute the [Dust Check]. Clean the lens when dust or dirt exists
Y-Dark Back Ground	•The LED or Camera might be damaged.	·Consult your distributor.
L-Too Dusty Fiber	 Dust or dirt is on the fiber surface. Dust or dirt is on the objective lens. [Cleaning Arc] time is too short or "OFF." Splicing indistinct core fibers with the SM or DS 	 Completely prepare the fiber again (strip, clean and cleave). Execute the [Dust Check]. Clean the lens if dust or dirt exists. Set the [Cleaning Arc] time to "150ms". When splicing carbon coated fibers, set to "200ms". Use the MM mode to splice indistinct core fibers
R-Too Dusty Fiber	modes. [Align] is set to "Core" to splice indistinct core fibers when using other splice modes. [Focus] is incorrectly set when using other splice modes.	 (i.e. MM fiber). Set [Align] to "Clad" to splice indistinct core fibers (i.e. MM fiber). Set [Focus] to "Edge" to splice indistinct core fibers (i.e. MM fiber). To splice distinct core fibers, "Auto" or the correct focus value shou be entered.

Error Message	Reason	Solution
ZL Motor Overrun (Forward) ZR Motor Overrun	•The fiber is not set correctly at the bottom of the V-groove. The fiber is not located in the Camera's field of view. •The cleave length (bare	 Press RESET key, and set the fiber again to seat it correctly at the bottom of the V-groove. Confirm the setting position of the stripped fiber end on the fiber cleaver. Check the cleave length
(Forward)	fiber part) is too short.	
ZL Motor Overrun (Backward)	•The taper speed or taper time is set too high.	•Adjust the taper parameters in the splice mode.
ZR Motor Overrun (Backward)	•Only occurs in manual mo	tor operation.
X motor Overrun	•The fiber is not set correctly at the bottom of the V-groove. The fiber	•Press RESET key and re-position the fiber
Y Motor Overrun	is offset too far and it exceeds the X or Y motor range.	V-groove.
Focus X Motor Overrun	•The fiber is not set correctly at the bottom of the V-groove. The fiber position is out of focus range.	•Press RESET key, and re-position the fiber again to seat it correctly at the bottom of the V-groove
Focus Y Motor	•Dust or dirt is on the fiber surface resulting in focus failure.	•Completely prepare the fiber again (strip, clean and cleave).
Overrun	•Dust or dirt is on the objective lens.	•Execute the [Dust Check]. Clean the lens.
Cover Opened	•The wind-protector is opened during splicing operation.	•Press RESET key after closing the wind-protector.
ZL/R X/Y Focus X/Y Heater Motor trouble	•Motor might be damaged.	•Consult the authorized distributor.

Error Message	Reason	Solution
Cannot detect fiber in AUTO mode	 Dust or dirt is on the fiber surface. The left and right fiber types are different. Splicing non-standard fibers. 	•Completely prepare the fiber again (strip, clean and cleave).Select the suitable splice mode.
Strong Arc Power	•Unable to calibrate due to strong arc.	
Weak Arc Power	 Unable to calibrate due to weak arc. 	•Replace the electrodes by using the [Replace Electrodes] function in. If this does not
Too Left /Right Arc	·Unable to calibrate due to poor arc field position (too far left or Right).	distributor.
Fiber	•The fiber stuff amount is insufficient.	•Execute the [Motor Calibration] function. If using other splice modes, check the [Overlap] setting in the splice mode.
Separation	•The pre-fuse power or pre-fuse time is set too high.	•Check the [Prefuse Power] and [Prefuse Time] settings in the splice mode.
L/R-Bad Fiber Position	•The fiber is not set correctly at the bottom of the V-groove.	•Press RESET key, and re-position the fiber again to seat it correctly at the bottom of the V-groove.
No Arc Discharge	•Arc Discharge did not occur.	 Assure the electrodes are in proper position. Replace the electrodes. Consult the authorized distributor.

Error Message	Reason	Solution
Large Cleave Angle	•Bad fiber end-face.	 Check the condition of the fiber cleaver. If the blade is worn, rotate the blade to a new position.
	 [Cleave Limit] is set too low. 	·Increase the [Cleave Limit] to an adequate limit.
Large Fiber	•Dust or dirt is on the V-groove or the clamp chip.	•Clean the V-groove and clamp chip, and set the fibers again. If the error occurs again, strip, clean and cleave the fibers.
Angle	•Bad fiber end-face.	 Check the condition of fiber cleaver. If the blade is worn, rotate the blade to a new position.
Cleave Shape NG	·Bad fiber end-face.	•Check the condition of fiber cleaver. If the blade is worn, rotate the blade to a new position.
Arc Discharge Delayed	•Arc Discharge is delayed	 Assure the electrodes are in proper position. Execute the [Stabilize Electrode] function. Replace the electrodes.
Thin Fiber	 Inadequate arc power 	 Calibrate the arc power with the [Arc Calibration] function.
	 Prefuse power or time is set too high 	 If using the Special mode, adjust or initialize [Prefuse Power] or [Prefuse Time] settings. For normal splice mode, the prefuse is fixed and cannot be adjusted.
	 Insufficient [Overlap] setting 	 If using the Special mode, adjust or initialize [Overlap] setting. For normal splice mode, the overlap is fixed and cannot be adjusted
Fat Fiber	·Too much [Overlap] setting	•Execute [Motor Calibration] function in the maintenance menu to calibrate the stuff amount.
Too Tapering Fiber	•Too much fiber taper.	 If using the taper splice function, the error message may appear meaning the fiber is tapered too much.
	•Bad fiber end-face.	 Check the condition of fiber cleaver. When the blade is worn, rotate the blade.
Bubble	•Prefuse power or time is set too low	 If using the Special mode, adjust or initialize [Prefuse Power] or [Prefuse Time] settings. For normal splice mode, the prefuse is fixed and cannot be adjusted.
Large Dust Burn	•Bad fiber end-face.	 Check the condition of the fiber cleaver. If the blade is worn, rotate the blade to a new position.
	•[Cleaning Arc] time is too short or "OFF."	•Dust still present after cleaning fiber or cleaning arc. Clean fiber thoroughly or Increase [Cleaning Arc Time]

Error Message	Reason	Solution
High Estimated Loss	·Insufficient fiber cleaning.	 Dust or dirt on the fiber surface results in bad splice loss and low tensile strength. Clean the fiber surface sufficiently. Do not clean the fiber after cleaving to prevent dust on the fiber end-face. Avoid any contact with the fiber end-face.
	•Bad fiber end-face.	 Check the condition of fiber cleaver. If the blade is worn, rotate the blade to a new position. Confirm the [Cleave Limit] setting. 2.0° or less is recommended.
	•Dust or dirt is on the V-groove or the clamp chip.	•Dust or dirt on the V-groove or clamp chip causes poor fiber movement during fiber stuffing. Clean them periodically.
	•Dust or dirt is on the lens	•Execute the [Dust Check]. If dust or dirt exists, clean the lenses.
	•Bad electrode condition.	•Replace the electrodes if they appear worn (rounded tip shape), dirty or bent.
	 Inadequate arc power. 	•Calibrate the arc power with the [Arc Calibration] function.
	 Using unsuitable splice mode 	\cdot Select a suitable splice mode for the fibers to be spliced.
	 [Loss Limit] is set too low. 	•Increase [Loss Limit] to an adequate limit.
	 Inadequate arc parameters in special mode 	•Confirm the arc parameters are adequate to splice the fibers.
	·Inadequate estimating parameters in special mode	•Confirm the estimating parameters are adequate to estimate the loss. The MFD mismatch function does not work for certain types of specialty fibers. In these cases, set the [MFD Mismatch] to "OFF".

Error Message	Reason	Solution
There is dust after executing Dust Check function	•Dirt or dust exists in optical path.	 Clean the objective lenses by referring see section [Cleaning of Objective Lens]. When the above processes cannot remove the dirt or dust, consult the authorized distributor.
X Camera Y Camera Trouble	•The Camera may be damaged.	•Consult the authorized distributor.
Heater Oven Trouble	 Heater does not heat. 	•Consult the authorized distributor.
Communication error	•Broken the internal device	•Consult the authorized distributor.
Temperature Sensor NG	•Temperature Sensor may be damaged.	•Consult the authorized distributor.

Power Supply

- (1) <u>Power does not turn on when pressing ON/OFF key</u> •The battery may not be charged. Charge is performed.
- (2) <u>Power does not turn off when pressing ON/OFF key</u> • Press and hold the key until the LED color changes from green to red.
- (3) <u>Few splices can be made with a fully charged battery pack</u>
 If the power saving function is not enabled, battery power degrades quicker. Always enable it to conserve power usage.
 - •The battery pack has reached the end of its service life. Install a new battery pack.
 - •The battery pack uses chemical reaction. The capacity decreases at low temperature, especially at lower than 0 degree C.

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

(4) <u>"CHARGE" LED on blinks during battery recharge</u>

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 the authorized distributor.
The battery pack has been used under the environment (especially 40 degrees C or more) where temperature is high, or direct rays.

- (5) <u>Method to change the power saving function settings</u> •Refer to [Machine Settings] function.
- (6) <u>Battery indicator is not displayed.</u> •At the time of AC adaptor use, a battery indicator is not displayed on a screen.

Splicing Operation

- (1) <u>Error message appears on monitor</u> •Refer to [Error Message List] function.
- (2) Inconsistent splice loss / High splice loss

·Clean the V-grooves, fiber clamps, and objective lenses.

- ·Replace the electrodes.
- "High Estimated Loss" error message section in the [Error Message List].

*·*If the fiber has curl or bend memory, position the fiber so the crown (curve) of the memory is turned downward.

•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 the authorized distributor Regular service (at least once a year) is recommended to maintain high splicing quality.

- (3) <u>Confirmation of splicing procedures</u> •Refer to [Basic Operation] function.
- (4) Monitor suddenly turned off

•The power saving function is automatically enabled 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 [Machine Settings] function.

(5) <u>Splicer power suddenly turned off without "Low Battery" message</u>

• The power saving function is automatically enabled when using a battery pack. The splicer turns the splicer power off after an extended period of splicer inactivity. Press ON/OFF key to turn on the splicer again. To change the length of time before the splicer turns the splicer power off, section [Machine Settings] function.

(6) <u>Method to initialize arc condition of Splice mode</u>
 ·Refer to [Initialization in the edited parameter] in [Splice Menu].

- (7) <u>Error message can be over-ridden</u> ·See Section [Splice Settings] to not allow error message override.
- (8) <u>Unable to change Arc Power and Arc Time</u>
 •The settings cannot be changed in AUTO modes.
 •If using the "Special Mode", the Arc Power and Arc Time may be locked by administrator, preventing them from being changed.
- (9) <u>Method to set Pause</u>
 ·See Section [Splice Menu] in [Splice Mode].
- (10) <u>Method to display Cleave Angle, Fiber Angle / Offsets</u> ·See Section [Splice Menu]. The fiber angle is not displayable in the SM, DS, MM or AUTO mode.
- (11) <u>Incorrect splice mode selected and used in AUTO mode</u> •The AUTO mode can detect only standard SM, DS, MM and NZDS fibers. When splicing specialty fibers, the AUTO mode may identify them incorrectly.

Tube-heating Operation

(1) Fiber protection sleeve does not shrink completely

·Fiber protection sleeve might not be set to the tube heater properly.

When setting the fiber to the heater, do not remove hands from the fiber until the heater cover closes and the buzzer sounds. If releasing hands from the fiber rapidly, the protection sleeve may not be set to the heatable position.

If the protection sleeve is not centered between yellow lines, the protection sleeve might not shrink completely.

- •Extend the heating time. •Refer to [Heater Mode].
- (2) Heater LED on panel keyboard blinks

•Pressing the HEAT key during heating causes the LED to blink. The tube heater is turned off if the HEAT key is pressed again. If, after 2 seconds have gone by without pressing the HEAT key again, the LED stays on continuously and the heater returns to its normal state. The LED will turn off when the heat cycle is completed.

·If the heating temperature does not reach its inputted setting, the LED blinks and the alarm sounds. If this happens, contact the authorized distributor.

- (3) <u>Fiber protection sleeve adhered to heating plate after shrink</u>
 ·Use a cotton swab or a similar soft tip object to push and remove the sleeve. If the black coating is removed, contact your authorized distributor.
- (4) <u>Method to initialize heating condition of Heater mode</u> ·See Section [Referring to or editing Heater Mode].
- (5) <u>Method to cancel heating process</u> ·<u>RESET</u> key does not cancel the heater. Press <u>HEAT</u> key twice to cancel the heating process.

Supervising

- (1) <u>What functions can be disabled</u> ·See Section [Menu Lock Settings].
- (2) <u>Method to lock "selection" or "editing" of Splice or Heater mode</u> ·See Section [Menu Lock Settings].
- (3) <u>Method to set parameters of Splice or Heater mode from a PC</u> •Refer to the communication software "Data Connection" included in CD-ROM.
- (4) <u>Forgot password</u> ·Contact the authorized distributor.

Other Functions

- (1) <u>Method to hide messages on [READY] screen</u>
 Change the fiber image from X/Y view to X magnified view or Y magnified view by pressing X/Y key.
- (2) Too many repetitions until "Test Finish" indicated in [Arc Calibration]

•The splicer needs to repeat the arc calibration after replacing the electrodes or when the environmental conditions change drastically. The number of arc calibrations can be set to a specific amount. When the splicer completes the set amount of calibrations, it indicates "Test Finish". However, this does not mean it is completely calibrated. The [Arc Calibration] of [Machine Settings] is referred to.

- (3) <u>"Test Finish" is never indicated after many repetitions in [Arc Calibration]</u>
 •Execute [Stabilize Electrodes] function in [Maintenance Menu]. If the splicer still does not indicate "Test Finish", replace the electrodes. See section [Replace Electrodes] function.
- (4) <u>No arc power change after [Arc Calibration]</u>
 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.
- (5) <u>Method to input different comments after each splice in splice results data</u> ·See section [Splice Memory Comment].
- (6) <u>Method to download splice results from splicer to PC</u> •Refer to the instruction manual "Data Connection" included in the CD-ROM. Press [F1] key after installing the software to display the instruction manual. Contact the authorized distributor for further inquiries.

Guarantee and Contact Address

Guarantee



1. Guarantee period and limits

If the splicer becomes out of order within one 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:

- (1) Trouble or damage due to natural disaster.
- (2) Trouble or damage due to mishandling.
- (3) Trouble or damage due to handling in disregard of the operating procedures or instructions described in the instruction manual.
- (4) Consumable items (discharge electrodes etc.) Please note that the memory of the splice results, parameters, etc. may be deleted during the repair.
- (5) Trouble or damage due to abnormal voltage supply. Most cases of damage to the AC adapter from an abnormal power supply occur within the warranty period. The specification of AC input voltage is up to AC240V (340V-peak).

2.Guarantee item coverage

It covers Splicer's and Accessories' standard package <u>except for consumables like battery</u> <u>or electrodes</u>.

3. Before shipping the splicer

Please consult the authorized distributor first.

4. Necessary information needed for repair

Include documentation with the splicer informing us of the details listed below.

- (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. *Etc.*

5. Transporting the splicer

Since the splicer is a high-precision machine, always use the original carrying case for transportation and storage in order to protect it against humidity, vibration and shock. When requesting splicer repair, please send it, along with its accessories, in its original carrying case.

6. Note for Repair

Please note the memory contents, such as splicing results, splice mode, etc., may be lost depending on the kind of repair.

Guarantee and Contact Address

Contact Address



Inquiries concerning products should be made to the authorized distributor or one of the following:

Fujikura Europe Ltd.
C51 Barwell Business Park
Leatherhead Road, Chessington, Surrey KT9 2NY
UK
Tel. +44-20-8240-2000 (Service: +44-20-8240-2020)
Fax. +44-20-8240-2010 (Service: +44-20-8240-2029)
URL http://www.fujikura.co.uk

AFL

260 Parkway East Duncan, SOUTH CAROLINA 29334 U.S.A. Tel. +1-800-235-3423 (Service: +1-800-866-3602) Fax. +1-800-926-0007 (Service: +1-800-433-5452) P.O.Box 3127 Spartanburg, SC 29304-3127 URL http://www.AFLglobal.com

Fujikura Asia Ltd. 438A Alexandra Road, Block A Alexandra Techno Park #08-03, SINGAPORE, 119967 Tel. +65-6278-8955 Fax. +65-6273-7705 URL http://www.fujikura.com.sg

Fujikura Ltd. 1-5-1 Kiba, Koto-ku, Tokyo 135-8512 Japan Tel. +81-3-5606-1131 Fax. +81-3-5606-1528 URL <u>http://www.fusionsplicer.fujikura.com</u>

----- End of Document -----